INTERNATIONAL COURT OF JUSTICE

CASE CONCERNING
AERIAL HERBICIDE SPRAYING

(ECUADOR v. COLOMBIA)

COUNTER-MEMORIAL OF THE REPUBLIC OF COLOMBIA

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COUNTER-MEMORIAL OF THE REPUBLIC OF COLOMBIA

Chapter 1

ECUADOR'S CASE: AN OVERVIEW

1.1 This Memorial is filed in accordance with the Court's Order of 30 May 2008 and responds to the Memorial submitted by Ecuador on 28 April 2009.

A. The Court's Jurisdiction over the Dispute and the Admissibility of Ecuador's Claims

1.2 The present dispute concerns Ecuador's objections to Colombia's programme of aerial spraying of illicit coca crops, and the supposed transboundary impact of that program on Ecuador, its residents and on the environment.

1.3 In its Memorial, Ecuador seeks to found the jurisdiction of the Court over the present dispute upon two bases,[1] namely:

(a) Article XXXI of the American Treaty on Pacific Settlement ("the Pact of Bogotá");[2] and

(b) Article 32 of the United Nations Convention Against Illicit Traffic in Narcotic Drugs and

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[1] EM, paras. 4.1, 4.3.

[2] EM, Vol. II, Annex 1.

Psychotropic Substances 1988 ("the 1988 UN Narcotics Convention").[3]

(1) JURISDICTION UNDER THE PACT OF BOGOTÁ

1.4 As to the Pact of Bogotá, Colombia has been a party since 1968. For its part, Ecuador signed it on 30 April 1948, subject to the following reservation:

> "The Delegation of Ecuador, upon signing this Pact, makes an express reservation with regard to Article VI and also every provision that contradicts or is not in harmony with the principles proclaimed by or the stipulations contained in the Charter of the United Nations, the Charter of the Organization of American States, or the Constitution of the Republic of Ecuador."

Article VI of the Pact provides that the obligation to settle disputes through access to the Court:

> "may not be applied to matters already settled by arrangement between the parties, or by arbitral award or by decision of an international court, or which are governed by agreements or treaties in force on the date of the conclusion of the present Treaty."

1.5 The effect of Ecuador's reservation upon signature would have been to expand the Court's jurisdiction to the matters deliberately excluded by Article VI, including matters "already governed by agreements or treaties in force". But

[3] 1582 UNTS 164; E/Conf. 82/15; EM, vol. II, Annex 3.

(quite apart from other problems with Ecuador's reservation, including the reference to its Constitution as overriding the Pact), a State cannot unilaterally expand the scope of another State's consent to jurisdiction. Thus the validity of the reservation was doubtful.

1.6 In the event, Ecuador waited almost 50 years to ratify the Pact, and when it did so, by notification of 7 May 2008, it paid no attention to the reservation it had already made. In its Memorial, although referring to the fact that a reservation was made upon signature, Ecuador simply states that the reservation is "of no relevance to this case:[4] in particular it does not resile from the reservation. In the circumstances that occurred, the requirement expressed in Article 23(2) of the Vienna Convention on the Law of Treaties has not been satisfied, and the reservation not having been "formally confirmed by the reserving State" must be regarded as having been withdrawn. Colombia calls on Ecuador to confirm that this is indeed the case.

(2) JURISDICTION UNDER THE 1988 CONVENTION

1.7 Ecuador asserts that the 1988 Convention "impos[es] obligations in relation to the respect for sovereignty and territorial integrity, protection of the environment and respect

[4] EM, para. 4.5.

for fundamental human rights,"[5] and that the consequence of Articles 2 and 14 of the 1988 Convention is that the Convention "imposes obligations that cover the entire subject matter of the dispute that is before the Court".[6] In this context it refers to:

(1) Article 2 of the 1988 Convention, in particular Article 2(2), which provides that the Parties "shall carry out their obligations under this Convention in a manner consistent with the principles of sovereign equality and territorial integrity of States and that of non-intervention in the domestic affairs of other States";[7] and

(2) Article 14(2), which imposes an obligation upon the Parties to take measures to "prevent illicit cultivation of and to eradicate plants containing narcotic or psychotropic substances", and goes on to provide that "The measures adopted shall respect fundamental human rights and shall take due account of traditional licit uses, where there is historic evidence of such use, as well as the protection of the environment."[8]

1.8 Elsewhere in the Memorial, Ecuador argues:

(1) "By allowing these deposits caused by aerial spraying in border areas, Colombia has violated its international obligations to respect the territorial sovereignty of Ecuador. These obligations arise under general international law. They also arise by operation of specific treaties,

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5 EM, para. 4.18.
6 EM, para. 4.18.
7 EM, para. 4.19.
8 EM, para. 4.20.

including in particular [Article 2 of the 1988 Narcotics Convention]"[9]

(2) that the obligation to prevent transboundary harm is "imported directly into these proceedings" by Article 14 of the 1988 Convention,[10] and that "Colombia has undertaken aerial spraying […] in a manner which fails to respect fundamental human rights and protect the environment, thereby violating, *inter alia*, Article 14(2) of the 1988 Narcotics Convention […]"[11]

(3) that "there is a continuing and necessarily evolving duty to protect Ecuador from environmental harm in accordance with the terms of Article 14(2)" of the 1988 Convention;[12]

(4) that Article 14(2) of the 1988 Convention "is intended to incorporate the relevant requirements of international environmental law […] [and] with respect to human rights";[13]

(5) that the alleged failure by Colombia "to protect the environment of Ecuador from the effects of its aerial spraying activities" "represents a breach of the 1988 Narcotics Convention" and of Colombia's "obligation under Article 14(2) to respect fundamental human rights";[14]

(6) that "Colombia has undertaken aerial spraying in a manner that violates Article 14(2) of the 1988 Narcotics Convention";[15]

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[9] EM, para. 7.1. However, later in Chapter 7, Ecuador does not explicitly plead breach of Article 2 of the 1988 Convention, see in particular EM, para. 7.22-7.23; although cf. EM, para. 1.19.

[10] EM, para. 8.1.

[11] EM, para. 8.2.

[12] EM, para. 8.74.

[13] EM, para. 8.73.

[14] EM, para. 8.79.

[15] EM, para. 8.81; see also *ibid.*, para. 8.84, alleging that "Colombia did not cooperate as required by international law, nor did it take measures to guarantee respect for fundamental human rights or protection of

(7) that obligations to protect human rights are "imported directly into the present dispute by the 1988 Narcotics Convention",[16] and that, by reason of the aerial spraying, not only is Colombia alleged to have violated a number of obligations owed to Ecuador under international human rights treaties "but additionally or alternatively the 1988 Narcotics Convention, Article 14(2)";[17] and

(8) that Colombia has "violated the 1988 UN Narcotic Drugs Convention, insofar as human rights obligations are incorporated thereunder by virtue of Article 14(2)".[18]

1.9 Ecuador's arguments in this regard suggest that the 1988 Convention imposes certain obligations in relation to territorial sovereignty, transboundary harm and fundamental human rights. As will be demonstrated in later Chapters, these arguments cannot be accepted.[19] On its true interpretation, the 1988 Convention merely makes reference to those concepts in defining and limiting the substantive obligations of the States Parties under the 1988 Convention, in particular the obligation to take measures to prevent illicit cultivation of and to eradicate plants containing narcotic or psychotropic substances under Article 14.

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the environment as required by Article 14(2) of the 1988 Narcotics Convention."

[16] EM, para. 9.11.

[17] EM, para. 9.11

[18] EM, para. 9.109.

[19] See Chapters 8 and 9 below.

1.10 Thus, the 1988 Convention is nonetheless central to the dispute, since it actually requires Colombia, by means of its choosing, to engage in the campaign against illicit drugs, including the eradication program, and indeed calls on other States to cooperate with Colombia in that regard.

1.11 Article 14 is entitled "Measures to Eradicate Illicit Cultivation of Narcotic Plants and to Eliminate Illicit Demand for Narcotic Drugs and Psychotropic Substances". Article 14(1) preserves the rights and obligations of parties to the earlier drugs conventions of 1961 and 1971: the 1988 Convention is to be "no less stringent" than these earlier conventions. Article 14(2) then provides:

> "Each Party shall take appropriate measures to prevent illicit cultivation of and to eradicate plants containing narcotic or psychotropic substances, such as opium poppy, coca bush and cannabis plants, cultivated illicitly in its territory. The measures adopted shall respect fundamental human rights and shall take due account of traditional licit uses, where there is historic evidence of such use, as well as the protection of the environment."

1.12 On its face, Article 14(2) does not impose independent obligations as regards fundamental human rights or protection of the environment. Rather, it is concerned with imposing an obligation upon States to adopt measures to prevent illicit cultivation of plants containing narcotic or psychotropic

substances, subject to the qualification that such measures respect or take into account the considerations mentioned.

1.13 It is Colombia's position that the aerial spraying program, far from being in breach of Article 14(2), is actually an implementation of it. This has material consequences for the case, in that if this is so, Ecuador itself was under an obligation, under Article 14(3)(c), to cooperate in its implementation, whereas in fact it has done nothing of the sort. But at the level of jurisdiction, there is plainly a dispute between the parties as to the interpretation and application of the 1988 Convention.

(3) INADMISSIBILITY OF ECUADOR'S CLAIMS ON BEHALF OF COLOMBIAN NATIONALS[20]

1.14 In Chapter 9 of its Memorial, Ecuador alleges breaches of a whole catalogue of international human rights obligations (including the rights to life, health, food, water, a healthy environment, private life, property and information) as well as alleging violation of the rights of indigenous peoples.

1.15 In setting out those allegations and its arguments as to its claim for compensation, Ecuador's Memorial is fundamentally unclear as to the group or groups of persons to which the claims

[20] Issues of admissibility can be raised at the merits phase: Avena and Other Mexican Nationals (Mexico v United States of America), ICJ Reports 2004, p. 28, para. 24. See also Application of the Convention on the Prevention and Punishment of the Crime of Genocide (Bosnia and Herzegovina v. Serbia and Montenegro), Judgment of 26 February 2007, para. 101.

relate and in relation to which declarations of violation or compensation is sought. In particular, it is not clear whether it purports to bring claims only on behalf of its own nationals. Clarity as to the scope of Ecuador's claims in this regard is not assisted by its tactic of requesting the Court first to declare a violation of the relevant obligations while reserving the right to provide proof of the damage allegedly suffered in a later phase of the proceedings.[21]

1.16 In setting out its claims of violation of human rights and the rights of indigenous peoples in Chapter 9 of the Memorial, Ecuador utilizes a variety of formulations to refer to the individuals in relation to whom the various violations are alleged to have occurred, including:

- "the indigenous Awá, Cofán and Kichwa peoples and of the Afro-Ecuadorian communities in Esmeraldas";[22] "the local indigenous populations";[23] "indigenous peoples", "the affected indigenous peoples", "indigenous communities" and "indigenous communities in the region";[24] "indigenous peoples [...] in border areas";[25] "indigenous communities who live, farm and hunt in the affected areas"[26]; and "indigenous communities,

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21 EM, paras. 9.110 and 10.58.
22 EM, para. 9.22.
23 EM, para. 9.28.
24 EM, para. 9.29(a)-(e).
25 EM, para. 9.36.
26 EM, para. 9.37.

including those in Ecuador"[27] (rights of indigenous peoples);

- "indigenous communities in the areas affected by the sprayings"[28] and "those living in affected border areas of Ecuador"[29] (right to life);
- "local communities in Ecuador";[30] "the affected populations in Ecuador";[31] "indigenous peoples living along the border" and "farming communities in the region";[32] and "the Ecuadorian population along the border";[33] (right to health);
- "communities in the areas affected by the aerial spraying";[34] and "local communities";[35] "local communities in Ecuador";[36] and "farmers and indigenous peoples"[37] (right to food);
- "[l]ocal communities in the border area between Colombia and Ecuador",[38] and "affected farmers and indigenous peoples [...] the most vulnerable populations

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27 EM, para. 9.38.
28 EM, para. 9.47.
29 EM, para. 9.48.
30 EM, para. 9.51.
31 EM, para. 9.51.
32 EM, para. 9.55.
33 EM, para. 9.56.
34 EM, para. 9.60.
35 EM, para. 9.61.
36 EM, para. 9.64.
37 EM, para. 9.65.
38 EM, para. 9.70.

living along the Ecuador-Colombia border"[39] (right to water);

- "the concerned Ecuadorian population"[40] and "farming and indigenous communities in the border area";[41] and "peoples'"[42] (right to a healthy environment);
- "people living in the border area with Colombia";[43] and "farmers"[44] (right to property);
- "the Ecuadorian population in the border region",[45] (right to humane treatment);
- "local communities" in the border area;[46] and "local communities", "farmers and indigenous peoples"[47] (right to private life);
- "the local population in the affected areas";[48] "those likely to be affected by the aerial sprayings";[49] "inhabitants in the border area" and "the population in the border area"[50] and "those likely to be affected when

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39 EM, para. 9.74
40 EM, para. 9.83.
41 EM, para. 9.83.
42 EM, para. 9.84.
43 EM, para. 9.86.
44 EM, para. 9.86.
45 EM, para. 9.89.
46 EM, para. 9.95.
47 EM, para. 9.99.
48 EM, para. 9.103.
49 EM, para. 9.104.
50 EM, para. 9.106.

spraying was due to take place"[51] (right to information); and

- "local inhabitants in Ecuadorian territory",[52] "the affected populations", and "indigenous peoples".[53]

1.17 As regards Ecuador's discussion of remedies, in Chapter 10 of its Memorial, Ecuador alleges in general terms that:

> "Colombia's actions have caused grave, continuing and long-lasting harms to Ecuador: to its sovereignty, to *its people and property, including indigenous peoples*, and to its environment".[54]

1.18 Ecuador goes on to make clear that it seeks declarations of Colombia's alleged breaches of international law, cessation of those alleged breaches, assurances and guarantees of non-repetition,[55] as well as compensation in relation to certain of the breaches.

1.19 At the outset of its discussion of the harm allegedly suffered, Ecuador alleges that the spraying has "caused damage and injury to human health, including illness and death among the *people who inhabit the border region*",[56] alleges that "the health of *people in the border region* has been adversely

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51 EM, para. 9.107.
52 EM, para. 9.108.
53 EM, para. 9.108.
54 EM, para. 10.2 (emphasis added).
55 EM, para. 10.2.
56 EM, para. 10.9 (emphasis added).

affected by pollution of freshwater supplies used for drinking, cooking and bathing"[57] and makes reference to the "crops upon which *indigenous and local communities in Ecuador's border region* depend".[58]

1.20 Chapter 10 of Ecuador's Memorial is contradictory as to the precise scope of Ecuador's claim for compensation as regards death or injury to health. One paragraph suggests that the claims in this regard should be understood as relating to damage suffered by "local communities and indigenous people *in the border region of Ecuador* affected by the aerial herbicide spraying", a position which would appear to cover literally "any person or persons".[59] However, a few paragraphs later, Ecuador specifies that it seeks compensation "in respect of the loss of life and damage to the health of *its nationals* caused by the herbicide spraying".[60]

1.21 Things are no clearer as regards the claim for compensation in relation to "loss of or damage to the property or livelihood or human rights of such persons". Ecuador alleges that Colombia's aerial spraying has "damaged property of *local and indigenous communities in the border region*, and adversely affected their livelihoods",[61] that the spraying has caused crop

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57 EM, para. 10.9 (emphasis added).
58 EM, para. 10.9 (emphasis added).
59 EM, para. 10.30 (emphasis added); and see also EM, para. 10.29.
60 EM, para. 10.34 (emphasis added).
61 EM, para. 10.35 (emphasis added).

damage which has had a "significant adverse impact on the livelihoods and food security of the *local people*,"[62] and that, as a consequence, it is "entitled to full compensation in respect of this loss of or damage to property, including crops and domestic animals, and the costs imposed by the displacement of *farmers and affected other individuals*".[63]

1.22 Ecuador's Final Submissions to the Court as regards compensation go substantially further than the arguments developed in the body of its Memorial. Paragraph (B) of the Submissions requests the Court to order that

> "Colombia shall indemnify Ecuador for any loss or damage caused by its internationally unlawful acts, namely the use of herbicides by aerial dispersion, and in particular:
>
> > (i) death or injury to the health of any person or persons arising from the use of such herbicides;
> >
> > (ii) any loss of or damage to the property or livelihood of such persons;
> >
> > (iii) *violation of the human rights of such persons*;
> >
> > (iv) *violation of the special rights of indigenous peoples*;
> >
> > (v) environmental damage or the depletion of natural resources;
> >
> > (vi) the costs of monitoring to identify and assess future risks to public health,

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62 EM, para. 10.36 (emphasis added).

63 EM, para. 10.37 (emphasis added).

> human rights and the environment resulting from Colombia's use of herbicides; and
>
> (vii) any other loss or damage;".[64]

1.23 Although the terms of sub-paragraphs (i), (ii), (v) and (vii) track the terms of Ecuador's development of its arguments as to compensation contained in Chapter 10 of the Memorial, set out above, sub-paragraphs (iii) and (iv) (relating, respectively, to the alleged violations of human rights and alleged violations of the rights of indigenous peoples) are not mentioned at all in the context of compensation in Chapter 10. Ecuador merely reserves its right to supplement the heads under which it claims compensation at a later date.[65]

1.24 Thus the way in which Ecuador's claims are put is far from consistent. Although certain passages of the Memorial are phrased extremely broadly, and might be read as implying that Ecuador is bringing claims in respect of the harm allegedly suffered by *all* individuals in the border region alleged to have been affected by the aerial spraying, whether in Ecuador or in Colombia, other passages (and in particular its claim for relief) imply that Ecuador is bringing claims on behalf of, and seeks compensation in respect of, alleged injury to all persons on its

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64 EM, p. 412 (emphasis added).

65 EM, para. 10.58. See also para. 9.110.

territory, [66] including Colombian nationals and any nationals of third States. In fact, Ecuador has filed a number of witness statements made by Colombians living in the border area,[67] Although elsewhere in the Memorial as a general matter it disclaims any intention "to press claims on behalf of the people of Colombia",[68] it appears to be pressing claims on behalf of some individual Colombians.

1.25 There is no basis for it to do so. It is well-established that a State cannot bring claims for compensation against another State in respect of nationals of the latter State. That rule, articulated in the *Mavrommatis* case,[69] is confirmed by modern practice as well. The ILC Articles on Diplomatic Protection sought to develop certain exceptions to the nationality of claims, but in all circumstances retained the rule that no claim could be brought against the State of nationality.[70]

B. Ecuador's Case as Disclosed by the Memorial

1.26 In its Memorial of 28 April 2009, Ecuador argues that Colombia's aerial spraying program has "caused extensive,

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[66] See e.g. EM, para. 5.3 "Ecuador's claims are based solely on harms caused by Colombia's aerial spraying programme within Ecuador, namely to *people, plants, animals and the natural environment on the Ecuadorian side of the common border*" (emphasis added).

[67] EM, vol. IV, Annexes 225-233.

[68] EM, para. 5.101; although cf. the more ambiguous terms of EM, para. 5.3.

[69] *Mavrommatis Palestine Concessions* (*Greece v. U.K.*) *P.C.I.J. Reports, 1924, Series A, No. 2,* p. 12.

[70] See ILC Articles on Diplomatic Protection, arts 5(3), 7, 8(3) & commentary thereto, in *ILC Report 2006*, A/61/10, ch. IV.

long-lasting and widespread harm to Ecuador, to its people and to its environment".[71] Ecuador's case is predicated on a conclusion of fact, expressed in such phrases as: "the toxic mixture used in the aerial fumigations has polluted water, killed wild and domestic animals, destroyed forest and decimated crops".[72] "Colombia's actions have had a particularly devastating impact on Ecuador's rich, protected environment, on plants, animals and wildlife, as well as on the communities that are dependent on the long term well-being of that environment. … The fragile equilibrium prevailing between these communities and their environment, which is a constitutive part of their specific culture, has been severely endangered and, in some cases, destroyed; this has forced indigenous and other local residents to abandon their areas of settlement."[73] "The spraying of toxic chemicals on the border area has severely disrupted the lives of local communities over many years, to the point that their lives have been transformed."[74] "Colombia's aerial spraying of herbicides has destroyed or damaged thousands of hectares of valuable crops in Ecuador, with particularly devastating effects on short-cycle crops and the subsistence crops upon which indigenous and local communities in Ecuador's border region depend."[75] Overall, "the harms occasioned by Colombia's fumigations constitute an integrated,

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71 EM, para. 1.5.
72 EM, para. 9.83.
73 EM, para. 1.10.
74 EM, para. 9.95.
75 EM, para. 10.9.

mutually reinforcing whole that have *undone the very fabric of life* in the border region".[76]

1.27 According to Ecuador, this is above all, then, a case about allegations of very serious transboundary harm allegedly caused by conduct of Colombia through a program ostensibly designed to combat the production process of cocaine, an illicit drug, on Colombian territory.

1.28 The catalogue of alleged damage is a long one, but it is sufficient to focus on deaths and long-term injury as set out in the fact witness statements annexed to the Memorial. There is uncertainty as to the identity of the victims, and in most cases names are not given. But it appears from those witness statements that a significant number of deaths of individuals resident within Ecuador, mostly children but also some adults, are attributed to exposure to aerial spraying.[77] Also attributed to the spraying are birth deformities (Annex 162), miscarriages (Annex 169, Annex 225), impaired sight (Annex 200), continued headaches and dizziness (Annex 203), facial disfigurement (Annex 218), as well as shorter term problems (vomiting, allergies, diarrhoea, flu-like symptoms).[78] These are

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[76] EM, para. 6.6.

[77] See EM, vol. IV, Annexes 161, 162, 166, 169, 194, 199, 200, 201, 204. Because of the vagueness of details and likely overlaps, it is not possible to say how many individuals are involved in these allegations, or indeed how many of these deaths are attributed by Ecuador to the spraying program.

[78] For further analysis see Chapter 7 of this Counter-Memorial.

serious allegations; but it is also said that the spraying caused the death of a veritable catacomb of cows, horses and other farm animals.[79]

1.29 Other documents relied upon by Ecuador are even more extreme. According to a report by *Acción Ecológica*, as of June 2001:

> "100% of the people living in the border have suffered poisoning from the sprayings with RoundUp Ultra in a 5-km band, and 89% if the band is extended to 10 km."[80]

1.30 There is not a trace of evidence that any proportion of persons living kilometres from the area where the spraying took place could possibly have been affected by it – still less 89% of the population. Far from being evidence of breach by Colombia of any obligation in relation to transboundary harm, the report by *Acción Ecológica* – if evidence of anything – is evidence of an epidemic unrelated to aerial spraying.

1.31 It is true that Ecuador also pleads causes of action that are not dependent on the proof of serious (or indeed any) transboundary harm. In particular:

(1) Under the rubric of "sovereignty" and "territorial integrity" it appears to assert a doctrine of

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[79] See in particular below, paras.7.149-7.152.

[80] See EM, Vol. IV, Annex 161, p. 11.

absolute immunity, i.e. that zero amount of drift of the spray mix should cross the border.[81]

(2) It argues that Colombia did not conduct an environmental impact assessment in relation to the aerial spraying program, whether in Colombia or specifically in relation to possible impacts in Ecuador.[82]

(3) It argues that Colombia failed to cooperate with Ecuador in investigating possible impacts of aerial spraying, and failed to provide relevant information.[83]

(4) It suggests, with little or no detail, that there have been cases of overflight over Ecuadorian territory.[84]

But these claims are subsidiary to Ecuador's principal position, which is that Colombia has persistently caused serious and substantial harm to Ecuador and its people in breach of applicable norms of international law.

C. Colombia's Response on the Merits

1.32 Colombia's position, as demonstrated in this Counter-Memorial, is straightforward. It is simply that there is no reliable evidence that any of the damage alleged has actually occurred, still less that it is attributable to aerial spraying; the evidence is to the contrary. In this context, it must be stressed that the onus of proof both of damage to its territory and of

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81 See EM, paras. 10.13, Submissions, para. (C)(v).

82 See EM, paras. 8.41-8.44.

83 See EM, paras. 8.38-8.70.

84 E.g., EM, para. 6.3.

causation is on Ecuador as the Applicant and moving party in these proceedings.

1.33 But Colombia does not rely only on the burden of proof. If the deaths of humans, large farm animals, etc had actually occurred in Ecuador on this scale as a result of the aerial spraying, that fact could – and should – be proved beyond a shadow of a doubt. There would be forensic reports, coronial inquests, detailed medical evidence supported by qualified experts, etc. None of this has been produced.[85] The same is true of the environmental devastation allegedly caused by spray drift. There should be concrete evidence, including photographs, of "thousands of hectares of valuable crops" lying dead in the fields, official government reports, substantiated reports by internationally recognised environmental and other scientific experts, etc. Again, none of this has been produced. Instead, Ecuador has produced a small number of anonymised witness statements, alleging in vague and unverifiable terms a range of harms which occurred between 7 and 9 years previously. It has also commissioned one new scientific report (hereafter the Menzie Report[86]) which focuses almost entirely on

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[85] By contrast, an affidavit by the Director of the Lago Agrio hospital – "the only hospital for the communities in Sucumbíos near the border with Colombia" (EM, Vol. IV, Annex 188, p. 2) – states that in the period since 1999 he "generally saw the most extreme cases" (*Ibid.*, p. 3). Dr Sánchez makes no reference to any deaths or long-term impairment. He produces no medical evidence as to the causes of the "headache, vomiting and skin problems" which he did observe.

[86] C.A. Menzie, P.N. Booth & S.B.K. Driscoll, "Evaluation on Chemicals used in Colombia's Aerial Spraying Program and Hazards

potentialities, is written in complete disregard of likely dose rates and actual exposures, and is not based on any scientific field work.[87]

1.34 The position described in the previous paragraph is confirmed by the following considerations:

(1) The aerial spraying program carried out by Colombia is not confined to the border region. It is a Colombia-wide program. Exactly the same procedure, equipment and materials are used when spraying in Colombian territory close to the border with Ecuador as in the rest of Colombia. If mere drift of the spraying mixture across the border into Ecuador had caused the catalogue of harms recited by Ecuador, what would be the position in Colombia itself, the actual target of many thousands of spray missions over 10 years? The result would be carnage, hundreds if not thousands of deaths of humans and large animals, environmental devastation, economic collapse. Nothing of the sort has occurred. No substantiated complaint of death or serious harm to human health has been presented in Colombia since the inception of the program. No

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Presented to People, Plants, Animals, and the Environment in Ecuador" (April 2009), EM, Vol. III, Annex 158.

[87] For an analysis of the Menzie Report see below, paragraphs 7.95-7.104.

substantiated case has been presented of death to large mammals (e.g., cows and horses). There have been occasional cases of harm to lawful crops – for which, if duly established, compensation has been paid.[88] But these were cases of direct spraying, not of spray drift over hundreds of metres, still less kilometres.

(2) The spray mixture (published and well-known) is based on commercially-available widely-used chemicals which are lawful in Colombia and in many other countries, including Ecuador. Glyphosate, the active ingredient, is incapable of causing most of the damages, in particular to humans and animals, alleged by Ecuador, when used as in the Colombian spray program. This fact is established by a series of scientific studies, prepared independently of the present proceedings. These studies were conducted under the auspices of the Inter-American Commission of Drug Abuse Control (CICAD), an organ of the OAS based in Washington.[89] The conclusion of the first of these studies (CICAD I), in 2005, was as follows:

> "The risk assessment concluded that glyphosate and Cosmo-Flux® as used in

[88] See below, paragraph 4.22.

[89] See further paras. 3.54-3.58 and 4.15-4.19 for the origin and outcomes of the CICAD work.

> the eradication program in Colombia did not present a significant risk to human health. Estimated acute worst-case exposures in humans via all routes were less than doses of concern, even for chronic responses. In the entire cycle of coca and poppy production and eradication, human health risks associated with physical injury during clear-cutting and burning and the use of pesticides for protection of the illicit crops were judged to be more important than those from exposure to glyphosate.
>
> For the environment, risks from the use of glyphosate and Cosmo-Flux® to terrestrial animals were judged to be small to negligible."[90]

The conclusion of the second set of studies (CICAD II), published in 2009, was as follows:

> "Overall, the risks to sensitive wildlife and human health from the use of glyphosate in the control of coca (and poppy) production in Colombia are small to negligible, especially when compared to the risks to wildlife and humans that result from the entire process of the production of

[90] Annex 116: CICAD, K.R. Solomon, A. Anadon, A.L. Cerdeira, J. Marshall & L-H. Sanin, "Environmental and Human Health Assessment of the Aerial Spray Program for Coca and Poppy Control in Colombia", OAS, Washington, D.C., 31 March 2005, p. 11 (hereafter referred to as CICAD I).

cocaine (and heroin) in Colombia."[91]

(3) Moreover, Ecuador – for the brief moment when it was prepared to consider the issue on the basis of actual, contemporary field evidence – acknowledged that this was so. In mid-2004, the Ecuadorian Commission on Atomic Energy took water samples in both zones, concluding that "no Glyphosate residues were found" in the waters tested.[92] On 15 October 2004, the Presidents of the two countries declared that "they were pleased with … the delivery of studies conducted in Colombia on the possible effects of the sprayings with glyphosate on illicit crops."[93] On 29 December 2004, the Ecuadorian Foreign Ministry summarized the situation as follows:

> "There is an environment of calm; daily activities are conducted normally; the locals who were interviewed are in good

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[91] Annex 131-A, CICAD II: K.R. Solomon, E.J.P. Marshall & G. Carrasquilla, "Human Health and Environmental Risks from the Use of Glyphosate Formulations to Control the Production of Coca in Colombia: Overview and Conclusions", in *Journal of Toxicology and Environmental Health*, Part A, 72:914-920, 2009, at p. 919. The set of 9 papers published in this Journal will be referred to collectively as CICAD II (Annex 131, Annex 131-A to Annex 131-I).

[92] Annex 80: Press Bulletin Nº 388 of the Ecuadorian Foreign Ministry, "No glyphosate residues exist in the waters of the rivers of the Sucumbíos Province", 25 June 2004; and Annex 81: Press Bulletin Nº 480 of the Ecuadorian Foreign Ministry, "No glyphosate residues were found in Esmeraldas, border with Colombia", 26 August 2004.

[93] Annex 17: Joint Declaration from the Presidents of Colombia and Ecuador, Esmeraldas, Ecuador, 15 October 2004, p. 2.

> health; animals and crops are in order. There has been no violation of the Ecuadorian airspace, nor has there been any displacement of persons."[94]

(4) This is detailed in Chapter 5. However, the point is that for most of the period from December 2004 to the present time (all but 14 months) during which aerial spraying was carried out, it has not been conducted close to the border, as a result of without prejudice abstention on Colombia's part of spraying within 10 km from the border. The relatively few missions conducted during the period when this suspension was not in place cannot possibly have caused the serious harm alleged by Ecuador. If no such harm had been caused by the end of 2004, it was never caused.

1.35 It is to be noted that this Court is not the only forum before which these issues are being litigated. A large group of Ecuadorian nationals (initially more than 3000, though already reduced by a third), plus three Ecuadorian provinces (Carchi, Esmeraldas, Sucumbíos), are plaintiffs in two joined proceedings before a United States District Court for the District of Columbia under the Alien Tort Claims Act. Their claims are brought against DynCorp, the United States corporation which actually carries out the spraying operation under contract with

[94] Annex 84: Memorandum of the Foreign Ministry of Ecuador, 29 December 2004.

the United States Department of State.[95] It is alleged that DynCorp is complicit in a spraying program unlawful under international law. Twenty test plaintiffs have been selected for the purposes of a trial of fact and law. The proceedings are public and the court file is publicly accessible. The names of all the plaintiffs are likewise public.[96]

1.36 The problem of reliability of affidavit evidence of alleged injury is highlighted by the following incident in the *Dyncorp* case before the United States District Court for the District of Columbia.

1.37 Although in the present proceedings Ecuador wishes to protect the identity of its witnesses, it makes an exception for Mr Victor Mestanza.[97] He is said to live at Puerto Mestanza, on the bank of the San Miguel River which constitutes the border. He and seven members of his family are plaintiffs in the *Dyncorp* case. In the course of depositions in that case, it emerged that allegations by five members of the Mestanza family that they suffered personal injury as a result of spraying

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[95] See *Arias v. Dyncorp*, 517 F. Supp. 2d 221 (2007).

[96] At one point there were 3292 named plaintiffs in the two joined cases. Of these, 681 were dismissed without prejudice by order of 16 September 2009, and 590 were dismissed with prejudice by order of 12 January 2010. The latter group of 590 dismissed plaintiffs were "given repeated opportunities to provide the requested information about the location of their exposure and their alleged damages, but have failed to do so", in violation of "multiple explicit court orders": See Annex 155: *Arias v. Dyncorp*, --- F. Supp. 2d ---, 2010 WL 94563 (DDC, 2010, Roberts J). That leaves, for the moment, 2018 plaintiffs, including the 20 "test plaintiffs".

[97] See EM, paras. 6.67, 6.85, 6.92, 6.93, 6.95.

were untrue: at all relevant times, they were resident at Guayaquil, 400 kms away. In consequence, their personal injury claims were withdrawn, and three of them were dismissed with prejudice from the case.[98] The point is that the five members of the Mestanza family in question gave statements indistinguishable in tone and generic content to those filed by Ecuador in vol. IV of its Memorial.[99] Their statements may appear to be true and telling; they relate to a location virtually on the border, not kilometres away. Yet they are conceded to have been fabricated.

1.38 Against this background, Colombia would make five points.

- First, it is impossible to tell from the anonymous[100] affidavits produced by Ecuador – any more than one can tell from the named affidavits of the Mestanzas – what actually happened seven or nine years ago. It is only by a proper forensic procedure – or by

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[98] See Annex 153: *Arias v. Dyncorp*, Plaintiffs' Motion to dismiss Three Individual Plaintiffs, 23 December 2009; Annex 154: Defendants' Response, 6 January 2010. The extent of misrepresentation is detailed at *ibid.*, pp. 3-10. These documents are publicly accessible on the District Court's file.

[99] See *ibid.*, pp. 5-8 for a summary of the sworn statements now retracted.

[100] After the Memorial had been filed, Ecuador made an offer through the Registrar to Colombia to disclose the names of witnesses on a restricted basis. The inference was that Colombian officials generally could not be trusted not to interfere with witnesses. Rather than allow such an inference to stand, Colombia has preferred to receive the witness statements anonymously. (It notes, however, that the plaintiffs in the *Dyncorp* litigation have not sought anonymity: see para.1.35 above.)

unequivocal independent evidence – that the truth can be established. In the present case there is no unequivocal independent evidence of harm, as distinct from mere assertion.

- Second, an even more crucial question in the present case is whether such harm as may have occurred was caused by the aerial spraying in Colombia. The fact that someone says he saw planes in the distance and that certain harms were suffered at the time does nothing to establish causation – even if it were true. It has to be shown that the spraying caused the injury.

- Third, when reputable scientists confirm that a spray mixture "did not present a significant risk to human health", a case that depends in major part on the proposition that serious long-term health problems were caused is directly challenged; it is challenged in its essentials. Ecuador's case, to repeat, is that Colombia "caused extensive, long-lasting and widespread harm to Ecuador, to its people and to its environment",[101] and the core of its case concerns lasting personal injury and perhaps even death. If that core fails, the whole case is fatally impaired.

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[101] EM, para. 1.5.

- Fourth, as will be shown in Chapter 2, the two Ecuadorian provinces concerned are amongst the poorest and most deprived regions of Ecuador. Child mortality throughout these provinces is abnormally high; sanitation is poor; access to medical services is limited. According to Ecuador itself, "nearly one-third of all the residents in rural areas of Esmeraldas, Carchi and Sucumbíos, including children, suffered from chronic malnutrition" in 2001.[102] That has nothing to do with the spray program.

- Health problems in the border area may however have something to do with the very reasons for the spray program, since the unlawful cultivation of coca plants carries a serious risk of personal injury, poisoning by much more toxic chemicals and harm to the environment. The production of coca paste for drug trafficking in this region is intimately linked to the activities of unlawful armed bands. Clearing of jungle to plant coca is immensely destructive: it has been estimated that from 1990-2004, approximately 345,233 hectares of forest were cleared.[103] The pesticides used in coca cultivation, and the chemicals

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[102] EM, para. 2.23.

[103] Annex 131-D, CICAD II: R.A. Brain & K.R. Solomon, "Comparison of the Hazards posed to Amphibians by the Glyphosate Spray Control Program versus the Chemical and Physical Activities of Coca Production in Colombia", in *Journal of Toxicology and Environmental Health*, Part A, 72:937-948, 2009, at p. 945.

used in the production process in laboratories in the border area, do much more damage to humans, to flora and fauna, than the spray mixture could ever do. Again, this point is established beyond doubt by independent scientists. As part of CICAD I, a two-tier hazard assessment was undertaken of the toxicology of substances used in the production of cocaine and heroin. The authors concluded:

> "many of the substances used in cocaine and heroin production and refining are potentially hazardous to human and environmental health. Comparatively, several of the short-listed pesticides are considerably more toxic to humans and non-target organisms in the environment than glyphosate (plus Cosmo-Flux®). Most of the more hazardous pesticides were found to be insecticides, which are toxic to mammals and other wildlife, as well as to insects. [I]f used improperly, particularly in the production of coca and heroin, these compounds have the potential to present significant hazards to human and environmental health, much more so than the hazards identified for glyphosate as used in the eradication of the illicit crops."[104]

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[104] Annex 118, CICAD I: R.A. Brain, A.N. Crossan, L. Smith, K.R. Solomon, "The Toxicology of Substances used in the Production and Refining of Cocaine and Heroin: A Tier-Two Hazard Assessment" (CICAD OAS, Washington, 31 July 2005) Executive Summary, p. v. The full Report with appendices is available at: http://www.cicad.oas.org/Desarrollo_Alternativo/ENG/Projects%20By%20Country/Colombia/OAS_CICAD_Tier_2_Hazard_Assessment_July_2005%5B1%5D.pdf (last visited 10 March 2010).

1.39 In short, if the harms enumerated by Ecuador occurred – and the extent to which they did so cannot be determined on the very limited evidence put forward by Ecuador – there are very good explanations for the cause of those harms which have nothing to do with aerial spraying.

1.40 Ecuador has sought to reformulate its arguments in terms both of human rights standards and of putative standards concerning the rights of indigenous peoples. These claims will be dealt with in Chapter 9 of this Counter-Memorial. But the core point is that a failed claim for causing serious transboundary harm to persons and the environment is not improved by recasting it in terms of human or indigenous rights. Colombia was, no doubt, obliged to consider potential impacts on its neighbours, and on the environment, in formulating and implementing the aerial spraying program. But if it in fact did no harm in the course of its lawful conduct, and no evidence has shown otherwise, if it gauged the risks in a reasonable manner, as will be demonstrated below, it is not necessary of the Court to analyse considerations of observance of human rights standards.

1.41 As to the *per se* violations of international law on which Ecuador relies (paragraph 1.33 above), Colombia would make the following points:

(1) The doctrine of "absolute immunity" relied upon by Ecuador does not represent international law:

the world is not divided into hermetically sealed boxes. The obligation is to take all reasonable measures not to cause significant harm.[105]

(2) As to assessment, Colombia assessed the aerial spraying program at the time it was introduced, and continued to do so. Its assessments, as reflected in the Environment Management Plan, accorded with Colombian law in force at all relevant times, and have since been vindicated by the two CICAD reports.[106]

(3) Colombia did in fact cooperate with Ecuador in investigating possible impacts of aerial spraying, and it did provide relevant information.[107] Ecuador's real complaint is that Colombia did not *agree* with its position against aerial spraying – but Colombia was under no obligation to accept Ecuador's views. On the contrary both States were and are bound by the 1988 United Nations Convention against Illicit Traffic of Narcotic Drugs and Psychotropic Substances, in particular Article 14. If there has been any failure of cooperation in the present case, it is a

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[105] See further, paragraphs 8.34-8.40 and 8.46-8.61.

[106] See further, paragraphs 4.8-4.19, 4.23-4.29. 6.26-6.29, 6.38, 7.12, 7.18-7.22, 7.29, 7.52-7.54, 7.58-7.64, 7.75-7.77, 7.86, 7.91-7.93, 7.171, 7.174-7.175.

[107] See further, paragraphs 5.2-5.44.

failure by Ecuador to cooperate with Colombia in the suppression of trafficking in illicit drugs.

(4) As to overflight, Colombia does not assert any right of overflight for aircraft engaged in spraying operations.

D. The Structure of this Counter-Memorial

1.42 This Counter-Memorial is divided into two parts. Part I (chapters 1-6) establishes the context of the dispute and deals with some key issues of fact.

- Chapter 2 describes the border region and gives a succinct account of its socio-economic difficulties.
- Chapter 3 explains the basis for the fight against the drug trade in Colombia, and the substantial international backing for Colombia's stance.
- Chapter 4 describes in some detail how the aerial spraying program (Program for the Eradication of Illicit Crops by Aerial Spraying with Glyphosate (PECIG)) is carried out.
- Chapter 5 gives a full account of the exchanges between the two States in relation to the dispute since 2000, correcting the many deficiencies of Ecuador's Memorial in that regard.
- Chapter 6 disposes of three of Ecuador's main factual allegations against Colombia.

1.43 Against this background, Part II (chapters 7-10) deals with Ecuador's legal and scientific case.

- Chapter 7 details the scientific evidence concerning aerial spraying with glyphosate, and analyses the allegations of injury made by Ecuador and its witnesses.
- Chapter 8 deals with Ecuador's legal claims for transboundary injury or harm.
- Chapter 9 deals with Ecuador's claims based on human and indigenous rights.
- Chapter 10 deals briefly with the remedial situation.

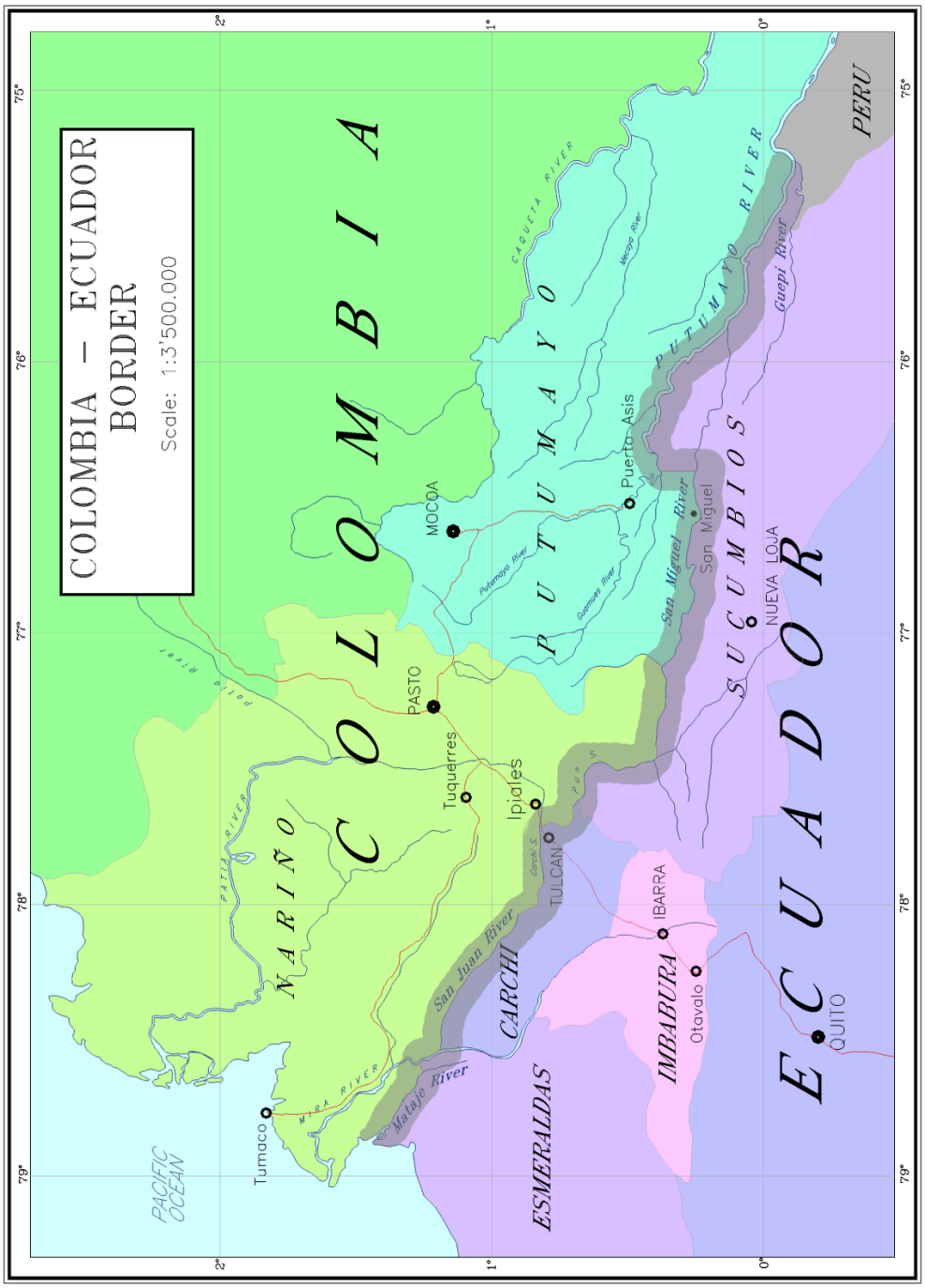
There follow Colombia's submissions.

1.44 Attached to this Counter-Memorial is an Appendix, consisting of an expert report by Dr Stuart Dobson, plus a separate volume of 156 documentary annexes.

PART I

THE FACTUAL MATRIX

Figure 2.1 Colombia-Ecuador Border Region



Chapter 2

THE COLOMBIA-ECUADOR BORDER REGION

2.1. Colombia and Ecuador formed part of a single State until 1830, when the federation of Gran Colombia was dissolved. The land boundary between the two countries was fully and definitively fixed by the Suárez-Muñoz Vernaza Treaty of 15 July 1916[108] and subsequent demarcation agreements. The boundary extends for 717 kilometres from the Pacific Ocean in the west, to the mouth of the Güepí River on the right bank of the Putumayo River in the Amazonian region. It is shown on *Figure 2.1*, opposite.

A. The Sectors of the Border Region

2.2. The frontier zone between Colombia and Ecuador is divided into three sectors with clearly differentiated social, economic and geographical features: the Pacific sector, the Andean sector and the Amazonian sector. For present purposes the relevant provinces are those of Nariño and Putumayo on the Colombian side, and the provinces of Esmeraldas, Carchi and Sucumbíos on the Ecuadorian side.

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108 221 CTS 375.

(1) THE PACIFIC SECTOR

2.3. The Pacific sector is formed of flat or slightly undulating terrain, with large areas of rainforest extending from the coast to the foothills of the Andes. In the territory of Colombia the Pacific sector comprises the province of Nariño; in Ecuador, the province of Esmeraldas. There are two ports in the area: Tumaco in Colombia and Esmeraldas in Ecuador.

2.4. The inhabitants of the Ecuadorian province of Esmeraldas include Afro-Ecuadorians and a number of indigenous groups. The economy of the province is based on the export of shrimp and bananas, as well as cocoa, tobacco and coffee. Other important activities are logging, cultivation of African oil palm (*Elaeis guineensis*), and provision of support and services to the trans-Andean pipeline. Despite a wealth of natural resources, the inhabitants of the Pacific sector suffer severe poverty, and difficult social conditions prevail.[109]

2.5. The Colombian part of the Pacific sector of the border extends for some 17,299 square kilometres, that is, slightly over half the total area of Nariño province. The largest part of the local population is mixed race, followed by Afro-Colombians, who make up approximately 19% of the population. Indigenous peoples make up approximately 11%. The main economic activity is agriculture, with particular emphasis on the

[109] This is conceded in EM, paras. 2.22-2.26. See also below, paras. 2.13, 2.15-2.19.

cultivation of corn, beans and cocoa. Cattle ranching, fishing and mining are also significant economic activities in the region.

2.6. Tumaco is an important fishing centre, particularly for tuna and shrimp, carried out mostly by vessels of Ecuadorian flag under contract from Colombian entrepreneurs who have moved their seat of business to the city of Manta, Ecuador.

2.7. During the 1990s, the cultivation of illicit crops in Colombia expanded considerably. The Nariño Province was affected in particular. Following the implementation of the Illicit Crops Integrated Monitoring System –SIMCI, for its Spanish acronym in 1999, it was possible to establish, for instance, that between March 1999 and August 2000, coca cultivation in the province increased by 136%.[110] Today, Nariño produces 24% of the total coca crop in the country.[111] The tightening of narcotics enforcement in the Caribbean has re-directed the activities of illegal armed groups and drug traffickers to the Pacific Ocean, and, for this reason, the Pacific sector of Colombia has become a principal staging area and export route for illicit narcotics.

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[110] Annex 103: UNODC, "Colombia Coca Cultivation Survey 2003", June 2004 (hereafter, Colombia Coca Cultivation Survey 2003), p.15.

[111] Annex 108: UNODC, "Colombia Coca Cultivation Survey 2008", June 2009 (hereafter, Colombia Coca Cultivation Survey 2008), p.13.

(2) THE ANDEAN SECTOR

2.8. The Andean Sector of the Colombia-Ecuador border is formed by the Andes mountain range, with cold and temperate climates and a predominantly mountainous terrain with elevations of up to 4,500 meters above sea level. The Andean Sector extends southeast for some 200 km, up to the edge of the Amazon basin. In Colombia, the sector falls within Nariño province; in Ecuador it comprises part of Carchi province.

2.9. Two important centres of trade and commercial exchange are located on either side of the border in this sector: Ipiales in Colombia and Tulcán in Ecuador. The Andean Sector is principally agricultural. Its crops and products include fruit, maize, oat, barley, wheat, sugarcane, cocoa, yucca, potatoes and coffee. The Pan-American Highway, which runs the length of South America, passes through the area.

2.10. The geographical and climatic characteristics of the Andean sector are not generally favourable for the production of illicit crops.

(3) THE AMAZONIAN SECTOR

2.11. The Amazonian sector, formed chiefly by the provinces of Putumayo in Colombia and Sucumbíos in Ecuador, is traversed by the Putumayo River, a tributary of the Amazon, and by the San Miguel River, a tributary of the Putumayo. The area

is partially covered by rainforest; land in the region is mainly devoted to conservation purposes, followed by forestry and agro-forestry. However, in certain areas, over-use has resulted in significant environmental damage. Growers of illicit crops are especially responsible, as they typically do not employ the soil management techniques appropriate to the local environment.[112] Destruction of forests by coca cultivators presents a threat to fauna of the region as well.[113]

2.12. Putumayo province in Colombia is geographically divided into higher, middle and lower Putumayo. The principal population group approximately 23%, consists of persons of mixed race; 21% of the population is indigenous, and 6% Afro-Colombian. A road connects Puerto Asís, a river port on the Putumayo River, with Mocoa, the provincial capital. From Mocoa, the road continues northwards. In the other direction, the road connects Puerto Asís with Ecuador by means of a bridge across the San Miguel River.

2.13. In Ecuador, Sucumbíos, despite being that country's richest oil province,[114] has extremely high poverty levels,

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[112] UNODC, Alternative Development in the Andean Area: Technical Guide, (date unknown), pp. 21-22. Available at: http://www.unodc.org/documents/alternative-development/0981448.pdf (last visited 10 March 2010).

[113] Maria D. Álvarez, "Illicit crops and bird conservation priorities in Colombia," (2002) 16(4) *Conservation Biology* 1086.

[114] Annex 77: Sucumbíos Provincial Government Homepage (History, Political Organization), p. 2.

various endemic diseases, and a scarcity of basic utilities and services. Sucumbíos has traditionally been one of the most neglected and underdeveloped regions of Ecuador and was until recently virtually isolated from the rest of the country. As Ecuador itself acknowledges, the frontier region in general lacks basic infrastructure and basic sanitation and health services. As a consequence, the quality of life in the isolated communities of the Ecuadorian Amazon is extremely poor, and the presence of the Ecuadorian State often scarcely felt.[115]

2.14. In 2000, the province of Putumayo accounted for 40% of the coca crop of Colombia—i.e., 30% of the total coca crop of the world.[116] The principal protectors of coca cultivation—and its principal benefactors—were the illegal armed groups operating in the region. As a result of measures taken under Plan Colombia, however, by 2008 the province accounted for only 12% of the coca crop in Colombia, down to 5.8% of the global total.[117] Suppression of narcotics cultivation in the province has contributed significantly to the overall progress of the counter-narcotics programme in Colombia: in 2000 Colombia produced 74% of the world's coca crop, whereas by 2008 the country's share had dropped to 48%.[118]

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[115] EM, paras. 2.22-2.26. See also *ibid.*, paras. 5.162, 6.1, 6.21, 6.22, 6.37, 6.50, 6.52, 6.86, 6.107, 6.119, 6.132, 9.86.

[116] Annex 104: UNODC, "Colombia Coca Cultivation Survey 2004", June 2005 (hereafter, Colombia Coca Cultivation Survey 2004), pp. 15, 19.

[117] Annex 108, Colombia Coca Cultivation Survey 2008, pp. 13, 17.

[118] *Ibid.*, p. 17.

B. Social Conditions in the Provinces of Sucumbíos and Esmeraldas

(1) BASIC PROBLEMS

2.15. Ecuador's Memorial alleges that the social and economic situation in the Ecuadoran provinces of Sucumbíos and Esmeraldas has "changed dramatically" as a result of aerial sprayings carried out in Colombian territory during certain periods and in certain areas has.[119] In truth, the provinces of Esmeraldas and Sucumbíos have been the victims of systemic neglect by the Government of Ecuador; their present difficulties are a continuation of long-term isolation and official failure to address basic needs.[120] The discovery of oil has enriched the central government, but the frontier provinces have realized little, if any, benefit from this development. Two UN Special Missions noted in their reports following visits to Ecuador in 2004 and 2006, at that country's request, that the border region has great potential and natural riches.[121] As Ecuador itself acknowledges in its Memorial,[122] however, this is in stark contrast to the high levels of poverty, scarcity of basic social services, and institutional, technical and financial weakness that

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[119] See EM, para. 2.6.

[120] Ministry of Foreign Affairs of Ecuador, *Plan Ecuador, Scenario of the Plan* (hereinafter: "Plan Ecuador"), pp. 5-6. Available at: http://www.resdal.org/ultimos-documentos/plan-ecuador07.pdf (last visited 10 March 2010).

[121] EM, Vol. II, Annex 27, p. 19; Annex 28, p. 14

[122] EM paras. 2.22 (footnote 33), 2.26 (footnote 36).

characterize this area.[123] Moreover, it is far from clear that the introduction of infrastructure to support the oil extraction industry has off-set the deleterious effects of that industry on public health.

2.16. According to the Ecuadorian Government, the percentage of persons below the poverty line in Ecuador in 2001 (assessed on the basis of Unmet Basic Needs[124]) was 61.6%. Of the 22 provinces of Ecuador, Sucumbíos had the second highest poverty level, with 86.2% of its population below the poverty line. Esmeraldas also had a level of poverty bordering 80%.[125] Conditions in the two provinces, relative to the rest of the country, were depressed before Colombia commenced the aerial spraying programme. In the period 2005-2006 the levels of poverty in Sucumbíos and Esmeraldas did not deteriorate, as claimed by Ecuador; they in fact improved somewhat, to 71%

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[123] See e.g., EM, paras. 2.22-2.26. Also, EM, Vol. II, Annex 27, pp. 17-19; Annex 28, pp. 14, 24.

[124] Under the Unmet Basic Needs (or "deprivation indicators") method, a household is defined as poor when it lacks access to education, health, nourishment, housing, urban utilities or services and/or Employment opportunities (structural poverty). The method was adopted by the United Nations Economic Commission for Latin America and the Caribbean (ECLAC), in the early 1980s: Expert Group on Poverty Statistics, *Compendium of Best Practices in Poverty Measurement* (Rio de Janeiro: Rio Group, September 2006) pp. 101-120, 123.

[125] Annex 78: "Social Development and Poverty in Ecuador, 1990-2001", Chapter 8, Poverty Profile according to Unmet Basic Needs", Social Front's Technical Secretariat Information and Analysis Unit, Government of Ecuador, Social Report 2003, Quito, December 2003, p. 10.

and 64.2%, respectively.[126] The observed improvement by no means shows that the border provinces of Ecuador have resolved their long-term social and economic crisis. It does however contradict Ecuador's contention that the aerial spraying programme in Colombia correlates to a worsening of conditions there. The social and economic crisis of the Ecuadoran border provinces is a long-term, structural crisis, and it is due to the failures of the Ecuadoran government, not to any alleged effects incidental to the spraying programme.

2.17. Ecuador would also attribute the environmental dimension of the regional crisis to Colombia's anti-narcotics effort. Yet the main causes of damage to the environment in the border region are well-known. Exploitation of forestry in the region has been indiscriminate, and widespread environmental damage has resulted.[127] The other major economic sector in the provinces, hydrocarbon extraction, likewise has not been subject to appropriate environmental controls. The Ecuadorian hydrocarbon industry has caused significant harm to the local ecosystem. Any incidental effects of anti-narcotics spraying—and Colombia will show that the spraying programme has had no adverse environmental effects in Ecuador—pale in

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[126] Annex 94: "The Living Conditions of Ecuadorians: Results of a Survey of Living Conditions – Fifth Round. Poverty and Inequality", National Institute for Statistics and Censuses of Ecuador, Quito, 2009, p. 10.

[127] Annex 106: "Report of the United Nations Technical Preliminary Mission to propose studies on the impact of the aerial sprayings and complementary actions in the northern border of Ecuador", Quito, Ecuador, April 2006, pp. 4, 15, 16.

comparison to the massive and indiscriminate damage resulting from Ecuador's own economic activities in the exploited provinces. Pollution and environmental degradation in the region is a significant problem, and the failure of the Ecuadorian government adequately to regulate exploitation of local resources has been the cause.[128]

2.18. During its visit to the northern border of Ecuador in 2006, the United Nations' Preliminary Technical Mission observed that the border region in general suffers from a lack of access to potable water supplies, has little infrastructure for the disposal of sewage and solid residues, and that the local population has no education with regard to sanitation.[129] All of those factors contribute to the critical epidemiological profile of the area, characterized by the prevalence of illnesses such as acute respiratory infections, acute diarrhoeal disease, illnesses common to humid, tropical climates, malnutrition and skin conditions.

2.19. According to the Ecuadorian Ministry of Public Health, the principal causes of morbidity in the provinces of Sucumbíos and Esmeraldas in 2007 were acute respiratory infections and acute diarrhoeal diseases. These are the same diseases which constitute the principal causes of morbidity in all twenty-two

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[128] CCM, Annex 129. See also, EM, Vol. II, Annex 27 p. 19, Annex 28 p. 14.

[129] See EM, Vol. II, Annex 28, pp. 341, 342.

provinces of Ecuador.[130] Provinces which Ecuador must concede are not in any way affected by aerial spraying display much the same disease profile as Sucumbíos and Esmeraldas; and no *prima facie* reason exists to attribute the epidemiological situation in Sucumbíos and Esmeraldas to aerial spraying. In any event, as will be demonstrated, there is no causal link whatever between aerial spraying and the two principal causes of morbidity in the border provinces.

2.20. What does distinguish the border provinces from other parts of Ecuador is the residence there of various criminal groups. The social and economic conditions of the provinces of Sucumbíos and Esmeraldas have combined with the lack of an effective State presence to create conditions favourable to illicit activity. Criminal groups, especially guerrillas, avoiding more stringent law enforcement, have fled Colombia and settled in the region. They have brought with them the cultivation, processing and sale of coca crops, as well as trafficking in arms, explosives and munitions.

2.21. These groups, using the bases they have established in Ecuador, have launched attacks against military personnel and carried out kidnapping, extortion and killing of civilians in Colombian territory.

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[130] Annex 92: "Ten Main Morbidity Causes per Province", Public Health Ministry of Ecuador, Epidemiology sub-process, Quito, 2007, p. 1.

2.22. Also, over the years, weapons, explosives, ammunition and chemical precursors involved in the processing of illicit drugs have been smuggled into Colombia across the common border with Ecuador.

2.23. This cross-border illicit trade was confirmed by the Commission on Transparency and Truth for the Angostura Case (*Comisión de Transparencia y Verdad sobre el Caso de Angostura*), set up by the President of Ecuador in March 2009. The Commission was established to investigate the facts relating to the attack by Colombian armed forces on an encampment of Colombian (FARC) guerrillas in Ecuadorian territory, located a few hundred meters from the border between both countries at the Putumayo River, on 1 March 2008, and to investigate links between Ecuadorian officials, illegal organizations involved in drug trafficking and the Colombian guerrillas. The Commission was made up of persons from diverse national backgrounds chosen by the Ecuadorian Government itself.

2.24. The final Report of the Commission, delivered to the President of Ecuador on 10 December 2009, clearly describes the serious situation in the northern region of Ecuador bordering Colombia. The report notes the presence of illegal armed groups and drug traffickers engaged in criminal activities. Excerpts of the Report read as follows:

> "Colombian illegal armed groups, in fulfilling their political-military project, have

> systematically violated [Ecuador's] national sovereignty and territorial integrity, through armed actions to attack military detachments and patrols with the purpose of seizing weapons and equipment (in subversive lingo, 'recovery of weapons' that belong to the people). And, they have used the national territory to set up laboratories for processing drugs, engendering a highly tense and risky atmosphere for the national and foreign population living in the border zone, seriously affecting both Ecuador's social as well as national security."[131]

2.25. The Report also refers to encampments and drug laboratories maintained by Colombian guerrillas and drug traffickers in Ecuadorian territory. It quotes a statement by the President of Ecuador to the effect that "it is... clear that all over that area, the FARC have a large intelligence support network from the civilian society."[132]

2.26. The Report posits that "[t]he low effectiveness of military and police efforts that operate on the basis of human intelligence for the location, capture, elimination and destruction of encampments, allows [the Commission] to infer the

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[131] *Informe de la Comisión de Transparencia y Verdad* [Report of the Commission on Transparency and Truth for the Angostura Case], Quito, December 2009, p. 65.
Available at:
http://www.diario-expreso.com/media/ediciones//20091211/actualidad/documentos/10122009_114132.pdf (p. 65) (last visited 10 March 2010)

[132] *Ibid.* p. 65.

infiltration of militia who are in charge of giving early warning to the FARC."[133]

2.27. Subsequently, the Report reads as follows:

> "As stated above, the efforts carried out for the control of drug trafficking and smuggling are still insufficient. Despite the controls… smuggling and drug trafficking continue to increase."[134]

2.28. Among the Report's conclusions, the Commission recalls the prevailing situation in the border area where it conducted its investigation, concerning the existence of laboratories for cocaine processing:

> "23. There is a lack of control in the import and destination of precursors for the processing of drugs. Ecuador has thus ceased to be merely a transit country in order to start becoming a place for [drugs] processing."[135]

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[133] *Informe de la Comisión de Transparencia y Verdad* [Report of the Commission on Transparency and Truth for the Angostura Case], Quito, December 2009, p. 65.
Available at:
http://www.diario-expreso.com/media/ediciones//20091211/actualidad/documentos/10122009_114132.pdf (p. 65) (last visited 10 March 2010)

[134] *Ibid.*, at p. 95. Available at:
http://www.diario-expreso.com/media/ediciones//20091211/actualidad/documentos/10122009_114405.pdf (pp. 95, 129) (last visited 10 March 2010)

[135] *Ibid.*, at p. 129.

(2) PROVINCE OF SUCUMBÍOS

2.29. As noted above, two Ecuadorian provinces are principally concerned in Ecuador's claims. Colombia turns first to consider the province of Sucumbíos. The majority of the inhabitants of Sucumbíos live in homes not serviced by public utilities. Only 13.9% have access to potable water, and only 26.7% are connected to sewage systems. The electricity grid covers only a fraction of the province, while waste disposal is precarious and well below the national average.[136]

2.30. Sanitary provisions in the province are therefore wholly inadequate. Together with the scarcity of health services,[137] this has resulted in high rates of respiratory infection and acute diarrhoeal diseases. These, in turn, are the main factors contributing to the province having one of the highest morbidity rates in the country.[138]

2.31. Hydrocarbon exploration and exploitation activities in Ecuador, particularly in the provinces of Sucumbíos and Orellana – the country's largest oil producing provinces – have resulted in serious environmental damage, and have worsened the public health situation in the border area. The adverse

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[136] Ministry of Foreign Affairs of Ecuador, *Plan Ecuador,* 2007, p. 5. Available at: http://www.resdal.org/ultimos-documentos/plan-ecuador07.pdf (last visited 10 March 2010)

[137] Annex 90: "Health baseline of the Ecuadorian Northern Border Provinces", Public Health Ministry of Ecuador, Pan-American Health Organization (PAHO), Quito, Ecuador, 2006, p. 27.

[138] Annex 92.

effects of the hydrocarbon industry on public health have been the basis of legal actions before United States' courts.[139] Claimants there contended that oil companies involved in the region have not used appropriate technologies to mitigate environmental harm, with the result that dangerous pollutants have been introduced into rivers, lakes, marshes and reservoirs. Some of the pollution has been gradual, such as leaching from separation ponds.[140] There also are frequent oil spills, events responsible for the sudden introduction of vast quantities of chemicals known to be damaging to human health and the environment.[141] Several indigenous communities have complained to the Ecuadorian Government about the environmental damage which has resulted from the activities of the oil industry in the region.[142]

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[139] The procedural history of one set of such actions is summarized in *Aguinda v. Texaco, Inc.,* 303 F.3d 470, 473-476 (2d Cir.2002) WL 2002524696.

[140] Annex 129: M. San Sebastián & A-K. Hurtig, "Oil exploitation in the Amazon Basin of Ecuador: a public health Emergency", *Pan Am J Public Health,*15(3):205-207, 2004.

[141] *Ibid*. As regards adverse health effects related to oil extraction activities in Amazon Basin of Ecuador (that includes the Sucumbíos province), see p. 208.

[142] For example, the Cofán territory in Ecuador "...was atomized and fragmented as of 1967 with the start of oil exploitation in the region". In Annex 76: "Ai'cofan indigenous nation", National Institute for Statistics and Censuses of Ecuador (date unknown), pp. 1, 3. The Council for the Development of the Nationalities and Peoples of Ecuador (*Consejo de Desarrollo de las Nacionalidades y Pueblos del Ecuador*) has also pointed out the difficulties encountered by the Cofan indigenous communities in Ecuador "facing heavy pollution due to the frequent oil spills as a result of the extraction operations". In their territory "there are also logging activities and some men work as day labourers in the settlers' farms". In Annex 93: "Cofan indigenous nation", Webpage of the Council for the Development of the Nationalities and Peoples of Ecuador, 6 November 2008. A similar

(3) PROVINCE OF ESMERALDAS

2.32. The Province of Esmeraldas is located on the north-east coast of Ecuador. Despite enormous potential in terms of natural resources, it suffers from various serious socio-economic problems that have impaired its development, notably deforestation. Some experts indicate that as early as 2010 there will be no primary forests remaining, except in nature reserves, which are themselves threatened.[143] According to the FAO, in 1960 the province of Esmeraldas had some 15 million hectares of Ecuador's wood reserves. Today those reserves do not exceed 200,000 hectares, as one of the main activities in Esmeraldas has been illegal and indiscriminate logging.[144] According to the German Agency for Technical Cooperation (GTZ), the forests of Esmeraldas constitute the source of most of the wood on the Ecuadorian national market.[145]

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situation confronts the Siona community, which has suffered "the loss of territory due to the opening of roads for the use of oil companies" and "pollution caused by oil exploitation". In Annex 75: Siona indigenous nation, Web page of the Council for the Development of the Nationalities and Peoples of Ecuador (date unknown), pp. 1, 3.

[143] Annex 79: "Model Project for the Planting, Production and Sustainable Agro-industry of *Guanábana* (Soursop)", Federation for the Integral Development of Peasants and Afro-descendants of Esmeraldas (FEDICAE), Esmeraldas, January 2004, p. 4.

[144] *Ibid.*, p. 4.

[145] Report of the Consulting Project ECU/99/017/UNDP, Diagnosis of the current situation of the Choco ecoregion in the Esmeraldas Province: Direct causes, authors and underlying causes of the loss of biodiversity and degradation of environmental biodiversity, Quito, 27 May 2005, p. 51. Available at: http://www.bibliotecaonu.org.ec/files/Diagnostico%20de%20la%20situacion%20actual%20Choco...ambiental.pdf (last visited 10 March 2010)

2.33. Sewage and waste collection pose a serious problem for public health; infant mortality rates are high and above rural national averages.[146] Likewise, chronic malnutrition in the province's rural areas runs at 23% of the population.[147]

2.34. The provincial government of Esmeraldas reported in 2005 that:

> "…tropical diseases such as malaria, dengue and leishmaniasis are frequent, as are sexually transmitted diseases (STD), HIV/AIDS and diseases related to deficient sanitation conditions. This is explained by several factors, among them, the situation of poverty, the low coverage of public utilities, the lack of attention to the canton from the central level, deficiencies in the coordination between actors in the local sphere, bad self-care habits of the population, among others."[148]

2.35. The proportion of the population without proper health service coverage in rural areas is very large. That situation results mainly from the lack of roads and scarcity of transport that deprive the population of access to the facilities of the health system.

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[146] Annex 100: United Nations Children's Fund (UNICEF), "Baseline of the Province of Esmeraldas, Final Consulting Report", April 1998, pp. 16, 21, 22.

[147] Annex 106, p. 24.

[148] Annex 91: "Esmeraldas Health and Environment Program (SYMAE)", Municipality of Esmeraldas, 1 August 2006, p. 2.

(4) COLOMBIAN COOPERATION WITH ECUADOR

2.36. Before 2006 Ecuador did not have a public health surveillance system in place in the border area that allowed any adequate follow-up on the alleged impacts of pesticides.

2.37. In a meeting between the Foreign Ministers of Colombia and Ecuador in December 2005, Colombia offered to cooperate on this subject:

> "5. The Colombian Foreign Minister offered to place at Ecuador's disposal, her country's successful experiences in projects aimed at strengthening public health surveillance on the use of pesticides, with a view to the preparation of a joint project that would be submitted to the PAHO-WHO under the technical cooperation scheme."[149]

2.38. As a result of a bilateral technical and scientific cooperation agreement between the two countries,[150] in December 2007 Ecuador implemented a Public Health Surveillance System of Intoxications due to Pesticides.[151] The

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[149] Joint Communiqué of the Meeting of Colombia-Ecuador Foreign Ministers, Quito, 7 December 2005, numbered para. 5 (EM, Vol. II, Annex 72). Ambassador Claudio Cevallos, Director-General for Ecuadorian Border Affairs with Colombia of the Foreign Ministry, during a Meeting of the Bilateral Technical Commission on Health, alluding to the Joint Communiqué, "emphasized Colombia's experience in pesticide management." (See Annex 22: Minutes of the Bi-national Technical Commission on Health, Atacames, Esmeraldas, 2-3 March 2006).

[150] Annex 23: Health and Environment integrating borders, Proposal for Technical Cooperation between Countries Colombia-Ecuador: Epidemiological Surveillance, Pesticides, and Water Quality, 2007.

[151] "For Ecuador it is very important to... establish at a national level, the Public Health Surveillance System for Pesticide Intoxication and the

project was jointly financed by the Governments of Colombia and Ecuador together with the PAHO/WHO. No mention is made of this initiative in Ecuador's Memorial.

C. Conclusions

2.39. Contrary to Ecuador's assertions,[152] Colombia's aerial spraying programme is not the cause of the very real and serious social and economic problems of the provinces of Esmeraldas and Sucumbíos, nor even a contributory factor. The provinces are plagued by chronically precarious infrastructure, long-term neglect by central government authorities, and rampant misuse of its natural resources, especially in the oil and forestry sectors. The mechanisms by which such factors undermine public health and degrade the environment are well-known. Their impact in Esmeraldas and Sucumbíos has not been limited to the immediate border area but has been felt throughout the provinces, affecting all the communities of the region, including the indigenous population.

2.40. Furthermore the population have long suffered from high poverty levels, social problems and serious difficulties in terms of access to basic services and utilities (including in particular

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Single Notification Record for Intoxications due to pesticides which Colombia has implemented several years ago". In Annex 29: Minutes of the Bilateral Evaluation Meeting. Health and the Environment Integrating Borders: "Strengthening of Surveillance in Public Health, Pesticides, and Water Quality", Ipiales, Nariño, 12 December 2007.

[152] EM, paras. 6.3-6.7.

water, sewage and health services). As Colombia will demonstrate, the situation in Esmeraldas and Sucumbíos has nothing to do with aerial spraying operations carried out in Colombia but, instead, originates in conditions within Ecuador pre-dating Colombia's anti-narcotics programme.

2.41. The leading causes of morbidity in the provinces of Sucumbíos and Esmeraldas (as well as in the rest of Ecuador) are acute respiratory and diarrheic diseases. The aerial spraying program carried out by Colombia over portions of its territory neighbouring Ecuador began only in 2000 and was carried out along certain segments of the border during circumscribed periods of time. Additionally, aerial spraying was suspended in the border for an entire year – December 2005 to December 2006 – and a new suspension remains in place since February 2007. As will be seen, the aerial spraying could not have caused the adverse effects complained of by Ecuador.

2.42. The absence of effective public authority in the region also fosters the presence of illegal armed groups. The presence of such groups in Ecuador hampers the efforts of Colombian authorities and facilitates the trafficking of illicit substances, chemical precursors and weapons.

2.43. Since 2006 Colombia offered cooperation for the implementation of a public health surveillance system, which

started to be implemented a year later with the financial support of Colombia, the WHO and PAHO.

Chapter 3

THE FIGHT AGAINST DRUGS IN COLOMBIA

A. An Overview of the Drug Problem in Colombia

3.1. Drug-trafficking in Colombia started to become a major problem in the mid-1970s due to the increase in marijuana consumption in the United States and Europe.[153] Taking advantage of Colombia's geographic location and complex terrain, armed groups and drug traffickers at first established illicit crops on small plots of land located in remote areas. Subsequently, the crops progressively came to cover ever larger areas that were protected by the illegal armed groups against government eradication efforts.[154]

3.2. During the 1980s, the drug cartels and mafia gained strength and began their violent and blood-ridden conflict for control of drug production and distribution in the United States

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[153] United Nations Office on Drugs and Crime (UNODC), *A Century of International Drug Control*, Vienna, 2008, pp. 65-66. Available at: http://www.unodc.org/documents/data-and-analysis/Studies/100_Years_of_Drug_Control.pdf (last visited 10 March 2010).

[154] Annex 99: General Assembly Resolution S-20/2, "Political Declaration", 10 June 1998, UN doc. A/S-20/4, p. 3. The 1998 Political Declaration expressed deep concern about "the links between illicit drug production, trafficking and involvement of terrorist groups, criminals and transnational organized crime" (§10), and was alarmed "by the growing violence resulting from links between illicit production of and illicit trafficking in arms and drugs" (§11).

and Europe.[155] They built clandestine air strips and processing laboratories in remote areas of the Colombian rainforests; they devised routes for the provision of coca paste from Bolivia and Peru; they ensured the provision of chemical precursors from industrialized countries for drug processing; finally, they succeeded in infiltrating and compromising law enforcement authorities both in the distribution centres, as well as in certain neighbouring States, which were used not only as necessary transport routes but also as places for the exchange of drugs for arms and explosives.

3.3. World consumption of cocaine increased throughout the 1980s.[156] In the 1990s, consumption fell for a time, then started to increase again in 1996.[157] In 1999, estimates suggested that some 13 million people abused cocaine worldwide.[158] The largest numbers of cocaine users were found in North America (45% of the world total), followed by Western & Central Europe (24%) and Latin America (19%).[159]

3.4. From the mid to late 1990s, there was an unprecedented growth in the areas affected by illicit crops in Colombia, coupled with an increase in the political and social problems

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155 *Op. cit.* UNODC, *A Century of International Drug Control,* p. 67.

156 *Ibid.*, pp. 66, 67, 83.

157 *Ibid.*, p. 71. See, also, United Nations Office for Drug Control and Crime Prevention (ODCCP), *Global Illicit Drug Trends,* (New York, 1999), p. 109. Available at: http://www.unodc.org/pdf/report_1999-06-01_1.pdf.

158 See, ODCCP, *Global Illicit Drug Trends,* 1999, p. 93, 95.

159 *Ibid.*, pp. 109-110.

linked to drug trafficking in those regions. That phenomenon reached a peak in 2000, when an integrated anti-drugs policy was adopted.[160]

3.5. The expanding trend reached the point where, despite all the efforts undertaken, in 2000 Colombia was the world's largest coca and cocaine producer, with 77% of the worldwide crop, 80% of coca leaf production, and 79% of cocaine manufacturing potential.[161]

3.6. Colombia has been one of the countries most affected by drug mafias. No other single nation has suffered or sacrificed as much in the fight against the world drug problem. With financial resources obtained as a result of activities related to cocaine and heroin, the illegal armed groups and drug mafias undertook a growing campaign of kidnappings, murders, coercion and threats, as well as attacking civilians (regardless of income, activity or political affiliation), infrastructure and public authorities. As a result, the traditional economy of several regions where the illicit crops were grown was undermined and the entire country was seriously threatened.[162]

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[160] Annex 57: "Plan Colombia Progress Report 1999-2005", National Planning Department of Colombia, Office of Justice and Security, September 2006, pp. 8; 10-12; 25-27; 33-40.

[161] Annex 102: United Nations ODCCP, "Global Illicit Drug Trends 2001", New York, 2001, p. 67.

[162] Three presidential candidates (Luis Carlos Galán, Carlos Pizarro and Bernardo Jaramillo), one Attorney General (Carlos Mauro Hoyos), two ministers of justice (Rodrigo Lara and Enrique Low), two senior journalists (Guillermo Cano, director of *El Espectador*, Raúl Echavarría, deputy editor

3.7. In 1988, addressing the United Nations Conference for the Adoption of a Convention against Illicit Traffic in Narcotic Drugs and Psychotropic Substances, the Colombian Minister of Justice, Guillermo Plazas Alcid said:

> "[N]o country in the world ha[s] paid as high a price as Colombia in the fight against drug abuse and illicit trafficking. One by one, Ministers of State, judges of the Supreme Court, officials in the armed forces and police, members of intelligence units, soldiers and journalists ha[ve] all fallen as an intimidated nation raised anguished voices for protection from the scourge. Ha[s] the world forgotten the burning up of Colombia's Palace of Justice which housed senior judges and law officials? ... Colombia's tough experience in fighting the problem ha[s] left lesions in the political and social fabric of the country... Timely and adequate treatment of the problem of drug abuse and illicit trafficking should be given maximum priority at the national and international levels."[163]

3.8. The fight against drugs in Colombia, including the fight against the drug cartels and mafias, has also had an enormous cost for the country as a whole, which remains unparalleled in

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in chief of *Occidente*), and hundreds of judges and policemen have been killed. A commercial plane with 111 passengers was bombed in the air after its take off at Bogotá's airport; the Headquarters of the National Security Agency (*Departamento Administrativo de Seguridad*, DAS) and main offices of *El Espectador* newspaper were also bombed.

[163] United Nations Information Service, directly transcribed from [the] "Statement by Justice Minister of Colombia and Minister of State for Home Affairs of Nepal address Conference to adopt Convention against Illicit Drug Trafficking", 4th Plenary Meeting, 1988, UNIS/NAR/262, in: *Op. cit.* UNODC, *A Century of International Drug Control*, pp. 67, 100.

proportion to any other State. Successive administrations in Colombia have waged a relentless fight against this scourge, devoting enormous resources that might have otherwise been employed for social investment and to promote the economic development of the country.

3.9. Colombia is the second most biologically diverse country in the world and the cultivation and processing of illicit drugs in Colombia has had particularly serious consequences for the environment. Studies have shown that the establishment of illicit crops and their processing are the worst cause of deterioration of the country's environment.[164]

3.10. These adverse impacts are spelled out in more detail in the following Sections.

B. Political and Social Impacts of Illicit Crops and Drug Trafficking in Colombia

3.11. It has been long recognized that illicit drugs fuel political instability. In Colombia, particularly during the 1980s and 1990s, presidential candidates, ministers, judges, officers, soldiers and corpsmen of the Army and the National Police, diplomats, priests, homemakers, journalists and thousands of other Colombians from all sorts of backgrounds, engaged in diverse economic activities and of all levels of means, fell victim to criminals associated with drug trafficking and

[164] Annex 116, CICAD I, pp. 11-12.

terrorism. The drug mafia tried to infiltrate different segments of the State and its executive, legislative and judicial branches. Millions of citizens were victims of generalized fear and threats or extortion.[165]

3.12. The violence Colombia has had to endure has largely been financed by the resources obtained by illegal armed groups from the cultivation, production and trafficking of illicit drugs. The symbiosis between drug-trafficking and terrorism strengthens criminal activities such as killings, attacks on civilian and governmental infrastructure, kidnappings and extortion perpetrated by illegitimate armed organizations. These activities would not be viable without the financial resources provided by drug-trafficking. It is no coincidence that most of the areas where the majority of the coca crops are located are under the influence of illegal armed groups.

3.13. In fact, drug trafficking has been the main cause for the high levels of violence in Colombia in the last two and a half decades. Drug trafficking has increased overall crime, caused congestion in the criminal justice system, and gradually transformed and corrupted moral values in favour of crime.

3.14. Drug trafficking has permeated the illegal armed groups and has been the key factor in the increase in size of guerrilla

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[165] Annex 97: UNDCP, "Economic and Social Consequences of Drug Abuse and Illicit Trafficking", Technical Series 0101, 1998, p. 39.

and paramilitary movements. Between 1980 and 2000, the guerrillas grew by twenty-fold. In 1980, the FARC had only 10 Fronts and 980 members. Twenty years later, the FARC had 63 Fronts and 16,492 members. There is a parallel between the increase in illegal crops and the growth in the number of guerrilla members in Colombia, starting in 1991. These figures explain the incidence of drug trafficking in the nation's levels of violence and the reason why combating drug trafficking became a crucial issue for Colombia. Fortunately, this trend has been reversed in recent years as a result of the implementation of "Plan Colombia" and the "Democratic Security Policy." The guerrilla groups have been significantly reduced and the overall security of the country has improved; 13,533 members of the FARC demobilized between August 2002 and December 2009.[166] Homicide rates and terrorist acts dropped 45% and 98%, respectively, between 2002 and 2008.[167]

3.15. The Government of Colombia continues its struggle for the stability of the State and within that framework, for the security, peaceful existence and health of millions of youths and

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[166] Presidency of the Republic of Colombia, *Communications* Office, *Demobilizations*, 2010. Available at: http://www.presidencia.gov.co/resultados/english/05_demobilized/demobilization_100209.pdf (last visited 10 March 2010)

[167] Presidency of the Republic of Colombia, *Ten Achievements: Security Based on Democracy,* 2009. Available at: http://www.presidencia.gov.co/resultados/english/documents/AVANsecurity_091019.pdf (last visited 10 March 2010)

adults in many other countries. Domestically, this effort has garnered massive popular support.

C. Economic Impacts of Illicit Crops and Drug Trafficking in Colombia

3.16. Illicit crops have had serious adverse impacts on Colombia's economy. Although only a fraction of the enormous illicit profits make their way back to Colombia – most of the money remains in the United States and Europe, and other consumer countries – the sudden peaks in revenue generated by drug trafficking greatly destabilized the country's finances by affecting its production capacity and deviating resources towards illicit enterprises and away from the construction or strengthening of industries, thereby affecting the country's economic growth.[168]

3.17. The illicit drug industry distorts internal consumption, investment and import patterns, since drug traffickers and their associates invest in equipment and non-productive goods that enable them to launder their illicit profits. Thus, drug trafficking not only has an adverse impact on domestic industry but also on the export sector since large influxes of foreign currency cause the value of domestic currency to rise artificially, to the serious detriment of exports. The testimony in 2003 before the United States' Senate Foreign Relations Committee

[168] Annex 97, pp. 27-29.

of a former State Department official with first-hand expertise on Colombian affairs is telling in this respect:

> "Only a fraction of the immense revenue of drug trafficking returns to Colombia. Most drug money remains in the United States. Still, the impact of those ill-gotten gains has been enormous. Analysts at various times using different methodologies have estimated the total flow of earnings back to the country as low as $1.5 billion and as high as $3 billion, i.e., not much more than one percent of GDP, but all conclude that the net effect on the Colombian economy has been negative and disastrous. The rise in narcotics trafficking is closely related to the rise of criminality in Colombia and that of course was closely related to the rise in violence. One study points out that criminality leads to a misallocation of resources and a drop in national productivity amounting to roughly one percent of the GDP. Other studies correlate the rise of violence with the drop of investment from 1980 onward and blame that for taking two percent points off GDP growth of the period."[169]

3.18. The adverse effects of drug trafficking and illicit crops are not only reflected in the private sector, but also have a significant impact on Colombia's national budget. Between 1978 and 2006 direct government spending by Colombia in the fight against drugs has consistently increased. In that period,

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[169] Testimony before the Senate Foreign Relations Committee, "Economy of Colombia", Statement by Phillip McLean, Senior Fellow and Deputy Director, Center for Strategic and International Studies, 29 October 2003.
Available at: http://csis.org/files/media/csis/congress/ts031029mclean.pdf (last visited 10 March 2010), pp. 4-5.

the total amounted to 13.3 trillion pesos at 2006 values, equal to US$ 4,781 billion.[170]

D. Environmental Impact of Illicit Crops and Drug Trafficking in Colombia

3.19. Illicit crops and their processing constitute the most critical factor contributing to environmental degradation in Colombia due to the deforestation of large areas of the Amazonian tropical rainforests and Andean forests in order to establish coca and opium poppy crops. Further, significant pollution of the ecosystem is caused by the quantities of pesticides, chemical precursors and solvents used in the cultivation and processing of illicit drugs and the disposal of residues and waste products as a result of such activities.[171]

(1) DESCRIPTION OF RESOURCES

3.20. Colombia has an area of 1,141,748 sq km, i.e., roughly the size of France and Spain combined. Further, Colombia is one of the world's richest countries in terms of species diversity

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[170] Annex 63: "Expenditures of the Colombian State in the fight against drugs, 2005-2006", National Narcotics Directorate and National Planning Department, Bogotá, 2008, p. 4.

[171] Annex 127: R.E. Ramos C., J.P. Ramos B., *Environmental Assessment of the Impact of coca crops and the processing of coca leaf*, Universidad de los Andes, Bogotá, Colombia, 2002, pp. 1, 5, 10-11 (Conclusions No. 5, 6, 7 and 8); See also Annex 116, CICAD I, p. 15, Table 1. "Pesticides used in the production of coca"; also, "The most obvious characteristic of coca cultivation is the degradation of ecosystem" in Annex 131-H, CICAD II: J.D. Lynch, S.B. Arroyo, "Risks to Colombian amphibian fauna from cultivation of coca (*Erythroxylum coca*): A geographical analysis" in *Journal of Toxicology and Environmental Health*, *Part A,*72:974-985, 2009, p. 975.

per unit area and is second only to Brazil in overall species numbers; although its land area accounts for only 0.77% of the total surface of the Earth, it is home to approximately 10% of the Earth's species of terrestrial plants and animals.[172] It is therefore one of the seventeen mega-diverse countries of the world.[173] Colombia is one of the largest environmental hubs in the planet, one of the top ten countries in terms of areas of primary forest, and it has a potential annual fresh water production – in cubic kilometres – greater than India or the continental United States.

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[172] J.A. McNeely, K.R. Miller, W.V. Reid, R.A. Mittermeier and T.B. Werner, *Conserving the World's Biological Diversity,* (IUCN, Gland, Switzerland; WRI, CI, WWF-US, and the World Bank, Washington, D.C., 1990), p. 93.
Available at: http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2000/01/15/000178830_98101901395728/Rendered/PDF/multi_page.pdf
(last visited 10 March 2010)

[173] Cancun Declaration of the Group of Like-Minded Megadiverse Countries, 18 February 2002. Available at:
http://www.lmmc.nic.in/Cancun%20Declaration.pdf (last visited 10 March 2010). For a definition of the term "Megadiversity countries", see Glossary of Biodiversity Terms of the United Nations Environment Programme – World Conservation Monitoring Center (UNEP-WCMC): "The small number of countries, located largely in the tropics, which account for a high percentage of the world's biodiversity by virtue of containing very large numbers of species."
Available at: http://www.unep-wcmc.org/reception/glossaryM-R.htm (last visited 10 March 2010). According to UNDP, biodiversity is essential in maintaining high levels of quality in the top soil; it helps regulate the composition of the atmosphere and is crucial to maintaining climatic stability, due to its role in stabilizing carbon levels. In aquatic ecosystems, biodiversity helps purify and maintain ph levels. Biodiversity also helps protect the forest against the cold. Some 99% of all the pests that affect agriculture are controlled by other organisms, whose survival depends on the preservation of biodiversity.

3.21. The Colombian territory includes ecosystems of such variety as the Amazon (tropical rainforest), the Plains (Llanos), the Andes mountain range, the Caribbean and the Pacific coasts and islands. The Amazon rainforest, responsible for 15% of the planet's oxygen supply, covers 40% of South America. Within Colombia, the Amazon rainforest constitutes 35% of the national territory. Colombia has between 45,000 and 55,000 plant species,[174] representing around 16% of all plant species.

3.22. In terms of animal species, Colombia is the country with the most birds in the world, with 1,865 bird species – 66 endemic – equal to 18% of the world's total. It is also the richest in amphibians, with 733 species – 400 of them endemic – 13% of the world's diversity. It is home to the world's second largest variety in butterflies, about 3,200 species. It has 2,000 species of freshwater fish, corresponding to 10% of the world's diversity, and 524 species of reptiles (6%). As for mammals, 471 species are found in Colombia, with 32 endemic species, i.e., the fifth most diverse country in that respect. Combined figures for reptiles, birds, amphibians and mammals, add up to a total diversity of 3,540 species.[175]

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[174] D.G. Campbell & H.D. Hammond, (eds.), *Floristic Inventory of Tropical Countries*, The New York Botanical Garden, NY, 1985.

[175] Alexander von Humboldt Research Institute on Biological Resources; CHM Colombia, Mecanismo de Facilitación del Convenio sobre Biodiversidad Biológica, *Biodiversity in Colombia*, Available at: http://www.humboldt.org.co/chmcolombia/biodiversidad.htm (last visited 10 March 2010); Tropical Butterflies Biodiversity Project, *Colombia*, Available at: http://www.andeanbutterflies.org/colombia_sp.html (last visited 10 March 2010); Alexander von Humboldt Research Institute on Biological Resources,

3.23. Colombia has a system of National Natural Parks covering a total area of 106,230 km^2, 10% of the national territory. In the last five years, 5 new national parks have been created. In total, there are 257 protected natural zones in Colombia, with a combined area larger than Belgium, Denmark and the Netherlands together.[176]

3.24. Colombia is furthermore renowned for its sound environmental practices. It was the first country in the region to adopt a code on natural resources in 1974, and to create a national environmental system in 1993,[177] that has been a landmark reference for other countries in the region. Thus, Colombia was ranked 9th out of 149 countries on the Yale and Columbia University 2008 Environmental Performance Index.[178]

Fish of the Colombian Andes, p. 11. Available at: http://www.humboldt.org.co/humboldt/homeFiles/inventarios/peces_01_01.pdf (last visited 10 March 2010).

[176] Annex 151: Colombian Association of Regional Autonomous Corporations (ASOCARS), "Shared Responsibility: The World Drug Problem from a Green Perspective", *Periódico Virtual*, Issue N° 14, 2008, p. 2.

[177] Colombian Decree N° 2811 of 18 December 1974, issued by the President of Colombia (Official Journal No 34.243 of 27 January 1975) Available at: http://www.secretariasenado.gov.co/senado/basedoc/decreto/1974/decreto_2811_1974.html (last visited 10 March 2010); Annex 32: Colombian Law 99 of 22 December 1993.

[178] The 2008 Environmental Performance Index (EPI) ranks 149 countries on 25 indicators tracked across six established policy categories: Environmental Health, Air Pollution, Water Resources, Biodiversity and Habitat, Productive Natural Resources, and Climate Change. Available at: http://epi.yale.edu/countryscores (last visited 10 March 2010).

(2) LOCATION OF ILLICIT CROPS

3.25. In general terms, illicit coca and opium poppy crops are located precisely in highly valuable forest ecosystems, including Amazon soils and the Andean biodiversity hotspot.[179] This is explained by the fact that growers tend to select areas isolated from urban centres, with abundant plant biomass and the presence of plentiful water bodies in order to set up crops and laboratories and deposits of chemicals.[180]

3.26. Illicit crops are typically located in areas with a large presence of illegal armed groups that hamper the authorities' activities and often provide "security services" to the crops and processing laboratories.[181]

3.27. In terms of the impact on the environment, the most troublesome aspect is the presence of illicit crops in natural reserves, designed to preserve biodiversity against damage from human activities. In 2008 nearly 3,450 hectares of Colombia's National Natural Parks were destroyed to make way for coca crops,[182] as illustrated by the map on the following page (*Figure 3.1*), taken from the UNODC Colombia Coca Survey 2009.[183]

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179 Annex 116, CICAD I, p. 9.

180 Annex 40: "Environmental Impact Caused by Chemical Substances, Illicit Crops and Related Activities", National Narcotics Directorate of Colombia, Strategic and Research Division, 2000, pp. 5, 6.

181 Annex 40, p. 6. See also Annex 108, Colombia Coca Cultivation Survey 2008, p. 70.

182 Annex 108, Colombia Coca Cultivation Survey 2008, p. 19.

183 *Ibid.*, p. 18.

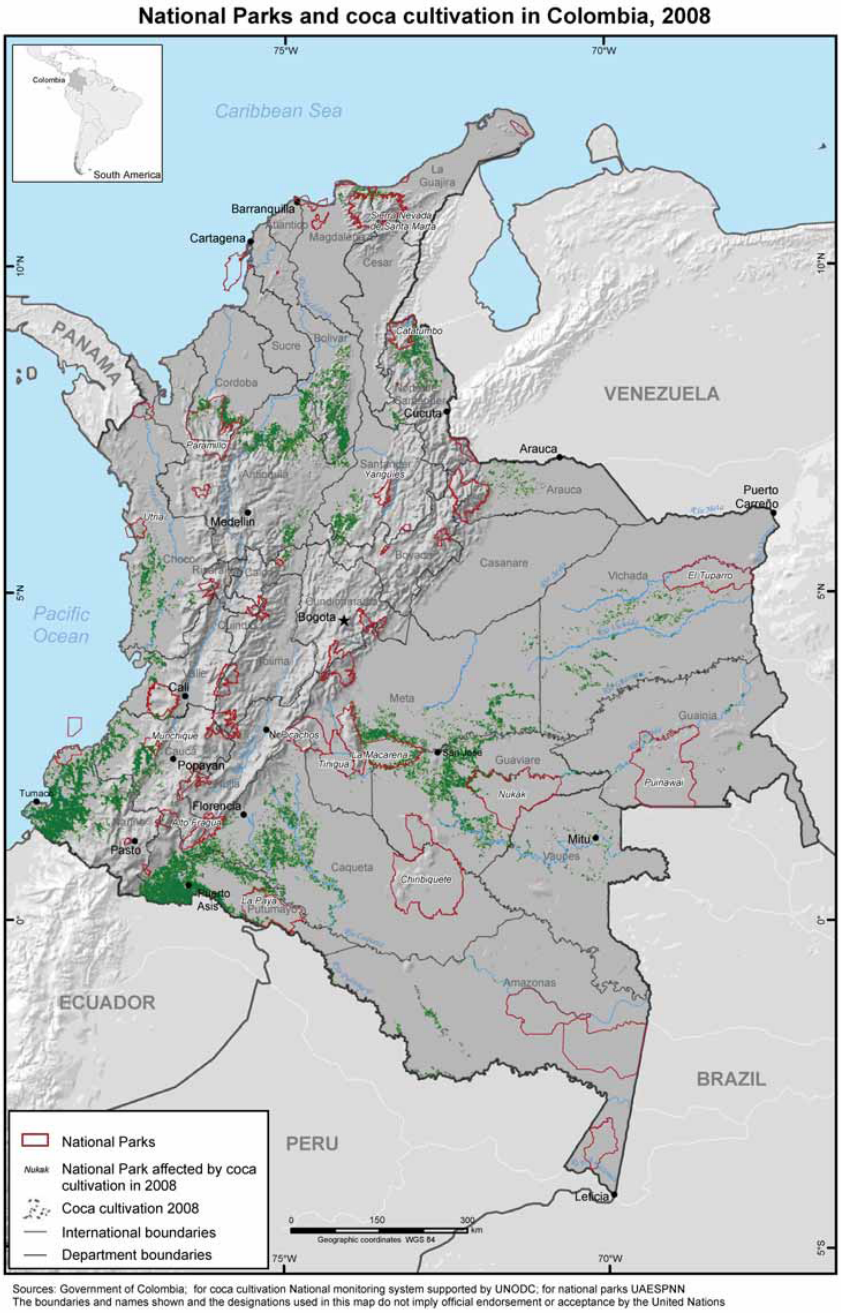

Figure 3.1 National Parks and coca cultivation in Colombia
(UNODC, Colombia Coca Cultivation Survey 2008, June 2009, p. 18)

(3) THE COCAINE PRODUCTION CHAIN AND ITS ENVIRONMENTAL EFFECTS

3.28. According to the findings of the second phase of the scientific study conducted under the auspices of the Organization of American States, through CICAD ("CICAD II"), "the degradation of ecosystems associated with the production of coca and its processing into cocaine paste and then into cocaine hydrochloride, constitutes one of Latin America's most important current environmental issues".[184] In Colombia, the most obvious environmental effect of coca cultivation is the clearance of forests.[185] In this regard, "the tropical rain forests constitute the largest biome in Colombia, though over 11 of the original 44 million hectares have been lost".[186]

3.29. The cocaine production chain consists of different stages, each of them damaging to the environment: clearance of existing vegetation; the planting of crops; the setting up of

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[184] Annex 131-D, CICAD II, R.A. Brain et al. (2009), p. 945, referring to the following studies: Armstead, L. 1992, "Illicit narcotics cultivation and processing: The ignored environmental drama" *Bull. Narcot.* 44:9–20; Viña, A., Echavarria, F. R., and Rundquist, "Satellite change detection analysis of deforestation rates and patterns along the Colombia–Ecuador border", *Ambio* 33:118–125, Washington, D.C., 2004.

[185] UNODC, *Coca Cultivation in the Andean Region - A survey of Colombia, Bolivia and Peru*, June 2006, p. 19.
Available at: http://www.unodc.org/pdf/andean/Andean_report_Part2.pdf (last visited 10 March 2010).

[186] Annex 131-D, CICAD II, Brain et al. (2009), p. 945. Biome is "a major portion of the living environment of a particular region (such as a fir forest or grassland), characterised by its distinctive vegetation and maintained by local climatic conditions." At: http://www.unep-wcmc.org/reception/glossaryA-E.htm (last visited 10 March 2010).

clandestine laboratories and cocaine factories; and the actual drug processing.

3.30. The most commonly used technique to clear the land is often characterized as "slash and burn"[187] consisting of the cutting, felling, and subsequent burning of forests. Generally, primary forests are felled by means of chainsaws, which leads to increased affected areas due to the dragging effect of larger felled trees on medium and smaller trees. On the other hand, the burning of the forest is not a controlled action since barriers to prevent fire from expanding are either not created at all, or are so small that they allow the flames to spread to other forest areas, causing the indiscriminate burning of many more hectares than are actually required for growing illicit crops.

3.31. One hectare of land devoted to coca cultivation produces on average 7.7 kilos of pure processed cocaine hydrochloride per year,[188] one gram being the measure of a dose. On average, coca growers clear an area four times larger than that required for the crops themselves in order to set up clandestine laboratories, or because of uncontrolled forest fires. Therefore, for each 7,700 doses of pure processed cocaine hydrochloride, 4 hectares or 40,000 square meters of forest are felled. In other

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[187] "The farmers deforest from the canopy to the leaf litter in order to prepare that land for a coca plantation, leaving the habitat completely destroyed by physical activities" in Annex 131-H, CICAD II, p. 975.

[188] UNODC, *World Drug Report 2006*, p. 239. Available at: http://www.unodc.org/pdf/WDR_2006/wdr2006_chap3_cocaine.pdf (last visited 10 March 2010).

words, for each gram of cocaine consumed, more than 5 square meters of tropical forest are clear cut.

(a) Lands deforested for crops

3.32. As is well-known, the destruction of an ecosystem includes the removal of native vegetation coverage, with the consequent loss of hydrological regulation capabilities; the degradation of micro flora, micro fauna and as yet unknown genetic potential; the displacement of endemic species; soil erosion and an irreparable loss of biodiversity. The normal clearance method result in air pollution from smoke and entails a considerable increase in CO_2 emissions which contribute to climate change.[189] As the 2005 study by CICAD ("CICAD I") explains:

> "...[T]he clear-cutting of forests for the purposes of coca and poppy production reduces biodiversity, contributes to the release of

[189] "Easily the most visible environmentally destructive effect of coca and poppy cultivation is deforestation... The immediate effect of deforestation is the reduction of natural habitat and subsequent reduction in the bio-diversity of the region. A secondary effect of the deforestation derives from the typical method of preparing an area for cultivation through a slash and burn procedure. This burning is the major source of air pollution in the jungle..." in American University, "Colombia Coca Trade", *Trade and Environment Database (TED) Case Studies*, November 1997, pp. 2. Available at: http://www1.american.edu/TED/colcoca.htm (last visited 10 March 2010); for definitions of reservoir and greenhouse gases sink, see Glossary of Terms of the United Nations Framework Convention on Climate Change.
At: http://unfccc.int/essential_background/glossary/items/3666.php#top (last visited 10 March 2010).

> greenhouse gases, increases the loss of soil nutrients, and promotes erosion of soils."[190]

3.33. Nearly 200,000 hectares of Colombian natural forest are deforested yearly to grow coca crops for cocaine production. Over the last 20 years, over 2.2 million hectares – an area the size of Slovenia and equal to half the territory of the Netherlands or Switzerland – has been deforested for coca crops.[191] According to CICAD I, "return to the conditions of tropical old-growth forest that existed prior to clear-cutting and burning may take hundreds of years".[192]

(b) Chemicals used

3.34. The adverse impact of illicit crops on the environment does not end with the destruction of the forests. Several of the agrochemicals used for growing and processing coca fall under toxicological categories I (Extremely Toxic) and II (Highly Toxic), and resist biodegradation. Among them are those known as the "dirty dozen".[193] For example, one of the chemicals used in processing cocaine is nitric acid which can cause death in humans and aquatic organisms and affects

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190 Annex 116, CICAD I, p. 14.

191 Annex 151.

192 Annex 116, CICAD I, p. 11.

193 Among the chemicals used in illicit crops are those considered worldwide as the so-called "Dirty Dozen" that have been banned in most industrialized countries. In addition to Paraquat, the use of Lindano for pediculosis control is common; pentachlorophenol is used as a pesticide and Parathion, a potent herbicide with action ranging from pest control in food crops to insect extermination. In Annex 40, p. 12.

soils.[194] It is estimated that growers of coca crops in Colombian territory apply five million litres of herbicides, pesticides and foliar fertilizers on a yearly basis. Overall, in order to transform coca plants into cocaine, it is estimated that every hectare of coca crops requires the use of approximately 127 kilos/ha of solid precursors, 447 litres/ha of liquid precursors and 400 litres/ha of water.[195]

3.35. Most of the chemical precursors used in the processing of illicit crops are smuggled into Colombian territory across its land borders, contrary to international instruments regulating the trade and distribution of such substances.[196] Contributing to the criminal atmosphere of the borders is the alliance between the drug trafficking cartels and armed groups in order to smuggle chemical precursors for drug processing into Colombia and smuggle out refined illicit drugs with the purpose of sending them to the United States and Europe.

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[194] Annex 118, CICAD I, Toxicology of Substances Used in the Production and Refining of Cocaine and Heroin: A Tier-Two Hazard Assessment (2005), p. 27.

[195] Annex 127, p. 5. See also, Speech of the Colombian Vice-President, Francisco Santos, at the University of California, Los Angeles (UCLA), *The environmental impact of cocaine*, 25 February 2009. Available at: http://newsroom.ucla.edu/portal/ucla/electronicplay.aspx?Fid=64241&id=E0C5478 (last visited 10 March 2010).

[196] Articles 12 and 13 of the UN 1988 Narcotics Convention; Annex 145: Andean Community Decision 602 of December 2004, Andean Regulation for the Control of chemical substances used in the illegal manufacture of narcotic drugs and psychotropic substances; Annex 137: Andean Cooperation Plan for the Control of Illegal Drugs and Related Offenses, Andean Community, Decision 505 of April 2001.

(c) Other effects

3.36. Further along in the chain of the processing of illicit crops, once the first harvest is obtained coca growers must turn their harvested leaves into more transportable and more easily concealed packages. Again, they resort to isolated areas – very often in the tropical rainforests or other sensitive areas – where they set about establishing processing labs in order to produce coca paste or base.[197]

3.37. Clandestine laboratories are always located near water sources that are essential both in order to dispose of the great amount of chemicals used during the processing of coca leaves, and so as to be able to submerge containers of precursor chemicals in water in order to keep them cool and prevent their evaporation in the warm climate of the rainforest. Since the containers used for storing chemicals are not airtight, they inevitably leak noxious substances into the rivers. In terms of chemical waste, in the production of 1 kg of coca paste, 625 kg of solid waste are generated, 1.9 litres of sulphuric acid and 1.25 litres of ammonia are released into the environment, and nearly

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[197] For further information on the process of growing coca and cocaine production, and its deleterious effects on the environment, see Annex 118: CICAD, R.A. Brain et al., "The Toxicology of Substances Used in the Production and Refining of Cocaine and Heroin: A Tier-Two Hazard Assessment", OAS, Washington. D.C., 31 July 2005 (part of CICAD I). Complete document available at: http://www.cicad.oas.org/Desarrollo_Alternativo/ENG/Projects%20By%20Country/Colombia/OAS_CICAD_Tier_2_Hazard_Assessment_July_2005%5B1%5D.pdf (last visited 10 March 2010).

200 litres of water are contaminated.[198] Despite the high levels of toxicity of these products, when working intensively with pesticides coca growers use no protection, thus exposing themselves to great health risks.

3.38. Additionally, the opening of rudimentary access trails; the construction of facilities – namely clandestine laboratories – for the processing of the coca leaves and extraction of coca paste or base; the establishment of dumps for the storage of chemical substances; and occasionally, the establishment of narcotics refining facilities, drying zones and sleeping quarters required for the processing of illicit crops, all add up to deepen the negative impact on these highly sensitive ecosystems.

3.39. From all of the above, the severity of the negative environmental impact of illicit coca crops and cocaine processing on the ecosystems of any country, and those of Colombia in particular, are clearly borne out. Therefore, in promoting eradication programs against illicit crops and other efforts in the fight against the trafficking of illicit narcotics, Colombia is not only complying with an international mandate, but is also aiming at protecting the environment as the heritage of mankind.

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198 Annex 127, p. 11.

E. International Support for the Fight against Drugs in Colombia

3.40. The noxious effects of illicit coca cultivation and production in Colombia described above were for a long time accompanied by the indifference of the international community as a whole. Certain States in particular did not adopt effective measures in response to the exponential increase in consumption, nor did they seek to curtail the sale and trafficking of chemical precursors, products and solvents involved in drug processing, or the illicit trafficking of arms and explosives used by terrorists. Others harboured the ringleaders and sheltered the money and assets derived from these criminal activities. Starting in 1987, at Colombia's initiative, the notion of "collective"[199] or "shared responsibility"[200] for the eradication

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[199] General Assembly Resolution 39/142, 14 December 1984; A/RES/39/142, para. 3: "The eradication of trafficking in narcotic drugs is the *collective responsibility* of all States, especially those affected by problems relating to illicit production, trafficking or abuse." (emphasis added).

[200] The term "shared responsibility", began appearing consistently as such in all relevant United Nations documents and instruments as of 1987-1988; See e.g., General Assembly Resolution 41/127, 4 December 1986; A/RES/41/127: "...the eradication of this scourge calls for acknowledgement of *shared responsibility* in combating simultaneously the problems of illicit demand, production, distribution and marketing..." (emphasis added). Colombia, at the time under the strain of the scourge of drug trafficking, had actively participated in the hemispheric and international discussions on the issue, a landmark of which was the ministerial-level International Conference on Drug Abuse and Illicit Trafficking held in Vienna from 17 to 26 June 1987, attended by representatives from 138 States: see e.g. United Nations, *Declaration of the International Conference on Drug Abuse and Illicit Trafficking and Comprehensive Multidisciplinary Outline of Future Activities in Drug Abuse Control* (1988) (Available at: http://www.nzdl.org/cgi-bin/library.cgi?e=d-00000-00---off-0cdl--00-0----0-10-0---0---0direct-10---4-

of trafficking in narcotic drugs began to be discussed: it was embraced in the 1988 UN Narcotics Convention.[201]

(1) UNITED STATES' SUPPORT AND PLAN COLOMBIA

3.41. Since 1999, Colombia and the United States, on the basis of the principle of shared responsibility, have concluded a series of agreements – widely known as "Plan Colombia" – in order to fight against illicit drugs and organized crime. The aim of these agreements is to strengthen Colombia's institutional capacities and to improve the socio-economic situation of the most vulnerable segments of the population by offering alternatives to the production of illicit drugs.[202]

3.42. Within this framework, Plan Colombia comprises 10 strategies: Economic, Fiscal and Financial, Peace, National Defence, Judiciary and Human Rights, Anti-Narcotics, Alternative Development, Social Participation, Human Development and International Cooperation. Colombia's program for the eradication of illicit crops has received funding

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[201] 1582 UNTS 164; E/Conf. 82/15; EM, vol. II, Annex 3, 10th preambular paragraph: "Recognizing that eradication of illicit traffic is a responsibility of all States and that, to that end, co-ordinated action within the framework of international cooperation is necessary".

[202] Annex 57, p. 8.

from Plan Colombia, as part of one of the Plan's components, namely, the "Fight against the world drug problem and organized crime".[203]

3.43. Resources for the implementation of Plan Colombia have been provided by both countries.[204] Using those resources, the Colombian armed forces and National Police were modernized, equipped and trained in order to improve their counter-narcotic capabilities.[205] During its initial phase, a significant reduction of 46.4% in the number of hectares planted with coca crops was achieved.[206]

3.44. Plan Colombia was initially conceived for a period of 6 years, but it has been progressively extended with certain variations up to the present time.

(2) SUPPORT FROM THE EUROPEAN UNION AND INDIVIDUAL COUNTRIES FOR PLAN COLOMBIA

3.45. In addition to the support from the United States, support for "Plan Colombia" also came from the European Union as well as other countries like Canada and Japan. In a first meeting in London on June 2000 "the support to the strategies contemplated in "Plan Colombia" by the European Union

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203 Annex 57, pp. 7-8.
204 Ibid.
205 *Ibid.*, p. 10-11.
206 *Ibid.*, p. 12.

started to become a reality."[207] Further meetings took place in Madrid,[208] Bogotá,[209] and Brussels,[210] where more than US$ 1.5 billion dollars were committed to programs associated with "Plan Colombia."

3.46. The strong support of the European Union to the fight against drugs in Colombia can be evidenced in the intervention made by Gun-Britt Andersson, the then State Secretary for Development Cooperation, Migration and Political Asylum of the European Union, during the Brussels meeting in April 2001:

> "The internal armed conflict and the production and traffic of illegal drugs are intertwined. The European Union has the determination to continue to condemn and combat the production and traffic of illegal drugs under the principle of shared responsibility. It is necessary that all parties are involved in joint efforts with the view of finding viable alternatives to drug production. The production and commerce of drugs can never be justified with economic arguments nor arguing concerns about poverty."[211]

(3) SUPPORT FROM THE UNITED NATIONS: ILLICIT CROPS INTEGRATED MONITORING SYSTEM (SIMCI)

3.47. In June 1998, during the 20th General Assembly Special Session devoted to Drugs, UNODC set up an Illicit Crop

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207 G. Fernández de Soto, *La Ilusión Posible*, Ed. Norma, Bogotá, 2004, p. 99.
208 *Ibid.*, p. 101.
209 *Ibid.*, p. 105.
210 *Ibid.*, p. 107.
211 *Ibid.*, p. 108.

Monitoring Programme (ICMP) in Vienna. Through this program, which makes extensive use of satellite imagery, member States are granted support in designing and implementing a system for monitoring the extent and evolution of illicit crops.[212]

3.48. The Illicit Crops Integrated Monitoring System – SIMCI, from its Spanish acronym – is implemented with the support of the ICPM. SIMCI derives from an agreement concluded between the Colombian Government and the United Nations in 1999, with the purpose of detecting the illicit crops present in Colombian territory by processing and interpreting satellite imagery, and publishing an annual survey of such crops in Colombia on that basis. The statistics produced also cover potential cocaine production and comparative analyses with previous years.[213]

3.49. The work resulting from this project has allowed the relevant Colombian authorities to collect reliable information on coca crops in order to improve eradication operations, as well as to finalise studies and research activities on issues relating to such crops.

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[212] UNODC Illicit Crop Monitoring Programme (ICMP). At: http://www.uncosa.unvienna.org/uncosa/en/directory/unodc/index.html (last visited 10 March 2010).

[213] Annex 95: Description of the Illicit Crops Integrated Monitoring System (SIMCI), p. 2.

(4) SUPPORT FROM THE ORGANIZATION OF AMERICAN STATES: INTER-AMERICAN DRUG ABUSE CONTROL COMMISSION (CICAD)

3.50. In light of the serious global and regional situation posed by the problem of production and consumption of illicit drugs, the Inter-American Drug Abuse Control Commission – CICAD from its Spanish acronym – was established in 1986 as an agency of the Organization of American States (OAS) as a specialized policy forum for matters relating to illicit drugs in the Americas.

3.51. CICAD has become the most important body in the Inter-American context in the fight against the drug problem and has been paid particular attention from all States of the continent. Its tasks cover a wide range of activities including follow-up on drug consumption, the related social and economic problems, prevention and rehabilitation, as well as providing basic information to institutions dealing with the problem in each State in the hemisphere.

3.52. The OAS, in particular through CICAD, has cooperated with the Colombian Government. CICAD provided technical assistance in order to establish a national "Observatory on Drugs",[214] based on the Drug Information System of Colombia

[214] Annex 114: Annual Report of the Inter-American Drug Abuse Control Commission (CICAD) to the General Assembly of the Organization of American States at its 34th Regular Session, 17-20 November 2003,

(SIDCO), set up in 1996 by the Colombian Government. The Observatory, the activities of which enjoy CICAD's continuing support, is entrusted with consolidating domestic information on the abuse of lawful substances and the production, trafficking, offer and consumption of illicit drugs and related crimes, enabling its distribution both domestically and internationally. CICAD has also sponsored national and international conferences and meetings on various aspects pertaining to the drug problem, including the activities of maritime drug trafficking and those that take place in coastal waters and zones and port facilities.[215]

3.53. CICAD has provided consultative assistance to Colombia's National Plan for Alternative Development; for an important programme of socio-economic development as an alternative to coca cultivation aimed at benefiting a Cofán indigenous community and the indigenous localities of Valle del Guamuez and San Miguel in Putumayo province;[216] also, for projects in the areas of agriculture and cattle raising, fish-breeding, and the sale of dairy products.

Montreal, Canada, 3 May 2004, p. 26. OEA/Ser.L/XIV.2.34 CICAD/doc.1264/03 rev. 2.

[215] Annex 112: Annual Report of the Inter-American Drug Abuse Control Commission (CICAD) to the General Assembly of the Organization of American States at its 32nd Regular Session, 12-15 November 2001, Caracas, Venezuela, 3 April 2002, pp. 7-8. OEA/SER.L/XIV.2.30 CICAD/doc.1123/01 rev.1.

[216] *Ibid.*, p. 13.

3.54. On 4 February 2004, Colombia and the Secretary-General of the OAS entered into a Memorandum of Understanding, pursuant to which a group of scientists, under the auspices, funding and supervision of CICAD, carried out an independent scientific study on the possible risks or effects on human health and the environment of the use of the herbicide glyphosate for the control of coca and poppy illicit crops in Colombia.[217] The results of the study (known as CICAD I), discussed at Chapters 4 and 7 below, were presented to the OAS Secretary-General and the OAS Permanent Council.[218]

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[217] Annex 113: 2004 Memorandum of Understanding between the Government of Colombia and the Organization of American States (OAS) for the execution of the study on the effects of the Program for the Eradication of Illicit Crops by aerial spraying with Glyphosate Herbicide (PECIG) and of illicit crops, on human health and the environment, 4 February 2004.

[218] At the 35th Regular Session of CICAD, Washington, D.C., 27-30 April 2004, a progress report on the first phase of CICAD's study was presented (Annex 115, Session Documents, p. 2). Likewise, during 37th Regular Session of CICAD, Santo Domingo, Dominican Republic, 26-29 April 2005, the conclusions of the first phase of CICAD's study were presented. (Annex 117: 37th Regular Session of CICAD, Santo Domingo, Dominican Republic, 26-29 April 2005, Document 1421). Also: "...A study of the environmental and human health impact of aerial spraying with the glyphosate herbicide on coca and poppy crops in Colombia was completed and the findings officially presented to the Government of Colombia, and to the scientific community and the general public through CICAD's website." In Annex 120: Annual Report of the Inter-American Drug Abuse Control Commission (CICAD) to the General Assembly of the Organization of American States at its 36th Regular Session, Santo Domingo, Dominican Republic, 4-6 June 2006, p. 13. The Colombian Vice-Minister furnished all the members of the Permanent Council with a copy of CICAD I at the Council's Session of 9 January 2007, where the issue of the sprayings near the border was examined (see OAS, CP/INF.5432/07, p. 4, available for download at: http://www.oas.org/consejo/Documents%20INF2007.asp (last visited 10 March 2010). The Permanent Council included the Vice-Minister's statement in its 2006-2007 Report to the General Assembly (Annex 121: Annual Report of the Permanent Council to the General

Likewise, the results were officially communicated to the Ecuadorian Government by Colombia, under cover of a diplomatic Note dated 6 May 2005.[219]

3.55. Ecuador argues that this study was "Colombia's unilateral initiative" and alleges that it was not informed or afforded an opportunity to participate in the study.[220] However, the CICAD study had been commissioned in order to analyse the effects of the aerial sprayings *in Colombia*. In any case, acknowledged by Ecuador in its Memorial, a copy of the first CICAD study was sent to it.[221]

3.56. The work of CICAD also contemplated a second phase, which was conducted pursuant to a further Memorandum of Understanding concluded on 23 May 2006 between Colombia and the OAS Secretary-General with a view to obtaining further in-field and laboratory confirmation of the results of the first phase, and dealing with certain unresolved issues.[222] As in the first phase, the study was carried out by an independent team of

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Assembly of the Organization of American States 2006-2007, pp. 33-34. OAS, AG/doc.4698/07).

[219] EM, Vol. II, Annex 67 (Diplomatic Note DAA/CAL 23927 of 6 May 2005, from the Ministry of Foreign Affairs of Colombia to the Ministry of Foreign Affairs of Ecuador).

[220] EM, para. 3.36.

[221] EM, para. 3.47.

[222] Annex 119: 2006 Memorandum of Understanding between the General Secretariat of the Organization of American States (SG/OAS) and the Government of Colombia for the execution of the study on the effects of the Program for the Eradication of Illicit Crops by aerial spraying with Glyphosate Herbicide (PECIG) on human health and the environment, 23 May 2006.

scientists. CICAD II involved several environmental and health issues including, among others, the influence of spray procedures and conditions on spray drift, and the assessment of toxicity of the spray mixture to amphibians. Mention of the CICAD II study's scope and progress was included in CICAD's 2007 Report to the OAS General Assembly,[223] approved during CICAD's 43rd Regular Session held on 30 April-2 May 2008, which Ecuador attended.[224]

3.57. Once completed, most of the conclusions of the follow-up study were presented to CICAD by the independent experts in November 2008, and an explanation of the study's scope as well as mention of its completion were again included in

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[223] Annual Report of the Inter-American Drug Abuse Control Commission (CICAD) to the General Assembly of the OAS at its 38th Regular Session, OAS Document OEA/Ser.L/XIV.2.43, CICAD/doc.1656/08 rev.1, 2 May 2008, pp. 14-15. Available at: http://www.cicad.oas.org/AnnualReports/2007/AnnualReportCICAD-2007-eng.pdf (last visited 10 March 2010). The pertinent excerpt reads as follows:
"Colombia: Study on the Effects of Aerial Glyphosate Spraying
Since 2005, CICAD's scientific evaluation team has been working on an independent study, undertaken at the request of the governments of Colombia, the United States and the United Kingdom, to measure the impact of aerial spraying of coca fields in Colombia on human health and the environment. In follow-up studies in 2007, CICAD's team carried out research analyzing the following components:
[...]

- Analysis of the drift from aerial spraying with Glyphosate and Cosmo-Flux, as employed in the Colombian eradication program. Tests duplicating wind conditions on the Ecuadorian-Colombian border took place in a wind tunnel at the University of Queensland in Australia."

[224] See Final Report of the 43rd Regular Session of the CICAD, 30 April-2 May 2008, Washington, D.C. OAS Document OEA/Ser.L/XIV.2.43, CICAD/doc. 1672/08 rev 1, 29 July 2008, p. 9 (section 13 - Participants). Available at: http://www.cicad.oas.org/apps/Document.aspx?Id=675 (last visited 10 March 2010).

CICAD's 2008 Report to the OAS General Assembly,[225] and approved during CICAD's 45th Regular Session held on 6-8 May 2009, which Ecuador also attended.[226] The OAS General Assembly adopted CICAD's 2008 Annual Report on 4 June 2009.[227] The study, the results of which are extensively discussed in this Counter-Memorial, was published in the peer-reviewed *Journal of Toxicology and Environmental Health*.[228]

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[225] Annex 122: Annual Report of the Inter-American Drug Abuse Control Commission (CICAD) to the General Assembly of the OAS at its 39th Regular Session, San Pedro Sula, Honduras, 2-3 June 2009. OEA/Ser.G, CP/doc.4395/09 corr. 1, 26 May 2009, p. 12. The pertinent excerpt reads as follows:
"Colombia: Study on the Effects of Aerial Glyphosate Spraying
In 2005, CICAD's scientific evaluation team presented the results of an independent study, undertaken at the request of the governments of Colombia, the United States and the United Kingdom, to measure the impact of aerial spraying of coca fields in Colombia on human health and the environment. Although no association between spraying and human reproduction was found, the team proposed to carry out additional studies to identify possible risk factors associated with other human activities or the environment. The independent scientific evaluation team that CICAD hired in 2006 presented most of its findings of the follow-up study on the human health and environmental evaluation of the aerial spraying to control coca and poppy crops in Colombia in late 2008. The completed study, which consisted of several technical articles, was submitted for consideration in the peer-reviewed scientific periodical *Journal of Human and Environmental Toxicology*..."

[226] See Final Report of the 45th Regular Session of the CICAD, 6-8 May 2009, Washington, D.C. OAS Document OEA/Ser.L/XIV.2.45, CICAD/doc. 1742/09, 9 July 2009, p. 11 (section III - Participants). Available at: http://www.cicad.oas.org/APPS/Document.aspx?Id=800 (last visited 10 March 2010).

[227] OAS Document AG/RES. 2493 (XXXIX-O/09). Available at: www.oas.org/dil/AG-RES_2493-2009_eng.doc (last visited 10 March 2010).

[228] Annex 131, Annex 131-A to 131-I (CICAD II) [9 articles]: *Journal of Toxicology and Environmental Health,* Part A Current Issues, Volume 72, Numbers 15 & 16, Taylor & Francis, London, 2009.

3.58. The study, in its field phase, was carried out by the research team in different areas within Colombia. This is in sharp contrast to the Menzie Report, submitted by Ecuador as its main scientific evidence (EM, Annex 158). Indeed, only one of the Exponent team members that prepared the Menzie Report visited the border zone in Ecuador and that person merely made field observations and collected testimonies,[229] without taking any samples or conducting actual field tests.

F. Colombia's Obligation to Take Action against Illicit Crops

3.59. In accordance with the provisions of the international instruments in force concerning the world drug problem, and, in particular, the 1961 Single Convention on Narcotic Drugs as amended by its 1972 Protocol,[230] the 1971 Convention on Psychotropic Substances,[231] the 1988 United Nations Convention against Illicit Traffic in Narcotic Drugs and Psychotropic Substances,[232] and other related instruments,

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[229] EM, Vol. III, Annex 148, pp. ix, 1.

[230] 976 UNTS 105 (consolidated version). For the 1961 Convention as originally adopted, see 520 UNTS 151; for the 1972 Protocol, see 976 UNTS 3.

[231] 1019 UNTS 175.

[232] "As of March 2008, 183 countries were parties to the 1988 Convention (i.e., 95% of all United Nations Member States, having more than 99% of the world's total population). Non-parties to the Convention are just three countries in Africa (Equatorial Guinea, Namibia and Somalia), one country in Asia (Timor Este), one country in Europe (Holy See), and seven island countries in the Oceania region (Kiribati, Marshall Islands, Nauru, Palau, Papua New Guinea, Solomon Islands, Tuvalu)." *Op. cit.*, UNODC, *A Century of International Drug Control*, p. 68.

Colombia is obliged to take effective measures to suppress the production and consumption of illicit drugs.

3.60. The 1988 United Nations Convention against Illicit Traffic of Narcotic Drugs and Psychotropic Substances,[233] the very instrument invoked by Ecuador in its Application before the Court, was inspired by the need to tackle the scourge of illicit drugs in a global fashion, setting a framework of State obligations in that regard. As stated in the Preamble to the 1988 Convention, the States Parties

> "Deeply concerned by the magnitude of and rising trend in the illicit production of, demand for and traffic in narcotic drugs and psychotropic substances, which pose a serious threat to the health and welfare of human beings and adversely affect the economic, cultural and political foundations of society;
>
> […]
>
> [Recognized] the links between illicit traffic and other related organized criminal activities which undermine the legitimate economies and threaten the stability, security and sovereignty of States;
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> […]
>
> [Recognized] also that illicit traffic is an international criminal activity, the suppression of which demands urgent attention and the highest priority;
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> […]

[233] 1582 UNTS 164; E/Conf. 82/15; EM, Vol. II, Annex 3.

> [Recognized] that eradication of illicit traffic is a collective responsibility of all States and that, to that end, co-ordinated action within the framework of international co-operation is necessary..."

3.61. These concerns find concrete expression in Article 2 of the 1988 Convention, which provides:

> "The purpose of this Convention is to promote co-operation among the Parties so that they may address more effectively the various aspects of illicit traffic in narcotic drugs and psychotropic substances having an international dimension. In carrying out their obligations under the Convention, the Parties shall take necessary measures, including legislative and administrative measures, in conformity with the fundamental provisions of their respective domestic legislative systems."

3.62. It is in that context that Article 14 of the Convention stipulates that:

> "Each Party shall take appropriate measures to prevent illicit cultivation of and to eradicate plants containing narcotic or psychotropic substances, such as opium poppy, coca bush and cannabis plants, cultivated illicitly in its territory. The measures adopted shall respect fundamental human rights and shall take due account of traditional licit uses, where there is historic evidence of such use, as well as the protection of the environment."

3.63. As acknowledged in the 1998 United Nations "Action Plan on International Cooperation on the Eradication of Illicit

Drug Crops and on Alternative Development",[234] "[w]hen there is organized criminal involvement in the illicit drug crop cultivation and drug production, the measures such as eradication, destruction of illicit drug crops and arrests … are particularly appropriate."[235] Moreover, as also acknowledged by the Action Plan, even when alternative development projects are successful, some growers and processors are not likely to abandon production voluntarily simply because more lucrative opportunities exist, or because pressure may be exerted by illegal armed groups; such growers must see that there is a risk associated with pursuing the illicit cultivation of drug crops.[236] Accordingly, the Action Plan stipulates that "[i]n areas where viable alternative sources of income already exist, law enforcement measures are required against persistent illicit cultivation of narcotic crops."[237]

3.64. Colombia's obligation to combat illicit crops is paralleled by the obligation of all States to cooperate in the fight against the world drug problem. Thus, the 1998 UN Action Plan affirmed in its Preamble that "the fight against illicit drugs must be pursued in accordance with the provisions of the international drug control treaties, on the basis of the principle

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[234] General Assembly Resolution S-20/4-E, 10 June 1998 (Measures to enhance international cooperation to counter the world drug problem: Action Plan on International cooperation on the Eradication of Illicit Drug Crops and on Alternative Development); A/S-20/14, pp. 19-22.

[235] *Ibid.*, §29.

[236] *Ibid.*, §27.

[237] *Ibid.*, §30.

of shared responsibility".[238] The 1988 UN Convention sets forth in its preamble the principle of collective responsibility of all States, that is "not only, or even especially, those affected by problems relating to illicit production, traffic or abuse" to cooperate in the suppression of illicit drugs.[239] Thus, "the preamble places the Convention in the category of multilateral treaties responding to general concerns or interests affecting all States within the international community in a similar manner".[240] For this reason international organizations such as the UN and the OAS have reaffirmed their commitment to seek to eradicate illicit drugs and have given strong support to Colombia's own struggle against them.

G. Conclusions

3.65. Colombia is the country that has most decisively maintained the struggle against the world drugs problem. In fulfilling its obligations to the international community in this regard, it has contributed to the security and health of youths and adults around the world, while ensuring the stability of the State. But in this struggle Colombia has had to pay a very high cost both in human lives and economic resources.

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[238] General Assembly Resolution S-20/4-E, 10 June 1998 (Measures to enhance international cooperation to counter the world drug problem: Action Plan on International cooperation on the Eradication of Illicit Drug Crops and on Alternative Development); A/S-20/14, Preamble, first para.

[239] United Nations, Commentary to the United Nations Convention against Illicit Trafficking in Narcotics and Psychotropic Substances (New York, 1999), E/CN.7/590, para. 0.21.

[240] *Ibid*.

3.66. The scourge of illicit drugs has affected Colombia in a variety of ways over the years. Financing of illegal armed groups with the revenue of drug trafficking, political instability, kidnapping and murder of hundreds of prominent national figures and thousands of common citizens, and the pervasive influence of drug trafficking in many segments of the country's political, economic and social life seriously affected Colombia's institutional structure.

3.67. The progressive environmental deterioration and the adverse impact on the Colombian population caused by the cultivation and production of illicit substances are just as serious. As described above, Colombia is the second most biologically diverse country in the world and hosts a considerable part of the Amazon rainforest, the planet's lung and home of several indigenous communities. However, it is precisely in the most biologically diverse zones of the country that illicit crops are found, given that the growers seek places with dense vegetation and plentiful water supplies from natural sources, in order to keep the crops and clandestine laboratories from being easily detected and to dispose of the chemicals used in the processing of alkaloids. As a consequence these illegal activities seriously imperil the subsistence and cultural development of the communities located in the areas where the illicit crops are planted.

3.68. Illicit crops and their processing are the most critical factors for environmental damage in Colombia, given the deforestation and forest burning involved in setting them up, and the highly toxic nature of the chemicals used during the growing of the crops and their processing – many of which are smuggled across the borders. The damage caused by clear cutting the forest is such that it can take over a hundred years for a single affected hectare to be restored to its original state. Hence, in taking steps to eradicate illicit crops, Colombia is not only fulfilling its international obligations to fight against the world drug problem, but it is also endeavouring to protect both its population and the environment.

3.69. A number of States and international organizations have cooperated with Colombia in its fight against illicit drugs. In particular, the United States' Government has contributed funds to Plan Colombia, the first phase of which achieved a reduction of 46.4% of the areas affected by illicit crops. The second phase is still ongoing and is producing results that are just as effective. The European Union has likewise cooperated with Colombia in various ways in this struggle. The United Nations, through SIMCI, has assisted Colombia to obtain reliable information as to the location of coca crops for the purposes of its eradication efforts. The OAS has taken part in several projects, including the Colombian National Drug Observatory and through CICAD has conducted studies on the effects of illicit crops and on the impact of the eradication program by means of aerial spraying.

3.70. Colombia's fight against illicit drugs is aimed at fulfilling its obligations under international law in relation to illicit drugs derived mainly from the Single Convention on Narcotics Drugs of 1961, the 1971 Convention on Psychotropic Substances and the United Nations Convention Against Illicit Traffic in Narcotic Drugs and Psychotropic Substances of 1988. Ecuador is also bound by these obligations.

3.71. It is particularly important for Colombia to be able to rely on decisive cooperation from bordering and neighbouring countries in its strenuous fight against the production and trafficking of illicit drugs. Otherwise, the hefty costs and sacrifices the country has had to endure will have been useless.

Chapter 4

THE PROGRAM FOR THE ERADICATION OF ILLICIT CROPS BY AERIAL SPRAYING WITH GLYPHOSATE (PECIG)

A. The Need for Aerial Spraying

4.1. Following the implementation of satellite detection techniques in 1999,[241] it became possible to identify the location of illicit crops with greater accuracy. In 2000 the Colombian provinces of Nariño and Putumayo bordering Ecuador harboured 46% of the total area of illicit crops detected in the country, a remarkable figure since the sum of their respective territories amounts to only 5% of the national territory.[242] As recalled above, in 2000, Colombia produced some 77% of the world's coca leaf: the significance of the two border provinces to the world drug supply chain at that time is obvious.[243]

4.2. As the planted areas grew progressively more extensive, plantations were increasingly located in remote areas and were protected and even operated by illegal armed groups.[244] Indeed, in Nariño and Putumayo – which up until that time had been peaceful – there was an alarming increase in killings,

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241 See above, paras. 3.48-3.49.
242 Annex 103, Colombia Coca Cultivation Survey 2003, p. 15.
243 See Annex 102, p. 67.
244 See para. 3.1 and note 154 above.

kidnappings, and attacks against civilians, the Police and the Army. Those responsible were illegal armed groups as well as drug traffickers faced with obstruction by the State of their illegal trade.

4.3. As a consequence of that situation, as well as the opposition of the growers of the illicit crops to eradication efforts, in 2000 the Colombian Government increased the use of aerial spraying as the principal method of eradication. In particular, it decided to implement the program now known as the *Program for the Eradication of Illicit Crops by Aerial Spraying with Glyphosate* (PECIG, from its Spanish acronym) in all affected portions of its territory, including the provinces of Nariño and Putumayo.[245]

4.4. At the same time, the Colombian Government continued manual eradication efforts in those areas of the country where security conditions permitted. However, this is extremely

[245] The Commentary to Article 14 of the 1988 UN Narcotics Convention reads as follows: "There are several elements and technologies available for use in eradication operations, including manual and mechanic uprooting and manual or aerial spraying [...] the use of agents to eradicate such plants will depend on a series of factors such as geographic location, climate, topographic features and prevailing socioeconomic conditions, to which it shall correspond." United Nations, *Commentary to the United Nations Convention against Illicit Trafficking in Narcotics and Psychotropic Substances* (New York, 1999), para. 14.27.

dangerous, due to attacks on the manual eradicators and accompanying personnel.[246]

4.5. Thus Colombia's eradication strategy continues to be threefold. Eradication is carried out through the following methods:

(1) Forced manual eradication where security conditions permit and in sensitive areas such as natural parks;

(2) voluntary manual eradication, as part of alternative development initiatives; and

(3) aerial spraying of larger and remote areas.[247]

4.6. Aerial spraying continues to be the most effective method for large-scale eradication of illicit crops. It continues to be carried out in Colombian territory in conformity with the

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[246] Despite the security measures provided by the National Defence Ministry, skirmishes with the illegal armed groups, antipersonnel mines, attacks and accidents have taken the lives of eradicators and Police and Army personnel involved in or accompanying manual eradication tasks. Thus, in the period between 2006 and 2009, 39 civilian manual eradicators were killed and 149 injured while performing *manual eradication* tasks. Also, 69 policemen were killed and 197 injured. In contrast, during *aerial spraying* operations in the period 2001-2009, 8 policemen have died and 18 have been injured. See Annex 72: Note N° 0958 ARECI/JEFAT from the Anti-Narcotics Direction of the Colombian National Police (DIRAN) to the Colombian Foreign Ministry, 18 February 2010, p. 2; and Annex 73: Note N° 20103291383181 from the Presidential Agency for Social Action and International Cooperation (*Acción Social*) to the Colombian Foreign Ministry, 23 February 2010. Also, see further below, para. 4.37.

[247] Annex 66: Report by the National Narcotics Directorate (DNE), 2010, p. 2.

strict procedures laid down by the Colombian legal system and with due respect for the environment.

4.7. This Chapter gives a full account of the origins, implementation and outcomes of the PECIG program. It provides the necessary factual and technical basis for the consideration, in Part II of this Counter-Memorial, of the scientific and other evidence (Chapter 7) and of the legal issues raised by Ecuador's claim (Chapters 8 and 9). The account in this Chapter is supported and supplemented by the following annexed reports of the relevant Colombian departments or agencies involved in the program:

- Report by the Anti-Narcotics Direction of the Colombian National Police (DIRAN);[248]
- Report by the Colombian Agriculture and Livestock Institute (ICA);[249]
- Report by the Ministry for the Environment, Housing and Territorial Development;[250]
- Summary of Activities carried out by the Ministry of Social Protection and the National Health Institute (INS);[251]

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[248] Annex 67: Report by the Anti-Narcotics Direction of the Colombian National Police (DIRAN), 2010.

[249] Annex 65: Report by the Colombian Agriculture and Livestock Institute (ICA), 2010.

[250] Annex 70: Report by the Ministry for the Environment, Housing and Territorial Development, 2010.

- Report by the National Narcotics Directorate (DNE).[252]

B. Scientific Assessments Supporting the Aerial Spraying Program

(1) STUDIES LEADING TO THE ENVIRONMENTAL MANAGEMENT PLAN

4.8. In 1992, after carrying out relevant scientific studies[253] and assessing the existing situation, the Government of Colombia, through the National Narcotics Council (*Consejo Nacional de Estupefacientes*) – the highest domestic authority for such matters – authorized controlled fumigation with glyphosate, initially for poppy crops in limited parts of the Colombian territory.[254]

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[251] Annex 68: Report by the National Health Institute (INS), "Summary of Activities Carried Out by the Ministry of Social Protection and the National Health Institute with Regard to the Program for the Eradication of Illicit Crops with Glyphosate Herbicide – PECIG", 2010.

[252] Annex 66.

[253] These studies included experimental assessments of glyphosate application in the Natural Park at the Sierra Nevada in Santa Marta in the 1980s. SGS Colombia S.A., under contract to the National Narcotics Directorate, analyzed the results of several soil and water samples following the application of glyphosate on the Sierra Nevada in Santa Marta; it found no traceable contamination due to glyphosate. See Annex 123: SGS (Societé Génerale de Surveillance, S.A.) Colombia S.A., "Report on Contamination Control for glyphosate application at the Sierra of Santa Marta", 1987, pp. 2, 5, 6, 7, 8, 12.

[254] Annex 31: Communiqué of the National Narcotics Council of Colombia to public opinion on the eradication of illicit poppy crops, 31 January 1992.

4.9. In October 1993, both the Health Ministry and the National Institute for Natural Renewable Resources and the Environment (INDERENA, the predecessor to the present Ministry for the Environment) issued a favourable opinion in relation to the use of controlled aerial spraying with glyphosate herbicide for the eradication of coca and marijuana crops.[255]

4.10. In December 1993, the Law on the Environment was passed. In 1994, a regulatory decree adopted under that Law provided that activities – including the aerial spraying of illicit crops – that had been authorized and begun prior to that date could continue, but that the relevant environmental authority could require the establishment of an Environmental Management Plan. In accordance with the provisions establishing a transitional regime, that Plan is equivalent to an environmental impact assessment.[256]

4.11. The new legal regime expressly set out the activities requiring prior environmental authorization; the application of pesticides was not included among them. However, the National Government, going beyond the legal requirements, regarded it as appropriate to require an Environmental

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[255] Annexes 35 and 36: Notes of 8 and 11 October 1993, signed by the General Manager of INDERENA (National Institute for Renewable Natural Resources and the Environment) and the Health Minister, respectively, authorities in charge of preserving the environment and protecting the health of the population.

[256] Annex 32: Colombian Law 99 of 1993, Article 57; and Annex 38: Colombian Decree 1753 of 1994, Articles 1 and 38.

Management Plan (EMP), taking the new regulations into account.

4.12. Subsequently, the Ministry for the Environment took steps with a view to establishing the EMP for the PECIG program. Thus, in 1996 it issued the terms of reference for the environmental study to be carried out by the National Narcotics Directorate.

4.13. The Ministry for the Environment and the National Narcotics Directorate jointly worked in developing the EMP. In November 2001, following several adjustments arising from initial field experience, the EMP was formally adopted by Resolution 1065 of 2001. However, environmental management programs are meant to be dynamic instruments. As a result of further experiences acquired in the PECIG program and the management of its EMP, the latter was amended by Resolution 1054 of 2003,[257] which *inter alia* included other government agencies in its execution.

4.14. To summarize, at the time the Colombian Government began conducting aerial spraying operations in the provinces of Nariño and Putumayo in 2000, it did so in the framework of the legislation in force with regard to health and the environment. In particular it drew up the EMP. That plan, together with the

[257] Annex 50: Resolution Nº 1054 of 30 September 2003 of the Ministry for the Environment of Colombia.

amendment adopted in 2003, has governed the PECIG up to the present time.

(2) SUBSEQUENT STUDIES: THE CICAD PROCESS

4.15. In 2001, the Colombian Government decided to request CICAD, an impartial, specialized agency of the Organization of American States, concerned with drug-related issues in whose work both Colombia and Ecuador participate,[258] to carry out a scientific assessment of the impact on human health and the environment of the use of glyphosate for the control of coca and poppy crops in Colombia. The United States and the United Kingdom (although the latter was not an OAS Member) made similar requests.

4.16. Following a careful process to establish the terms of reference, agreement was reached with CICAD and a Memorandum of Understanding was signed in February 2004, by Colombia and the Secretary General of the OAS.[259] The study to be undertaken was intended to deal with the use of glyphosate in the entire Colombian territory and not only its use in the border area with Ecuador.

4.17. On 15 October 2004, during a meeting in Esmeraldas, the President of Colombia informed the Ecuadorian President of

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[258] See http://www.cicad.oas.org/EN/AboutCICAD.asp (last visited 10 March 2010).

[259] See above, para. 3.54.

the study Colombia had requested CICAD to carry out.[260] In addition to information concerning the study's progress and completion, which were transmitted to all CICAD members throughout,[261] the results of the study were officially communicated to Ecuador on 6 May 2005.[262] The Scientific and Technical Commission analyzed the results of the study.[263]

4.18. On 23 May 2006 a second Memorandum of Understanding was concluded between Colombia and the OAS Secretary-General with the purpose of conducting a second phase of the study (CICAD II).[264] This was completed in 2008 and published in 2009.

4.19. Despite the fact that the Ecuadorian Government on several occasions was invited to take part in the CICAD study,[265] it declined to participate at all.[266] However, the Ecuadorian Government was kept informed of its progress and completion in the course of CICAD regular sessions, as well as through CICAD's reports to the OAS General Assembly.[267]

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260 Annex 17, p. 2.

261 See above, para. 3.54-3.58.

262 EM, Vol. II, Annex 67.

263 EM, Vol. III, Annex 153.

264 See above, para. 3.56.

265 Annex 24: Diplomatic Note DM/VRE/DPM/CDR/DDA/CAL Nº 44664 from the Colombian Foreign Minister to the Ecuadorian Foreign Minister, 5 September 2006. Annex 25: Diplomatic Note Nº 39064/06-VM/SSNDF/DGRFC from the Ecuadorian Foreign Minister to the CICAD Executive Secretary, 20 September 2006.

266 Annex 25.

267 See above, para. 3.56-3.58.

(3) CONCLUSIONS

4.20. The PECIG program was based on investigations and reports concerning potential impacts of aerial spraying, going back to the INDERENA opinion of 1993.[268] These studies have been substantially amplified and developed since 2001, most notably through the two CICAD studies of 2005 and 2009. This has occurred without challenging, still less undermining, the overall positive appraisal of the PECIG program and its implementation, which the Colombian Government had already adopted in 2000. These later scientific studies will be examined in detail in Chapter 7.

C. Implementation of the PECIG Program

4.21. The PECIG eradication program is set out and implemented under a series of Resolutions, including Resolutions 001 of 1994 and 013 of 2003, which govern the involvement of the different Colombian agencies responsible for

[268] Annex 35: Note from the General Manager of INDERENA (National Institute for Renewable Natural Resources and the Environment) to the Director of the National Narcotics Directorate of Colombia, 8 October 1993.

the program.[269] In particular, the program is carried out on the basis of the EMP of 2001 as amended.[270]

4.22. Furthermore, in 2001 the Colombian Government introduced a compensation program to deal with any claims as to the harmful effects that might incidentally occur in relation to lawful crops in the immediate vicinity of sprayed illicit crops.[271] In this regard, between 2002 and 2008, 117 individuals who had addressed complaints concerning damages to lawful crops were compensated.[272] Many more complaints have been rejected for want of satisfactory proof of harm or for other reasons.

(1) THE SUPERVISORY FRAMEWORK – ENVIRONMENTAL MANAGEMENT PLAN

4.23. The Environmental Management Plan is a set of rules and procedures that must be followed and observed by all the agencies that directly or indirectly take part in the Program for the Eradication of Illicit Crops by Aerial Spraying with Glyphosate (PECIG). Its purpose is to ensure that the

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[269] Annex 37: Resolution Nº 001 of 11 February 1994 of the National Narcotics Council of Colombia; Annex 41: Resolution Nº 005 of 11 August 2000 of the National Narcotics Council of Colombia; Annex 49: Resolution Nº 013 of 27 June 2003 of the National Narcotics Council of Colombia. See also Annex 66, p. 1; Annex 67, p. 1.

[270] EM, Vol. II, Annex 15 (Resolution Nº 1065 of 26 November 2001 of the Ministry for the Environment of Colombia); modified by Resolution Nº 0099 of 31 January 2003 of the Ministry for the Environment of Colombia (CCM, Annex 48); CCM, Annex 50.

[271] Annex 43: Resolution Nº 017 of 4 October 2001 of the National Narcotics Council of Colombia; Annex 61: Resolution Nº 008 of 2 March 2007 of the National Narcotics Council of Colombia.

[272] Annex 67, p. 11.

implementation of the PECIG eradication program is in accordance with the environmental provisions in force, to verify the effectiveness of the spraying of illicit crops and to assess any effects on surrounding areas.[273]

4.24. The EMP sets out measures for the inspection, verification and control of spraying operations, industrial security at sites used in spraying operations, management of solid waste and residual water, and environmental monitoring through the collection and analysis of soil and water samples. It also foresees a public health program, a program of communications and social management, and a contingency management plan.[274]

4.25. The State agencies that take part in the implementation of PECIG are responsible for compliance with the EMP.[275] As for the verification of the effectiveness of aerial spraying, other entities are involved as observers, including, among others, the Ministry of Social Protection, the Colombian Agricultural Institute, the Attorney General's office, and the office of the Public Prosecutor.[276]

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[273] EM, Vol II., Annex 15; CCM, Annex 50.

[274] EM, Vol II., Annex 15; CCM, Annex 50.

[275] Annex 65, pp.1-3; Annex 66, pp. 2-4; Annex 67, p. 1; Annex 68, pp. 2-4; Annex 70, p.2.

[276] EM, Vol II, Annex 15; CCM, Annex 50.

4.26. The Ministry for the Environment oversees the implementation of the EMP and verifies compliance with the guidelines and duties foreseen in it. Two reports per year are submitted to the Ministry, which may issue rulings on the activities carried out by the agencies involved in the implementation of the PECIG program.[277]

4.27. Although Ecuador annexed the text of Resolution 1065 of 2001 to its Memorial, it failed to translate the passage concerning the verification carried out by Colombia's Ministry for the Environment. That verification is carried out through a technical visit to a spraying base, in order to assess the level of compliance by the relevant authorities involved in the execution of the PECIG with the operational parameters as well as norms relating to industrial safety, storage of spray mix substances and final disposal of residues at the spraying base.[278]

4.28. The PECIG program is also overseen by an external technical audit, contracted yearly through public tender with resources provided by the National Narcotics Council.[279] The

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[277] EM, Vol II, Annex 15 (Resolution Nº 1065 of 26 November 2001 of the Ministry for the Environment of Colombia); modified by Resolution Nº 0099 of 31 January 2003 of the Ministry for the Environment of Colombia (CCM, Annex 48) and CCM, Annex 50. See also, Annex 70, p. 2.

[278] Annex 45: Resolution Nº 1065 of 26 November 2001 of the Ministry for the Environment of Colombia, Section 3 of the 'whereas' part, Technical Visit.

[279] Annex 37, Resolution Nº 001 of 11 February 1994 of the National Narcotics Council of Colombia (Article 7), modified by Resolution Nº 005 of 11 August 2000 of the National Narcotics Council of Colombia (Annex 41),

technical auditors conduct visits to the operation sites and the spraying zones, as well as to the offices of the agencies in charge of implementing the PECIG program, in order to verify that their activities abide by the procedures and guidelines contained in the Environmental Management Plan. For instance, in order to verify the environmental monitoring provided for in the Plan, the auditors take counter-samples of soil and water.[280] Likewise, at the operation sites, the audit verifies whether industrial security measures are being implemented as well as whether there is compliance with the rules as to solid waste and residual water management.

4.29. The auditing company submits quarterly reports[281] of its evaluations and assessments, with recommendations for any outstanding corrective actions to be taken. The results of the external technical audit are submitted to the National Narcotics Council annually.[282]

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revoked by Resolution Nº 013 of 27 June 2003 of the National Narcotics Council of Colombia (Annex 49). See also Appendix 1 to Report by the National Narcotics Directorate (DNE), 2010 (Annex 66).

[280] Resolution Nº 013 of 27 June 2003 of the National Narcotics Council of Colombia, Article 5 (Annex 49); Annex 59: Addendum Nº 1 to Tender Nº 02 of 2007, with the purpose of "Contracting the Audit to the Program for the Eradication of Illicit Crops by Aerial Spraying with Glyphosate Herbicide", National Narcotics Directorate of Colombia, pp. 1, 6-7.

[281] Appendix 1 to Annex 66.

[282] Annex 49: Resolution Nº 013 of 27 June 2003 of the National Narcotics Council of Colombia (Article 5).

4.30. In its Memorial,[283] Ecuador refers to a 2003 decision of the Administrative Tribunal of Cundinamarca – a province in the middle of Colombia, more than 900 km from the border with Ecuador – which ordered the suspension of the aerial spraying program. But on appeal, the Council of State found that there was no cause for ordering the suspension, since a measure of that type could lead to the weakening of the State and at the same time, to the strengthening of the illegal armed groups financed with the revenues of drug trafficking. Although in its judgment the Council of State did not entirely dismiss the adverse effects allegedly caused by the sprayings and stressed the need for continuing control over the sprayings, it also stressed that these effects were not as serious as was claimed by the plaintiff.[284]

(2) OVERALL SUCCESS OF THE PROGRAM

4.31. As the 2009 *World Drug Report* shows, despite the enormous difficulties encountered in the process, eradication and interdiction efforts in Colombia have succeeded to the point that the area affected by illicit crops in the country underwent a 50% decrease as compared with 2000. As a result only 48% of the world's coca crop is currently produced in Colombia, in contrast to 77% in 2000.[285] According to the most recent

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[283] EM, para. 2.49

[284] Annex 54: Council of State of Colombia, Judgment on appeal from the Administrative Tribunal of Cundinamarca, 19 October 2004 (excerpts).

[285] Annex 109: United Nations Office on Drugs and Crime (UNODC), "World Drug Report 2009", Vienna, 2009, p. 64; Annex 102, p. 67.

figures from the United States' Department of State, between 2007 and 2008 there was a 29% decrease in the areas cultivated with coca.[286]

4.32. As to cocaine production potential, whereas in 2000 79% of the world's total could be allocated to Colombia, that figure decreased to 51% in 2008, with a significant impact on reducing worldwide figures.[287] Cocaine production potential in Colombia in 2004 was estimated at 640 tons, while in the year 2008 the UNODC placed it at 430 tons, reflecting a 33% decrease;[288] a 39% decrease between 2007 and 2008 alone, according to the United States' Department of State.[289]

4.33. In the border area with Ecuador, in 2000, the province of Nariño produced 6% of coca crops in Colombia, while the province of Putumayo produced 40%; together, they produced 34% of the world's coca crops.[290] Between 2000 and 2005 a 69.7% decrease of the cultivated area was registered in the two provinces.[291]

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[286] Annex 152: Embassy of the United States in Bogotá, Fact Sheet 2008, "Cocaine production and cultivation: Colombia", 6 November 2009, enclosure to Press Item: "Official U.S. Colombia Survey Shows Sharp Drop in Coca Cultivation and Cocaine Production".

[287] Annex 109, pp. 11, 64 (Table 6), 68 (Figure 27).

[288] Annex 108, Colombia Coca Cultivation Survey 2008, p. 48 (Figure 9).

[289] Annex 152.

[290] Annex 103, Colombia Coca Cultivation Survey 2003, pp. 12, 15.

[291] Annex 108, Colombia Coca Cultivation Survey 2008, p. 13.

4.34. In the year 2000, in a 10-kilometre strip along the border there were 20,731 hectares of coca plants. Five years later, in 2005, following the application of the PECIG program, that figure was reduced to only 4,281 hectares, a 79% decrease. However, during 2006, following the first suspension of aerial sprayings in the 10-kilometre strip at the request of Ecuador, the cultivated areas increased by 72%, a marked setback in the progress achieved with the sprayings carried out in the previous five years.[292]

(3) ALTERNATIVES TO AERIAL SPRAYING

4.35. The particular conditions of the growing of illicit crops in Colombia, including the fact that large areas are devoted to their cultivation, that the crops are situated in remote locations and associated security problems, make aerial spraying the most effective eradication method. However, the Colombian Government has endeavoured to include other methods to supplement the fight. To that effect, two programs have been implemented in those regions where appropriate conditions exist: manual eradication and alternative development or crop substitution programs.

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[292] "In a belt of about 10 km width along the Ecuadorian border that covers about 550,000 hectares, in the departments of Nariño and Putumayo, 7,000 hectares of coca cultivation were found in 2006. This represented an increase of almost 3,000 hectares (or 72%) compared 2005." In Annex 107: UNODC, "Colombia Coca Cultivation Survey 2006", June 2007, p. 27.

4.36. Manual eradication is carried out by workers, using a variety of methods: pulling out the bushes by hand or using small shovels; cutting the bushes with mechanical tools such as scythes; or applying herbicides with handheld spraying equipment. The eradicators are joined by members of the Colombian National Police, Army or Navy.

4.37. However, as noted above, following the inception of the Government's manual eradication program in certain areas of the country, illegal armed groups involved in drug trafficking and drug mafias started to systematically employ mine fields and anti-personnel mines in the midst of their illicit crops in order to impair these efforts, resulting – in the period between 2006 and 2009 alone – in 39 civilian manual eradicators killed and 149 wounded, as well as 69 policemen killed and 197 wounded during manual eradication tasks.[293]

4.38. Alternative development seeks to generate licit productive activities for the communities engaged in the cultivation of illicit crops, so as to allow them to provide a stable income through the sustainable use of natural resources.[294]

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[293] Annex 72, p. 2; and Annex 73.

[294] *Agencia Presidencial para la Acción Social y la Cooperación Internacional* [Presidential Agency for Social Action and International Cooperation] (ACCION SOCIAL), Available at: http://www.accionsocial.gov.co/contenido/contenido.aspx?catID=217&conID=170; and

4.39. Nevertheless, such projects are not possible in all areas: the projects planned by the Alternative Development Program have faced enormous obstacles in their implementation given the pressure exerted by illegal armed groups on the communities in question. Further, the Alternative Development Program is ineffective to tackle the cultivation and processing of illicit crops that such groups undertake themselves.

4.40. The topographic configuration of the border region, the extensive areas cultivated with illicit crops found there, the difficulties involved in accessing the area, together with the threat posed by illegal armed groups, have prevented these alternative methods from being implemented consistently throughout the zone contiguous to Colombia's border with Ecuador.

D. Technical Aspects of Aerial Spraying

4.41. The technical aspects of the aerial spraying program conducted within Colombian territory may be summarized as follows.

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http://www.accionsocial.gov.co/contenido/contenido.aspx?catID=217&conID=965 (last visited 10 March 2010).

(1) THE SPRAYING MIXTURE

4.42. In accordance with the legal provisions in force since 2001, the spray mix used in Colombia for the eradication of coca crops in the PECIG program, consists of 44% glyphosate-based formulated product, 1% surfactant based on ethoxylated linear alcohols and 55% water.

4.43. In 2001, the Ministry of Health of Colombia rendered an opinion according to which:

> "[t]he use of the mixture Glyphosate + POEA + Cosmoflux (1%) would fall into toxicological category III (Moderately Toxic), without the addition of such additives posing inadmissible risks. It should be recalled that pesticides within that category are admissible, in accordance with their intended action, for use in household environments, as is the case of common pesticides such as Baygon spray, Raid mosquitoes and flies, Rayol spray, Rodasol, Cupex for flying insects …" [295]

4.44. Colombia has not used products with active ingredients other than those mentioned above, nor has it included biological agents in the mix during the implementation of the aerial spraying operations.[296] Suggestions to the contrary by Ecuador[297] and in the Menzie Report[298] are without foundation.

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[295] Annex 44: Toxicological Opinion Nº 0685 regarding the toxicological classification of the mix Glyphosate + POEA + Cosmo-Flux(1%), Colombian Health Ministry, 8 October 2001.

[296] Annex 42: Communiqué of the Ministry for the Environment of Colombia to the Public, October 2000: "The Ministry for the Environment

4.45. Moreover, the composition of the spray mixture has been a matter of public knowledge since 2001. The public character of the chemical composition of a pesticide is a legal requirement within the rules of the Andean Community of which Colombia and Ecuador are Member States. In order for a commercial product to be registered – and hence for its sale to be authorized – information concerning its active ingredient, as well as other ingredients that have any degree of toxicity, must be made public.[299]

4.46. Even before this was required by the rules of the Andean Community, Colombian law required publicity as to the ingredients of products the sale or use of which was authorized within Colombia. Thus, all the products used in the PECIG program have been issued "sales registrations" by the Colombian Agricultural Institute (ICA), in which all the

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did not accept the proposal advanced by the United Nations International Drug Program (UNDCP), to conduct tests with Fusarium oxysporum Erythroxylum mycoherbicide, given that it considers that any agent external to our country's native ecosystems might pose serious hazards to the environment and human health", issued on the occasion of the Meeting of Vice-ministers of Foreign Affairs of the Andean Community in October 2000.

[297] EM, paras. 2.43, 5.27 – 5.34.

[298] Menzie Report, EM, Vol. III, Annex 158, p. 6-8.

[299] Annex 135: Andean Regulation for the Registration and Control of Chemical Pesticides for Agricultural Use, Andean Community, Decision 436 of 2000, Arts. 57-59.

ingredients of the product that have any degree of toxicity appear.[300]

(a) Glyphosate

4.47. Glyphosate is a liquid, clear, viscous herbicide; it is amber in colour and practically odourless. For over 30 years, it has been the most widely used herbicide in the world.[301] Glyphosate-based products are registered in over 130 countries and are approved for weed control in relation to over 100 crops.[302] Glyphosate is an "herbicide registered for use on many food and non-food field crops as well as non-crop areas where

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[300] Annex 39: Roundup SL: Sales Registration Nº 0756 of 11 August 1997; Annex 46: Gly–41: Sales Registration Nº 4294 of 2 July 2002; Annex 33: Cosmo-Flux 411F: Sales Registration Nº 2186 of 19 April 1993. See also Annex 65, p. 2.

[301] "Based upon EPA reviews of domestic use conditions, glyphosate appears to be one of the most safely-used pesticides in the U.S." in Annex 142: United States Environmental Protection Agency (EPA), *Details of the Consultation for Department of State: Use of Pesticides for Coca and Poppy Eradication Program in Colombia*, August 2002. (The text of this annex appears in: United States Department of State, Bureau of International Narcotics and Law Enforcement Affairs, *Report on Issues Related to the Aerial Eradication of Illicit Coca in Colombia*, December 2003, p. 2 (partially included as EM, Vol. III, Annex 143)).

[302] For instance, in the US, glyphosate was re-registered in September 1993 after the EPA reviewed new studies and concluded that the use of glyphosate-based studies in accordance with label directions "will not pose unreasonable risks or adverse effects to humans or the environment". In EM, Vol. III, Annex 132 (United States Environmental Protection Agency (EPA), *R.E.D. (Re-registration Eligibility Decision) Facts,* September 1993). By 1999, the Environmental Protection Agency (EPA) of the United States, one of the strictest and most widely respected environmental agencies in the world, had authorized the use of 237 glyphosate-based products for more than 400 uses or applications in the United States. The EPA estimated total global use of glyphosate to be between 350-360 million pounds of glyphosate per year.

total vegetation control is desired."[303] No other herbicidal active ingredient is comparable in terms of the number of approved uses.[304]

4.48. In Colombia, there are 52 glyphosate-based products publicly available on the market under different commercial names.[305] As the CICAD I study points out, glyphosate "is widely used in agriculture and for purposes other than eradication of coca and poppy".[306] Thus it has been used for sugarcane ripening for over 30 years and as an herbicide in crops such as coffee, banana, rice, cocoa, pasture-land, African oil palm and citrus fruits.[307]

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[303] EM Vol. III, Annex 132.

[304] According to the United Nations Food and Agriculture Organization (FAO), glyphosate has "a broad spectrum of applications in agriculture, horticulture, viticulture, forestry orchards, plantation crops, amenities, home gardening and greenhouses for the control of annual and perennial grasses and broadleaved weeds. Furthermore it is used for weed control on aquatic areas, industrial areas, railroad tracks and on other non-cultivated areas. Besides the weed control it is used for root sucker control, for reseeding of grassland and to facilitate harvest." In Annex 101: Food and Agriculture Organization of the United Nations (FAO), "Specifications and Evaluations for Plant Protection Products. Glyphosate N-(phosphonomethyl)glycine", 2000/2001, p. 17.

[305] See Colombian Agriculture and Livestock Institute, *Registros de Venta de Plaguicidas Químicos de Uso Agrícola* [Sales Registrations for Chemical Pesticides for Agricultural Use], 30 April 2009. Available at: http://www.ica.gov.co/getdoc/2dae6093-c021-49d1-8b29-c9dfebce2757/REGISTROS-DE-VENTA--PQA-24-01-09.aspx (last visited 10 March 2010)

[306] Annex 116, CICAD I, p. 9.

[307] Annex 141: United States Environmental Protection Agency (EPA), Addendum to memorandum. Subject: Description of Glyphosate Use in the U.S. as a Basis for Comparison to Glyphosate Use in Colombia for Coca Eradication, From: Virginia Werling and Timothy Kiely (EPA, BEAD Biological and Economic Analysis Division) to Jay Ellenberger (EPA, BEAD Biological and Economic Analysis Division), 21 August 2002, p. 2.

4.49. In Ecuador itself there are 47 glyphosate-based registered products[308] and glyphosate is widely used both in relation to agricultural crops as well as for weed control. Of those 47 products, 24 possess the same glyphosate concentration as the herbicide used in Colombia's aerial spraying eradication program. Herbicides containing glyphosate are used by wildlife organizations to protect and restore wildlife habitats threatened by invasive, non-native vegetation in Ecuador. For example, according to Ecuadorian official sources, Roundup, the main commercial brand worldwide that contains glyphosate as an active ingredient, was selected to control invasive weeds in the unique and particularly sensitive Galápagos Islands ecosystem, which is protected by strict environmental measures.[309]

4.50. With regard to the formulated products used in Colombia's illicit corps eradication program, since 2000 only two glyphosate-based commercially formulated products have

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[308] Ministry of Agriculture, Livestock, Aquaculture and Fishing of Ecuador, Ecuadoran Livestock and Agriculture Sanitary Service (SESA), List of Pesticides Registered in SESA, October 2002. Available at: http://www.sica.gov.ec/agro/insumos/plgregecg.htm (last visited 10 March 2010).

[309] Annex 89: "Manual for the Identification and Management of Weeds on the Galapágos Islands", Charles Darwin Foundation and Galápagos National Park Service, 2006, pp. 16-18, 21-29, 32 (charts). Additionally, "Glyphosate is also used by wildlife organizations to protect and restore wildlife habitats threatened by invasive non-native vegetation. Conservation groups have chosen glyphosate formulations because of their effectiveness against most weeds and because they have very low toxicity to wildlife." In Annex 132: Center for Toxicology and Environmental Health, L.L.C., University of Arkansas for Medical Sciences, *GLYPHOSATE Frequently Asked Questions*, 2009, p. 1.

been used, namely, Roundup SL and GLY41.[310] Roundup SL, used until 2004, is registered in many countries for agricultural use and contains 41% glyphosate salt and 59% inert ingredients.[311] The commercial product GLY41, used since 2004, also contains 41% glyphosate salt and 59% inert ingredients.[312]

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[310] Annexes 39, 46. Also, Saftety Data Sheet for Roundup SL (Annex 133), and Label and Safety Data Sheet for GLY-41(Annex 134). See also EM, Vol. III, Annex 115 (Label for Roundup SL).

[311] According to the United States Environmental Protection Agency (EPA) "An inert ingredient means any substance (or group of structurally similar substances if designated by the Agency), other than an active ingredient, which is intentionally included in a pesticide product. Inert ingredients play a key role in the effectiveness of a pesticidal product. For example, inert ingredients may serve as a solvent, allowing the pesticide's active ingredient to penetrate a plant's outer surface." In: EPA, *Inert Ingredients Permitted in Pesticide Products,* date unknown. Available at: http://www.epa.gov/opprd001/inerts/lists.html (last visited 10 March 2009). Also: "Since glyphosate is only effective if absorbed by plant foliage, glyphosate is combined with a surfactant to facilitate its absorption… Surfactants are commonly used as wetting agents with herbicides and in other products such as laundry and dishwashing detergent." In United States Environmental Protection Agency (EPA), *Details of the Consultation for Department of State: Use of Pesticides for Coca and Poppy Eradication Program in Colombia*, August 2002. In Annex 142, p. 10 (partially at EM, Vol. III, Annex 143).

[312] As of 2005, with the purpose of avoiding the possible effects associated with the use of the POEA surfactant contained in Roundup SL, in particular the risk of eye irritation to workers in charge of preparing the mix at the operation sites, the Colombian Government decided to use a new glyphosate-based formulated product, called GLY41. Although that product contains some POEA as a surfactant, it is present in very small proportions, and produces no adverse effects on human health. According to Williams et al, "Glyphosate, AMPA and POEA were not teratogenic [gestational malformations] or developmentally toxic. Likewise there were no [medium or long-term] adverse effects in reproductive tissues from animals treated with glyphosate, AMPA or POEA in chronic and/or sub-chronic studies. It is concluded that under present and expected conditions of use, Roundup herbicide does not pose a health risk to humans". Annex 125, pp. 117, 160.

(b) Cosmoflux

4.51. The addition of adjuvants or wetting agents to herbicides is a common practice in agriculture. Adjuvants are added to herbicides in order to reduce evaporation and improve their efficiency upon spraying, since they add weight to the drops and render them homogeneous in size. Further, the addition of adjuvants ensures adhesion of the mix to the surface of the leaf, reduces dispersion of drops in the air and the percentage of mix deposited on the ground, and contributes to reducing drift. The fact that the adjuvant increases the effectiveness of the application of the spray mix – allowing for more precise control of the targeted plant species – does not in itself increase the toxicity of the mix.

4.52. In the case of Cosmo-Flux 411F,[313] used in Colombia's spraying program, the CICAD I study stated that the addition of the adjuvant Cosmo-Flux to the glyphosate did not change its toxicological properties to mammals.[314] In 2001, the United States EPA determined that all of the ingredients in Cosmo-Flux 411F may be used when applied for crops destined for human consumption given their low toxicological risk.[315] The

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[313] See Annex 138: COSMO-FLUX® 411-F Technical Data Sheet, Cosmoagro, June 2002.

[314] Annex 116, CICAD I, p. 78.

[315] Annex 142, p. 23 (partially at EM, Vol. III, Annex 143). Also, "the Cosmo-Flux 411F added to the glyphosate in Colombia has little or no effect on the overall toxicity of the formulated product" (*Ibid.,* at p. 39).

toxicological category to which the Cosmo-Flux used in the PECIG program has been allocated is IV, i.e., slightly toxic.[316]

4.53. The Menzie Report annexed to Ecuador's Memorial states correctly that "the addition of various surfactants and additives to enhance the effectiveness of the herbicide formulation has been the subject of research by the U.S. Department of Agriculture (USDA) (Collins and Helling 2002)".[317] However, the research carried out by Collins and Helling (2002) is mistakenly cited to suggest that the products tested may have been used in the Program for the Eradication of Illicit Crops by Aerial Spraying with Glyphosate (PECIG). In fact, the USDA tests were carried out in greenhouses in Maryland (United States) and the field studies were carried out in Hawaii (United States). None of the products tested has ever been or is currently used in the PECIG program; i.e., they have not been used in Colombia for illicit crops eradication purposes. Collins and Helling simply recommended "adding a Colombia-manufactured agricultural adjuvant with properties similar to one of the most effective surfactants tested in this research".[318] Colombia chose the adjuvant Cosmoflux 411F, an agricultural adjuvant manufactured in Colombia, which does not increase

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[316] Annex 34: Provisional Toxicological Opinion LP-0593-93 (Cosmo-Flux 411F), Colombian Health Ministry, 30 July 1993; Annex 44.

[317] EM Vol. III, Annex 158, Section 3.3, referencing Collins, R.T. & C.S. Helling. 2002. Surfactant-enhanced control of two *Erthroxylum* species by Glyphosate. *Weed Technol*. 16: 851-859. (The study also appears as EM Vol. III, Annex 141.)

[318] EM Vol. III, Annex 141 (Collins & Helling (2002)).

the toxicity of the mixture but does increase the effectiveness of the herbicide application from a physical perspective.

4.54. Ecuador states in its Memorial that the glyphosate-based mix is "adulterated by Colombia" by adding "another chemical, known as Cosmo-Flux 411F" that "is not sold in the United States".[319] Cosmo-Flux has been reviewed by the EPA[320] and is sold in a number of countries, including Ecuador itself. In this regard, the Ecuadorian Memorial notably omits to mention that Cosmo-Flux 411F, exactly the same substance as that used in the PECIG program, is lawfully imported into and used in Ecuador in accordance with an authorization of the Ecuadorian Ministry of Agriculture, Livestock, Aquaculture and Fishing, under registration No. MAG 3199076.

4.55. Ecuador also omits to mention that the Cosmo-Flux 411F label it submitted as Annex 113 of its Memorial corresponds precisely to that affixed to the container of a

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[319] EM, para. 5.20, p. 123. Also: "While the specific spray adjuvant product identified as that used in Colombia is not sold in the U.S., similar substances and products are commonly used." United States Environmental Protection Agency (EPA), *Details of the Consultation for Department of State: Use of Pesticides for Coca and Poppy Eradication Program in Colombia*, August 2002. In Annex 142, p. 4 (partially at EM, Vol. III, Annex 143).

[320] See para. 4.52 above.

product made in Colombia in November 2007 and imported into Ecuador, as the stamps on the label show.[321]

4.56. Besides Colombia and Ecuador, Cosmo-Flux 411F is registered for use in a number of other Latin-American countries, including Panama, Costa Rica and Bolivia,[322] among others.

(2) PROCEDURES FOLLOWED IN THE PECIG PROGRAM

4.57. It must be recalled at the outset that the eradication of illicit crops by aerial spraying in no way constitutes a procedure followed solely in the Colombian provinces bordering Ecuador; it has been applied throughout Colombian territory in areas affected by illicit crops. Although in its current form it began in 2000, aerial spraying has been in use since the early 1990s and has become one of the most effective methods in Colombia's fight against the scourge of drugs.

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[321] EM, Vol. III, Annex 113. See also CCM, Annex 74: Main Fertilizers Import and Manufacturing Companies (date unknown), Ministry of Agriculture, Livestock, Aquaculture and Fishing of Ecuador, pp. 2-3.

[322] Registration in Panama, Agriculture and Livestock Development Ministry, National Directorate of Vegetation Health, Agrochemicals Division, available at: http://www.panamatramita.gob.pa/Formularios/2006_8_8_2006_9_3_3.pdf (last visited 10 March 2010); Registration in Costa Rica, Agriculture and Livestock Ministry, Phytosanitary Service of the State, available at: http://www.protecnet.go.cr/insumosys/ConsultarInsumo.asp?cCodigo=4042&sTipoQry=Plaguicidas (last visited 10 March 2010); Registration in Bolivia, National Service for Agricultural and Livestock Health and Food Safety, Vegetation Health National Unit, available at: http://www.senasag.gov.bo/egp/productossv3.html (last visited 10 March 2010).

4.58. In Colombia, aerial spraying is carried out following a detailed procedure, divided into a number of stages consisting of detection, spraying and control, each of which includes a planning phase.[323]

4.59. The detection procedure consists of the identification, through the interpretation of satellite imagery processed by the SIMCI Project and verification by aerial photography, of areas affected by illicit crops.[324] This data is mapped using digital cartography with the purpose of determining the exclusion zones and the 100-meter contiguous strips around them, in which no spraying takes place.[325] Exclusion zones are applicable to areas including human settlement, bodies of water and rivers, and areas where illicit crop substitution projects are underway.[326] National Natural Parks and indigenous reserves constitute special management zones.[327]

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[323] Annex 67, p. 1.

[324] *Ibid.*, pp.1-2.

[325] Annex 30, Arts. 87, 102; Annex 50, Num. 3.2.1, 3.2.2. See also Annex 67, pp. 1-2.

[326] Ibid.

[327] For National Natural Parks, the relevant provision reads as follows: "Taking into account that there is evidence of illicit crops within these zones [National Natural Parks], which threatens their conservation and sustainability, the implementation of PECIG is authorized therein, following the submission to the National Narcotics Council of the environmental and social characterization of the areas to be sprayed". Resolution Nº 013 of 27 June 2003 of the National Narcotics Council of Colombia, Article 1, para. 2 (Annex 49). As for indigenous reserves, the relevant provision reads as follows: "Taking into account that, according to Colombian legislation, indigenous communities have the right to ancient traditional use of coca leaves and that on some occasions crops planted in their territories exceed the

4.60. The data resulting from the detection phase together with data as to the course of international boundaries are loaded onto a specialized computer application with which the spraying planes are fitted, in order to ensure that the operation is carried out with precision.[328]

4.61. The spraying operations are planned on a daily basis and a coordination briefing with the personnel involved in the spraying tasks takes place.[329] Following an assessment of whether the minimum requisite security and weather conditions – including temperature, wind direction and speed and relative humidity – are present in the areas to be sprayed, the operations begin. Any alteration to these conditions entails the immediate cancellation of the spraying mission.[330]

4.62. Upon reaching the area to be sprayed, prior to releasing the spray mix, the spraying aircraft descends to an average flight

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ones required for such use, a prior consultation process is carried out with indigenous communities in order to determine the eradication method to be applied". In Annex 70, p. 6.

[328] Annex 67, p. 7.

[329] During the briefing, the pilots are informed of security conditions, and are reminded of the requirements set forth in the Environmental Management Plan, as well as of the aerial and industrial safety measures to be observed, among others. Each pilot receives the maps or plots affected by illicit crops to be eradicated. See Annex 67, pp. 3-5, 2.2.2. Operation Planning Meeting.

[330] "When an aircraft is the object of hostile fire...[t]he flight leader will cancel the spray mission" and "The mission may be cancelled if during its course, reliable information is received on possible attempts against the aircraft of the spray team". In Annex 67, p. 5.

altitude of 30 meters, with a maximum operational air speed of 165 miles per hour. The Environmental Management Plan foresees a maximum flight altitude of 50 meters when spraying, subject to geographical features or obstacles so as to avoid risks to the pilots.[331] With the aid of the computerized system and with the cockpit screen showing the exact location of the aircraft with regard to the targeted plots, the pilot activates the release of the spray mix that exits through the nozzles. The nozzles have an automatic calibration mechanism that determines the amount of spray mix to be released in order for the number of litres discharged per hectare to be kept constant at 23.65 litres per hectare.[332]

4.63. The aircraft used for spraying operations are AT-802 planes manufactured by Air Tractor; they are specially designed to operate with precision during those tasks and possess a system of tank, nozzles and pumps similar to those used for the spraying of crops in other parts of the world. The spraying personnel – pilots – are provided by DynCorp, Inc., a private company contracted by the United States Department of State. The pilots are specifically certified, trained and experienced. They are expressly instructed to comply strictly with the relevant legal provisions concerning the duties of pilots engaged

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[331] Annex 50, Table Nº 1 (Operational Parameters of the Program for the Eradication of Illicit Crops by Aerial Spraying).

[332] Annex 48, Preliminary Section; and Annex 67, pp. 7-8.

in aerial spraying of pesticides or herbicides, such as those concerning exclusion zones and contiguous strips.[333]

4.64. Once daily spraying operations are finished, a detailed report of the day's operations is prepared on the basis of the computerized system which records each spraying operation with its respective route, geo-referenced areas of application and the amount of spray mix released per minute. This allows verification of the location of the places where the operations took place and quantification of the hectares sprayed.[334] A record is signed by the Base Commander and the personnel involved in the operation.

4.65. As set out in Chapter 2, the border between Colombia and Ecuador extends for some 717 km. To the extent that sprayings have actually taken place in the immediate area contiguous to the border with Ecuador, they have only been conducted along two limited segments, as acknowledged by the Ecuadorian Memorial.[335] The spraying has only taken place in those areas of Colombian territory where clusters of illicit crops have been found. Moreover, those sectors of the border with

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[333] Annex 30: Colombian Decree 1843 of 1991, Article 102, Duties of pilots. As for the contiguous strips, Article 87 of the same decree provides: "The application of pesticides in rural areas may not be carried out within 10 meters if land-based and 100 meters for aerial [spraying] as safety strips in relation to bodies of water or watercourses, main roads, human or animal nuclei, or any other area that requires special protection."

[334] Annex 67, p. 8.

[335] EM, Maps 5, 6 & 7.

Ecuador that are marked by watercourses are protected by a 100-meter strip on the Colombian side over which no spraying takes place.

4.66. Any given plot affected by illicit crops is normally sprayed once a year. Exceptionally, an area may be sprayed twice in a year. Spraying can occur at any time of the year as long as the weather conditions allow.

(3) MINIMIZING DRIFT

4.67. The operation of the PECIG program has always taken into account the phenomenon of drift, inherent to aerial application of herbicides, and the factors that determine it have been carefully considered.

4.68. Spray drift depends essentially on wind speed and direction, as well as on a number of other atmospheric factors including temperature, relative humidity and atmospheric stability. It is also dependent on the altitude at which spraying takes place and the air speed of the spraying aircraft, as well as the calibration of the spraying equipment, the density of the spray mix and the initial size of the spray droplets.

4.69. The PECIG, taking into account all these factors, set minimum and maximum figures in the Environmental Management Plan for the parameters upon which drift is

contingent, with the purpose of reducing it as much as possible. These parameters are strictly observed by the personnel involved in spraying operations.[336]

4.70. Ecuador's Memorial claims that "fear of hostile ground-fire from narcotraffickers protecting their illicit crops causes pilots to fly above the otherwise mandated altitude", and relies on assumptions contained in the Menzie Report as support for that scenario.[337] The Menzie Report asserts that "the spray missions are often conducted under highly adverse and violent conditions" and concludes that "*It is reasonable to expect* that the hostility would be a reason why pilots would fly higher and faster than they would during normal agricultural crop-spraying. Under those circumstances, the released spray *would be prone* to greater drift".[338] But no spraying operations are authorized on plots that are assessed as being high risk until military operations to guarantee appropriate security conditions are carried out; as noted above, if the aircraft comes under fire, the mission is cancelled.[339]

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336 Annex 50, Table Nº 1 (Operational Parameters of the Program for the Eradication of Illicit Crops by Aerial Spraying).

337 EM para. 5.95, p. 162

338 EM, Vol. III, Annex 158, p. 13.

339 Above, para. 4.61 and note 330; and see Annex 67, p. 4.

E. Conclusions

4.71. Aerial spraying is one of the main techniques used by the Colombian Government in order to combat illicit crops and consequently, cocaine production throughout the country.

4.72. Starting in the late 1990s, the Colombian Government decided to enhance its aerial eradication program, within a precise domestic legal framework. That decision was taken for a variety of reasons. On the one hand, there had been an accelerated increase in the total area given over to production of illicit crops in Colombia, a trend towards growing those crops in remote areas and an increase in the size of the plots themselves. On the other hand, those phenomena were coupled with an accompanying deterioration of security conditions and a surge in violence in the areas affected, in particular in the border area with Ecuador where the most hectares devoted to illicit crops were to be found.

4.73. Prior to the implementation of the eradication program by aerial spraying with glyphosate herbicide, the Colombian Government requested scientific studies. The program only began once the competent health and environmental authorities had issued favourable opinions.

4.74. Colombia enacted rules and standards governing the aerial spraying program in order to ensure that standards relating

to the protection of human health and the environment were consistently followed and applied throughout its territory. When aerial spraying operations started in the zone near the border with Ecuador, the same rules were applied with no modification. These rules were embodied in the Environmental Management Plan that governs the eradication program up to the present time. The EMP ensures the adequate management of the environmental aspects of the program by all agencies involved in its implementation, as well as verifying the effectiveness of the aerial spraying operations. Additionally, the program is overseen by a permanent external audit.[340]

4.75. From 2000 to 2005, the areas cultivated with illicit crops in the Colombian provinces of Nariño and Putumayo, which previously had the most hectares in the country devoted to coca, experienced a significant decrease. Throughout that period, during which sprayings were carried out in the 10-km strip along the border, that zone alone registered a 79% decrease in areas affected by illicit crops. By contrast in 2006, when spraying operations were suspended in that strip, the areas in which illicit crops were cultivated increased by 72%.

4.76. Colombia has never sought to conceal the composition of the mix used to eradicate coca crops. Pursuant to the relevant regulations on the matter, which are freely and publicly

[340] Appendix 1 to Annex 66.

available, the composition of the mix used to eradicate coca crops in Colombia is well-known; the spray mix consists of 44% formulated glyphosate commercial product, 1% Cosmo-Flux as adjuvant and 55% water.

4.77. Glyphosate, the active ingredient of the herbicide in the spray mix, is contained in numerous registered commercial products which have been widely used worldwide for over three decades. Those products have been used for multiple purposes, both agricultural and non-agricultural, in over 100 countries, including, as stated above, ecologically sensitive areas such as the Galápagos Islands of Ecuador. The advantage of glyphosate is that it does not compromise soil fertility since it has no residual effects. It has been vetted by international organizations entrusted with protecting human health and agricultural productivity, including the WHO and the FAO, as well as by other specialized agencies such as CICAD (OAS) and the EPA in the United States. Rigorous scientific studies conducted in Colombia and elsewhere corroborate the findings of those independent organizations.

4.78. In order for herbicides to achieve their desired results in certain types of application, it is common practice to add an adjuvant that, in facilitating the absorption on the targeted plant, increases the effectiveness of the active herbicide ingredients. The adjuvant in the mix used for the eradication of illicit crops in Colombia is Cosmo-Flux; the addition of that ingredient does

not alter the formula's toxicity level, which remains low. The inclusion of Cosmo-Flux as adjuvant is the only addition to the formulated glyphosate product, and implies no "alteration".

4.79. Aerial spraying operations were carried out along only in certain limited portions of the shared border and took place only over areas in which illicit crops were present. Moreover, throughout the entire Colombian territory, according to the work schedule, any given area is normally sprayed only once or, exceptionally, twice a year.

4.80. The parameters under which the PECIG program is conducted in Colombia manifests due diligence on the part of Colombia. Moreover, as will be shown in Chapter 7, the scientific appraisal on the basis of which the PECIG program was approved has been thoroughly vindicated by subsequent research, as well as by field experience in Colombia.

Chapter 5

THE DISPUTE WITH ECUADOR

5.1. The Memorial of Ecuador provides a one-sided and incomplete version of the diplomatic history of the present case. Indeed, as the record shows, from the outset, Colombia's attitude toward its neighbour's perceived concerns was always cooperative and forthcoming, with a view to preserving bilateral relations while continuing its struggle to curtail the growth of illicit crops in the border area. For its part, as will also be shown, Ecuador's account is contradicted by both the contemporaneous factual background, as well as by the acts and official positions adopted by Ecuador itself.

A. Overview of Diplomatic and Other Exchanges 2000 to 2004

5.2. Shortly after the aerial sprayings began in the area of Colombian territory adjacent to the border with Ecuador, on 24 July 2000, the Ecuadorian Foreign Ministry – following the protests of certain "communal groups" in the provinces of Sucumbíos and Esmeraldas – stated its concern concerning future sprayings of coca crops "with toxic and/or biological substances that may cause serious impacts on human health and the environment, with possible repercussions for Ecuador".[341]

[341] EM Vol. II, Annex 36.

5.3. It is noteworthy that:

(1) Ecuador speculated that the sprayings would have "repercussions for Ecuador", albeit without providing any substantiation of these concerns;

(2) Ecuador seems to have assumed on the basis of no evidence that the sprayings would be carried out "with toxic and/or biological substances"; and

(3) Ecuador anticipated, albeit again without providing any support for its assertion, that the sprayings might "cause serious impacts on human health and the environment".

5.4. In its Memorial[342] Ecuador refers in a misleading fashion to a short *note verbale* sent by Colombia on 29 December 2000 as if it were a refusal on the part of Colombia to hold bilateral meetings in order to discuss the spraying program. In fact, the Colombian note refers to and encloses a proposal from the Government of Panama – not Ecuador – addressed to *several* other countries proposing "to hold a meeting on the implementation of Plan Colombia".[343] It was the Panamanian proposal to discuss "the implementation of Plan Colombia" with

342 EM, para. 3.8.

343 See EM, Vol. II, Annex 37.

a number of other countries that Colombia found inappropriate, as was clearly stated in the *note verbale*.

5.5. The Colombian Government had thoroughly explained the components and scope of its policy in the fight against the world drug problem on several occasions in different fora, including at the highest level. Particularly noteworthy are: the meeting of the Presidents of Colombia and Ecuador on 23 August 2000;[344] the meeting of the Presidents of South America held on 1 September 2000 at Brasilia;[345] the meeting of Andean Foreign Ministers convened by the Foreign Minister of Peru and held at Lima on 16 March 2001;[346] the meeting of Andean Presidents held in April 2001 at Cartagena, on Colombia's initiative;[347] and the meeting of Presidents of ATPA-beneficiary

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[344] Speech by the President of the Republic, Andrés Pastrana Arango, at the dinner hosted for his Ecuadorian counterpart, Gustavo Noboa Bejarano, Bogotá, 23 August 2000, in Ministerio de Relaciones Exteriores de Colombia, *La Política Exterior de Colombia. 1º de julio – 30 de septiembre de 2000*, Fondo Editorial Cancillería de San Carlos, Bogotá, 2000, p. 186.

[345] Speech by the President of the Republic, Andrés Pastrana Arango, at the work session of the Presidents taking part in the Summit of South American countries, Brasilia, 1 September 2000, in Ministerio de Relaciones Exteriores de Colombia, *La Política Exterior de Colombia. 1º de julio – 30 de septiembre de 2000*, Fondo Editorial Cancillería de San Carlos, Bogotá, 2000, p. 227.

[346] Press Communiqué of the Meeting of Andean Foreign Ministers, Lima, 16 March 2001, in Ministerio de Relaciones Exteriores de Colombia, *La Política Exterior de Colombia. 1º de enero – 30 de abril de 2001*, Fondo Editorial Cancillería de San Carlos, Bogotá, 2001, p. 195.

[347] "'Full Support' of Andean Community to Plan Colombia", Press Release by Colombian News Agency (ANCOL), concerning support for Plan Colombia by the States members of the Andean Community, Cartagena, 18 April 2001, in Ministerio de Relaciones Exteriores de Colombia, *La Política Exterior de Colombia. 1º de enero – 30 de abril de 2001*, Fondo Editorial Cancillería de San Carlos, Bogotá, 2001, p. 283.

Andean countries and the President of the United States, held on 23 March 2002 at Lima.[348]

5.6. On the other hand, the Colombian Government was under no obligation to hold meetings with any other State in relation to the "implementation" of Plan Colombia, a bilateral agreement concluded with a third State – the United States of America – which, as has been explained, concerned activities to be carried out by Colombia within its own territory related not only to the fight against illicit drugs, but also to other sensitive issues such as the country's security and its social, economic and political development.

5.7. In July 2001, Ecuador again expressed its concerns on the alleged adverse effects that the sprayings might have on human health and the environment in Ecuador, and demanded that the sprayings take place at a distance of at least 10 km from the border, in order to prevent the likelihood of their reaching Ecuadorian territory as a result of the alleged drift supposedly caused by the winds.[349]

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[348] Press Releases concerning Presidential meeting between Andean ATPA-beneficiary Presidents and the United States, Lima, 23 March 2002, in Ministerio de Relaciones Exteriores de Colombia, *La Política Exterior de Colombia. 1º de enero – 30 de abril de 2001*, Fondo Editorial Cancillería de San Carlos, Bogotá, 2001, p. 187. ATPA refers to the Andean Trade Preferences Act (USA).

[349] See EM, Vol. II, Annex 41 (Diplomatic Note N° 55416/2001-GM/SOI/SSN of 2 July 2001, from the Ecuadorian Foreign Minister to the Colombian Foreign Minister).

5.8. Ecuador's demands were unreasonable. For Ecuador to demand that Colombia suspend an entirely lawful activity such as the eradication of illicit crops in the fight against drug trafficking is surprising. This is particularly so given, on the one hand, that the lawful activity in question was to be carried out within Colombia's own territory, under the strict control and supervision of the relevant national authorities; and on the other, that the demand was made without any evidentiary basis whatsoever to support it.

5.9. Nevertheless, in its reply of 14 July 2001 the Colombian Government explained that the program for the eradication of illicit crops was conducted under technical and controlled parameters in order to minimize any risk to the environment, or human and animal health.[350] The note gave details of the spray mix, a fact which the Ecuadorian Memorial, despite annexing the full text of the *note verbale*,[351] passes over in silence.

5.10. In the same note, Colombia proposed the holding of a seminar/workshop with the purpose of informing Ecuadorian officials of technical aspects relating to the eradication of illicit crops by aerial spraying with glyphosate in Colombia. In that regard, the note stated as follows:

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[350] EM, Vol. II, Annex 42 (Diplomatic Note No. DM/AL 25009 from the Colombian Foreign Minister to the Ecuadorian Foreign Minister, 14 July 2001).

[351] EM, Vol II, Annex 42.

> "Bearing in mind the concerns expressed by Your Excellency, I propose holding a seminar-workshop in Colombia within the next thirty (30) days. During this event, the Government of Colombia will have the opportunity to illustrate its program of eradication of illicit crops and provide all the technical information required by Ecuadorian officials, in view of allaying all existing concerns and strengthening the spirit of bilateral cooperation."[352]

5.11. Following the Ecuadorian Government's acceptance,[353] the proposed seminar was held in Bogotá on 13-15 February 2002.[354] During the seminar, representatives of the Colombian agencies in charge of the implementation of the eradication program explained the technical issues concerning spraying operations, including the composition of the spray mix, observed variables and technical parameters for aerial application, as well as aspects relating to the environment and human health. One of the activities forming part of the seminar was a site visit to one of the zones subjected to the sprayings, where Ecuadorian officials were able to observe firsthand how the operations had been carried out.

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[352] EM, Vol II, Annex 42.

[353] Annex 5: Diplomatic Note No. 72523/2001-SG/SSN from the Ecuadorian Foreign Minister to the Colombian Foreign Minister, 12 September 2001.

[354] Annex 7: Note E. 455/90 from the Colombian Ambassador in Quito to the Colombian Foreign Minister, 26 March 2003, enclosing the non-paper given to the Ambassador by Ecuadorian authorities at the meeting held on the same date.

5.12. In its Memorial, Ecuador attributes to the Colombian officials who attended the workshop the view that objective and impartial scientific research studying the effects of the spray mix on health and the environment was lacking.[355] Ecuador further contends that the Colombian participants in the seminar assured their Ecuadorian counterparts that Colombia would leave an 8 to 10-km safety margin from the San Miguel River, but that this assurance was "quickly broken".[356]

5.13. These views were allegedly recorded in a "Joint report from the workshop", which was filed by Ecuador as Annex 163 of its Memorial. However, the document is not at all a "Joint report"; it was neither jointly drafted, nor agreed by both parties.

5.14. As is clear from the handwritten annotation on the top right margin of its first page, the document filed at Annex 163 of Ecuador's Memorial is a draft dated 6 March 2002.[357] This document is on the letterhead of the Ecuadorian Ministry for the Environment and bears no indication that it was ever approved in final form or, for that matter, that it was ever subscribed to – or, indeed, even seen – by any of the Colombian officials who had attended the workshop. Moreover, the general tone of the document and the use of the first person plural when discussing Ecuador's position clearly demonstrates that the document was

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355 EM, para. 3.19.
356 EM, paras. 3.20-3.21.
357 EM, Vol. III, Annex 163.

intended to present Ecuador's position as a result of the seminar. It cannot in any way be assimilated to a "joint report" of the proceedings.

5.15. As to the alleged "assurance" given on behalf of Colombia, the document itself refers to an oral assurance and adds that a "declaration should be officially requested through the Foreign Ministry".

5.16. Ecuador's allegations are further disproved by the record. As was made clear in the Note from the Embassy of Colombia to the Foreign Minister of Ecuador dated 20 February 2002,[358] i.e. a few days after the seminar, Colombia continued to maintain its position with regard to the aerial sprayings. In particular, this Note stated, in relevant part:

> "During the visit made to Colombia by an Ecuadorian delegation last week, they were able to verify that sprayings do not have harmful effects on Ecuadorian territory or in Colombia, for that matter; the care with which they are carried out and the products used are a guarantee of their innocuousness."[359]

5.17. As a result of the seminar held in February 2002, Colombian and Ecuadorian officials recommended to their governments that they should create a Scientific and Technical Commission to analyze any possible effects in the Ecuadorian

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358 EM, Vol. II, Annex 43.

359 EM, Vol. II, Annex 43.

border provinces of the operations involving the aerial spraying of glyphosate carried out over Colombian territory. Thus, as stated in a 2003 non-paper prepared by the Ecuadorian Government,

> "one of the commitments made during the Binational Spraying Seminar-Workshop, carried out from 13 to 15 February 2002 in Bogotá, was the implementation of an inter-institutional technical commission in charge of controlling and monitoring these tasks at national level, in order to assess the potential impacts to the environment and the health of the Ecuadorian communities that live in the border with Colombia -Carchi, Esmeraldas, and Sucumbíos-, produced by the spraying plan in Putumayo". [360]

5.18. In pursuance of the proposal to create a bilateral mechanism and in response to Ecuador's concerns,[361] in February 2003 during talks held in Quito between the then-Director of Plan Colombia, Sandra Suárez, and Nina Pacari, the Foreign Minister of Ecuador at that time, Colombia renewed its proposal for the creation of a Joint Scientific and Technical Commission entrusted with the task of analyzing the issue of spraying operations carried out in Colombian territory near the Colombia-Ecuador border. As stated in the non-paper prepared by the Ecuadorian Government in early 2003:

> "…A meeting was held on 26 February 2003, with the participation of members of the Ministry

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360 Annex 7.

361 EM, Vol. II, Annexes 45 and 46.

> of Environment, the Ministry of Foreign Affairs, and the Government, and the official in charge of the Plan Colombia Mrs. Sandra Súarez, who suggested the implementation of a committee, composed of members from the Ministry of Environment of both countries, in order to discuss common matters such as the ecological effects of spraying.
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> ….
>
> In addition, it was suggested that the Binational Commission, supported by international organisms, could carry out scientific research…"[362]

The Joint Scientific and Technical Commission was eventually set up later that year, in September 2003.

5.19. The Commission met on four separate occasions between October 2003 and August 2004. In the course of these meetings, the Colombian delegation provided detailed information on the aerial spraying program to the Ecuadorian delegation.[363] Ecuador's Memorial acknowledges that Colombia submitted four reports on the subject in November 2003. However, it goes on to dismiss them as a whole, without referring to the content of the studies and without any scientific

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[362] Annex 7.

[363] EM, Vol. II, Annex 50 (Diplomatic Note VRE/DBR No. 40153, of 12 November 2003, from the Colombian Foreign Minister to the Ecuadorian Foreign Minister); CCM, Annex 9: Note Verbale DBR/CAL unnumbered from the Colombian Foreign Ministry to the Ecuadorian Embassy in Bogotá, 13 November 2003; EM, Vol. II, Annex 53 (Diplomatic Note DM/DBR Nº 47356 of 15 December 2003, from the Colombian Foreign Minister to the Ecuadorian Foreign Minister); EM, Vol. II, Annex 54 (Diplomatic Note DBR/CAL No. 1405 of 14 January 2004, from the Colombian Foreign Ministry to the Ecuadorian Embassy in Bogotá).

or technical arguments. The Memorial simply states that "the Colombian Foreign Minister sent Ecuador *four documents of limited scope*". The delegations decided to perform field visits to locations situated on both sides of the border in order to establish the veracity of the complaints regarding alleged adverse effects of the sprayings.

5.20. While the work of the Joint Scientific and Technical Commission was on-going, the Foreign Minister of Ecuador wrote to the Colombian Embassy in Quito to announce that Ecuador had received a number of complaints regarding the aerial sprayings from bordering regions and communities.[364] Ecuador's letter attached a proposed Memorandum of Understanding formally suggesting for the second time a 10-kilometre security or "buffer" no-spraying zone in Colombian territory, measured inward from the land border.[365] Again, the Ecuadorian Note did not refer to or produce any evidence demonstrating that there had indeed been adverse impacts on the health of the Ecuadorian population or on the flora and fauna in Ecuadorian territory as a result of the eradication program.

5.21. On 18 September 2003, the Government of Colombia replied that for national security reasons, which could also have

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[364] EM, Vol. II, Annex 47 (Diplomatic Note No. 23205/GM of 10 April 2003, from the Ecuadorian Foreign Minister to the Colombian Ambassador in Quito).

[365] EM, Vol. II, Annex 47 (Diplomatic Note No. 23205/GM of 10 April 2003, from the Ecuadorian Foreign Minister to the Colombian Ambassador in Quito).

a serious impact on Ecuador's territory, it was not feasible to declare a no-spray zone in the Colombia-Ecuador border region. The Note reads in relevant parts as follows:

> "To declare a zone of crops free of aerial sprayings in the common border, would open the door to the free movement of the drug-trafficking international networks, gunrunning and chemical precursors smuggling, in collaboration with the terrorist groups that operate in the south of Colombia, and would create a greater risk for the security of the two nations, particularly, for the residents of the border zone." [366]

5.22. Ecuador contends in its Memorial that at the second meeting of the Joint Scientific and Technical Commission held in Quito on 9 February 2004, Colombia agreed to provide information regarding prior fumigations, including flight paths, altitude, wind and other parameters, but never did so.[367] However, Colombia's contemporary minutes of the meeting of February 2004, which are attached as Annex 51, and the correspondence with Ecuador following the meeting, contradict Ecuador's allegations. According to these minutes and the agreed conclusions attached therein as Annex 3, the two delegations agreed as follows, in relevant part:

> "Development of a model that avoids mistakes in aerial sprayings, instead of referring to a distance to spray from the borderline. In this regard, it was

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[366] Annex 8: Note Verbale VRE No. 32759 from the Colombian Foreign Ministry to the Ecuadorian Embassy in Bogotá, 18 September 2003.

[367] EM, para. 3.34.

> highlighted that it is important to share information about the technical aspects of spraying processes. [The] Director of the DNE [National Narcotics Directorate] made clear that for security reasons under no circumstances the activities schedule would be informed."[368]

5.23. In disregard of this understanding, on 16 February 2004, the Government of Ecuador requested that, until the procedures agreed upon during the second Meeting of the Scientific and Technical Commission were completed, aerial sprayings near the border with Ecuador should be suspended.[369]

5.24. Once again, the Colombian Government demonstrated its willingness to collaborate: on 23 February 2004, the Colombian Foreign Ministry replied to Ecuador that, due to the calendar and priorities set for the remainder of the year, no aerial spraying would in fact take place in areas adjacent to the

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[368] Annex 51: Note Rec'd. No. 29157 from the Director of the National Narcotics Directorate (Head of the Colombian Delegation to the Joint Commission) to the Colombian Foreign Minister, 6 April 2004. The letter read, in Colombia's translation: "I submit the report of the meeting that I had the responsibility to preside on behalf of the Colombian Commission, as well as the conclusions that were drafted in coordination between the representatives of both countries." Annex 3 to the Note, entitled "Conclusions of the Colombia-Ecuador Scientific and Technical Commission" reads: "The following are the conclusions agreed to between the Colombian and Ecuadorian delegations of the Colombia-Ecuador Scientific and Technical Commission."

[369] EM, Vol. II, Annex 56 (Diplomatic Note No. 10181/2004-GM of 16 February 2004, from the Ecuadorian Foreign Minister to the Colombian Foreign Minister. See also, EM, Vol. II, Annex 58 (Diplomatic Note 15715/2004-GM of 9 March 2004, from the Ecuadorian Foreign Minister to the Colombian Foreign Minister).

border.[370] However, the Colombian Foreign Ministry also observed that if surveillance flights carried out in the zone were to find new illicit crops, the aerial spraying program in that area would need to be resumed.

5.25. Through a subsequent diplomatic Note dated 7 April 2004, the Colombian Foreign Ministry explained the effectiveness of the strategy for the eradication of illicit crops, which includes aerial spraying anywhere in the national territory that the Anti-Narcotics Police determined the existence of illicit crops.[371]

5.26. A few days later, in a diplomatic Note of 14 April 2004, the Government of Colombia clarified that it had at no time subordinated its national policy of eradication of illicit crops, including by aerial sprayings, to any conclusions of the Scientific and Technical Commission; still less had it made any commitment as a result of Ecuador's pressure for a suspension of spraying in the border area.[372]

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[370] EM, Vol. II, Annex 57 (Diplomatic Note DM/DBR No. 8092 of 23 February 2004, from the Colombian Foreign Minister to the Ecuadorian Foreign Minister).

[371] Annex 12: Diplomatic Note DPM/CDR Nº 20125 from the Colombian Acting Foreign Minister to the Ecuadorian Foreign Minister, 7 April 2004.

[372] Annex 14: Diplomatic Note VRE/DAA/CAL Nº 18067, from the Colombian Vice-Minister of Foreign Affairs to the Ecuadorian Vice-Minister of Foreign Affairs, 14 April 2004.

5.27. Also on 14 April 2004, Colombia's Narcotics Directorate submitted information to the Ecuadorian Scientific and Technical Commission concerning earlier sprayings in Colombian municipalities bordering Ecuador and explained the methodology followed in the PECIG.[373] It also reiterated that the operational parameters of the Program were described in the Environmental Management Plan, which had been furnished to Ecuador in November 2003,[374] explained the mathematical formula to calculate drift, and enclosed several reports, including a progress report by the Colombian National Health Institute pursuant to Record Nº 7 of the EMP, technical data on Cosmo-Flux 411F and the Acute Toxicity Study on Laboratory Animals conducted by Inmunopharmos laboratory.[375]

5.28. As a consequence of the work of the Joint Scientific Technical Commission and during a visit of the Ecuadorian President to Colombia in March 2004, it was agreed to promote inspection and scientific assessment visits on both sides of the border.[376] However, it was only possible to carry out fieldwork in Puerto Mestanza (Ecuador) one day late, on 26 May 2004, due to the fact that the Ecuadorian delegation did not turn up at

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[373] Annex 13: Note SARE-142 from the Director of the National Narcotics Directorate of Colombia to the President of the Scientific and Technical Commission of Ecuador, 14 April 2004 (partially translated at EM, Vol. II, Annex 62).

[374] Annex 9.

[375] Annex 13.

[376] Annex 52: Report from the Colombian Delegation, Joint Scientific and Technical Commission on Aerial Sprayings, Orito, Putumayo, 25- 28 May 2004, p. 1. See also, EM, Vol. II, Annex 61.

the agreed venue on the following day.[377] The report of the Colombian delegation at the time observed that "although the objective of the visit was to inspect in situ the alleged effects on both human health and the environment on Ecuadorian territory caused by aerial sprayings with glyphosate, in the Ecuadorian delegation there were no officials from the Health Ministry and the Ministry of Agriculture."[378]

5.29. In subsequent correspondence addressed to Ecuador, the Government of Colombia expressed its regret as to the refusal of the Ecuadorian Scientific Commission to take part in seven of the eight site visits scheduled to take place in the region of the border between Colombia and Ecuador and which had been agreed through diplomatic exchanges.[379] Colombia also stated that it was not willing to pursue that bilateral mechanism if the agreed agenda was not respected.[380]

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[377] "Although at the end of the first day it was agreed with the Ecuadorian delegation that on the following morning they would be picked up in the vicinity of the San Miguel International Bridge, in order to conduct the field visit to the locations in the Putumayo province, the representatives of the neighbouring country did not show up…. the Colombian delegation notes for the record, that it fulfilled its share of the commitment, which could not be completed due to the no-show of the delegation of Ecuador, despite the efforts of the Energetic and Ways Special Battalion 9 of Orito [Putumayo province], that had deployed military units to cover all the locations …". (Annex 52, pp. 4-5).

[378] Annex 52.

[379] Annex 15: Diplomatic Note VR/ST/CVICE Nº 27776 from the Colombian Vice-Minister of Foreign Affairs to the Ecuadorian Ambassador in Bogotá, 9 June 2004; Annex 16: Diplomatic Note VRE/DAA/CAL Nº 28511 from the Colombian Vice-Minister of Foreign Affairs to the Ecuadorian Vice-Minister of Foreign Affairs, 17 June 2004.

[380] Annex 15.

5.30. Despite the failure of the site visits by the Joint Scientific Technical Commission, water samples were taken in Ecuador in April and May 2004 in the province of Sucumbíos in an area allegedly affected by spraying with glyphosate carried out in Colombia. Those samples were taken by an Ecuadorian group, the Ecuadorian Commission on Atomic Energy (*Comisión Ecuatoriana de Energía Atómica*), which had formed part of the Ecuadorian Delegation, in order to determine the possible presence of glyphosate in the rivers of Sucumbíos.

5.31. The results of the analyses of the samples were published by the Foreign Ministry of Ecuador in Press Bulletin N° 388 of 25 June 2004 entitled: *"No glyphosate residues exist in the waters of the rivers of Sucumbíos province"*. The Press Bulletin read as follows:

> "The Foreign Ministry reported that the Ecuadorian Commission on Atomic Energy (CEEA) that takes part in the Ecuadorian Scientific and Technical Commission (CCTE), created to analyze the possible effects of sprayings with glyphosate in the northern Ecuador-Colombia border between Ecuador and Colombia, travelled to the border area during the months of April and May, in order to analyze the possible presence of that component in the waters of the rivers of Sucumbíos.
>
> Samples were taken from the rivers Conejo, San Francisco, San Miguel, La Punta, Zancudo, Mataje, wherein no glyphosate residues were found. The report presents favourable results

> which have assuaged the population that inhabits that sector."[381]

5.32. In July 2004, the Ecuadorian Commission on Atomic Energy again visited the border area, this time focusing on the *western zone*, in the province of Esmeraldas. Again the Commission carried out thorough studies and again took water samples that were taken back to Quito for analysis.

5.33. The last meeting of the first Joint Scientific and Technical Commission, which included a seminar organised by Colombia with the purpose of explaining various aspects relating to the PECIG program to Ecuadorian officials, was held on 2 August 2004. In a letter addressed to the Ecuadorian Foreign Minister, the Director of the National Narcotics Directorate of Colombia registered his satisfaction with the work of the Commission in the following terms:

> "[T]he existing differences were settled well, in particular, that relating to the drift of the Program for the Eradication of Illicit Crops – PECIG, issue concerning which it was agreed that conceptual differences and differences regarding mathematical formulae would never be settled on a blackboard; that this case in particular could be resolved by the presence of members of the Ecuadorian Scientific and Technical Commission in a validation process to which they would be

[381] Annex 80.

> invited, with the purpose of verifying PECIG's real drift on the field."[382]

Moreover, the Director stated:

> "The activity of the Scientific and Technical Committee was finished to the extent that it was not deemed necessary to set a date for a new meeting."[383]

5.34. At the last meeting of the Commission "the Ecuadorian delegation at the Scientific and Technical Commission abandoned the request of setting a 10 km strip along the border between Colombia and Ecuador where the PECIG would not be carried out."[384]

5.35. At the same meeting, the representative of Colombia reiterated that, "should sprayings along the border continue, the technical conditions necessary to prevent the spray from reaching Ecuadorian territory shall be guaranteed".[385] In fact, at this meeting Colombia offered to notify Ecuador when aerial spraying operations were taking place in the border area so that samples could be taken and analyses carried out. As noted in the Minutes of the meeting:

> "The Colombian Party shall notify, by the fastest means, at the moment that such sprayings are being conducted along the border area, so that the

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382 Annex 53: Note Nº SARE-321 from the Director of the National Narcotics Directorate to the Colombian Foreign Minister, 11 August 2004.

383 Ibid.

384 Ibid.

385 EM, Vol II. Annex 64.

> Ecuadorian Commission may take samples and conduct the respective analyses in a timely manner."[386]

Colombia also informed its Ecuadorian counterparts that aerial sprayings for the year had ended in May 2004 and would not be resumed until the following year, unless deemed necessary.[387]

5.36. Shortly after the last meeting of the joint Commission, the Ecuadorian Government publicly announced its decision to abandon its position of requesting Colombia to refrain from spraying in an area of 10 km of Colombian territory parallel to the border with Ecuador, and stated that it would be sufficient simply to adopt certain preventive measures. The most important daily newspaper in Ecuador – *El Comercio*, published in Quito – ran a front page article on 4 August 2004 transcribing statements from the Vice-minister of Foreign Affairs of Ecuador, entitled "Ecuador accepts sprayings to continue", excerpts of which read as follows:

> "Thus, the Ecuadorian Foreign Ministry abandoned the thesis that the Government of Bogotá was to refrain from carrying out sprayings with glyphosate in a strip of 10-km from the border line. The agreement was reached yesterday, during the closing of the fourth meeting of the Technical Scientific Commission in Quito.'"[388]

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386 EM, Vol II. Annex 64.

387 Ibid.

388 Annex 139: Press item: "Ecuador accepts sprayings to continue", *El Comercio* (Ecuadorian newspaper), Quito, 4 August 2004.

5.37. The analyses of the samples collected in July 2004 had in the meantime been performed by Ecuadorian scientists. The results were published by the Foreign Ministry of Ecuador in Press Bulletin N° 480 dated 26 August 2004, under the title "*No glyphosate residues were found in Esmeraldas, border with Colombia"*. The Press Bulletin stated, in particular, as follows*:*

> "The Foreign Ministry presented the report of the Analysis of Glyphosate Residues performed on water samples collected in the Province of Esmeraldas (San Lorenzo – Zona Mataje), by technical personnel of the Ecuadorian Commission on Atomic Energy, on 14 July 2004.
>
> These studies were carried out as follow-up to the works that the Ecuadorian Scientific and Technical Commission is currently undertaking, as implementation of the Minutes signed at the IV Meeting of the Scientific and Technical Commissions of Ecuador and Colombia. And they were carried out by the scientists of the CEEA using, for that purpose, the EPA 547 procedure, high-tech equipment and the analytical standards provided by the company Riedel de Haën, obtaining as a result, *the non-existence of glyphosate residues in any of the analyzed samples*."[389]

5.38. On 15 October 2004, during a meeting held in Esmeraldas in Ecuador, the Presidents of Colombia and Ecuador issued a joint declaration in which, *inter alia*, Ecuador expressed

[389] Annex 81 (emphasis added).

itself satisfied with the explanations and documents received from Colombia on the possible effects of the PECIG program:

> "9. The Presidents of both countries expressed they were pleased with the presentations by experts in the workshops that have taken place in that regard, and with the delivery of studies conducted in Colombia on the possible effects of the sprayings with glyphosate on illicit crops."[390]

5.39. The Colombian Ministry of Foreign Affairs subsequently informed Ecuador through diplomatic channels on 4 November 2004, as soon as it itself was informed by the Colombian National Police,[391] that the sprayings had resumed two days earlier. The relevant diplomatic Note stated:

> "The Ministry of Foreign Affairs of the Republic of Colombia presents its compliments to the Honourable Embassy of the Republic of Ecuador and informs that the Anti-narcotics Police has notified us of the resumption of the aerial sprayings with glyphosate in the border zone that will extend until late December."[392]

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390 Annex 17, p. 2.

391 The Note of the National Police read as follows: "In accordance with what was agreed on [at the meeting of the] Scientific and Technical Commission between Colombia and Ecuador, held on 2 August 2004 in Quito, I kindly ask your Office to inform the Ecuadorian Government that the National Police – Anti-Narcotics Direction, will carry out *from now and until the end of December* spraying operations in the border area." (emphasis added) Annex 55: Note Nº 001727 from the General Director of the National Police of Colombia to the Colombian Foreign Minister, 2 November 2004.

392 Diplomatic Note Nº DPM/CDR 65881 from the Colombian Foreign Minister to the Ecuadorian Foreign Minister, 4 November 2004 (EM, Vol. II, Annex 65), following the Note Nº 001727 from the National Police General Directorate – Anti-Narcotics Directorate to the Colombian Foreign Minister, 2 November 2004 (CCM, Annex 55).

5.40. Ecuador complains in its Memorial that this statement did not make clear "whether the aerial sprayings had already recommenced."[393] However, there is no ambiguity in the language of this letter and it is incorrect to argue, as Ecuador does, that Colombia's "promise was quickly broken when, just three months later, Colombia conducted sprayings in the area without appropriate notice to Ecuador"[394] or that Colombia did not fulfil its promise to inform Ecuador "by the fastest means, at the moment that such sprayings are being conducted in the border area".[395] Such notice was given as soon as was reasonably possible, i.e. immediately after the National Police informed the Foreign Ministry that the aerial sprayings had been resumed.

5.41. On 8 November 2004, the Government of Ecuador replied to the Note of 4 November 2004, requesting that technical measures be taken into account in order to ensure that the drift caused by the sprayings did not reach Ecuadorian territory.[396] That communication shows that Ecuador had well understood the meaning of Colombia's communication.

5.42. Throughout the work of the Joint Commission, Colombia displayed a cooperative approach and sought to meet Ecuador's concerns, to the extent that this was reasonably

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393 EM, para. 3.45.
394 EM, para. 3.3.
395 EM, para. 3.45.
396 EM, Vol. II, Annex 66.

possible. For instance, on three separate occasions during the course of November and December 2003 and January 2004, Colombia provided Ecuador with technical studies and other information in a continuing effort to assist Ecuador in its requests.[397]

5.43. Ecuador's Memorial cursorily dismisses the study entitled "Environmental Risk of the Herbicide Glyphosate"[398] which was sent to Ecuador on 14 January 2004 as a "wholly inadequate assessment of the risks of the aerial spraying program".[399] However, that report had been specially commissioned by the Anti-Narcotics Directorate of the National Police of Colombia and, as evidenced by the detailed analysis contained therein, it did not corroborate Ecuador's catastrophic assessment of the adverse impact of the principal chemical used in the sprayings.

5.44. Colombia's cooperative attitude continued in the subsequent months of 2004. As noted above, no aerial sprayings were carried out until early November 2004 in the areas adjacent to the common border with Ecuador, although Colombia

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397 EM, Vol. II, Annex 50 (Diplomatic Note VRE/DBR No. 40153 from the Colombian Foreign Minister to the Ecuadorian Foreign Minister, 12 November 2003); CCM, Annex 9; EM, Vol. II, Annex 53 (Diplomatic Note DM/DBR Nº 47356 from the Colombian Foreign Minister to the Ecuadorian Foreign Minister, 15 December 2003); EM, Vol. II, Annex 54 (Diplomatic Note DBR/CAL No. 1405, from the Colombian Foreign Ministry to the Ecuadorian Embassy in Bogotá, 14 January 2004).

398 EM, Vol. II, Annex 101.

399 EM, para. 3.33.

reserved the right to resume the sprayings if its aerial surveillance revealed the presence of any new illicit crops in the border area.[400] The Joint Scientific and Technical Commission continued to meet, and on 14 April 2004 Colombia sent Ecuador further information regarding the aerial sprayings in response to a new request sent by the Ecuadorian Foreign Minister on 31 March 2004.[401] At the fourth meeting of the Joint Commission held in August 2004, Colombia renewed its commitment that "should sprayings along the border continue, the technical conditions necessary to prevent the spraying from reaching Ecuadorian territory shall be guaranteed".[402]

B. Ecuador Confirmed in December 2004 that There Were No Adverse Effects Due to the Sprayings

5.45. Ecuador also alleges in its Memorial that, following the resumption of the sprayings in the border areas in November 2004, "*several weeks afterwards*, representatives of Ecuador's Foreign Ministry visited the communities of El Afilador and Santa Marianita in northern Sucumbíos in an effort to collect evidence of the sprayings' impact. *They were unable to do so.*"[403] The inference appears to be that failure to collect any evidence was in some way the fault of Colombia. Since Ecuador avoids mentioning the factual background in this

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400 EM, Vol. II, Annex 57.
401 Annex 13.
402 EM, Vol. II. Annex 64.
403 EM, para. 3.47 (emphasis added).

respect, it is important to set out in some detail what actually happened at the time.

5.46. In December 2004, the Foreign Minister of Ecuador commissioned a high-level delegation under the Director for Amazonian and Regional Affairs, to visit the border area of the Province of Sucumbíos, in order to verify reports of alleged adverse effects caused by the sprayings, as well as to collect soil and water samples to check for glyphosate residues. Also forming part of the delegation were a member of the cabinet of the Vice-Minister of Foreign Affairs, a colonel from the Ecuadorian National Police who was the head of the Liaison Office of the Government Ministry at the Foreign Ministry, and scientists from the Ministry for the Environment and the Ecuadorian Commission on Atomic Energy. The delegation was accompanied by representatives of the print media, radio and television.

5.47. The relevant Press Bulletin issued by the Ecuadorian Foreign Ministry under the title: "Commission of the Foreign Ministry finds no evidence of sprayings following verification in the entire area where sprayings were claimed to have taken place", recorded that, during the second part of the field visits conducted in late December 2004, the Ecuadorian Delegation collected plant, soil and water samples for analysis:

> "The Special Commission appointed by the Minister of Foreign Affairs to verify the

> existence of sprayings, concluded the second stage of a thorough tour of the area where, according to recent complaints, Colombian sprayings would have taken place.
>
> The visit conducted on Wednesday, 29 December, this time included the sites of El Afilador, Santa Marianita and a site facing the Colombian locality of Azul, sites located on the banks of the San Miguel River…
>
> ...
>
> Engineer Santiago Salazar of the Ministry for the Environment and Dr. Ramiro Castro, Head of the Laboratory of the Ecuadorian Commission on Atomic Energy took samples of plants, soil and water with the purpose of subjecting them, along with the evidence collected last week, to chemical and biological analyses which will be made public in the next few days."[404]

5.48. It might also be noted that the Ecuadorian Memorial completely omits to mention that the results of the first part of the Delegation's visit to the area, conducted between 23 and 24 December 2004, and reflected in a Memorandum delivered to Ecuador's Foreign Minister, confirmed that no flights or sprayings had taken place over Ecuadorian territory. The internal Memorandum of the Foreign Ministry of Ecuador of 24 December 2004 reported as follows:

> "Thursday, 23 December.

[404] Annex 85: Press Bulletin N° 732 of the Ecuadorian Foreign Ministry, "Commission of the Foreign Ministry finds no evidence of sprayings following verifications in the entire area where sprayings were claimed to have been conducted", 30 December 2004.

> In the city of Lago Agrio…. having been informed that in the constant patrols of this Special Forces Group and Jungle Battalion '56 Tungurahua', *there have been no reports of violations to the Ecuadorian airspace nor have they had any knowledge of sprayings on the Ecuador-Colombia border in the past weeks.*
>
> Likewise, we were informed that the flux of Colombian and Ecuadorian nationals has been normal; the acting Governor and the Police Quartermaster stated that due to the requirement of the 'Judicial Record' [certificate] violence statistics have dropped, *without their having received any complaints of sprayings or displacement of Ecuadorians*…"[405]

5.49. However, the Ecuadorian population did complain to the delegates about other issues. As recorded in this report:

> "….they stated their concern due to the lack of basic services evidenced in the Province and requested the Foreign Minister to convey to the Presidency of the Republic, their needs in [matters of] roads, health, education, agriculture and support for the National Police."[406]

5.50. During the visit to Lago Agrio, a number of persons stated that the sprayings had caused damages in Puerto Nuevo, Puerto Mestanza and their surroundings. However, they provided no evidence of the supposed damage.[407] In an attempt to verify these complaints, the Delegation decided to visit the

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405 Annex 83: Memorandum of the Foreign Ministry of Ecuador, 24 December 2004.

406 *Ibid*.

407 *Ibid*.

locations in question, together with the civil and military authorities of the Province. Once on site they learned from the local civilian and military authorities in the area that the complaints lacked any basis. As recorded in the Memorandum produced by the Ecuadorian Foreign Ministry dated 24 December 2004:

> "Puerto Nuevo: In the afternoon we went to Puerto Nuevo… where we interviewed the only civilian authority present, Mr. Lenin López, Secretary of the Committee for Improvements, who stated that there was a population of 800, most of which were Colombian, that there was a calm environment, that the incoming and outgoing flux of people was normal, that they are aware of the existence of sprayings in Colombia, *without having ever seen any aircraft in the zone or any displacement of Ecuadorians* further into the Province.
>
> […]
>
> Friday, 24 December. Puerto Mestanza.
>
> In the early morning the Delegation went to Puerto Mestanza…
>
> We received the testimonies of 2 inhabitants, who stated that *activities were being carried out as usual, despite the fact that they have heard rumours of imminent sprayings in the zone*. One of the people interviewed even stated that on Tuesday the 21st at noon, he had seen 2 small aircraft and 5 helicopters in the distance, *on the Colombian side*…
>
> …Confirming the information provided by Colonel José Pastor, Commander of the Special Forces Group '24 Rayo', Colonel Robert Arauz, Commander of the Jungle Battalion '56

> Tungurahua', stated over the telephone to the Head of the Delegation that the Armed Forces conduct permanent patrols all over the areas where there have been claims of alleged sprayings, *without having recorded any incidents*."[408]

5.51. During its visit, the Delegation also met with officials of the United Nations High Commissioner for Refugees (UNHCR) assigned to the area, one of whom stated his surprise at reports of alleged sprayings, and declared that they had had no news of any such sprayings in the sector. Again, the Memorandum of the Ecuadorian Foreign Ministry of 24 December 2004 states:

> "Meeting with UNHCR Delegates.
>
> In the evening, the Delegation met with Mr. Oscar Butragueño, representative of the United Nations High Commissioner for Refugees (UNHCR) in Sucumbíos, who mentioned he had received a visit by delegates of FORCCOFES [*Federación de Organizaciones Campesinas del Cordón Fronterizo Ecuatoriano de Sucumbíos*] last Tuesday, the 21st, during which they had reportedly informed him of the existence of 900 displaced Ecuadorians, purportedly as a result of the fear caused by the violence present on the Colombian side of the border. The UNHCR official stated that this was the first complaint he had received on the matter and clarified that he *had not received any news* – including UNHCR in Colombia – *concerning sprayings in the sector* and that, moreover, out of all the Colombians applying for refugee status, only 0.5% have

408 Annex 83.

> claimed that as the reason for coming to this country..."[409]

5.52. The result of the Delegation's first visit and inquiries was made public through Press Bulletin N° 721 of the Foreign Minister of Ecuador of 24 December 2004. The conclusion was categorical:

> "The Special Commission appointed by the Minister of Foreign Affairs… was able to physically ascertain, on the basis of testimony from the population and local authorities that *no spraying whatsoever took place affecting the Ecuadorian territory in that sector...*
>
> …The Commission determined, on the other hand, that *in none of the visited zones had there been any population displacement, as a result of the alleged resumption of sprayings,* situation that was confirmed by the UNCHR Representative in Sucumbíos, Oscar Butragueño."[410]

5.53. On 29 December 2004, the Delegation delivered a further Memorandum to the Foreign Minister of Ecuador, Patricio Zuquilanda, reporting on the second part of the investigation carried out in the border area.[411] The report stated that the situation was calm, daily activities were being carried out normally, the population was in good health and there were no incidents concerning animals or agriculture. The

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[409] Annex 83.

[410] Annex 82: Press Bulletin Nº 721 of the Ecuadorian Foreign Ministry, 24 December 2004.

[411] Annex 84.

Memorandum referred to the visit of the joint Commission on 23 and 24 December 2004, their collection of samples and the evidence that no planes had been witnessed over Ecuadorian territory. As noted in the Memorandum of 29 December 2004:

> "Pursuant to your instructions and the announcement by the Foreign Ministry upon the conclusion of the verification mission that took place on 23 and 24 December, on this date the technical commission visited the villages facing the Colombian sites of El Azul and El Afiladero, as well as Monterrey, in the sector of Santa Marianita, *with the purpose of fulfilling the mandate of gathering testimony and collecting soil and water samples relating to the alleged resumption of sprayings in Colombia and their repercussions in Ecuadorian territory.*
>
> On the first verification site, facing El Azul in Colombia, Dr. Ramiro Castro, of the CEEA, took a water sample from the San Miguel River, a few meters off the place where the helicopter landed; for its part, the technical commission interviewed two locals – of Colombian nationality – who inhabited the farm at the visited site. The interviewees stated that the previous week – without specifying what day – they had sighted between six and eight helicopters and two small aircraft leaving a trail in Colombian territory. *They also indicated that they had no incidents to report, were carrying out their activities as usual and that both their animals and their crops were in good condition.*
>
> […]
>
> On the third site of verification, Monterrey, Santa Marianita Sector, on the banks of the San Miguel River, a local, the owner of the visited farm – also of Colombian nationality – stated to the

> technical commission that he had not seen or heard anything out of the ordinary with respect to the purported sprayings in Colombia. *He indicated that he is in good health and that there were no incidents with regard to his animals – cattle, farm birds or his cocoa plants*."[412]

5.54. The Ecuadorian Delegation summarized its findings as follows:

> "The technical commission has verified in two stages, as announced to the public, the main sites named in the complaints gathered by the press concerning the resumption of sprayings in Colombia and their purported repercussions in Ecuadorian territory.
>
> The second stage, completed today, has allowed us to confirm the conclusion that was arrived at during last week's visit: There is an environment of calm; daily activities are conducted normally; the locals who were interviewed are in good health; animals and crops are in order. There has been no violation of the Ecuadorian airspace, nor has there been any displacement of persons."[413]

5.55. The final part of the Report is clear:

> "In any case, even if it was to be accepted that Colombia had resumed aerial sprayings, *the truth is that the observations conducted and the gathered testimony do not afford evidence of any repercussions in Ecuadorian territory*."[414]

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412 Annex 84 (emphasis added).

413 *Ibid.*

414 *Ibid*. (Emphasis added).

5.56. On 30 December 2004, the Ecuadorian Foreign Ministry issued a further Press Bulletin, N° 732, entitled: "Commission of Foreign Ministry finds no evidence of sprayings after carrying out verifications in the entire area where sprayings were reported to have been conducted". This document supplemented the information contained in the previous bulletin, described the latest reconnaissance activities carried out and added the following clarifications:

> "The Special Commission appointed by the Minister of Foreign Affairs to verify the existence of sprayings, concluded the second stage of a thorough tour of the area where, according to recent complaints, Colombian sprayings would have taken place.
>
> The visit conducted on Wednesday, 29 December, this time included the sites of El Afilador, Santa Marianita and a site facing the Colombian locality of Azul, sites located on the banks of the San Miguel River, where ecologist organizations had claimed that there had purportedly been 'intense sprayings that even caused the displacement of local residents.'
>
> Out of the physical corroboration carried out last week as well as on this opportunity, the Commission ascertained that in the entire area there is an environment of calm and no displacement of population has been evidenced.
>
> In its report, the Commission observes that the citizens interviewed in the zone are in good health, no alterations were observed in plants or animals, as well as that, according to locals' accounts, there has been no *violation to the*

> *national airspace, nor have any vestiges of glyphosate reached Ecuadorian territory*."[415]

5.57. Following the analysis of the soil and water samples collected in December 2004 by representatives of Ecuador, the Foreign Ministry issued Press Bulletin Nº 027 of 24 January 2005, which reported as follows:

> "The Ministry of Foreign Affairs, just as it had announced days ago, the reports of the glyphosate Residual Analysis made on soil and water samples collected in the Sucumbíos Province during the two special missions sent following the claims submitted by farmers living in the border area and members of *Acción Ecológica*, regarding the possible resuming of aerial sprayings on illicit crops in Colombia and its alleged repercussions on Ecuadorian territory.
>
> These reports were carried out based on nine samples collected from the sectors of Tapi, Puerto Mestanza, La Balastrera, Azul Chiquito, and the Ecuadorian area facing the Colombian sector of Afilador.
>
> The result obtained by scientists of the Ecuadorian Atomic Energy Commission, who are also members of the Ecuadorian Scientific and Technical Commission, *from the analyses made is that no glyphosate residues were found, the same as on the two previous occasions when similar claims arose*."[416]

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415 Annex 85 (emphasis added).

416 Annex 86: Press Bulletin Nº 027 of the Ecuadorian Foreign Ministry, 24 January 2005. (Emphasis added).

5.58. In its Memorial, Ecuador omits to mention the findings of the missions. Instead it suggests that, when the representatives of Ecuador's Foreign Ministry "visited the [border] communities of El Afilador and Santa Marianita in northern Sucumbíos in an effort to collect evidence of the sprayings' impact", "[t]hey were unable to do so".[417] As the record shows, the reason the representatives of the Foreign Ministry were "unable" to collect evidence of the impact of the spraying is that there *was* no such impact. The results of the analyses conducted at the time on the ground by the joint Commission, combined with Ecuador's own contemporary official accounts, provide a strong contrast with the version of the facts provided by Ecuador in its Memorial.

5.59. It is also noteworthy that the witness statements gathered by Ecuador for these proceedings portray an entirely different scenario than that provided by the testimonies of "the citizens interviewed", collected in the field by the Delegation of the Ecuadorian Foreign Ministry in 2004.

5.60. A review of some illustrative examples drawn from the witness statements filed with Ecuador's Memorial against the background described above is revealing:

> "…I remember particularly a *period in 2004 and early 2005* during which there were many patients complaining of headache, vomiting and

[417] EM, para. 3.47.

> skin problems, which coincided with border sprayings…".[418]
>
> "…Finally, *in 2004*, I had to leave the community to work in the city of Puerto Nuevo, because after the sprayings, there was nothing to harvest in Yana Amarum, and life had become too hard…".[419]
>
> "…I remember clearly a spraying approximately *four years ago* that extremely affected the cattle. Shortly after the planes came, the cattle died. I have several neighbors whose cows were pregnant and had miscarriages…"[420]

5.61. These statements cannot be reconciled with the declarations made by the joint Commission in the relevant years and with Ecuador's own official reports.

5.62. It should also be noted that the analyses carried out in July 2004 in the Esmeraldas province, neighbouring the Colombian province of Nariño, confirmed that no adverse effects due to the sprayings had been experienced. Thus, there can be no connection between the alleged adverse effects on human health and the aerial spraying, at least up until that date. Sprayings in the border areas ended in December 2005 and no

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[418] EM, Vol. IV, Annex 188: Declaration of Dino Juan Sánchez Quishpe, 15 Jan. 2009 (emphasis added).

[419] EM, Vol. IV, Annex 212: Declaration of Witness 28, 17 Feb. 2009 (emphasis added).

[420] EM, Vol. IV, Annex 198: Declaration of Witness 10, 16 Jan. 2009 (emphasis added).

further sprayings took place in the relevant areas of Nariño province until 17 December 2006.[421]

5.63. The same applies to Sucumbíos province, neighbouring the Colombian border region of Putumayo, where research and investigations carried out by the Ecuadorian authorities shortly after the sprayings conducted in December 2004 confirmed the absence of any adverse effects in Ecuador. No further sprayings took place in this area until 24 September 2005 and they were suspended thereafter on 11 December 2005.[422]

C. The Position of the Parties as from 2005 to 2008

5.64. On 25 July 2005, nearly a year after the Ecuadorian Government had abandoned its position of requesting Colombia to refrain from spraying in a 10-km area within its territory parallel to the border,[423] the new Government of Ecuador again changed its position during a meeting between the Foreign Ministers of the two States, held in Quito, and reverted to requesting the establishment of a no-spray zone adjacent to the border.[424] The Colombian Foreign Minister explained the Government's policy and maintained that the sprayings were not harmful.

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421 Annex 67.
422 Ibid.
423 See above para. 5.36.
424 EM, Vol. IV, Annex 178.

5.65. In a further meeting at ministerial level, this time held in Bogotá in August 2005,[425] Ecuador reiterated its request for the establishment of a 10-km no-spray zone, invoking the precautionary principle.[426] For its part, Colombia stated that it was not possible to accede to that request.[427] The Colombian authorities however invited Ecuador to send observers to observe directly how the aerial spraying was being carried out; Ecuador did not accept the invitation.[428]

5.66. The Colombian Minister of Foreign Affairs expressed her willingness to undertake strict monitoring of the sprayings, including with the participation of Ecuadorian observers, as well as to receive and investigate *in situ* any complaint concerning alleged damage to human health and/or the environment due to the effect of aerial sprayings.[429] Again Ecuador did not accept that offer.[430] However, during the course of the same meeting, the Colombian Minister of Foreign Affairs accepted a proposal agreed to in a prior joint meeting of experts and officials, to resort to a specialized international organization in order to conduct studies to determine any possible effects of the use of

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425 Annex 87: Press Bulletin Nº 419 of the Ecuadorian Foreign Ministry, 2 September 2005.

426 Annex 56: Aide-Mémoire "Aerial Spraying Issue with Ecuador", Ministry of Foreign Affairs of Colombia, Division of Multilateral Political Affairs, Sub-division for Drug Affairs, September 2005, pp. 6-7.

427 Annex 87.

428 Annex 56, pp. 6-7, 8.

429 *Ibid.*, pp. 6-7, 8.

430 *Ibid.*, pp. 6-7, 8.

glyphosate in aerial sprayings, the conclusions of which would be submitted to both Governments.[431]

5.67. Given that the differences in this regard were having a growing negative impact on bilateral relations, the Colombian Vice-Minister of Foreign Affairs announced in a meeting held with his Ecuadorian counterpart on 17 November 2005 that the Colombian Government would temporarily suspend the sprayings in those areas located less than 10 km from the common border.[432] In a meeting between the Foreign Ministers of both countries held in December 2005, Colombia confirmed the decision "to suspend temporarily aerial sprayings in areas bordering Ecuador as of January 2006".[433] In fact, the sprayings were suspended earlier: on 11 December 2005 in Putumayo, and 27 December 2005 in Nariño.[434]

5.68. Colombia's gesture of goodwill is all the more significant in light of the fact that it was adopted in spite of the fact that a number of international agencies, including CICAD and the Inter-American Commission on Human Rights,[435] had seen no reason to recommend a suspension of the sprayings

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431 Annex 87.

432 Annex 88: Press Bulletin Nº 593 of the Ecuadorian Foreign Ministry, 18 November 2005.

433 EM, Vol. II, Annex 72 (Joint Communiqué, Ecuador-Colombia Meeting of Foreign Ministers, Quito, 7 December 2005).

434 Annex 67.

435 See below, paras. 5.69-5.70.

conducted on Colombian territory in the border area with Ecuador.

5.69. In particular, Ecuador makes no mention in its Memorial of the fact that the Inter-American Commission had received a request for precautionary measures submitted by the Ombudsman of Ecuador on 18 August 2005,[436] pursuant to Article 25(1) of the Inter-American Commission's Rules of Procedure. Article 25(1) provides that:

> "In serious and urgent cases, and whenever necessary according to the information available, the Commission may, on its own initiative or at the request of a party, request that the State concerned adopt precautionary measures *to prevent irreparable harm to persons*."[437]

5.70. In response to that request, the Inter-American Commission's Executive Secretary informed the Colombian Foreign Minister on 18 November 2005 that during its 123rd Session, the Inter-American Commission had reviewed the

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[436] Annex 18: Note Nº DSF40.1/3.1.3-4-00421 from the Executive Secretary of the Inter-American Commission on Human Rights (IACHR) to the Colombian Foreign Minister, 12 September 2005, Ref. 187-05 "Transboundary effects of the sprayings in Colombia", referring to the request for precautionary measures, addressed by the Ombudsman of Ecuador to the IACHR of the Organization of American States (OAS). The requested measures were intended to establish mechanisms of surveillance, control and monitoring, in order to ensure that sprayed chemicals do not enter Ecuadorian territory.

[437] Rules of Procedure of the Inter-American Commission on Human Rights, Article 25 (emphasis added). Available at: http://www.cidh.oas.org/Basicos/English/Basic18.RulesOfProcedureIACHR.htm (last visited 10 March 2010)

Ecuadorian request and Colombia's reply. The Note stated that "in that regard, after considering all the available information on this question... it was decided that for the moment there was no basis for invoking the mechanism of provisional measures provided for in Article 25 of its Rules".[438]

5.71. The sprayings in the border area were not resumed until almost a year later, when they were resumed for a period of slightly over a month. The sprayings took place from December 2006, at which time the resumption was duly explained and communicated to the Ecuadorian Government.[439] They ceased in January 2007. No spraying in the border area has taken place since.[440]

5.72. Following the Colombian Government's acceptance in August 2005 of resort to a specialized international organization[441] the President of Ecuador at the time, Alfredo Palacio, during his speech before the 60th Ordinary Session of the United Nations General Assembly, referred to the "aerial spraying of glyphosate as herbicide to eliminate illicit crops in areas neighbouring the Ecuador-Colombia border" and requested that the United Nations system "promote a comprehensive, reliable and credible study on the actual impact

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438 Annex 20: Note Nº DSF40.1/3.1.3-4-00423 from the Executive Secretary of the Inter-American Commission on Human Rights to the Colombian Foreign Minister, 18 November 2005 (emphasis added).

439 See below, paras. 5.81-5.85.

440 Annex 67.

441 See above, para. 5.66.

of this spraying."[442] In a Note addressed to the United Nations Secretary-General, the Ecuadorian Government formalized that request and stated that "the Permanent Mission of Ecuador to the United Nations is willing to contribute with the Secretary-General to coordinate the studies that the Ecuadorian Government requests".[443]

5.73. On 29 November 2005, the United Nations replied to Ecuador's request for a study on the impact of the aerial fumigations as follows:

> "It has been agreed to send to Ecuador a technical mission of the United Nations system, with a preliminary character... [whose] objective will be to explore the viability of the requested study".[444]

5.74. On 7 December 2005, during a bilateral meeting, the Colombian Foreign Minister agreed to analyze the results of the study requested by Ecuador from the United Nations and to assess the adoption of any measures that may be necessary. The Joint Communiqué issued at the conclusion of the meeting provided:

> "20. Bearing in mind that both Governments have not reached an agreement on the innocuousness of the effects of the glyphosate herbicide and its coadyuvant [*sic*] on health and the environment, the Government of Colombia

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442 EM, Vol. II, Annex 68, at p. 2.
443 EM, Vol. II, Annex 69.
444 EM, Vol. II, Annex 71.

> has duly noted the request made by the Ecuadorian Government to the United Nations for a *prospective* study on this issue and has agreed to participate in the definition of the terms of reference of the study. Colombia further agreed to review the results of the study and evaluate the adoption of relevant measures."[445]

5.75. On 20 January 2006, the Government of Ecuador notified the Colombian Government of the commencement of the United Nations technical mission:

> "The Ministry of Foreign Affairs… is honoured to inform you, to the ends established in paragraph 20 of the Joint Communiqué of the Ministers of Foreign Affairs of Ecuador and Colombia of 7 December 2005, that the office of the Representative of the United Nations Development Programme in Ecuador has notified this Foreign Ministry that a UN Mission will visit the country from 13 February to begin working on a *prospective* study of the effects of aerial sprayings with glyphosate and its adjuvants on the northern border of Ecuador."[446]

5.76. It should be noted that this communication was a simple notification to Colombia of the visit of the UN delegation to Ecuador and not an invitation to participate in its work, which in any event would have been inappropriate. It is thus not clear what Ecuador means when it states in the Memorial that "Colombia chose not to participate" in this visit.[447]

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445 EM, Vol. II, Annex 72. (Emphasis added)
446 EM, Vol. II, Annex 73. (Emphasis added)
447 See EM, para. 3.56.

5.77. The Terms of Reference of the UN Mission referred to the Joint Communiqué and took note of its precise terms, insofar as they recalled that what Ecuador had requested, and Colombia agreed to, was that the studies to be proposed would be of a prospective nature. In relevant part, the Terms of Reference provided:

> "On 7 December 2005, the Ministers of External Relations of both Colombia and Ecuador issued a joint press release based on a meeting that same day in which they discussed a number of issues including the aforementioned fumigations. In this joint communication, the Government of Colombia took due note of the GoE's request to carry out a *prospective* study on the impact of these fumigations."[448]

5.78. Between 13 and 24 February 2006, the "Preliminary Mission to propose studies on the impact of the aerial sprayings and complementary actions in the northern border of Ecuador" held meetings with public and private organizations in Ecuador.[449] In that regard, the Mission recommended that five studies be conducted:[450]

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[448] Annex 21: United Nations, Terms of Reference of the "Scoping Mission for a Detailed Assessment Study on the Potential Impact to Human Health, the Environment and Agriculture that Occurs in Ecuador's Territory as a Result of Glyphosate Fumigations Done by the Government of Colombia in the Border Area with Ecuador", January 2006. (Emphasis added) (Enclosure to Note Nº E-104/032 from the Colombian Ambassador in Quito to the Colombian Foreign Minister, 27 January 2006).

[449] Annex 106, p. 12.

[450] It is noteworthy that the Spanish original of EM Annex 28 states that "options are presented regarding five studies… in health

(1) "Retrospective epidemiological study of morbid-mortality trends in communities exposed and non exposed to aerial sprayings";

(2) "Experimental toxicological studies of acute and sub-acute effects of the mix used in aerial sprayings";

(3) "Study to assess the possible impact of aerial sprayings on water biota and soil in exposed and non exposed areas in the northern border";

(4) "a Study to assess the pathogen population dynamics in soils exposed and non exposed to aerial sprayings on the northern border" and

(5) "Study on retrospective assessment of the behaviour of agricultural production in sprayed and non sprayed areas".[451]

5.79. Taking into account the fact that no evidence had been produced of any damage caused in Ecuador by the Colombian spraying program, as well as the short half-life and limited effects of the spray chemicals in the environment,[452] the

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(epidemiological *retrospective* study…)" ["*se presentan opciones sobre cinco estudios… en la salud (estudio epidemiológico de cohorte retrospectivo*…)"]. However, in its English translation, Ecuador omitted the word "retrospective". See: EM, Vol II, Annex 28, p. 5.

[451] Annex 106, p. 33.

[452] The principal component of the spray mixture, glyphosate, adsorbs rapidly to soils, and dissipates in a matter of a few weeks; the added

Colombian Government considered that only studies with regard to future sprayings were relevant. It accordingly objected that the character of the proposed studies was not in conformity with what had been agreed to by the Foreign Ministers in December 2005.[453]

5.80. Ecuador's Memorial claims that "the Colombian Foreign Minister's pledge to suspend aerial fumigations in January 2006 was empty" because "[h]istorically, most of Colombia's aerial fumigations along the border had taken place during the final months of one year and the beginning of the next" and therefore no further sprayings would have been planned until the end of 2006.[454] The truth is otherwise. First of all, sprayings in any given area can be carried out at any time of year. For instance, in 2005, for the Nariño province, the schedule foresaw sprayings in the months of January, February, March, April, November and December; In relation to Putumayo, the relevant months were those from July to October.[455]

5.81. More importantly, any suspension of the spraying could not be accepted lightly as they would represent a serious set-

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components also biodegrade rapidly. See below, paras. 7.84-7.88; also, paras. 7.73-7.75, 7.79-7.82, 7.90, 7.92 and 7.94.

[453] Annex 26: Diplomatic Note from the Colombian Foreign Ministry to the Ecuadorian Embassy in Bogotá, 20 December 2006.

[454] EM, para. 3.54.

[455] The months of operation according to the spraying schedule refer to the entire territory of each province, and not solely to spraying in those areas adjoining the border.

back for Colombia's fight against drugs. The first suspension of the sprayings in the 10-km strip parallel to the border as of December 2005, resulted in a substantial growth of illicit crops in that strip. In the period during which spraying was suspended, there was a 72% increase of illicit crops detected within the 10-km no-spray area.[456] This was compounded by an increasing amount of terrorist and illicit activities perpetrated by illegal armed groups in the region. The Colombian Government was compelled to resume aerial spraying operations in that area.

5.82. The difficulties of reconciling these national security considerations with Ecuador's demands are evident in a speech delivered in October 2006 by the Colombian President, who stated in particular:

> "Almost a year ago, for considerations of fraternity, solidarity, sisterhood with the Ecuadorian Nation and its Government, we agreed to suspend the sprayings in a zone of 10 kilometres from the border line, inland in Colombian territory. The result is very worrisome.
>
> And I have to state this concern to my fellow citizens today, and I intend to convey it to my good friend Alfredo Palacio, President of the sister Ecuadorian republic.
>
> Terrorism has abused this decision and has strengthened the planting in those 10 kilometres. Today, there are more than 8 [*sic*] thousand coca hectares in the 10 kilometre zone of the border

[456] See above, para. 4.34 and see Annex 107, Colombia Coca Cultivation Survey 2006, p. 27.

> with Ecuador. It is advancing without measure, unstoppable. It is a challenge to the democratic world. They are growing it with all of the technology, with fertilizers, it would seem that what is there is a zone of impunity. They grow it as if it were highly competitive crops in the lawful sector of the agricultural economy.
>
> What happens with that coca? It fuels terrorism…"[457]

5.83. The Government of Colombia shared its concern with the Ecuadorian Government at the highest level. The President of Colombia called the President of Ecuador on 5 December 2006 and the Colombian Defence Minister did the same with regard to his Ecuadorian counterpart shortly thereafter. In that regard, the Colombian Minister of Defence stated:

> "We explained to the Ecuadorian authorities, President Uribe spoke to President Palacio, I spoke to the Minister of Defence of Ecuador, and we explained to them why we are taking that step. We cannot allow the production of coca plants to keep growing, or the proliferation of processing laboratories, or the presence of the guerrillas and the increase in violence in that zone of the country".[458]

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[457] Speech by the President of Colombia, Álvaro Uribe Vélez, during the Consejo Comunal de Gobierno (Communal Government Council) No. 8, Puerto Asís – Putumayo, 7 October 2006. Available at: At: http://www.presidencia.gov.co/prensa_new/discursos/discursos2006/octubre/cc_puertoasis.htm (last visited 10 March 2010)

[458] Annex 148: Press item: "Defence Minister welcomes the new Super Tucano airplanes of the Air Force", 14 December 2006.

5.84. The Ministers of Foreign Affairs and National Defence of Colombia officially reiterated that decision on 12 December 2006 in the following terms:

> "...taking into account that it has been a year since this temporary suspension, and that it has resulted in a substantial increase of illicit crops in that strip, through which narco-terrorism is financed, the Government of Colombia has adopted the decision to resume the spraying tasks in that zone".[459]

5.85. Ecuador claims in its Memorial that Colombia 'violated' its commitment made in December 2005 "to suspend further sprayings *altogether*".[460] However, the decision taken by Colombia and communicated to Ecuador was to "*temporarily* suspend spraying".[461] This is expressly recognized in paragraph 3.53 of Ecuador's Memorial. Colombia always reserved the right to resume spraying in the border areas if circumstances required it.

5.86. Two days later, Ecuador protested against Colombia's decision and again requested the suspension of the aerial sprayings in the 10-km zone.[462] Colombia responded with two Notes sent on 20 and 21 December 2006 by the Foreign

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459 Annex 58: Communiqué of the Ministers of Foreign Affairs and National Defence of Colombia, 12 December 2006 (emphasis added).

460 EM, para. 3.59 (emphasis added).

461 See above, para. 5.67.

462 EM, Vol. II, Annex 76

Minister and President of Colombia, respectively.[463] Those Notes are ignored by Ecuador in its Memorial.

5.87. The note sent by the Colombian Minister of Foreign Affairs, provided in relation to the resumption of the sprayings:

> "As expressed in the Press Communiqué of the Ministries of Foreign Affairs and National Defence on 12 December 2006, the Government of Colombia decided to resume aerial spraying tasks within 10 kilometres from the borderline shared by the two countries, due to the significant increase of illicit crops in this area, which are used to promote narco-terrorism activities, posing a great risk to people and democracy in Colombia. In this connection, the Ministry of Foreign Affairs kindly reasserts to the Honourable Government of Ecuador the invitation to understand this measure that the Colombian Government was forced to take for obvious reasons of national security, and in compliance with the obligations our country has in the fight against the world drug problem, a scourge with devastating effects, not only in Colombia but in the entire region."[464]

5.88. In his Note to the Ecuadorian President, the Colombian President explained that the reasons justifying the resumption of the sprayings included:

> "The alarming proliferation of illicit crops as a result of that decision [sc. the temporary suspension of aerial sprayings in a 10-km strip

[463] Annex 26; Annex 27: Note from the President of Colombia to the President of Ecuador, 21 December 2006.

[464] Annex 26.

> inside Colombian territory adjacent to the border], as well as the unfortunate consequences that those illicit crops have in the fight against the world drug problem and narco-terrorism".[465]

5.89. Soon thereafter, at a bilateral meeting between the President of Colombia, Álvaro Uribe, and the then recently elected President of Ecuador, Rafael Correa, held on 10 January 2007, the Parties agreed to establish a second Scientific and Technical Commission. That Commission was entrusted with a task similar to that of the first Joint Scientific and Technical Commission, i.e. to determine, through the means of *in situ* fieldwork involving sample-taking and verification, whether glyphosate used in the eradication of illicit crops in Colombian territory had any impact on Ecuadorian territory.[466]

5.90. In a further gesture of good will towards Ecuador and with a view to promoting and improving bilateral relations, notwithstanding the risks and difficulties with which Colombia was confronted, Colombia again decided to suspend the aerial sprayings in areas within the 10-km strip of Colombian territory running parallel to the border. The suspension of aerial sprayings has been continuously maintained ever since.

5.91. The decision to suspend the fumigations in a 10-km corridor parallel to the border with Ecuador was confirmed by

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465 Annex 27.

466 EM, p. 88, para. 3.65.

Colombia in a press release issued by the Ministry of Foreign Affairs on 8 February 2007. The press release reads as follows:

> "The Minister of Foreign Affairs of Colombia, María Consuelo Araújo, announced that Colombia ceased yesterday the aerial sprayings carried out in the [Provinces] of Nariño and Putumayo – bordering Ecuador. Likewise, she confirmed the beginning of manual eradication works on 12 February…"[467]

5.92. On 9 February 2007, the Government of Colombia addressed a Note to the Ecuadorian Government referring to the suspension of aerial sprayings on the border:

> "I wish to inform that on this date the aforesaid spraying program was concluded and next week, the manual eradication program, to which over 2,200 people will be devoted, begins."[468]

5.93. In its Memorial, Ecuador claims that during a meeting between the Foreign Ministers in May 2007, the Colombian Foreign Minister "concluded by communicating his government's position that *it would not* suspend aerial spraying operations in the border area".[469] However, Ecuador omits to mention that, at that time spraying near the border had already been suspended by the Colombian Government some three months earlier and that, as recalled above, that suspension had

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[467] Annex 60: Press Release of the Colombian Foreign Ministry, 8 February 2007.

[468] Annex 28: Diplomatic Note DM/VRE Nº 6454 from the Colombian Foreign Minister to the Ecuadorian Foreign Minister, 9 February 2007.

[469] EM, para. 3.72 (emphasis added).

officially been notified by a diplomatic Note from the Colombian Foreign Minister.[470]

5.94. The first meeting of the new Scientific and Technical Commission took place in April 2007. At the meeting the two delegations agreed to exchange, through diplomatic channels, documents in support of their respective views.[471] During the meeting, Colombia renewed its willingness to notify Ecuador if sprayings were scheduled to resume again in the area, so as to allow Ecuadorian officials to verify the lack of any effects in Ecuadorian territory.

5.95. Ecuador's Memorial contends – on the basis of an Aide-Mémoire prepared by Ecuador's Scientific-Technical Commission at the time – that at the first meeting of the new Commission, Colombia refused to provide Ecuador with the chemical formulation used in the spray mixture and that it rejected Ecuador's proposal that the Commission determine the implications of the precautionary principle for the spraying program. Ecuador also alleges that Colombia never sent to Ecuador the environmental impact study concerning the sprayings.[472] However, the position then expressed by the Colombian Government was far from being unreasonable.

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470 Annex 28.
471 EM, Vol. II, Annex 80.
472 EM, paras. 3.68-3.69.

5.96. First, it is not at all clear from the Aide-Mémoire of the meeting that the Ecuadorian delegation requested the composition of the formula, but only that it stated that an "issue to consider was the chemical composition used for the eradication of illicit crops". The spray mix was a matter of public knowledge, and had been communicated to Ecuador as early as 2001;[473] the Environmental Management Plan of the spraying program had also been furnished to Ecuador in 2003.[474] Further, the position taken by the Colombian delegation that "it should first be proved that glyphosate crosses into Ecuador" before the precautionary principle could be invoked was perfectly reasonable.

5.97. The report of the Ecuadorian Scientific and Technical Commission of April 2007 describes the composition of the spray mix based on Colombian official sources.[475] Having asserted that "about Cosmoflux, nothing is known", the report provides a lengthy description of the product and its components.[476] However, the Report lacks scientific rigor and even goes as far as to question the validity of the scientific studies conducted by international organizations.[477]

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473 See para 6.3-6.19.
474 Annex 9, para. 5.27 above; also, para. 6.25 and note 524 below.
475 EM, Vol. III, Annex 157, at pp. 23-24.
476 EM, Vol. III, Annex 157, at p. 30.
477 EM, Vol. III, Annex 157, p. 35 (not translated by Ecuador).

5.98. The Joint Commission, according to its terms of reference agreed upon by the Governments of Colombia and Ecuador, had the mandate of carrying out work of a strictly scientific and technical nature without the power to commit the Governments in actions or projects of any kind. However, the Ecuadorian Commission strayed from that role and displayed a markedly political stance in trying to impose the notion that the sprayings caused damage in Ecuadorian territory, rather than undertaking the scientific works (field visits, studies) that the Joint Commission had been entrusted with.

5.99. The new Joint Commission met for the second – and last – time on 9 July 2007. Without attempting to enter into the slightest debate on the substantive issues, the Ecuadorian delegation claimed at the outset that they had encountered certain "scientific disagreements" and demanded that in order to continue the dialogue, the Colombian representatives should accept the Ecuadorian position from the outset that:

> "- Glyphosate is not harmless to health and the environment;
>
> - the problem is not limited to glyphosate and drift;
>
> - the precautionary principle must be applied, as there are well-sustained scientific doubts and technical disagreements;
>
> - while the scientific dialogue is underway, aerial sprayings should be suspended within a 10-km strip from the border line;

> - if joint studies are carried out, their purpose should be to assess the damage and establish compensation measures."[478]

5.100. The Colombian delegation replied that it could not share the views of the Ecuadorian delegation on the matter and proposed that a joint methodology of analysis of risk assessment be developed, complemented by the corresponding fieldwork that would allow the Commission to fulfil the task entrusted to it, i.e., to determine whether sprayed glyphosate could reach and impact upon Ecuadorian territory due to drift. That proposal was flatly rejected by Ecuador in the following terms:

> "The Ecuador Scientific Commission argued that it could only continue the dialogue based on the recognition of the scientific reports of the damages and a comprehensive approach that warrant the immediate application of the precautionary principle."[479]

5.101. On 12 July 2007, a communiqué from the Ministry of Foreign Affairs of Colombia declared that:

> "The programs for the eradication of illicit crops, and particularly eradication by aerial sprayings, have been conducted by Colombia in full exercise of its sovereignty, exclusively within the national territory.
>
> The Government of Colombia reiterates the importance of collaboration between neighbouring countries in the fight against terrorism and the world drug problem, and within

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478 EM, Vol. II, Annex 83.

479 EM, Vol. II, Annex 83

> the framework of that effort, the consolidation of security in Colombia, that represents security for the region.
>
> Since the month of February of the current year, no aerial sprayings are being carried out in the vicinity of the border with Ecuador and instead, the manual eradication of illicit crops is being undertaken, efforts to which over 1,100 people are devoted."[480]

5.102. Notwithstanding Colombia's straightforward representations, on 16 July 2007 the Ecuadorian Minister of Foreign Affairs declared at a press conference that she regretted the outcome of the meetings of the Scientific and Technical Commissions, that she considered the diplomatic means of resolution to be exhausted and announced her Government's decision to bring a case against Colombia before the International Court of Justice.

5.103. On 18 July 2007 Colombia reiterated its willingness to continue with the mechanism of the Commission, although insisting on the performance of the field work that both commissions had deemed necessary to carry out following the first meeting of the Commission on 10 April 2007.[481] Ecuador, in its reply of 27 July 2007, asserted that the task of the Joint Scientific Commission had ended and considered that "the path

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[480] Annex 62: Communiqué of the Colombian Foreign Ministry, 12 July 2007.

[481] EM, Vol. II, Annex 85.

of dialogue" had been exhausted.[482] In addition, it demanded that the Colombian Government "…formalize a written commitment regarding the definitive suspension of aerial sprayings, and thus cause the payment of indemnities to compensate the harmful effects that the sprayings have had on the health and the environment [to] become viable."[483]

5.104. During the course of 2007, the Government of Colombia had repeatedly expressed, through its highest officials, its willingness to receive and examine the complaints of Ecuadorian citizens and to indemnify any actual damages which were shown to have occurred as a result of the aerial sprayings carried out in Colombian territory. For example, at the regional summit on drugs held in March 2007, the President of Colombia publicly stated that:

> "We have offered –and I so reiterate at this Summit, before its distinguished participants- that if any citizen of a sister nation shows that the Colombian fumigation has caused him harm, the Government of Colombia will immediately indemnify him, as it does with its own Colombian nationals."[484]

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482 EM, Vol. II, Annex 86.

483 EM, Vol. II, Annex 86.

484 See, Speech of Colombian President Alvaro Uribe at the Santo Domingo Regional Summit on Drugs, Security and Cooperation, 16 March 2007. Available at: http://www.presidencia.gov.co/prensa_new/sne/2007/marzo/16/09162007.htm (last visited 10 March 2010).

5.105. Despite that offer, to date, not a single Ecuadorian citizen residing in Ecuador has requested the Colombian authorities, whether directly or through the Ecuadorian Government, to provide any compensation for actual adverse effects suffered by reason of the aerial spraying conducted in Colombian territory.[485]

5.106. In February 2008, in a Diplomatic Note sent to his Ecuadorian counterpart, the Colombian Foreign Minister stated:

> "In this regard, please allow me to again express the interest of the National Government in attending to the complaints of Ecuadorian citizens, with the purpose of paying indemnification for real and ascertainable damages, and through the most expedient mechanism possible, for what the corresponding legal analyses are being done…"[486]

5.107. Ecuador however rejected outright Colombia's offer to consider the payment of compensation on a case-by-case basis on the ground that, *inter alia*, Colombia had not accepted Ecuador's demand for an agreement between the two governments providing for the definitive suspension of the aerial sprayings in the areas within Colombian territory adjacent to the border:

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[485] It is true that substantial damages have been claimed in court proceedings in the United States against the US company that is contracted by the US State Department to assist in the spraying operations. Colombia is not a party to those proceedings. See above, para. 1.35.

[486] EM, Vol. II, Annex 87.

> "In particular, the [Colombian] note does not accept the Ecuadorian Government's demand that the Government of Colombia sign a formal agreement and of mandatory undertaking to stop, definitively and permanently, the aerial sprayings within 10 kilometres from the border between Ecuador and Colombia. The note does not accept in satisfactory terms either, the demand from the Ecuadorian Government that the Government of Colombia should indemnify it."[487]

5.108. More than one year after Colombia suspended the aerial sprayings on the border area, and in spite of that suspension, Ecuador instituted the present proceedings against Colombia before the Court.

D. Conclusions

5.109. The account provided in Ecuador's Memorial of the diplomatic exchanges, of the facts and of the actions of the Colombian Government is inaccurate and misleading. The documents and other evidence collated in this Chapter establishes the following:

(1) Ecuador began to speculate on the adverse impacts the program might have on its territory without evidence of any kind, and did so even before the PECIG program was implemented in the Colombian provinces bordering Ecuador.

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[487] EM, Vol. II, Annex 88 (Diplomatic Note N° 14087/GM/GVMRE/SSNRF/2008 from the Ministry of Foreign Affairs of Ecuador to the Embassy of Argentina in Bogotá, 24 March 2008).

(2) Colombia was always prepared to pursue discussions with Ecuador and cooperated in addressing Ecuador's concerns including, *inter alia*, by participating in bilateral meetings at different levels, organizing workshops and seminars, establishing scientific and technical commissions, conducting site visits, and supplying Ecuador with technical documents, scientific studies. Colombia even provided technical assistance for the establishment of a public health surveillance system on intoxication by pesticides which Ecuador lacked.[488]

(3) The make-up of the approved spray mix was never unknown. It was widely divulged by the competent authorities of Colombia and published in the press and the Official Journal of Colombia in both 2001 and 2003. Details of the composition were also provided in the course of the diplomatic exchanges and documents furnished by Colombia to Ecuador, and further explained, together with the relevant specific procedures followed in the Program, during bilateral training and information sessions held by the entities responsible for carrying out the Program.

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[488] See above, paras. 2.37-2.38 on the Colombia-Ecuador agreement for a public health surveillance system.

(4) In November 2003, Colombia sent to the Ecuadorian Scientific and Technical Commission the PECIG program's Environmental Management Plan, a document which pursuant to the applicable regime in force in Colombia, was equivalent to an environmental impact assessment.

(5) With a view to identifying any possible effects of the spraying program, the Colombian Government resorted to a specialized body of the OAS, CICAD, to request an environmental and human health scientific assessment of the aerial spray program. The Ecuadorian Government chose not to take part in the second phase of the CICAD study, despite having been invited to do so by both CICAD and Colombia.

(6) Without any scientific assessment or technical basis, starting in July 2001 Ecuador began to request Colombia to refrain from spraying in a 10-km zone parallel to their common border. Although the Ecuadorian Government at one point desisted in its requests for the establishment of a 10-km buffer zone, the Government of Colombia suspended the sprayings from December 2005, as a gesture of goodwill towards Ecuador. Given the renewed increase of illicit

crops in the affected areas during the period in which the sprayings were suspended, Colombia had no choice but resume the operations for a brief period, between December 2006 and January 2007. From the latter date, again as a goodwill gesture towards Ecuador's new administration, the aerial sprayings in the border region were suspended once more, a situation that continues to date.

(7) On 18 November 2005, the Inter-American Commission on Human Rights, in answer to an Ecuadorian request for precautionary measures in that regard, found no reason to recommend the suspension of the sprayings conducted on Colombian territory in the border area with Ecuador. Moreover, nothing in the scientific studies and evidence deriving from specialized organizations, such as CICAD, indicates that any suspension of the sprayings was called for.

(8) The protests and concerns voiced in Ecuador with regard to the alleged effects of the sprayings were investigated by the Ecuadorian authorities themselves, who came to the conclusion that they were unfounded. Indeed, the Ecuadorian authorities themselves verified *in situ* that the alleged effects had not occurred. It was the

Ecuadorian authorities, including high officials from the Ministries of Foreign Affairs and the Environment, together with the local authorities and commanders of the military units assigned to the border, who were able to verify, through gathered testimony and studies, that up until December 2004, there had been no damage to human health, the environment, wildlife, domestic animals, water or soils in Ecuador as a result of the spraying.

(9) As to the years subsequent to 2004, following the verification by Ecuadorian authorities that there had been no damage in Ecuadorian territory due to the spraying operations conducted in Colombia, the only time periods in which sprayings took place in the border zone with Ecuador have been between 14 January and 26 December 2005, and between 17 December 2006 and 14 January 2007 as regards those areas in Colombia contiguous to the border of the Colombian province of Nariño where sprayings were actually conducted; and between 26 September and 10 December 2005, and again between 11 December 2006 and 21 January 2007 as regards those areas in Colombia contiguous to the border of the Colombian province of

> Putumayo. None of the allegations of damage or of spraying flights contained in the witness statements submitted by Ecuador corresponds to those time periods. No damages could have occurred since.

5.110. In the light of a situation where no scientifically rigorous evidence has been adduced of *any* harmful effects of the aerial sprayings in Ecuador or on its population and the environment, Colombia's willingness to suspend the sprayings in the border area, in spite of the inevitable security risks associated with other eradication methods, such as manual eradication, is noteworthy.

5.111. In spite of Colombia's efforts, following the suspension of aerial spraying in the border area from 2007 onwards, and while the proceedings relating to the second Joint Scientific and Technical Commission were on-going, the Ecuadorian Government suddenly announced its intention to bring a case against Colombia before the Court, thus unilaterally putting an end to the dialogue between the Parties.

Chapter 6

CERTAIN DISPUTED QUESTIONS OF FACT

A. Introduction

6.1. As the Court will have observed, the present dispute largely concerns questions of fact – whether alleged harm suffered by Ecuadorian inhabitants in the border region, and/or the environment of Ecuador, can be shown actually to have occurred, and whether such harm could have been caused by the aerial spraying. There are also many particular disputed questions of fact: for example, whether Colombia ever promised to terminate, as distinct from suspending, spraying missions in a 10-km zone on its side of the border. Many of these factual issues have already been disposed of in Chapters 4 and 5. In this Chapter, three particular issues of fact are dealt with in greater detail. They are:

- Colombia's alleged failure to disclose the ingredients of the spray mixture;
- Colombia's alleged failure to deliver an environmental impact assessment of impacts of spraying on Ecuador;
- Colombia's alleged failure to notify spraying missions;

These claims will be dealt with in turn.

B. Alleged Failure to Disclose the Formula

6.2. Ecuador's Memorial repeatedly asserts that the mix used in the sprayings in the zones close to the border is unknown, implying or insinuating that its composition has been kept secret by the Colombian authorities.[489] Those assertions lack any foundation in fact. As stated above,[490] in the operations conducted in the areas near the border with Ecuador between 2000 and 2007 the Colombian authorities used exactly the same mix and spraying procedures as were applied in the rest of Colombia's territory.

6.3. In fact the composition and characteristics of the spray mixture used in the PEGIC program have been widely known and divulged since 2001 in a variety of publicly available documents issued by the competent Colombian authorities. Colombia has at no point sought to conceal or keep secret the formula of the sprayed mix, nor could it have done so in light is its own laws and regulations governing the use of herbicides.

6.4. Further, during the periods in which the sprayings took place near the border, the Ecuadorian authorities carried out water analyses on a number of occasions, arriving at the conclusion that there were no residues of either glyphosate or its

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[489] See e.g. EM, paras. 1.14, 1.17, 2.7, 2.38-2.39, 2.42-2.43, 5.2, 5.5, 5.19, 5.21-5.22, 5.27, 6.51, 8.40, 8.58, 10.11-10.12 . See also Menzie Report, Section 3 which (no doubt on instructions) is similarly confused.

[490] See above, para. 4.3, and para. 7.43 below.

metabolite AMPA.[491] There was no mystery about what they were looking for.

(1) PUBLICLY AVAILABLE COLOMBIAN DOCUMENTS

6.5. In fact the composition of the spraying mixture was officially published in 2001, as were subsequent modifications.

6.6. The Colombian Environment Ministry, in Resolution Nº 1065 of 20 November 2001, which is included among the annexes to Ecuador's Memorial[492] and is freely available on the Internet, accepted the dosage recommended by the Colombian Agriculture and Livestock Institute (*Instituto Colombiano Agropecuario* (ICA)) of "8 litres of mix per hectare (Roundup 480 SL + Cosmo-Flux 411)".[493] As noted in Chapter 4, Roundup is a proprietary herbicide whose active ingredient is glyphosate; it is available over the counter in many countries.[494] Cosmo-Flux 411 is an adjuvant, licensed for use in Colombia and surrounding countries.[495]

6.7. The Ministry based its decision on the opinion issued by the Health Ministry in October 2001[496] and on the field

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491 See above paras. 5.30, 5.31, 5.32 and 5.37; see also paras. 5.56-5.57.

492 EM, Vol. II, Annex 15.

493 EM, Vol. II, Annex 15. (Resolution N° 1065 of 2001, Technical Considerations, 1 Follow-up to Article 9 of the Resolution 341 of 2000, Tenth Article, second para.)

494 See above, paras. 4.47, 4.50.

495 See above, paras. 4.51, 4.56.

496 Annex 44.

assessments of the agronomical efficiency of the mix performed by ICA.[497]

6.8. The Resolution also stipulated that the mix and approved dosage were to be maintained and that any change in the formula would require prior approval by the ICA. Article Tenth of the Whereas part of the Resolution reads as follows:

> "In the event that DNE [National Narcotics Directorate] intends to use higher doses than those foreseen here, it shall carry out the relevant assessments pursuant to the procedure and protocols approved by ICA to that effect, and obtain prior approval from that Institute… In the event that DNE intends to use mixtures with Glyphosate as the active ingredient, different to those assessed by ICA and the Health Ministry, DNE shall carry out the relevant assessments pursuant to the procedure and protocols approved by ICA and the Health Ministry to that effect."[498]

6.9. In January 2003, following a favourable technical opinion rendered by the ICA issued on the basis of differential analyses of dose efficacy submitted by the National Narcotics Directorate,[499] the Ministry for the Environment authorized the

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[497] EM, Vol. II, Annex 15 (Resolution N° 1065 of 2001, Technical Considerations, 1 Follow-up to Article 9 of the Resolution 341 of 2000, Tenth Article, second para.)

[498] EM, Vol. II, Annex 15 (Resolution N° 1065 of 2001, Technical Considerations, 1 Follow-up to Article 9 of the Resolution 341 of 2000, Tenth Article, fourth and fifth paras.).

[499] Annex 47: Note Nº 00500 from Assistant Manager for Agricultural Protection and Regulation of the Colombian Agriculture and Livestock

National Narcotics Directorate to use a higher dose per hectare of glyphosate in the spray mix (an increase to 10.4 litres/ha).[500] Resolution N° 0099 of 2003 was published in the Official Journal of Colombia on 21 February 2003.[501] In relevant part, it provides:

> "Pursuant to the provisions of Resolution 1065 of 2001, the Ministry for the Environment accepts the opinion issued by the *Instituto Colombiano Agropecuario*, ICA, for the provisional increase of the dose of the commercial formula of the glyphosate herbicide to 10.4 litres/ha, the mix being Roundup 480 SL (10.4 litres/ha) + Cosmo-Flux 411 (0.25 litres) + water (13 litres), for the eradication of coca crops, in the framework of the Program for the eradication of illicit crops with glyphosate [PECIG] in the national territory."[502]

6.10. A number of websites, including some to which reference is made in Ecuador's Memorial and in particular that of the U.S. Department of State, contain detailed information on the composition of the mix used in aerial spraying to eradicate illicit crops in Colombia.[503]

Institute to the Director of the National Narcotics Directorate, 28 January 2003.

[500] Annex 48: Resolution Nº 099 of 31 January 2003 of the Ministry for the Environment of Colombia.

[501] *Ibid*.

[502] Annex 48, Preliminary Section.

[503] United States Department of State, Bureau for International Narcotics and Law Enforcement Affairs, *Report on Issues Related to the Aerial Eradication of Illicit Coca in Colombia: Chemicals Used in the Aerial Eradication of Illicit Coca in Colombia and Conditions of Application,* September 2002 (EM, Vol. III, Annex 144). See also, United States Environmental Protection Agency (EPA), *Details of the Consultation for*

(2) COMMUNICATIONS BY COLOMBIA TO ECUADOR (2000-2004)

6.11. Quite apart from the fact that information as to the composition of the spray mix was, and remains, widely available, the Colombian authorities in fact explained the composition of the mix and the modalities of its use in detail to the Ecuadorian authorities on a number of occasions.

6.12. For example, in October 2000, a Meeting of Vice-Ministers of Foreign Affairs of the Andean Community was held in Caracas. The agenda included an item called "Early Warning Mechanism for the detection of biological control agents in the eradication of illicit crops, that affect Andean ecosystems". During the meeting, the Colombian Vice-Minister of Foreign Affairs stated:

> "The Government of Colombia has stated that it does not approve under any circumstance, experimenting with mycoherbicides exogenous to our ecosystems and that might affect the environmental balance and health of the population. In particular, it has rejected experimentation with fusarium oxysporum. It is important to clarify that no mycoherbicide is currently being studied."[504]

Department of State: Use of Pesticides for Coca and Poppy Eradication Program in Colombia, August 2002. In Annex 142, p. 13 (partially at EM, Vol. III, Annex 143).

[504] Annex 136: Report of the Fifth Meeting of Vice-Ministers of Foreign Affairs of the Andean Community, Caracas, 16-17 October 2000.

6.13. For his part, at the same meeting the Vice-Minister of Foreign Affairs of Ecuador stated that:

> "…complete and absolute assurances were received from the authorities of the Colombian Government to the effect that no use or experimenting with the fungus *fusarium oxysporum* or any other type of mycoherbicide will be undertaken for the programs for the eradication of illicit crops. Thus, the Government of Ecuador deems it unnecessary to bring this issue to the next meeting of the Council". [505]

6.14. The Ministry for the Environment of Colombia subsequently reiterated the decision not to use any biological agents:

> "The Ministry for the Environment, as the highest environmental authority in the country, in relation to the possible experimenting, use or application of the fungus *Fusarium oxysporum*, as a mechanism for the eradication of illicit crops in the national territory, reiterates the following:
>
> The Ministry for the Environment DID NOT accept the proposal advanced by the United Nations International Drug Program (UNDCP), to conduct tests with *Fusarium oxysporum Erythroxylum* mycoherbicide, given that it considers that any agent external to our country's native ecosystems might pose serious hazards to the environment and human health."[506]

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505 *Ibid*.

506 Annex 42.

This position of the Colombian Government remains unchanged; the use of biological agents for the control of illicit crops has never been contemplated.

6.15. A diplomatic Note sent by the Colombian Foreign Ministry on 14 July 2001 explained each of the ingredients of the mix and included information on their toxicological classification. It stated:

> "Furthermore, Colombia uses products which have been demonstrated to have no harmful effects and it has based its illicit crops eradication program on reliable and consistent international scientific studies.
>
> Indeed, the chemical substances used against illicit crops are the same used by both countries on their plantations of bananas and flowers for export... For a better illustration of the matter, we have been guided by two studies prepared by NAS /Plan Colombia – PECI and by the Counternarcotics Directorate of the National Police of Colombia. I would like to stress the following points contained in these studies:
>
> The herbicide used by the Program of Eradication of Illicit Crops - PECI- is a commercial formulation made with glyphosate, which has the registered name of Roundup Ultra, manufactured by the company Monsanto Inc.
>
> Its toxicological category is No. IV, which means that it is at the bottom of the universally accepted toxicity scale.
>
> [...]
>
> Glyphosate, POEA and the herbicide Roundup have been tested in numerous sub-chronic,

> chronic, reproductive, and developmental studies, including tests to determine adverse effects on the nervous system, and the conclusion is that there is no evidence of neurotoxicity in any of these studies. Therefore, it is evident that no neuropathies or alterations of the nervous system or alterations of the foetal nervous system have been observed.
>
> The surfactant Cosmo-Flux 411F is a coadjuvant commonly used in commercial farming, added to many herbicides used in many cash crops, including rice, corn, sorghum, soy, etc.
>
> Dioxin is 100 times below WHO and FAO standards, so there is no reason for concern regarding human or animal health."[507]

6.16. In July 2001 Colombia also proposed the holding of a seminar/workshop with the purpose of informing Ecuadorian officials of technical aspects relating to the eradication of illicit crops by aerial spraying with glyphosate in Colombia. During the seminar, which was held in Bogotá in February 2002, the composition of the spray mix was explained in detail to the Ecuadorian delegation.[508]

6.17. In November 2003, in response to an Ecuadorian request,[509] the Colombian Government submitted to the Foreign Minister of Ecuador[510] a toxicity study of the spray mix entitled: "Toxicity studies in laboratory animals – Inmunopharmos Ltd."

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507 EM, Vol. II, Annex 42.
508 See above, paras. 5.11-5.16.
509 EM, Vol. II, Annex 52.
510 EM, Vol. II, Annex 50.

This study expressly specified the components of the mix as follows: "Glyphosate 44% + Cosmoflux 1% + Water 55%".[511]

6.18. In 2004, in reply to a further request from the chairman of Ecuador's Scientific and Technical Commission,[512] Colombia's National Narcotics Directorate again submitted precise and detailed information on the spray mix. The 2004 Note specified as follows:

> "Concentrations used for the spraying of coca crops:
>
> Mix of glyphosate, water and adjuvant 23,65 litres/ha (10,4 litres of glyphosate per hectare).
>
> Spraying of 1,04 millilitres/m^2.
>
> Maximum concentration of 480 mg/litre.
>
> Every m^2 sprayed receives 0,499 ml of active ingredient.
>
> Concentration below critical values and way far from LD-50 [lethal dose 50] and LC-50 [lethal concentration 50]."[513]

6.19. Together with the 2004 Note, which was addressed to the Ecuadorian Scientific and Technical Commission, the Ecuadorian Government was again furnished with the toxicity

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[511] Annex 128: O. Saavedra, Inmunopharmos Ltda., *Toxicity Study on Laboratory Animals for two concentrations of Glyphosate 44% + Cosmoflux 1% + Water 55%*, Bogotá, 15 February 2002, pp. 1, 2, 7, 13, 14, 37, 38, 45, 50, 62, 67, 74, 77, 80, 88.

[512] Annex 11: Note N° CMFS-46-2004 from the President of the Ecuadorian Scientific and Technical Commission to the Acting Director of the Anti-Narcotics Direction of the Colombian National Police, 18 March 2004.

[513] Annex 13.

study on animals conducted by the Inmunopharmos laboratory, and the technical data sheet of the adjuvant Cosmo-Flux 411F used, which specified the chemical features and toxicological aspects of that product.

(3) COLOMBIAN ENVIRONMENTAL AUDIT

6.20. Since 1994, Colombia's National Narcotics Council has required that aerial eradication operations must be subject to an external environmental audit in order to ensure that the mix with which the aerial spraying aircrafts are loaded conforms with the relevant regulations as to permitted composition and dosage under Colombian law.[514] That requirement was reiterated in a new Resolution in 2003, as follows:

> "The PECIG shall have an external technical audit […]
>
> The general tasks of the technical audit will be the following:
>
> - Validate whether the execution of the PECIG's operative activities adhered to the procedures and guidelines set in the PMA (Environmental Management Plan) [...]."[515]

6.21. The external environmental auditors and the ICA carry out random quality control operations on the spray mix through the collection of samples that are sent for analysis to the National Laboratory of Agricultural Products (*Laboratorio*

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[514] Annex 37; Annex 41.

[515] Annex 49: Resolution Nº 013 of 27 June 2003, from the National Narcotics Council of Colombia (Article 5).

Nacional de Insumos Agrícolas (LANIA)).[516] In all the analyses performed, the concentration of the active ingredient, glyphosate, has been found to be 480 milligrams/litre, just as has been repeatedly reported and officially indicated to Ecuador.[517]

C. Alleged Failure to Deliver an Environmental Impact Assessment

6.22. Ecuador alleges in the Memorial that it requested the Colombian Government to provide an "Environmental Impact Assessment conducted prior to sprayings of Glyphosate" and reiterates repeatedly that Colombia never furnished it with any such study.[518]

6.23. In particular, Ecuador claims that during a meeting of the Joint Scientific and Technical Commission in October 2003, "the Colombian delegation agreed to provide the information requested", i.e. "existing environmental impact studies pertaining to the fumigations".[519]

6.24. A review of the records of the meeting drawn up by the Colombian delegation shows that no such commitment was made. Nor could it have been made at the time since Colombia

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[516] See Annex 65, p. 3.

[517] Annex 71: Spray Mix Quality Control, National Laboratory for Agricultural Use Products (LANIA), Colombian Agriculture and Livestock Institute, 18 February 2009; Annex 65, p. 3.

[518] EM, paras. 3.1, 3.2, 3.31 to 3.34.

[519] EM, para. 3.28.

had only developed an Environmental Management Plan, on the basis of the experience gained by prior experimental spraying programs and studies, and not an "Environmental Impact Assessment conducted prior to sprayings of Glyphosate" as requested by Ecuador. Nevertheless, Colombia offered to provide Ecuador with the studies at its disposal.

6.25. In that regard, Ecuador's Memorial fails to mention that, in November 2003, pursuant to the commitment undertaken at the meeting of the Joint Scientific and Technical Commission in October 2003, Colombia sent to the Ecuadorian Scientific and Technical Commission, among other technical documents and scientific studies, the Environmental Management Plan.[520]

6.26. However, Ecuador continued to insist on an "Environmental Impact Assessment conducted prior to sprayings of Glyphosate".[521] The PECIG's Environmental Management Plan was elaborated in 2001, as provided for in Colombian law in force at the time. According to the transitional regime which was then in force, the Environmental Management Plan was equivalent to an environmental impact

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[520] Annex 9.

[521] See e.g. EM, Vol. II, Annex 51 (Diplomatic Note 75204/2003-GM, sent from the Ministry of Foreign Affairs of Ecuador to the Ministry of Foreign Affairs of Colombia); CCM, Annex 10: Note No. 4-2-336/03 from the Ecuadorian Foreign Ministry to the Colombian Foreign Ministry, 10 December 2003; EM, Vol. II, Annex 61 (Diplomatic Note 20434/2003-GM, from the Ecuadorian Foreign Ministry to the Colombian Foreign Ministry, 31 March 2004).

assessment.[522] Having been approved and adopted by administrative resolution, the Environmental Management Plan is widely known and publicly accessible.[523]

6.27. Ecuador also omits to mention that at the second meeting of the Joint Scientific and Technical Commission, the Colombian Delegation explained in detail the environmental impact of the PECIG, as acknowledged in a note sent by the Ecuadorian Foreign Minister to his Colombian counterpart, which states as follows:

> "The CCTE [Ecuadorian Scientific and Technical Commission] again requested the report on environmental impact that the CCTC [Colombian Scientific and Technical Commission] possesses. *This report* has been considered essential since the beginning of the research and *was presented during the 2nd Meeting*."[524]

6.28. Colombia presented the available research at that meeting. The signed Minutes of the meeting recorded a commitment on the part of Colombia to exchange "documents

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522 See paras. 4.10-4.14 above.

523 EM, Vol. II, Annex 15; CCM, Annex 50.

524 EM, Vol. II, Annex 55 (Diplomatic Note 4820/2004-GM from the Ministry of Foreign Affairs of Ecuador to the Ministry of Foreign Affairs of Colombia, 10 February 2004), emphasis added. Ecuador was also aware of the nature, content, scope, objectives and procedures of the Environmental Management Plan since, after its request to the Inter-American Commission for Human Rights for the indication of precautionary measures, the Colombian Government was required to reply to the request, and detailed information on the Plan was included therein (see Annex 19: Diplomatic Note Nº DDH. 58003 from the Colombian Foreign Ministry to the Executive Secretary of the Inter-American Commission on Human Rights, 18 September 2005).

with the respective scientific-technical basis that support their positions".[525] In no way do those minutes reflect any commitment by Colombia to deliver an "environmental impact study" of the kind demanded by Ecuador. Ecuador's assertions that, "[t]o the surprise of the Ecuadorian delegation, the Colombian delegation stated that the Colombian Ministry of the Environment had conducted an environmental impact study… [t]he study was never provided to Ecuador"[526] are therefore incorrect.

6.29. Quite apart from providing the PECIG program's Environmental Management Plan, and consistently showing its willingness to address Ecuador's demands and queries, the Colombian Government on a number of occasions submitted information and studies relating to the various technical aspects of the spraying operations conducted in Colombia. The information and studies were provided to assorted agencies and departments of the Ecuadorian Government, including members and the President of its National Congress.[527]

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525 Minutes of the I Meeting of the 2nd Ecuador-Colombia Scientific and Technical Commission, 10 April 2007 (EM, Vol. II, Annex 80).

526 EM, para. 3.69.

527 Annex 1: Note Nº E-067 from the Colombian Ambassador in Quito to the Presidential Adviser for Coexistence, National Security, and Fight against Crime, 18 January 2001. Annex 2: Note No E-934 from the Colombian Ambassador in Quito to the Ecuadorian Defence Minister, 16 August 2001; Annex 6: Note No E-1313 from the Colombian Ambassador in Quito to the Ecuadorian Minister of Agriculture, 15 November 2001; Annex 3: Note No. E-931 from the Colombian Ambassador in Quito to Valerio Greffa Uquiña, Ecuadorian Congressman, 20 August 2001; Annex 4: Note

6.30. Legal issues associated with the alleged failure to conduct an EIA are discussed in Chapter 8 below.[528]

D. Alleged Failure to Notify Ecuador of Spraying Missions

6.31. It is a key feature of the aerial spraying campaign that it was conducted across the entirety of Colombia, wherever illicit crops were detected. It was not focused on border areas but on Colombian territory.[529] It was not necessary to notify any other country, whether or not neighbouring Colombia, of the precise timetable of operations being undertaken in Colombia.

6.32. Moreover there were very good reasons not to do so. At a meeting of the Joint Scientific and Technical Commission in February 2004, the Colombian delegation made clear that "for security reasons information under no circumstances the activities schedule would be informed."[530] Nevertheless, subsequently, during the last meeting of the first Joint Commission, held in August 2004, the Colombian Government, in a gesture of goodwill, agreed to notify "by the fastest means, at the moment that such sprayings are being conducted along the border area, so that the Ecuadorian Commission may take

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No E-962 from the Colombian Ambassador in Quito to the President of National Congress of Ecuador, 23 August 2001.

528 See below, paras. 8.65-8.91.

529 See above, para. 4.57.

530 Annex 51, Annex 3 to the Letter.

samples and conduct the respective analyses in a timely manner."[531]

6.33. The Government of Colombia did in fact notify Ecuador of the fact that sprayings were being carried out in November 2004, in accordance with the undertaking given at that meeting.[532] Shortly thereafter, Ecuadorian members of the Joint Scientific and Technical Commission collected water samples in Ecuadorian territory near the border to carry out analyses, the results of which were described above.[533]

6.34. Furthermore, the suspension of the sprayings in the 10-km strip along the border with Ecuador from December 2005, the brief resumption between December 2006 and January 2007, and the suspension from February 2007 to date, were all duly notified to Ecuador.[534] It is accordingly not true, as the Memorial asserts, that "not once has Ecuador received advance notice of aerial sprayings along its borders."[535] As to advance notifications of individual missions, Colombia was under no obligation, having regard to the evident security concerns, to give such notification. It may be noted, however, that Ecuador

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531 See above, para. 5.35; EM, Vol. II, Annex 64.
532 See above, para. 5.39.
533 See above, paras.5.30-5.31, 5.37.
534 See above, paras. 5.39, 5.67, 5.71.
535 EM, para. 3.2.

was invited to observe individual missions, and did so in February 2002;[536] but declined to do so subsequently.[537]

E. Conclusions

6.35. Ecuador's allegations that Colombia failed to disclose the composition of the spraying mix are unfounded.

6.36. The composition of the mix used for the aerial sprayings has been publicly available since 2001. The Ecuadorian Government had been informed all along and was therefore fully aware of the composition of the spray mix used to eradicate illicit crops in Colombia.

6.37. Not only was the composition of the spray mixture publicly available and officially communicated to Ecuador, it was in fact known and appreciated by Ecuadorian authorities. In 2005, the Ecuadorian Scientific and Technical Commission (CCTE), submitted a technical report on the study commissioned by the Inter-American Drug Abuse Control Commission (CICAD I), in which it stated that: "The toxicity data for the active ingredient glyphosate is obtained from the literate [*sic*] and from acute intoxication tests of laboratory

536 See above, para. 5.11.
537 See above, para. 5.35, 5.65.

animals undertaken with a mixture of glyphosate and Cosmoflux such as the one used in the spraying program".[538]

6.38. As to Ecuador's contention that Colombia never provided an Environmental Impact Assessment, Colombia did supply Ecuador, upon its request, in November 2003, with the PECIG program's Environmental Management Plan, which pursuant to the applicable legal regime in Colombia was tantamount to an Environmental Impact Assessment.[539]

6.39. In the same spirit of collaboration, and although it was under no obligation to do so, Colombia also notified Ecuador that aerial sprayings were being conducted in border areas. Following January 2007, the PECIG program has been suspended in this region and has not been resumed.

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538 EM, Vol. III, Annex 153.

539 See further, paras. 4.10-4.14, 5.27, 5.98, 6.25, note 524 to para. 5.27, and 8.89-8.90.

PART II

SCIENTIFIC AND LEGAL ISSUES

Chapter 7

THE DAMAGE ALLEGED BY ECUADOR

A. Overview

7.1. As will be demonstrated in this Chapter, Colombia's PECIG program simply cannot have caused the kind of damage to the Ecuadorian population, wildlife or environment alleged by Ecuador.[540]

7.2. This was confirmed by the Ecuadorian authorities themselves, who expressly and publicly stated that, up until December 2004, no damage to human health, the environment or the wildlife of Ecuador had occurred in the area adjacent to the border with Colombia.[541] Further, in June and August 2004, the Ecuadorian Foreign Ministry released the results of scientific analyses carried out by Ecuadorian officials on water samples taken from rivers in the provinces of Sucumbíos and Esmeraldas adjacent to the Colombian border. Those analyses showed no evidence of glyphosate residues in the rivers in question,[542] whereas it is a predicate of Ecuador's theory of the case that the rivers were polluted in 2004.[543]

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[540] For Ecuador's characterization of losses suffered, see above, para. 1.26-1.31.

[541] See above, paras. 5.45-5.63.

[542] See above, paras. 5.30-5.32, 5.37.

[543] See e.g. EM, paras. 2.11, 2.25, 3.61, 5.48, 6.3, 6.100, 9.60, 9.70, 9.73, 9.74.

7.3. Thereafter sprayings were suspended over Colombian territory in the 10-km strip parallel to the border between December 2005 and December 2006. They were only resumed for a brief period between December 2006 and January 2007 before they were again suspended pursuant to a decision of the Colombian Government announced in February 2007. Since that date, no spraying has taken place over Colombian territory in the area within 10 km of the border. Accordingly, no damage could have occurred in Ecuadorian territory as a result of spraying by Colombia from late January 2007 to the present.

7.4. After the end of 2004, the only periods in which sprayings took place in any area near the border area with Ecuador were:

(1) as regards areas contiguous to the border in the Colombian province of Nariño, between 14 January and 26 December 2005, and between 17 December 2006 and 14 January 2007; and

(2) as regards areas contiguous to the border area in the Colombian province of Putumayo, between 24 September and 10 December 2005 and between 11 December 2006 and 21 January 2007.

None of the witness statements submitted by Ecuador relates to spraying which occurred in the relevant province during those

periods. Yet Ecuador itself is on record as denying that any harm had occurred prior to that time. The testimony concerning alleged damage or spraying on Ecuadorian territory, including in particular the *ex post facto* witness statements procured by Ecuador and submitted together with its Memorial, are contrary to the evidence gathered by Ecuador itself at the relevant time and as such have no probative weight.

7.5. But in any event, taking into account the scientific evidence on the limited effect of drift and the strict technical parameters under which the spraying operations are carried out in Colombia – including the observance of 100m exclusion strips along watercourses – no damage could have occurred in Ecuadorian territory.

7.6. Moreover, even if Ecuador's position on spray drift were tenable (which it is not), the extent and scope of the alleged damage referred to by Ecuador in its Memorial is simply not credible. Nothing remotely like it has occurred in Colombia, where the sprayings actually took place.

7.7. This Chapter will substantiate these propositions by reference to the scientific evidence, much of which is ignored or misrepresented in Ecuador's Memorial, and also to the affidavits so far submitted. Colombia has commissioned an expert study by Dr Stuart Dobson, a toxicologist of 30 years experience who chaired the Expert Task Group which finalised the WHO

assessment of glyphosate,[544] and who is currently Chair of the Risk Assessment Steering Group of the International Programme on Chemical Safety (IPCS), a joint activity of the World Health Organisation (WHO), the United Nations Environment Programme (UNEP) and the International Labour Organisation (ILO).[545] The Dobson Report is appended to this Counter-Memorial.

B. The Factual Prerequisites for Ecuador's Case

7.8. Ecuador's case is contingent on proving four separate sets of facts: (a) that the aerial applications of the spray mixture used by Colombia in its drug eradication program are damaging to human health, to other biota and to the environment, (b) that spraying which took place has (primarily by spray drift) resulted in the spray mixture being deposited on Ecuadorian territory in significant quantities, (c) that Ecuadorian nationals, their livestock and farms have thereby been exposed to the spray mixture, and (d) that there is a causal link between the sprayings and the injuries alleged, i.e. that it was the exposure to the spray mix that caused the harms of which Ecuador complains in these proceedings.

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[544] See WHO, Glyphosate. Environmental Health Criteria 159 (World Health Organization, Geneva, 1994), (excerpts in Annex 96, full text available at: http://www.inchem.org/documents/ehc/ehc/ehc159.htm (last visited 10 March 2010). For more recent published work by Dr Dobson on glyphosate see J.P. Giesy, S. Dobson S & K.R. Solomon, "Ecotoxicological risk assessment for Roundup herbicide", *Reviews of Environmental Contamination and Toxicology* 167: 35-120 (2000).

[545] See http://www.who.int/ipcs/en/ (last visited 10 March 2010).

7.9. The burden of proving these facts lies on Ecuador and Ecuador has failed to discharge that burden. But independently of any onus, the scientific and other evidence supports Colombia's position.

(1) TOXICITY OF THE SPRAY MIXTURE

7.10. With respect to the first point, there is no scientific evidence of significant risk to human or animal health or to the environment due to exposure to the spray mixture used by Colombia in its drug eradication program. Glyphosate is one of the most commonly used pesticides world-wide. Both glyphosate and its various formulations have been the object of numerous investigative studies in order to ascertain whether they may have adverse effects on humans, animal species and on the environment. Likewise, it has been shown that the adjuvant Cosmo-Flux 411F, that accounts for 1% of the spray mix, does not alter the formulation's toxicity.

7.11. For instance, the independent scientific study completed in 2005 by an expert panel composed of Dr Keith R. Solomon and other scientists at the request of the OAS agency CICAD (CICAD I), concluded that Colombia's spray eradication program did not pose significant risks for humans and most wildlife.

> "The toxicity of glyphosate has been rigorously assessed in a number of jurisdictions and in the published literature. Glyphosate itself has low toxicity to non-target organisms other than green plants. It is judged to have low acute and chronic toxicity, carcinogenic, mutagenic, or a reproductive toxicant. With respect to humans, is not considered hazardous, except for the possibility of eye and possibly skin irritation (from which recovery occurs). The toxicity of the formulation as used in the eradication program in Colombia, a mixture of glyphosate and Cosmo-Flux®, has been characterized in specific tests conducted in laboratory animals. The mixture has low toxicity to mammals by all routes of exposure, although some temporary eye irritation may occur. By extrapolation, the spray mixture is also not expected to be toxic to terrestrial mammals and vertebrates."[546]

7.12. The subsequent studies forming CICAD II, published in 2009 in the *Journal of Toxicology and Environmental Health*, focused on remaining uncertainties identified as subjects for further study in CICAD I, in particular, the issues of spray drift, the effects on sensitive wildlife such as amphibians and the effects on humans. Summing up the effect of these studies, the overall conclusion of CICAD II was as follows:

> "Laboratory and field tests on amphibians showed that Colombian species were of similar sensitivity to species tested in other locations and that they were not especially sensitive to glyphosate formulations. Tests on larvae stages of amphibians under realistic conditions showed

[546] Annex 116, CICAD I, pp 10-11.

that toxicity was reduced, most likely because of the rapid absorption of glyphosate and its adjuvants to sediment and particulate matter. Terrestrial stages of frogs showed a range of sensitivity, but all had LC50 values less than the application rate used for eradication of coca. Given interception by foliage, risks to aquatic and terrestrial stages of frogs from Colombia, even from direct exposure to aerial eradication sprays, are judged to be small to negligible. The study of the large distribution of large diversity of frog species in Colombia in relation to coca production and eradication spraying showed that there were only a few species of frogs potentially at risk because of their location in southwest Colombia. As these species are also found in Ecuador, the likely small risks are to populations in Colombia, not the species as a whole. A much greater risk to frogs in Colombia is from the other pesticides used by the growers of coca (and poppy) and particularly the deforestation that precedes the planting of these crops.

In terms of effects on humans, an epidemiological study did not provide evidence of effects on reproductive function in terms of TTP [time to pregnancy]. In a study on potential genotoxicity that combined epidemiological surveys with biological monitoring of MN [micronuclei] in white blood cells, differences in the baseline frequency were observed in relation to region sampled... In some regions the frequency decreased after spraying but in one, it did not. These observations do not fulfil all the criteria for causality, suggesting that if glyphosate spraying had any influence on MN, this is small and not of biological significance.

Overall, the risks to sensitive wildlife and human health from the use of glyphosate in the control of coca (and poppy) production in Colombia are

> small to negligible, especially when compared to the risks to wildlife and humans that result from the entire process of the production of cocaine (and heroin) in Colombia."[547]

7.13. The fact that glyphosate has relatively low toxicity levels may be confirmed by reference to Annex I of the Kiev Protocol on Civil Liability and Compensation for Damage Caused by the Transboundary Effects of Industrial Accidents of 21 March 2003, which addresses the question of civil liability for "hazardous activity".[548] The Protocol defines "hazardous activity" in Article 2(2)(f) as: "any activity in which one or more hazardous substances are present or may be present in quantities at or in excess of the threshold quantities listed in annex I and which is capable of causing transboundary effects on transboundary waters and their water uses in the event of an industrial accident". Annex I lays down precise criteria for substances as "Very Toxic", "Toxic" or "Dangerous to the Environment". Glyphosate does not meet the criteria for either "very toxic" or "toxic". It meets the criterion for "dangerous to the environment" for algae (hardly surprising for a herbicide),

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547 Annex 131-A, CICAD II, at p. 919.

548 See Protocol on Civil Liability and Compensation for Damage Caused by the Transboundary Effects of Industrial Accidents on Transboundary Waters to the 1992 Convention on the Protection and Use of Transboundary Watercourses and International Lakes and to the 1992 Convention on the Transboundary Effects of Industrial Accidents, Kiev, 21 May 2003, see http://www.unece.org/env/civil-liability/documents/protocol_e.pdf for the text of the Convention, which has only 1 ratification and is not yet in force.

technically meets it for daphnids, but does not meet it for fish, still less mammals.[549]

7.14. Ecuador claims that the spray mix used in the program of the aerial eradication of illicit crops in Colombia is atypical because the glyphosate concentration differs from that used in agriculture.[550] The underlying basis for that comparison is flawed, but in any event it is simply incorrect. As to the basis for the comparison, glyphosate concentrations always vary contingent upon the species of plant the herbicide is intended to control and the desired effects. Further, coca eradication is evidently a non-agricultural use of glyphosate. But in any case, Colombia's aerial eradication program for illicit crops results in the application of doses equivalent to those which are authorised in other countries.[551]

7.15. In an attempt to stress the toxicity of the spray mix, Ecuador makes much of the information contained in the labels

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[549] The acute LD50 for rats (oral) for glyphosate is >5000 mg/kg body weight. The acute dermal LD50 for rats and rabbits are >2000 and >5000 mg/kg bw respectively. For the environmental criteria, 7 out of 17 values for EC50 in algae are <10 mg/litre. 1 value for Daphnia species is just <10 (9.7) mg/litre; the other 4 reported are >10 (12.9 to 25.5) mg/litre. All fish LC50 values are >10 mg/litre. Data from Giesy et al. 2000 (e.g., p. 69) and WHO 1994.

[550] EM, paras. 5.13, 6.79.

[551] The EPA found that, based on a comparison of the glyphosate use pattern in Colombia and the use in the U.S., the most equivalent U.S. uses of glyphosate would be in forestry or rights-of-way. The glyphosate product used in Colombia (as at 2004) is registered in both the U.S. and Colombia, and application rates described as used in Colombia were found to be within the parameters listed on U.S. labels. In Annex 142, pp. 8-9 (partially at EM, Vol. III, Annex 143), see also Annexes 143, 144, 149, p. 1.

on containers of glyphosate and Cosmoflux.[552] Such labelling is not only standard, but mandatory and is entirely "hazard based", indicating the potential for harm rather than the probability of harm (risk). It is the same information that all the labels of chemical pesticides for agricultural use within the Andean Community have to contain. Needless to say, this information is quite similar to that commonly found – and generally required – to appear on over-the-counter and prescription medicines, household products, and even processed food products.

(2) SPRAY DRIFT

7.16. Since every care is taken to ensure that spraying occurs only on Colombian territory, the present case has as a central issue the question of the extent and effects of spray drift.

7.17. As described in some detail in Chapter 4 above, spray drift depends essentially on wind speed and direction, as well as on a number of other atmospheric factors including temperature, relative humidity and atmospheric stability. It is also dependent on the altitude at which spraying takes place and the air speed of the spraying aircraft, as well as the calibration of the spraying equipment, the density of the spray mix and the initial size of the spray droplets. The PECIG's Environmental Management Plan has taken into account all these factors and set minimum and maximum figures for the parameters upon which drift is

552 EM, paras. 5.39-5.47.

contingent, with the purpose of reducing it as much as possible. To summarize:

- Target areas are carefully identified in advance.
- The aircraft are equipped with GPS readers and computerised information about the terrain.
- Aircrew are fully trained and flights are monitored and recorded.
- The same area is not sprayed more than twice a year.
- An exclusion zone of 100m is observed in relation to all water bodies, including the boundary rivers.

These parameters are strictly observed by the personnel involved in spraying operations.[553]

7.18. A specific study during the second phase of the CICAD process addressed the issue of drift in further detail.[554] The study assessed the drift potential under extreme conditions of flight speed (333 km per hour), wind speed (9.3 km per hour, with wind direction perpendicular to the flight line) and air temperature (35º C). The study used computer modelling and wind tunnel experiments to define a safety zone protective of

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[553] See above, paras. 4.67-4.69, and Annex 50, Table Nº 1, Operational Parameters of the Program for the Eradication of Illicit Crops by Aerial Spraying.

[554] Annex 131-B, CICAD II: A.J. Hewitt, K.R. Solomon & E.J.P. Marshall, "Spray Droplet Size, Drift Potential, and Risks for Nontarget Organisms from Aerially Applied Glyphosate for Coca Control in Colombia", in *Journal of Toxicology and Environmental Health*, Part A, 72:921-929, 2009.

95% of non-target species downwind of the spray operations; it did so on the basis of "the worst-case assumption that the concentration resulted from direct overspray of a 15-cm-deep pool with no exposure reduction via adsorption to sediments and organic matter, and no interception by surrounding plants".[555] Moreover the risk assessment focused on the most vulnerable species: juvenile frogs.

7.19. The study found that the great majority of the active ingredient (>90%) was deposited within the target area.[556] As the figure on the following page shows,[557] the amount of spray drift deposition decreases exponentially as the distance from the swath edge increases:

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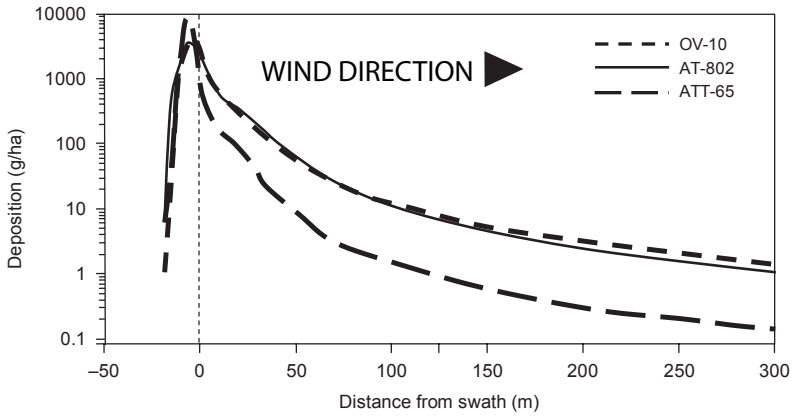
[555] Annex 131-B, CICAD II, p. 923.

[556] Hence, the assertion contained in the Menzie Report and reprised by the Memorial (EM para. 5.97) to the effect that "[T]he turbulence created by high plane speed causes 'spray droplets to break apart, and these smaller, lighter droplets have a potential to be carried further by wind currents'", is inapplicable to the actual circumstances of the present case. Also disproven by the CICAD II study are the Memorial's assertions with regard to the prevailing high temperatures along the border as allegedly aggravating drift, by making the "spray more prone to form small droplets that will be carried away by the wind. These shrunken droplets are also more concentrated, increasing their toxicity." (EM para. 5.89.)

[557] Annex 131-B, CICAD II, at p. 926, Figure 5.



Dobson, Figure 1, adapted from Hewitt et al. (2009). Deposition rates for spray drift (g/ha on a log scale) for different aircraft types at representative flight speeds.

In reading this Figure 5, it is important to note that the vertical axis is a log scale, depicting orders of magnitude. In other words the extent of spray drift resulting from the ATT-802,[558] 50 metres downwind, is less than 1% of the spray at the target point (<100/10000 g/ha). The extent of spray drift 100 metres downwind is 0.1% (10/10000).

7.20. The study concluded that effects of spraying were negligible beyond 120 meters even for those plants most sensitive to the spray mixture.[559] It also found that:

> "The extensive vegetation of the forest canopy and environment around the area where the coca and poppy plants are sprayed in Colombia will

[558] AT 802 are the planes currently in use in the aerial spraying program.

[559] Annex131-B, CICAD II, at pp. 923, 925, 929.

afford excellent reductions in spray drift potential by interception of droplets with leaf and other surfaces (Raupach et al., 2001). This will greatly reduce the spray drift exposure risk from the values reported in this study by 50–90% (AgDRIFT, 2008)."[560]

7.21. The authors concluded that:

"Based on modeled drift and 5th centile concentrations, appropriate no-spray buffer zones (distance from the end of the spray boom as recorded electronically ±5%) for protection of sensitive plants were 50-120 m for coca spray scenarios... the equivalent buffer zone for amphibians was 5m. The low toxicity of glyphosate to humans suggests that these aerial applications are not a concern for human health."[561]

7.22. In terms of long-distance transport the authors concluded that:

"Long-distance transport of spray drift particles is small and not an issue for humans or the environment beyond 50m downwind at the maximum permitted wind velocity of 9 km/h for spraying operations. Long-distance movement of glyphosate is negligible if appropriate no-spray buffers are used and nonexistent if the wind direction during spray is away from the area of concern."[562]

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560 Annex131-B, CICAD II, at p. 928.
561 *Ibid.*, p. 921.
562 *Ibid.*, p. 929.

7.23. For its part, Ecuador's Memorial baldly asserts that drift has reached Ecuador, heavily relying on the unfounded assertions of the Menzie Report in its discussion of topics such as spray operation parameters, off-target release of spray, ground-based hostilities and localized weather conditions.[563]

7.24. For instance, the Memorial quotes the Menzie Report's reference to "agricultural studies conducted in the United States [that] have 'shown that pesticides delivered through aerial spraying can be transported miles in the drift … spray drift may extend as far as four to ten miles.'"[564] The Report makes that assertion based on studies carried out several decades ago, in which the substances under study and their method of application are not comparable to the spray mixture which has been used in the PECIG program since 2000.[565] In any event, those same studies found that at 300 metres downwind the spray deposited would be about 1 gram/hectare (g/ha); on a scale of

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563 EM, paras. 5.83, 5.86-5.90, 5.93-5.95, 5.97, pp. 157-163. EM, Vol. III, Annex 158, Section 4.

564 EM, para. 5.83, p. 157.

565 For example, it cites the study carried out by Currier et al. (1982) that assessed the application of two active ingredients (Cipermetrina, Triazopho) – without using an adjuvant – for insect control. For several reasons, these insecticides are not comparable to the herbicide used in Colombia to eradicate coca crops. For example, the droplet size for insecticides is much smaller. The study by Westra & Schwartz (1989) also refers to the application of pesticides without the use of adjuvants. As previously stated, an adjuvant is used in the PECIG precisely to help reduce drift as much as possible. The study conducted by Fox (1978) is also cited; he studied terrestrial applications of different herbicides for weed control in grape crops. Clearly, terrestrial applications are not comparable to aerial spraying because the equipment and procedures used are significantly different.

kilometres, measurements would be in micrograms/hectare (μg/ha). This is far below the dose which could affect any organism, animal or plant.

7.25. The Menzie Report asserts that "the spray missions are often conducted under highly adverse and violent conditions" and concludes that "*It is reasonable to expect* that the hostility would be a reason why pilots would fly higher and faster than they would during normal agricultural crop-spraying. Under those circumstances, the released spray *would be prone* to greater drift".[566] But this is sheer speculation: as stated in Chapter 4, no spraying operations are authorized on plots that are assessed as being high risk until military operations to guarantee appropriate security conditions are carried out,[567] and spraying missions are cancelled if the situation changes.[568] In any event the work of Hewitt et al. (2009), summarised above, assumed a worst-case scenario of a spray plane flying at 333 km per hour: even so, predicted deposition of spray downwind was as shown in the Table.

7.26. Ecuador attaches great importance to the speculative and hypothetical discussion contained in the Menzie Report concerning "localized [wind] circulation patterns [that] can

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566 EM, Vol. III, Annex 158, p. 13 (emphasis added).

567 See above, paras. 4.61, 4.70 and note 330, Annex 67, pp. 4-5.

568 Ibid.

increase the risk of off-target deposition…"[569] The Menzie Report seeks to infer local circulation conditions on the basis of notions of general circulation of the atmosphere. But local conditions are random in character, depending on the time of year, time of day, etc. To determine a local wind circulation pattern, it is necessary to have actual data obtained from direct measurements from both land and air (radio scanning) meteorological stations, which the Menzie Report does not provide, but which are checked *in situ* prior to each spray mission.[570]

7.27. Another speculative item in the Menzie Report, also recalled in the Memorial, is the suggestion of "frequent 'thermal inversions'[571] along the international frontier" as "another meteorological condition that increases spray drift into Ecuador".[572] The Report states that "thermal inversions are common in the tropics and are *expected to be* a frequent occurrence in the Ecuador/Colombia border area".[573] But for a thermal inversion to occur, very particular local meteorological conditions are needed, such as clear sky at night and calm winds so that the soil cools down faster than the air located above it. Even when this phenomenon does occur, it is of short duration because it usually starts to disappear from the very moment the

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569 EM, paras. 5.86-5.87.

570 See above, para. 4.68.

571 The thermal inversion phenomenon is defined as the increase in temperature as height from land increases.

572 EM, para. 5.90.

573 *Ibid.* (Emphasis added)

sun comes up. It would have little or no influence on drift because spraying operations take place after sunrise.

7.28. An accurate method of measuring drift of any aerial spraying, in lieu of wind-tunnel or other type of studies, is by conducting soil and water sample analyses from the areas surrounding the sprayed areas to measure the residues of the applied substance. The Menzie Report, on whose assertions the Ecuadorian Memorial heavily relies, drew conclusions without taking any such samples. In contrast, in 2004 Ecuadorian scientists performed actual soil and water sample analyses and did not find any glyphosate residues.[574]

7.29. The overall conclusion of CICAD II on spray drift was as follows:

> "In terms of spray drift, new data showed that drift from eradication spraying is minimal and that relatively small buffer zones, ranging from 5 to 120 metres, are protective of sensitive aquatic animals and the target organisms, plants, respectively."[575]

7.30. In sum, the scientific evidence does not substantiate Ecuador's arguments with regard to any alleged damage in its territory due to drift.

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[574] See above, paras. 5.30-5.32, 5.37.

[575] Annex 131-A, CICAD II, at p. 919.

(3) EXPOSURE OF ECUADORIAN RESIDENTS

7.31. Colombia took full account of the available scientific knowledge available at the time it decided to start the spraying program, and adopted a precautionary approach. Even in the absence of any scientific evidence supporting the allegation that the spray mix causes serious adverse effects to human health and to animals, out of an abundance of caution, Colombia has nevertheless implemented strict procedures in relation to the aerial fumigations of illicit crops in its territory.[576] The conduct of the aerial sprayings is heavily regulated to minimize any risks of human exposure and so as to reduce the chances of drift, if any, to a minimum.

7.32. Prior to any spraying operation, the areas affected by illicit crops are mapped out by digital imagery and the exclusion zones and safety strips where no aerial spraying takes place are identified. No sprayings occur over human settlements, bodies of water or water courses. Such areas are considered to constitute exclusion zones, around which 100-metre safety strips are also established.[577] In the case of the border with Ecuador the rivers are protected by a 100-metre safety strip. The Colombian Government has also taken the precaution of imposing set minimum and maximum figures for the parameters of drift (wind speed, aircraft speed, height, temperature). The

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576 See above, paras. 4.21-4.29, 4.41-4.70.

577 See, para. 4.59.

aircraft fly at low altitudes, usually 30 meters, with a maximum operation speed of 165 miles per hour. They are specially designed and equipped for precision flying, and the spray mix is propagated through automatically calibrated nozzles that release the same amount of mix.[578]

7.33. As set out in Chapter 5 of this Counter-Memorial, a high-level Ecuadorian delegation conducted analyses of soil and water samples on at least three separate occasions in the year 2004 when sprayings near the border were being conducted. No residues of glyphosate were found as a result of the tests carried out by this delegation, who also received reports from the people residing in the area, including both the local population and UNCHR officials, stating that there had been no sprayings affecting Ecuadorian territory at that time.[579] Thus, these findings confirm that no drift of spray mixture has occurred over Ecuadorian territory –or if there was any, that it was insignificant.

(4) EXISTENCE OF A CAUSAL LINK

7.34. Crucially, Ecuador fails to produce any evidence of a causal link between exposure to the spray mixture, and the various illnesses and injuries complained of.

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578 See above, paras. 4.62-4.63.

579 See above, paras. 5.45-5.63.

7.35. Representative of this is the witness statement of Dr. Dino Juan Sánchez Quishpe,[580] an Ecuadorian employee at the local public hospital in Lago Agrio, prepared for these proceedings. Dr. Sánchez records flu-like symptoms and skin problems "which coincided with border sprayings". But although at the time both of the events (2004-5) and of his statement (2009), Dr. Sánchez had access to the hospital in Lago Agrio (the only one in the region), he produces no medical evidence of any causal link between spraying and these symptoms. The two may have coincided, but coincidence is not enough. Moreover Dr. Sánchez has nothing to say about more serious illnesses or deaths.

7.36. While not producing any direct evidence or scientific studies supporting its allegations of harms to health caused by the aerial sprayings, Ecuador's Memorial depicts the very poor living conditions of the farmers and indigenous people who reside in the areas situated along the Ecuador-Colombia border.[581]

7.37. The fact that these groups of Ecuadorians live in precarious hygienic conditions and only have limited access to medical facilities is highly relevant for present purposes. In the light of the situation on the ground, and in the absence of any medical and scientific studies carried out at the relevant times

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580 EM, Vol. IV, Annex 188.

581 EM, paras. 2.17-2.27.

which link the alleged injuries with the sprayings in Colombia, it is impossible to establish whether the ailments complained of – in particular gastrointestinal disorders such as vomiting and diarrhea – resulted from the sprayings, or whether they were due to other causes which are common among poorly nourished populations living in precarious hygienic conditions. Alternatively they may be the result of the much more toxic chemicals used in the cultivation and processing of coca in those areas. As noted in the UNODC 2009 *Coca Cultivation Survey for Ecuador*, there were laboratories in the regions of Esmeraldas and Sucumbíos that were apparently destroyed by the Ecuadorian Government during 2007-2008.[582]

7.38. The Ecuadorian Memorial[583] uses the maps included in the annual survey reports of the SIMCI Program to purportedly show, by way of inference, how close the Ecuadorian localities are from the locations where illicit crops targeted by the PECIG

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[582] UNODC, Ecuador – Coca Crop Monitoring, September 2009. Available at: http://www.unodc.org/documents/crop-monitoring/ecu_repo.pdf?bcsi_scan_8896DBBFDB1B0269=0&bcsi_scan_filename=ecu_repo.pdf (last visited 10 March 2010)

[583] EM, paras. 6.23, 6.30, 6.36: "As the Court can see, official UNODC data shows how close to Salinas Colombia conducted sprayings in 2006. The map also shows how little (if any) drift is required for the toxic herbicide to reach into and directly affect Ecuadorian communities" (para. 6.23); "… the Court will see just how little drift is required for the herbicide to reach Ecuadorian communities on the border" (para. 6.30); "As is clear, the yellow spray areas actually overlap much of the Mataje River which constitutes the international border in the area and has historically been the chief source of fresh water for area residents." (para. 6.36).

program are found, or that Colombia has sprayed over border rivers.

7.39. According to Ecuador's arguments, minimal ("if any") drift would be required for the spray mix to reach Ecuadorian territory. However, according to the operator of the SIMCI Program,

> "…the maps printed in the reports should not be used for calculating areas or distances because that is not what they were created for and do not possess the adequate cartographic precision; they *work as illustrations*. Likewise, attempts to intersect areas of different kinds should be made on the basis of detailed information and not on the basis of the illustrations in the report."[584]

7.40. Moreover, the information concerning sprayed areas shown on the maps should "be used only as a reference to the areas linked to the [spraying] process, but not to make measurements or to locate a particular area in a detailed way."[585] On the basis of the information provided by the UN Office on Drugs and Crime –UNODC, agency in charge of conducting the

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[584] Annex 111: Diplomatic Note from the United Nations Office on Drugs and Crime (UNODC) Representative to Colombia to the Colombian Vice-minister for Foreign Multilateral Affairs, 20 January 2010, p. 2. Emphasis added. In reply to Diplomatic Note N° 57491 from the Colombian Vice-Minister for Foreign Multilateral Affairs to the United Nations Office on Drugs and Crime (UNODC) Representative to Colombia, 19 October 2009 (Annex 110).

[585] Annex 111, p. 2.

annual surveys of coca crops, the assertions of the Ecuadorian Memorial are unfounded.

(5) CONCLUSION

7.41. For these reasons, the fundamental theory of Ecuador's case fails. Ecuador has demonstrated neither actual risk, nor exposure, nor causation. On the contrary, as will now be demonstrated, the available scientific evidence leads to a quite different conclusion.

C. The Scientific Evidence Concerning Glyphosate-Based Sprays

7.42. Scientific evidence supports the position of the Colombian Government as to the negligible effects upon human health, wildlife, soil and water of the spraying conducted as part of the PECIG program. In the present section, the conclusions of the studies containing such evidence are presented. The views expressed by organizations or individuals with no expertise in the relevant disciplines of human health, epidemiology, medicine, public health, or eco-toxicology are not considered as scientific evidence.

7.43. It bears emphasising again that in the aerial sprayings carried out up until 2007 over Colombian territory situated close to the border with Ecuador, exactly the same modalities, mix and procedures as were applied in the rest of the Colombian

territory were used. At no time was there any selective variation as concerns spraying near the border.[586]

(1) ALLEGED EFFECTS ON HUMAN HEALTH

7.44. There is no scientific evidence showing a significant impact of the PECIG program on human health. To the contrary, a number of studies exist concluding that concerns for human health are unjustified.[587]

7.45. Several competent entities, international organizations and foreign scientific agencies, among them the Food and Agriculture Organization (FAO), the Inter-American Drug Abuse Control Commission (CICAD), the WHO's International Programme on Chemical Safety (IPCS),[588] and the United States Environmental Protection Agency (EPA), have undertaken

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[586] None of the provisions governing aerial spraying in Colombian territory make selective reference to the provinces bordering the Republic of Ecuador. See e.g., Annex 49.

[587] "Glyphosate has been the subject of hundreds of health, safety, and environmental studies … it is important to consider the total weight of evidence from scientific studies provided by regulatory agencies, industry, universities, governmental agencies, and scientists from around the World. The U.S Environmental Protection Agency (EPA), Health Canada, European Commission, U.S. Department of Agriculture Forest Service, World Health Organization and other scientists have reviewed this data. Those reviews applied internationally accepted methods, principles and procedures in toxicology and have determined that there are no grounds to suggest concern for human health." In Annex 132: Center for Toxicology and Environmental Health, L.L.C., University of Arkansas for Medical Sciences, *GLYPHOSATE Frequently Asked Questions*, 2009, pp. 1-2.

[588] The International Programme on Chemical Safety (IPCS) is a joint venture of the United Nations Environment Programme, the International Labour Organisation, and the World Health Organization.

studies and issued statements on the innocuous character of one or both of glyphosate or the spray mix used in the PECIG program.

7.46. In 1994, the Environmental Health Criteria on Glyphosate issued by the WHO`s International Program on Chemical Safety alluded to a study conducted in Taiwan in 1991, according to the results of which, "[s]evere effects occurred only in the cases of intentional ingestion (80 of the 93 reported). Accidental exposures led to only mild effects."[589]

7.47. Moreover, according to the WHO recommended classification of pesticides based on the hazards linked to its use (developed as well by the International Program on Chemical Safety), glyphosate is "unlikely to present acute hazard in normal use".[590]

7.48. Similarly, the FAO's 2000-2001 *"Specifications and evaluations for plant protection products, Glyphosate*" concluded that glyphosate exhibits "a low toxicity", as well as noting that glyphosate and its metabolite AMPA were found not

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589 Annex 96: International Programme on Chemical Safety (IPCS), International Programme on Chemical Safety, "Environmental Health Criteria (EHC) 159, Glyphosate", Geneva, 1994, p. 36.

590 Annex 105: World Health Organization (WHO), "The WHO Recommended Classification of Pesticides by Hazard", 2005, p. 54. Available at: http://www.who.int/ipcs/publications/pesticides_hazard_rev_3.pdf (last visited 10 March 2010).

to exhibit a mutagenic risk to humans. The FAO further remarked that "it should be also taken into consideration that there is no evidence of carcinogenic effects in humans, although glyphosate products have been in world-wide use for many years".[591] The Specifications noted that experiments conducted on rats did not indicate any specific hazards from glyphosate or AMPA for reproduction or for the development of embryos or foetuses.[592]

7.49. These conclusions were echoed in a scientific study published in 2000 on Roundup (the principal commercial brand worldwide containing glyphosate) and glyphosate more generally, which stated that: "Reviews on the safety of glyphosate and Roundup herbicide that have been conducted by several regulatory agencies and scientific institutions worldwide have concluded that there is no indication of any human health concern."[593]

7.50. In 2002, the Office of Prevention, Pesticides and Toxic Substances of the United States EPA, in a report prepared on the possible effects on health and the environment of the PECIG program in Colombia, stated that:

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591 Annex 101, p. 24.

592 Ibid.

593 Annex 125: G. M. Williams et al., "Safety evaluation and risk assessment of the herbicide Roundup® and its active ingredient, glyphosate, for humans" in *Regulatory Toxicology and Pharmacology* 31:117165, 2000, p. 117.

> "As for potential human health effects of the coca eradication program, there are no risks of concern for glyphosate, *per se*, from dermal or inhalation routes of exposure, since toxicity is very low... There are no expected toxicological effects of concern for acute (short-term) or chronic (long-term) dietary exposure through food and water from the coca eradication program."[594]

Glyphosate is not bio-magnified nor does it move along the food chain.[595]

7.51. With regard to the spraying mixture used in Colombia, the United States EPA has informed the US State Department on a number of occasions that the herbicide mix used in the sprayings conforms to EPA label requirements for comparable use in the United States. Moreover, the US Secretary of State determined and certified, for the purposes of internal legal requirements in the US during the continued assessment of the Plan Colombia supported by that Government, for the years 2002-2007 that "the herbicide mixture, in the manner it is being used, does not pose unreasonable risks or adverse effects to humans or the environment".[596] Significantly, the EPA also observed in a 2004 report that: "[d]espite an aggressive search

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[594] Annex 142, pp. 4-5 (partially reproduced at EM, Vol. III, Annex 143).

[595] Annex 116, CICAD I, p. 10.

[596] US Department of State, Bureau for International Narcotics and Law Enforcement Affairs, Memoranda of Justification Concerning the Secretary of State's 2002-2007 Certifications of Conditions Related to the Aerial Eradication of Illicit Coca in Colombia, Washington D.C., 2002-2007, Annexes 140 (p. 1), 143 (p. 4), 144 (pp. 3-4), 146 (pp. 1-2), 147 (pp. 1-2), 149 (p. 2).

for cases, there does not appear to be any evidence that glyphosate aerial spraying has resulted in any adverse health effects among the population where this spraying takes place."[597]

7.52. These conclusions were confirmed by a further independent scientific study conducted in 2005, entitled "Environmental and Health Assessment of the Aerial Spray Program for Coca and Poppy Control in Colombia" (CICAD I). That study was conducted with the collaboration of Dr. Keith R. Solomon, Dr. Arturo Anadón, Dr. Antonio Luiz Cerdeira, Dr. John Marshall and Dr. Luz Helena Sanín. The first phase of the study concluded that both glyphosate and Cosmo-Flux, in the manner in which they have been used in the eradication program in Colombia, do not pose any significant risk to human health.[598] The study was republished in 2007 in the peer-reviewed journal *Reviews of Environmental Contamination and Toxicology*.[599]

7.53. CICAD I found, *inter alia,* that:

> "[i]n the entire cycle of coca and poppy production and eradication, human health risks associated with physical injury during clear-

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[597] Annexes 144, 146, 147, 149.

[598] "The risk assessment concluded that glyphosate and Cosmo-Flux® as used in the eradication program in Colombia did note present a significant risk to human health". In Annex 116, CICAD I, p. 11.

[599] *Reviews of Environmental Contamination & Toxicology* 2007; 90:43-125.

> cutting and burning and the use of pesticides for protection of the illicit crops were judged to be more important than those from exposure to glyphosate."[600]

The study also took note of the prevailing view in the scientific community that glyphosate is a substance of low toxicity to organisms other than green plants, and is not a carcinogenic, mutagenic or reproductive toxicant.[601]

7.54. In addition, CICAD I indicated that in chronic and sub-chronic studies, no adverse effects were found on mammal reproductive tissues treated with glyphosate or AMPA. Nor did the results of normal studies with these substances show effects indicating any endocrine modulation. It was therefore concluded that the use of glyphosate has no adverse effects for the development, or on the reproductive or endocrine systems of humans and other mammals.[602] Furthermore, no evidence of neuro-toxicity due to glyphosate exposure was found. No neuro-toxicity was observed in numerous studies of acute, sub-chronic or chronic effects conducted on rodents, nor were any such effects observed in two specific studies conducted on dogs. Immune-toxicity results suggest that glyphosate does not affect

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600 Annex 116, CICAD I, p. 11.

601 Annex 116, CICAD I, p. 10.

602 "Comprehensive reproductive and developmental toxicology studies carried out in accordance with internationally accepted protocols have demonstrated that glyphosate is not a developmental or reproductive toxicant and is not an endocrine disruptor (Williams et al. 2000) (USEPA 1993a) (World Health Organization International Program on Chemical Safety 1994)". In Annex 116, CICAD I, p. 52.

mammalian immune response at realistic exposure concentrations.[603]

7.55. The first phase of the CICAD study was extensively discussed in both Colombian and international scientific circles, mainly due to its wide circulation in the academic and scientific arena. Among the various comments on the first CICAD study, a critique was prepared by members of Colombia's National University (Universidad Nacional de Colombia).[604] In the light of those comments, CICAD requested the scientific team responsible for the study to carefully review the arguments put forward by the critique and to clarify the technical questions submitted. The reply of the scientific team begins by explaining that the objections to the study were mainly due to a "misunderstanding, lack of knowledge, or possibly a less critical approach to the subject under discussion than is desirable".[605] The reply notes that the National University team did not include members with any apparent expertise in human health, epidemiology, medicine, public health or ecotoxicology: "clearly some of the comments in the Critique would not have been necessary if the team had included expertise in these critical areas".[606]

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603 Annex 116, CICAD I, p. 52.

604 EM, Vol. III, Annex 152.

605 Annex 130: K. Solomon et al., *A Response to Tomás León Sicard et al.,* CICAD, 2005, p. 1.

606 *Ibid.*, p. 2.

7.56. The reply affirms that the CICAD team members are independent experts and goes on to address and clarify each of the issues set forth in the critique, including the field assessments that were conducted, and the underlying scientific basis for each of the conclusions.

7.57. The second phase of the CICAD study (CICAD II), conducted in 2007, included studies on the potential effects on human health of the use of the glyphosate formulation and Cosmo-Flux for the eradication of coca. These were also peer-reviewed and were published in 2009 in the scientific review *Journal of Toxicology and Environmental Health*.

7.58. One of the studies carried out in the framework of the CICAD process was a cytogenic bio-monitoring study (i.e. analyses of blood, tissue, urine, etc., carried out in order to estimate the genetic effects of exposure to a given external factor, such as a chemical substance, in the body and in the cellular components, particularly chromosomes), conducted by a group of international scientists on people living in five different regions of Colombia that had been exposed to the sprayings or had exposure to glyphosate. It concluded that:

> "Overall, these results suggest that genotoxic damage associated with glyphosate spraying [...] is small and appears to be transient. [...] Evidence indicates that the genotoxic risk potentially associated with exposure to glyphosate in the areas where the herbicide is

> applied for eradication of coca and poppy is of low biological relevance. [...] Glyphosate persists in the environment for only a short time (half-life for biological availability in soil and sediments is hours, and 1-3 d in water; Giesy et al., 2000), is rapidly excreted by animals and other vertebrates [...] and chronic effects, if any, would not be expected."[607]

7.59. Another study looked at possible effects of exposure on human fertility, assessing 2,592 women from 5 different regions. It concluded that "aerial spraying of glyphosate was not consistently associated with delayed time to pregnancy".[608]

7.60. Yet another study involved "a cytogenetic biomonitoring study... carried out in subjects from five Colombian regions, characterized by different exposure to glyphosate formulations and other pesticides".[609] 274 volunteers were involved. The authors conclude that "[o]verall, these results suggest that genotoxic damage associated with glyphosate spraying... is

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[607] Annex 131-I, CICAD II: C. Bolognesi, G. Carrasquilla, S. Volpi, K.R. Solomon, D.C. Cole & E.J.P. Marshall, "Biomonitoring of Genotoxic Risk in Agricultural Workers from Five Colombian Regions: Association to Occupational Exposure to Glyphosate", in *Journal of Toxicology and Environmental Health*, Part A 72:986-997, 2009.

[608] Annex 131-E, CICAD II: L.H. Sanin, G. Carrasquilla, K.R. Solomon, D.C. Cole & E.J.P. Marshall, "Regional Differences in Time to Pregnancy among Fertile Women from Five Colombian Regions with Different Use of Glyphosate", in *Journal of Toxicology and Environmental Health*, Part A 72:949-960, 2009, at p. 959.

[609] Annex 131-I, CICAD II, at p. 986.

small and appears to be transient"[610] and of low biological relevance.[611]

7.61. Likewise, Colombian scientific institutions and authorities have conducted studies on possible effects of the aerial spraying program on human health. In 2001, the *Clínica de Toxicología Uribe Cualla* located in Bogotá (a toxicology clinic), one of the most prestigious national centres of this type, conducted a study to examine the complaints concerning the alleged adverse effects on human health attributed to aerial sprayings. It concluded that the health problems observed in the municipalities under study had prevalence rates similar to those in the years prior to the start of the sprayings, and that the problems were also present in municipalities where no aerial spraying had taken place.[612]

7.62. The study also concluded that the symptoms initially attributed to aerial sprayings originated in multiple sources including non-chemical sources. In particular, it concluded that the symptoms in question could be due to the chronic exposure of the population to the multiple agrochemicals used for

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610 Annex 131-I, CICAD II, p. 994.

611 *Ibid.*, p. 995. See also Annex 132, p. 3: "glyphosate does not pose a risk of heritable (passed from parent to child) or somatic (body cell) mutations in humans."

612 Annex 126: Embassy of the United States of America - Clínica de Toxicología 'Uribe Cualla', *Alleged effects of Glyphosate on Human Health*, Bogotá, December 2001, pp. 52-53.

growing coca, and that those symptoms could also result from other infectious and allergic causes:

> "The illnesses most often attributed by the study's subjects as secondary to glyphosate spraying were: gastrointestinal symptoms (diarrhea, vomit and nausea), skin symptoms (pruritus or itch, erythema or reddening, vesicles or blisters, soreness and sores), eye symptoms (soreness, reddening, pink eye, pain and pruritus), respiratory symptoms (dyspnea or fatigue, cough and croup or rhinorrhea), cephalea (headache and fever). These symptoms may originate due to multiple causes, as well as to exposure to chemical elements."[613]

7.63. In the same year, the National Narcotics Directorate of Colombia commissioned a set of six studies in relation the toxicity of the mix used in the spraying program.[614] Those studies were carried out by Laboratorio Inmunopharmos Ltda., an immunological and pharmaceutical laboratory located in Bogotá, specializing in biomedical research for the purposes of protecting human and animal health and the environment. The studies, conducted in compliance with good laboratory practices and according to US EPA guidelines, analyzed the mix of 44% Glyphosate/1% Cosmo-Flux/55% water. Results from these studies showed that the effects due to exposure to the spray mix

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[613] Annex 126, p. 54.

[614] The studies conducted by the *Laboratorio Inmunopharmos* (Annex 128) were: Acute oral toxicity LD50 (EPA Guideline 870-1100), Acute dermal toxicity LD50 (EPA Guideline 870-1200), Acute inhalation toxicity LD50 (EPA Guideline 870-1300), Acute eye irritation (EPA Guideline 870-2400), Acute dermal irritation (EPA Guideline 870-2500), Dermal sensitization (EPA Guideline 870-2600).

are slight and not lasting.[615] According to the studies' conclusions, the mix is to be classified as "slightly toxic", like any other agricultural fertilizer or household pesticide.

7.64. The National Health Institute of Colombia, after collecting and analyzing biological and environmental samples related to complaints received about alleged adverse effects on health caused by aerial sprayings as part of the Public Health Program component of the Environmental Management Plan,[616] found that none of the alleged effects on human health in any of the claims submitted bore any relation to the aerial sprayings but were instead due to other causes.[617]

The National Health Institute concluded that:

> "To date, in relation to the complaints on alleged adverse effects of the sprayings on human health, analyses conducted by Colombia's National Health Institute showed no relation between the sprayings and reported symptoms. Instead, complaints received were related to the endemic health conditions of the regions concerned…"[618]

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615 Annex 128.

616 Under the Program, the General System of Social Security in Health is responsible for processing claims relating to alleged adverse health effects. To that end, a procedure has been put in place for determining whether exposure to the spray mix may have caused any harmful symptoms. See Annex 68, pp. 3-4.

617 Annex 68, p. 4.

618 *Ibid.*, and see Annex 69: Report on Complaints submitted to the Colombian National Health Institute with regard to the Program for the Eradication of Illicit Crops with Glyphosate Herbicide – PECIG, 2010.

7.65. In support of its arguments as to the alleged effects of the spraying, Ecuador refers to the results of an investigation carried out by the Putumayo Department of Health between 22 December 2000 and 2 February 2001 ("the DASALUD Report").[619] While the DASALUD Report notes that some of the local hospitals reported an increase in the number of complaints for conditions which were attributed by the patients to aerial spraying, it does not refer to any medical findings whatsoever supporting the allegation that those symptoms were in fact caused by the spraying.

7.66. To the contrary, a passage in the report (which, significantly, was not included by Ecuador in the translation provided in Annexes to its Memorial) casts doubt on the actual causes of the symptoms complained of by the individuals:

> "In the emergency clinical cases for the month of December 2000 it may be noted that, *out of 6 cases examined*, 50% attribute their symptoms to the fumigation, while of the remaining 50%, 2 result from alcoholic intoxication, and one case from intoxication due to direct manipulation of chemicals in other circumstances."[620]

That is, in circumstances unrelated to the aerial spraying.

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619 EM, Vol. II, Annex 90.

620 Ibid., p. 13 (emphasis added, free translation by Colombia). The Spanish original reads as follows : "En las historias clínicas de atención de urgencias del mes de diciembre del 2000 se puede constatar que de 6 casos que consultaron, el 50% atribuye su sintomatología a la fumigación, mientras que del 50% restante 2 corresponden a intoxicación alcohólica y un caso a intoxicación por manipulación directa de químicos en otras circunstancias."

7.67. In the light of that statement, it is open to serious question how many of the other cases reported in the DASALUD Report were in fact caused by the aerial sprayings. Furthermore, direct manipulation of chemicals -including those used for coca cultivation and processing- is quite different from exposure to spray mix used in aerial eradication. In the absence of any medical evaluation of the illnesses allegedly suffered by the individuals in question, in light of the dates and times of the fumigations, there is no way of establishing that the health problems mentioned in the Report were indeed caused by or were even related to the sprayings.

7.68. The scientific evidence presented above rebuts the arguments of the Menzie Report, on which Ecuador heavily relies. The Report claims that the reported adverse health effects "are consistent" with the "known risks"[621] and "recognised properties"[622] of the surfactants "believed to be used in the spray mixture."[623] These assertions are made merely on the basis of a review of scientific literature and without conducting any toxicological analysis of the spray mixture, still less any actual field work.

7.69. As the scientific evidence shows, cases of accidental exposure to glyphosate would entail minimal risks to human

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621 EM, para. 6.44. EM Vol. III, Annex 158, Section 5.
622 EM, para. 6.46. EM Vol. III, Annex 158, Section 5.1.1.1,
623 EM, para. 6.47. EM Vol. III, Annex 158, Section 5.1.1.1.

health, generating "primarily eye and skin irritation" symptoms that are not long lasting.[624] In fact, glyphosate is rapidly eliminated via urine and feces. Thus, "in one metabolism study with rats, most of the glyphosate administered (97.5 percent) was excreted in urine and feces as the parent compound; less than one percent of the absorbed dose remained in tissues and organs, primarily in bone tissue".[625]

7.70. Moreover, contrary to what the Menzie Report asserts,[626] glyphosate is a non-volatile substance and no question of intoxication due to inhalation of the spray mix arises, since its permanence in the air is minimal. As the EPA states "the acute inhalation toxicity study was waived because glyphosate is non-volatile and because adequate inhalation studies with end-use products exist showing low toxicity".[627]

7.71. The overwhelming weight of scientific evidence supports Colombia's assertions to the effect that the spray mix used in the PECIG program has negligible effects on human health. This conclusion is not new: it reflects the general scientific opinion as of 2000. CICAD II notes that by 2000,

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624 EM, Vol. II, Annex 132, p. 4. EM, paras. 5.36, 6.46, 6.47, 6.48.
625 EM, Vol. II, Annex 132, p. 3.
626 EM, para 6.49.
627 EM, Vol. II, Annex 132, p. 2.

glyphosate and its formulations had already been extensively investigated for potential adverse effects in humans.[628]

(2) ALLEGED EFFECTS ON FAUNA

7.72. Similar conclusions have been drawn as to the effect of the spray mixture on fauna.

7.73. In 1994, the International Programme on Chemical Safety (IPCS) study found that in experimental animals, "technical glyphosate has very low acute [short-term] toxicity by the oral and dermal administration routes… Long-term toxicity was also studied in mice and rats. Few effects were observed and, in almost all cases, at relatively high dose levels only." The available studies did not indicate that technical glyphosate is carcinogenic or capable of causing genetic mutations or alterations to embryos or foetuses.[629]

7.74. Similarly, in 2000, the FAO concluded that:

> "on the basis of toxicity data and application rates for the active substance glyphosate, the risks for birds, mammals, aquatic organisms, bees, earthworms and micro-organisms in soil in

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[628] Annex 131-A, CICAD II, p. 918, citing G.M. Williams et al., "Safety evaluation and risk assessment of the herbicide Roundup® and its active ingredient, glyphosate, for humans" in *Regulatory Toxicology and Pharmacology,* 31:117–165, 2000, pp. 117, 160 (Annex 125).

[629] Annex 96, pp. 5, 6. Also: "EPA would not expect any risk to birds and mammals, including livestock, based on dietary exposure to the active ingredient glyphosate." In Annex 142, p. 5 (partially at EM, Vol. III, Annex 143).

> observance of corresponding risk management measures are regarded as slight."[630]

The FAO study also found that glyphosate and its metabolite AMPA are not carcinogenic, do not produce genetic mutations or alterations to embryos or foetuses, and do not impair reproduction.[631]

7.75. In 2005, CICAD I stated that "for the environment, risks from the use of glyphosate and Cosmo-Flux® to terrestrial animals were judged to be small to negligible".[632] It added that "the addition of the Cosmo-Flux® to the glyphosate did not change its toxicological properties to mammals."[633] Even the effects of direct overspray on farm animals would be minor (temporary eye and skin irritation).[634]

7.76. However, it had been suggested in the literature that amphibians (especially tadpoles) were more sensitive. It should be recalled that amphibians are deemed as organisms that attest to the toxicity, if any, of a given substance. They are suited for this role, given their sensitiveness to alterations in their surroundings and their high reproductive rate. It is scientifically accepted that toxicity studies conducted on minor species[635] may

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630 Annex 101, p. 26.
631 *Ibid.*, p. 24
632 Annex 116, CICAD I, p. 11.
633 *Ibid.*, p. 85.
634 Annex 116, CICAD I, pp. 41-70.
635 Minor species often used include, among others, earthworms, toads, adult frogs, juvenile frogs, amphibian larvae, bees, rabbits, mice and rats.

be used for extrapolating their findings to other species and humans. Hence, the particular issue of amphibians was the subject of four of the studies in CICAD II:

- Lynch & Arroyo examined which Colombian frog species might be most at risk as endemic to coca-producing areas.[636] They stress the damage done to frog habitats by clearing forest areas for planting: "cultivation of coca is likely to reduce the resident frog fauna by approximately 90%... prior to consideration of any effects of glyphosate spraying upon the amphibian fauna".[637]

- Brain & Solomon (2009) compared "hazard quotients" for amphibians of the spray mixture compared with major chemicals used for coca production. The latter "were up to 10- to 100-fold more toxic to frogs that the Glyphos–Cosmo-Flux mixture".[638]

- Bernal, Solomon & Carrasquilla (2009) investigated whether the spray mixture was more lethal to Colombian frogs than to the temperate region frogs on which most scientific testing had focused, and concluded that the answer was

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636 Annex 131-H, CICAD II.
637 *Ibid.*, p. 975.
638 Annex 131-D, CICAD II, Brain et al. (2009), at p. 937.

negative.[639] Glyphosate itself was "essentially nontoxic to amphibians", and the addition of Cosmo-Flux did not change that conclusion. The surfactant was the source of mild toxicity: "overall 95% of larval frogs would have LC50s greater than" that caused by the concentration used in the aerial spraying program.[640]

- In a companion study, the same authors investigated the impact of the spray mixture on Colombian frogs under field conditions.[641] They concluded that "under realistic worst-case exposure conditions, the mixture of Glyphos and Cosmo-Flux as used for control of coca in Colombia exerts a low toxicity to aquatic and terrestrial stages of anurans and that risks to these organisms under field conditions are small".[642]

7.77. CICAD II concluded that:

> "...when considering the cumulative impacts and risks of coca production collectively in a

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639 Annex 131-F, CICAD II: M.H. Bernal, K.R. Solomon & G. Carrasquilla, "Toxicity of Formulated Glyphosate (Glyphos) and Cosmo-Flux to Larval Colombian Frogs 1. Laboratory Acute Toxicity", in *Journal of Toxicology and Environmental Health*, Part A 72:961-965, 2009 at p. 937.

640 *Ibid.*, p. 964.

641 Annex 131-G, CICAD II: M.H. Bernal, K.R. Solomon & G. Carrasquilla, "Toxicity of Formulated Glyphosate (Glyphos) and Cosmo-Flux to Larval and Juvenile Colombian Frogs 2. Field and Laboratory Microcosm Acute Toxicity", in *Journal of Toxicology and Environmental Health*, Part A 72:966-973, 2009.

642 *Ibid.*, p. 966.

> multifactorial context to amphibian populations in coca growing regions, they are judged to be greater than those posed by the use of glyphosate and Cosmo-Flux employed for the spray control program."[643]

7.78. The matter is considered in detail by Dobson, in light of CICAD II's conclusions. His own view is that to protect 99% of species of tadpoles in even shallower water depths would require an increase in the necessary protective swath to 50 metres: he reached "the overall conclusion that effects as far away as Ecuador are highly improbable".[644]

7.79. The Ecuadorian Memorial again relies on unfounded arguments in the Menzie Report[645] in an attempt to show alleged damages to fauna of aerial spraying. For instance, the Report refers to adverse effects caused by direct ingestion of glyphosate products in large quantities,[646] a situation that does not occur with aerial spraying where the amount susceptible of being deposited on the ground, even in the context of direct overspray (and *a fortiori* of drift), is low. Moreover, due to the swift

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643 Annex 131-D, CICAD II, Brain et al. (2009), pp. 945-946.

644 Appendix: Dr Stuart Dobson, Critique of "Evaluation of chemicals used in Colombia's aerial spraying Program, and hazards presented to people, plants, animals and the environment in Ecuador" Menzie et al. (2009) Annex 158, (hereafter referred to as "Appendix – Dobson Report") p. 21.

645 EM, para 5.58.

646 These assertions are based on reports of poison control centres due to voluntary or accidental ingestion of concentrated glyphosate. The Menzie Report, p. 19, acknowledges that for such symptoms to occur, an individual would have to ingest significant quantities of glyphosate. These are simply impossible to ingest taking into account the actual amount of glyphosate released per hectare in the course of aerial spraying. See para. 7.80 below.

degradation and non-persistence of the ingredients of the spray mix in the environment, there is no question of the ingestion through drinking water or foodstuffs, since according to EPA "the chronic dietary risk posed by glyphosate food uses is minimal"[647] and "in animals, most glyphosate is eliminated in urine and feces".[648]

7.80. Although alleged effects on human health were discussed in the previous section, it is relevant to make the following precisions at this point: taking into account glyphosate's Lethal Dose 50 (LD 50)[649] – 5,000 milligram per kilogram of bodyweight of the individual)[650] – a person would need to directly swallow more than 625cc of glyphosate-based commercial formulated product (i.e., over half a litre or two cans of soda) or 1.4 litres of the spray mix, in order to ingest the LD 50 estimated for an individual weighing 60 kg, and that is assuming the body absorbed 100% of the glyphosate commercial formulation present in the spray mix. However, neither the glyphosate-based commercial formulated product nor the spray mix used in Colombia can be absorbed 100% by the human body. In fact, studies show that only 30-36% of ingested

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647 EM, Vol. III, Annex 132, p. 3.

648 Ibid.

649 Lethal Dose 50 is the "statistical estimate of the minimum dose required to kill fifty percent of a population of laboratory test animals in controlled conditions." Annex 135, Annex 1, Glossary, "Mean Lethal Dose, LD 50". See also, para. 7.76 and note 634 above.

650 Annex 96, p. 29.

glyphosate is absorbed.[651] This means that only *direct ingestion* of *at least* 1.74 litres of the glyphosate commercial formulation *as is* or 3.95 litres of the spray mix *as is* by an individual weighing 60 kg could –in theory- possibly result in death. This is clearly not possible in the framework of Colombia's spraying program since, as recalled above, the amounts released in the PECIG program are 23.65 l/ha of spray mix containing 10.4 l/ha of glyphosate-based formulated product. Therefore, a 60-kg individual would have to ingest, in one go, all of the glyphosate sprayed over 1,673 square meters directly under the spray swath to achieve this dose.

7.81. It is relevant to recall that Colombia's spraying program does not target food crops or pastures. Where coca crops are sprayed and part of the spray were to fall on pastures, the mixture amount would not cause significant effects on livestock, since a very significant amount of herbicide deposited per hectare would be required to affect grazing animals to any degree. According to Dr Dobson:

> "It is difficult to take this section of the Menzie et al. (2009) paper seriously. It is the perfect example of the dangers of expressing hazard (the possibility) without reference to exposure and risk (the probability) of something adverse occurring."[652]

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651 M. Burger et al, "Exposición al herbicida glifosato: aspectos clínicos toxicológicos", *Rev Med Uruguay;* 20: 202- 207, p. 203. Available at: http://www.scribd.com/doc/2628324/Glifosato (last visited 10 March 2010)

652 Appendix – Dobson Report, para. 92.

7.82. The Menzie Report findings of many reported fish kills[653] are unsubstantiated: according to the literature "glyphosate [has] exhibited little chronic toxicity to fish".[654] In any event, it should be recalled that 100-metre no-spray buffer zones along watercourses or around water bodies are observed in the PECIG program. Also, results of tests on over 80 water samples collected in the framework of the PECIG program's Environmental Management Plan have shown no presence of glyphosate or its metabolite AMPA.[655]

7.83. Thus, as was clear from the scientific evidence from the outset, the evidence derived from spraying operations at various locations throughout Colombia over several years evidences that the glyphosate-Cosmo-Flux mix does not produce significant effects on fauna.

(3) ALLEGED EFFECTS ON SOIL AND IMPACTS ON NON-TARGET CROPS

7.84. According to numerous scientific studies carried out at both the national[656] and international levels, glyphosate has no

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653 EM, para. 6.104.

654 Annex 124: J.P. Giesy, S. Dobson S & K.R. Solomon, "Ecotoxicological risk assessment for Roundup herbicide", *Reviews of Environmental Contamination and Toxicology* 167: 35-120 (2000), p. 74.

655 Annex 149, p. 2.

656 Analyses of soil samples, collected mainly in the Colombian provinces corresponding to the Amazon and Andean regions, between 2003 and 2008, were conducted in the framework of the EMP. The analyses show that the likelihood of glyphosate having a negative or positive incidence on

long-term effects on soil, as it does not persist in soil. In a recent field study, the United States Department of Agriculture found that:

> "[I]n two years of field evaluation no significant effects of glyphosate were detected on soil or root microbial communities after two in-season glyphosate applications. Exposure of soils to glyphosate in a laboratory experiment resulted in small, short-term changes in the microbial community and a brief inhibition of microbial activity."[657]

7.85. Due to these characteristics, the International Program on Chemical Safety recommended that "the major formulation Roundup may, for instance, be used in pre-plant treatments for seed bed preparations..."[658] In fact, the sprayed fields are quickly colonized by invading vegetation.[659] In soils treated with glyphosate, any vegetable species can be replanted immediately following application and the plants will develop

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highly acidic soils, such as those in the Amazon region from where most of the samples were taken, is minimal. Samples of results of soil analyses, Appendices 2 and 3, to the Environment Ministry Report, Annex 70.

[657] United States Department of Agriculture (USDA), Agricultural Research Service, *Maintaining soil resources for effective conservation and herbicide management in mid-south crop production*, 2007. Available at: http://www.reeis.usda.gov/web/crisprojectpages/410786.html (last visited 10 March 2010). Also: "Glyphosate has no residual activity, once adsorbed to soil it quickly becomes unavailable to plants and no longer has herbicidal activity… In contrast, some herbicides have month-long or even year-long residual activity which limits the plants that may be grown following their use." In Annex 142, p. 9 (excerpt included at p. 5 in EM, Vol. III, Annex 143).

[658] Annex 96, p. 12.

[659] Annex 116, CICAD I, pp. 48-49.

normally.[660] No decrease in productivity of crops planted following application occurs.[661]

7.86. In the physiochemical analyses conducted on almost 180 soil samples from sprayed plots in Colombia, no adverse effects caused by glyphosate have been evidenced in any of the physical, chemical or biological characteristics assessed.[662]

7.87. It is true that glyphosate is a non-selective herbicide: if it falls on non-targeted plants outside the scope of the eradication program, they may, depending on the dose, also be affected. In order to prevent this situation, all reasonable measures are adopted when spraying as part of the PEGIC program.[663] Moreover, the Colombian Government has also implemented a program to compensate for proven incidental damage to lawful crops.[664]

7.88. Glyphosate and AMPA residues found in soil samples do not necessarily result from aerial spraying, but may rather be

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660 United States Department of Agriculture, *"Effects of glyphosate on soil microbial communities and its mineralization in a Mississippi soil",* published in the peer-reviewed journal *Pest Management Science*, in 2007, Abstract. Available at: http://www.ars.usda.gov/SP2UserFiles/Place/64022000/Publications/Weaver/Weaveretal07PMS63.pdf (last visited 10 March 2010)

661 Contrary to Ecuador's assertions in, e.g., EM, paras. 5.54-5.55.

662 Annex 70, Environment Ministry Report and Appendices 2-3 (soil sample analyses). See also, Annex 149, p. 2.

663 See above, para. 7.174.

664 See above, para. 4.22 for Colombia's Complaints Attention Program.

due to the chemical treatments used by the growers of the illicit crops themselves. Some results even reported traces of glyphosate and AMPA prior to spraying in areas that had never been sprayed before as part of the PECIG program, evidencing the use of this very herbicide in coca cultivation for the purpose of weed control.

(4) ALLEGED EFFECTS ON WATER RESOURCES

7.89. In the context of the PECIG program in Colombia, bodies of water and watercourses are designated as exclusion zones: a 100-meter no-spray strip is left around them. Water resources in the areas subject to the spraying program are not targeted.

7.90. But even in case of accidental overspray, as the Guidelines on drinking-water quality first published by the WHO in 1998 note: "[t]he low mobility of glyphosate in soil indicates a minimal potential for the contamination of ground water". Moreover, glyphosate is chemically stable in water and is not subject to photochemical degradation. While the WHO also remarks that glyphosate "can enter surface and subsurface waters after direct use near aquatic environments or by runoff or leaching from terrestrial application", it concludes that "because of the low toxicity of glyphosate, the health-based value derived for this herbicide is orders of magnitude higher than the concentrations normally found in drinking-water. Under usual

conditions, therefore, the presence of glyphosate in drinking-water does not represent a hazard to human health, and the establishment of a numerical guideline value for glyphosate is not deemed necessary".[665] These results were confirmed in the recent update of the Guidelines.[666]

7.91. Colombia's National Health Institute (*Instituto Nacional de Salud*) conducted studies in Putumayo in 2007 of cases of human consumption of water alleged to be contaminated with glyphosate. It was concluded that the symptoms reported and supposedly attributable to sprayings were in fact due to the water being contaminated with bacteria.[667] In certain cases, the reported symptoms have been associated with other highly toxic pesticides used in the growth and processing of coca.

7.92. According to analyses carried out for the purpose of assessing glyphosate and AMPA concentrations on surface waters (CICAD I), in every location and on nearly all occasions, glyphosate and AMPA residues were below the detection level

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[665] Annex 98: World Health Organization Geneva, "Guidelines for Drinking-Water Quality", 2nd ed., Addendum to Volume 1, Recommendations, 1998, p. 21.

[666] World Health Organization Geneva, Guidelines for Drinking-Water Quality (3rd ed., incorporating the first and second addenda, Volume 1, Recommendations, 2008) p. 379. Available at: http://www.who.int/water_sanitation_health/dwq/fulltext.pdf (last visited 10 March 2010).

[667] Annex 64: "Investigation Regarding Possible Secondary Effects on Human Health, Allegedly Derived from Glyphosate Spraying in the Rural Area of Villanueva of the Orito Municipality, Putumayo on 6 August 2007", Final Report, National Health Institute of Colombia, June 2008, pp. 14-15 (Conclusions).

of the analytical method used.[668] That data suggests that "little or no contamination of surface waters with glyphosate at significant concentrations has resulted from the use of glyphosate in either agricultural or eradication spraying in Colombia".[669]

7.93. Despite the absence of evidence of harm, there is continued monitoring to verify that the PECIG program is not causing adverse effects on the environment in general and water resources in particular.[670] Attached to the Report of the Ministry for the Environment is an example of a twice-yearly Verification Report covering the period September 2008-February 2009.[671] It concluded that:

> "- Achieved Field Efficacy was 92,2% and 96,4% for Swath [Efficacy], which indicates that 38.084 hectares of coca crops were effectively controlled. The figures were above the 7-year historical average of 89% and it has been the highest efficacy ever achieved in the course of the program for the eradication of illicit crops.
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> - The accuracy index represented as Off-Target was 2,2%, an acceptable range within the parameters set out in the Environmental Management Plan.

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668 This limit is equal to 25 µg/lt.

669 Annex 116, CICAD I, pp. 45-46.

670 Annex 50, Record 5, Num 3.2. See also Annex 66, p. 3; Annex 67, p. 14; Annex 70, pp. 4-5, 7.

671 19th Verification Mission Concerning the Spraying Operations Conducted Between September 2008 and February 2009, Technical Report (July 2009), Appendix 1 to the Environment Ministry Report, Annex 70.

> - Not a single spray line was found to be over a [vegetation] cover other than illicit coca crops. 100% were over plantations targeted for control (Coca)."[672]

Soil and water samples taken at the time are also appended; their results were negative for glyphosate and AMPA.[673]

(5) ALLEGED EFFECTS ON AIR QUALITY

7.94. Although the Ecuadorian Memorial does not actually refer to air pollution as being caused by aerial spraying operations, some of the anonymous witness statements submitted by Ecuador do mention it. Such assertions have no scientific basis since, as confirmed by the United States' Environmental Protection Agency, the low vapour pressure of the chemical compound renders it "non-volatile".[674]

(6) ECUADOR'S SCIENTIFIC EVIDENCE: THE MENZIE REPORT

7.95. In addition to selective citations from a limited number of published sources, Ecuador produces one additional item, the Menzie Report. The Exponent team that prepared this Report consisted of 10 professionals, of whom only one visited the border zone in Ecuador. That person made field observations and collected testimonies, without taking any samples or conducting actual field tests. Furthermore, according to the

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672 Appendix 1 to the Environment Ministry Report, Annex 70, p. 15.

673 See Appendices 2-5 to the Environment Ministry Report, Annex 70.

674 EM, Vol. III, Annex 132.

information provided in the Report, none of the team members has a background or experience in meteorology, physics or the aerial application of pesticides.[675]

7.96. These shortcomings are reflected in the language used in the Report itself. Its formulations used are highly speculative. The word "may" is used 67 times; the word "likely" 19 times. Expressions such as "We believe it is likely that these conditions would result in..." or "…although we have no confirmation, it is entirely possible that…" abound. The word "consistent", used to try to establish a causal relation between alleged effects and aerial spraying, is to be found 21 times.

7.97. The Report does refer to literature that is relevant on certain topics, but either the studies themselves or their conclusions are presented out of context. For instance, with regard to the effects on human health, some of the studies quoted refer to symptoms attributable to dermal exposure, but the Report does not differentiate the circumstances analyzed. One study involved tests on volunteers who agreed to have concentrated glyphosate, among other substances, applied to their skin.[676] In fact, the study found that the herbicide was "less irritant" than dishwashing detergent, general all purpose

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675 EM, Vol III, Annex 158, Section 1.

676 H.I. Maibach, "Irritation, sensitization, photoirritation and photosensitization assays with a glyphosate herbicide", *Contact Dermatitis,* Vol. 15, 1986, pp. 152-156. (Document deposited with the Registry of the Court)

cleaner and even baby shampoo, a conclusion disregarded in the Report. Another study cited by Menzie[677] referred to an episode of multiple complaints reporting alleged adverse effects of glyphosate spray in California. The case involved the accidental exposure of a small number of actual applicators to the concentrated formulation or to the spray solution (i.e. it was a case of occupational exposure, not of incidental exposure in the field). The symptoms were very mild and, in any case, the main conclusion was that large numbers of reports of adverse effects cannot be construed to indicate the likelihood or severity of any widespread problem of exposure to glyphosate.[678]

7.98. Although the adverse effects of the chemicals used in coca cultivation and processing on the environment are well known, the Menzie Report completely omits any mention of them, exhibiting a lack of balance. An assessment that fails to factor in those elements as well as other variables present in the area – e.g., felling of the natural forest,[679] inadequate agricultural practices – is lacking in scientific rigor.

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[677] D.A. Goldstein, J.F. Acquavella & R.M. Farmer, "An analysis of glyphosate data from the California Environmental Protection Agency Pesticide Illness Surveillance Program", Journal of Toxicology *Clinical Toxicology,* Vol. 40, 2002, pp. 885-892. (Document deposited with the Registry of the Court)

[678] D.A. Goldstein, J.F. Acquavella & R.M. Farmer, "An analysis of glyphosate data from the California Environmental Protection Agency Pesticide Illness Surveillance Program", Journal of Toxicology *Clinical Toxicology,* Vol. 40, 2002, pp. 885-892. (Document deposited with the Registry of the Court)

[679] It should be recalled that the area has endured the felling of the natural forest for different purposes, including wood-exploitation activities

7.99. The Menzie Report states that "the exact mixture used by GOC [Government of Colombia] is unknown —it has been kept confidential".[680] However, in the same paragraph it refers to a document from the Department of State ("U.S. Department of State. 2002a") entitled "Report on issues related to the aerial eradication of illicit coca in Colombia: Chemicals used for the aerial eradication of illicit coca in Colombia and conditions of application". This document, which is Annex 144 to the Memorial of Ecuador, starts by defining the spray mixture in a precise and accurate way:

> "The aerial spray mixture currently used in the U.S.-supported program of aerial eradication of coca in Colombia contains three components: water, an EPA-registered formulation of the herbicide glyphosate, and a surfactant (Cosmo-Flux 411F)… These components are mixed together into a spray mixture in the following percentages: 55 percent water, 44 percent glyphosate formulation, and 1 percent Cosmo-Flux 411F..."

7.100. In addition to its conjectures concerning the components of the spray mix used in Colombia, the Memorial relies on the Menzie Report in support of its assertion that surfactants in general – and those it speculates may be part of the Colombian spray mix – increase the mix's toxicity, posing greater risks to

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and slash-and-burn practices associated with the establishment of coca as well as lawful crops.

680 EM Vol. III, Annex 158, Section 3.

plants, humans and animals.[681] In this regard, research and studies carried out by Collins & Helling (2002) were cited by the Menzie Report in support of the conclusion that the addition of an adjuvant represents a fourfold increase in the mixture's toxicity. In fact, what Collins & Helling found was that two of the tested surfactants "increased glyphosate phytotoxicity fourfold", i.e., its effect on plants. "Phytotoxicity" refers to growth inhibitors or a substance's effects on plants, and is quite different to the notion of "toxicity", that is the degree to which a substance can harm non-target species, i.e. humans or animals.[682]

7.101. With regard to spray drift, the Ecuadorian Memorial relies heavily on the assertions of the Menzie Report[683] in its discussion of topics such as spray operation parameters, off-target release of spray, ground-based hostilities and localized weather conditions. However, as with the rest of the Report, the relevant section is essentially theoretical, divorced from any consideration of the conditions of the border area or actual

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681 EM, para. 5.18.

682 "Phytotoxicity" in *The American* Heritage® *Science Dictionary*. Source location: Houghton Mifflin Company. Available at: http://dictionary.reference.com/browse/phytotoxicity (last visited 10 March 2010). For further explanations of "phytotoxicity" see: http://www.agf.gov.bc.ca/pesticides/e_10.htm (last visited 10 March 2010). "Toxicity" in the United States' Environmental Protection Agency, *Terms of Environment: Glossary, Abbreviations and Acronyms*. Available at: http://www.epa.gov/OCEPAterms/tterms.html (last visited 10 March 2010).

683 EM, paras. 5.83, 5.86, 5.87-5.90, 5.93-5.95, 5.97. The section of the Menzie Report referred to is at EM, Vol. III, Annex 158, Section 4.

exposures. It is also laden with unfounded or misguided assumptions.[684]

(7) AN EXPERT EVALUATION OF THE MENZIE REPORT

7.102. Reference has already been made to the evaluation of the Menzie Report by Dr Stuart Dobson.[685] He comments on the "major deficiencies in methodology" of the Menzie Report as follows:

> "13. The Menzie et al. (2009) report describes itself as a hazard assessment. However, it seldom mentions dose response. Much of the report emphasises the severity of the hazard (the possible) without considering whether or not the effects are probable. It is, therefore, largely hazard identification rather than hazard assessment. No attempt is made by the Menzie et al. report to assess risk.
>
> 14. Consideration of hazard in isolation from exposure and risk will give a misleading picture of the real effects of the chemical on either human health or organisms in the environment."

7.103. Dr Dobson goes on to review the Report and the sources on which it relies, disagreeing with most of its conclusions and qualifying the remainder. This is done as follows:

- spray drift (paras. 22-25);
- effects on human health (paras. 26-32);

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684 See above, para.4.70.

685 See above, para. 1.44.

- effects on organisms and ecosystems (paras. 33-35);
- effects on amphibians (paras. 36-80);
- effects on plants and soils (paras. 81-91);
- domestic animals (paras. 92-98);
- fish (paras. 99-100);
- insects and mites (paras. 101-108).

7.104. His specific conclusions have mostly been referred to under the relevant heads. His general conclusion is as follows:

> "127. No environmental effects or effects on crop plants would be seen more than 50 metres downwind of the spray swath even taking a highly precautionary approach. There should, therefore, be no adverse ecological effects in Ecuador."[686]

(8) CONCLUSION FROM THE SCIENTIFIC EVIDENCE

7.105. It may be concluded that the scientific evidence lends no support to Ecuador's case. It should be recalled that this case was avowedly brought because Ecuador had suffered a range of injuries "that have undone the very fabric of life in the border region".[687] The fabric of life may well be under threat in the region but this is because of its poverty, remoteness,

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686 Appendix – Dobson Report.

687 EM, para. 6.6, and See above, para. 1.26 for other comparable Ecuadorian assertions.

governmental neglect and the presence of the FARC guerrillas. It has nothing to do with the impacts of aerial spraying.

D. The Categories of Injury Alleged by Ecuador

7.106. Against this background it is proposed to consider in greater detail the evidence adduced by Ecuador of injury, under the various categories.

(1) ALLEGED INJURIES TO INDIVIDUAL LIFE AND HEALTH

7.107. Ecuador contends that the spray mix used in Colombia's aerial fumigations program causes serious damage to human health. Ecuador's contentions are unsubstantiated and are contradicted by scientific studies and by the contemporaneous documentary evidence.

(a) Ecuador's "independent reports" of harm

7.108. The "independent reports" cited by Ecuador as substantiating its claims of harm to the health of Ecuadorian nationals are the following:

(1) Visits to the area conducted by two Ecuadorian NGOs in early 2001 and in September 2002 and by a consortium of Ecuadorian and Colombian NGOs in July 2001;[688]

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[688] EM, Vol. IV, Annex 162. See also, paras. 7.144-7.146 below.

(2) An investigation conducted by the Ecuadorian Government in July 2003, the findings of which were essentially based on oral testimonies;[689]

(3) An investigation conducted by an Ecuadorian Congressman in late 2003;[690]

(4) A declaration of an Ecuadorian doctor, prepared on behalf of Ecuador for these proceedings;[691]

(5) The April 2007 report of the Ecuadorian Scientific Commission;[692]

(6) An addendum to the Report of the U.N. Special Rapporteur on the Rights of Indigenous People, dated 28 December 2006;[693]

(7) A preliminary note dated 4 March 2007 by the U.N. Special Rapporteur on the Right to Health;[694]

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[689] EM, Vol. IV, Annex 166 (per List of Annexes in Vol. I and Annex cover in Vol. IV, although actual pages of Annex appear mislabelled as Annex 165). In detailing the results of the analyses carried out following the Verification Mission, particularly with regard to effects on agriculture, the document concludes at p. 9: "*In light of the absence of a laboratory result that confirms or discards whether agricultural damages are caused by the sprayings* within the so-called Plan Colombia, is worth noting that the *indicia reported* by peasants are *credible enough to deduce* that with regard to agriculture, sprayings are noxious to agricultural crops". Moreover, it states: "*According to the account of a Colombian peasant* who has received the spraying directly, interviewed during the inspection, *it is further deduced* that the pathological symptoms of the crops are *similar to those reported* by the peasants on the Ecuadorian side." (Emphasis added)

[690] EM, Vol. IV, Annex 166.

[691] EM, Vol. IV, Annex 188.

[692] EM, Vol. III, Annex 157.

[693] EM, Vol. II, Annex 30.

(8) A report attributed to the United Nations High Committee for Refugees ("UNCHR") of February 2007;[695]

(9) A report of the U.N. Special Rapporteur on the adverse effects of the illicit movement and dumping of dangerous products and wastes, dated 5 May 2007.[696]

7.109. Taking these documents in turn, the accounts by official Ecuadorian sources cannot be held out as being "independent" and their probative weight and import must be assessed accordingly. Moreover, most of these accounts pre-date the analyses carried out by the Ecuadorian delegation in 2004 and 2005 and they are contradicted by that contemporaneous evidence.

7.110. The Report by Congressman López Moreno is essentially based on oral testimonies, and is as inaccurate as other documents with equivalent provenance. It refers generically to "the deaths of family members due to the impact of the sprayings" without giving any details whatever. Other items attributed to the aerial spraying include "congenital deformities (though it has not been established which ones)" and "death of animals due to ingestion of contaminated water and

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694 EM, Vol. II, Annex 31.
695 EM, Vol. II, Annex 29.
696 EM, Vol. II, Annex 32; EM, para. 5.13.

grass". The Memorial refers to this as "an official Ecuadorian government investigation",[697] but it is simply a statement by an individual Congressman.

7.111. As to the declaration of Dr Dino Juan Sánchez Quishpe,[698] his recollection concerns the same province, Sucumbíos, and the same time period in 2004 and early 2005 during which the Ecuadorian official delegation conducted interviews with the local population in the border areas allegedly affected by the sprayings. As will be recalled, the Ecuadorian delegation found that "the citizens interviewed in the zone are in good health [and] no alterations were observed in plants or animals".[699] The Ecuadorian delegation also carried out analyses which showed that the water and soil samples collected in the area contained no glyphosate residues.[700] Dr Sánchez' account is inconsistent with the contemporaneous findings of the Ecuadorian delegation. He states as follows, in relevant part:

> "I remember in particular a period in 2004 and early 2005 during which there were many patients complaining of headache, vomiting and skin problems, which coincided with border sprayings. During these periods, patients came to the hospital to consult with me, privately, about

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697 EM, Vol. IV, Annex 167 (per List of Annexes in Vol. I and Annex cover in Vol. IV, although actual pages of Annex appear mislabelled as Annex 166); see EM, para. 6.16.

698 EM, Vol. IV, Annex 188.

699 Annex 85.

700 See above, paras. 5.30-5.32, 5.37.

their severe headaches, vertigo and nausea, some also reported diarrhea and skin problems."[701]

7.112. Ecuador's official accounts and contemporary statements by international organisations paint a different picture. For example:

- Press Bulletin of the Foreign Minister of Ecuador, N° 480 of 26 August 2004: "They [the studies] were carried out by the scientists of CEEA [i.e. the *Comisión Ecuatoriana de Energía Atómica* (Ecuadorian Commission on Atomic Energy)] using, for that purpose, the EPA 547 procedure, high-tech equipment and the analytical standards provided for by the company Riedel de Haën, obtaining as a result the non-existence of glyphosate residues in any of the analyzed samples."[702]

- Press Bulletin of the Foreign Minister of Ecuador, N° 721 of 24 December 2004: "The special Commission appointed by the Minister of Foreign Affairs [...] was able to physically ascertain, on the basis of testimony from the population and local authorities that no spraying whatsoever took place affecting the Ecuadorian territory in that sector [i.e. Sucumbíos]".[703]

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701 EM, Vol. IV, Annex 188.
702 Annex 81.
703 Annex 82.

- Declaration by the representative of the U.N. High Commissioner for Refugees (UNHCR) in Sucumbíos to the Delegation on 23 December 2004, in response to allegations that there were 900 Ecuadorian refugees due to violence on the Colombian side of the boundary: "The UNCHR official remarked that this was the first denunciation he received on the subject and specified that he knew of no sprayings in the sector – including from UNCHR in Colombia – and that, in addition, of the Colombians seeking refuge, only 0,5% affirmed coming to the country for this reason."[704]

- Report of the Ecuadorian Delegation to the Foreign Minister of Ecuador of 24 December 2004, concerning a visit to Lago Agrio: "no violations of the Ecuadorian air space have been reported nor is there any knowledge of sprayings in the Ecuadorian-Colombian boundary during the last weeks. [...] Similarly we were told that the movement of Colombian and Ecuadorian people has been normal."[705] Similar reports were received by the Delegation during their visits to Puerto Nuevo and Puerto Mestanza.[706]

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[704] Reported in Foreign Ministry of Ecuador, Memorandum of 24 December 2004 (Annex 83).

[705] *Ibid.*

[706] *Ibid.*

- Report of the Ecuadorian Delegation to the Foreign Minister of Ecuador of 29 December 2004, referring to the visit and collection of water and soil samples carried out by the joint Commission in the Ecuadorian villages facing the Colombian locations of Azul, el Alfiladero and Monterrey in the Santa Marianita sector:

> "The interviewees stated that the previous week [...] they had sighted between six and eight helicopters and two small aircraft leaving a trail in Colombian territory. They also indicated that they had no incidents to report, were carrying out their activities as usual and that both their animals and their crops were in good condition. [...] In any case, even if it was to be accepted that Colombia had resumed aerial sprayings, the truth is that the observations conducted and the gathered testimony do not afford evidence of any repercussions in Ecuadorian territory. It was of particular utility that important media participated in the mission. They could verify on the ground the reality of the facts and [will be able to] reach, we hope, the same conclusion as this report."[707]

- Press Bulletin of the Foreign Minister of Ecuador, N° 732 of 30 December 2004: "[T]he citizens interviewed in the zone are in good health, no alterations were observed in plants or animals, as

[707] Annex 84.

well as that, according to locals' accounts there has been no violation to the national airspace, nor have any vestiges of glyphosate reached Ecuadorian territory."[708]

- Press Bulletin of the Foreign Ministry, Nº 027 of 24 January 2005: "The result obtained by scientists of the Ecuadorian Atomic Energy Commission, who are also members of the Ecuadorian Scientific and Technical Commission, from the analyses made is that no glyphosate residues were found, the same as on the two previous occasions when similar claims arose."[709]

7.113. Thus the situation on the ground in the Colombia-Ecuador border at relevant times, as recognized by the Ecuadorian authorities themselves, was the following: up until January 2005 no glyphosate residues had been found in any of the soil and water samples analyzed and there had been no officially-recorded damage to human health, flora or fauna due to the aerial sprayings in Ecuador's regions adjacent to the border with Colombia. Colombia informed Ecuador when it resumed the sprayings in December 2006. In spite of this notice, Ecuador was still unable to obtain any water or soil

[708] Annex 85.
[709] Annex 86.

samples resulting in a positive identification of glyphosate residues.

7.114. Ecuador also relies on a report of the Ecuadorian Scientific Commission of 27 April 2007 in support for its assertions that the local populations suffered physical and psychological damage.[710] However, the scientific standing and general reliability of this document are highly questionable. It bases all of its purported findings on erroneous assumptions as to the composition of the mix sprayed by Colombia,[711] and it contains few references to field tests or medical analyses of the individuals allegedly affected.[712] Such findings cannot be held to evidence any alleged impacts of the Colombian spraying program.

7.115. The report's true political motivations can be seen from the statements given to the press on the same day the report was received by the Ecuadorian Minister of Foreign Affairs. According to Press Bulletin N° 510 of the Ecuadorian Foreign

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[710] EM, para. 6.18 and Vol. III, Annex 157.

[711] See e.g., EM, Vol. III, Annex 157, p. 21, where the conclusions are based on the analysis of "a chemical package consisting of *at least* glyphosate, POEA and Cosmo Flux 411 F, *possibly* made hazardous with a microbiological additive (*Fusarium oxysporum*)." (Emphasis added). See also, *ibid.*, pp. 29-31, where unsubstantiated and speculative assertions are made as to the components of the spray mix, and their characteristics or effects.

[712] For instance, *ibid.*, p. 53, to describe what they term as the "exposure pattern", the Report of the Ecuadorian Scientific Commission relies on interviews with only four individuals in Mataje, held on a single day, where reported symptoms were mostly mild, and on other studies (i.e., Maldonado, 2002; Ordoñez, 2002), details of which are not provided.

Ministry, the then Minister of Foreign Affairs, María Fernanda Espinosa, stated: "We have also implemented a legal way, preparing a case that Ecuador will bring against Colombia before the International Tribunal at The Hague... [the Minister] vetted the report, after stating that the government's policy has been supplemented 'by the scientific way'. [...] President Correa reiterates that report is basis for compensations sought by Ecuador for those affected."[713]

7.116. Given its avowed purpose, this report, issued long after Colombia had suspended the aerial sprayings in the 10-km corridor parallel to the border with Ecuador in February 2007, cannot be considered an objective, still less an independent scientific study.[714]

7.117. Ecuador repeatedly relies on the position taken by the then U.N. Special Rapporteur on the Rights of Indigenous People in 2006.[715] Mr Stavenhagen, a distinguished Mexican sociologist, per Ecuador's invitation, visited that country for 10 days in April-May 2006, at a time when aerial spraying within a 10 km band on the Colombian side of the border was suspended. He recounts what he was told but he conducted no independent examination of the position. He does however emphasise the

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[713] Annex 150: Press item: "Ecuador will sue Colombia over sprayings in the border", *Revista Caminos*, 2 July 2007. See also, EM, Vol. III, Annex 182.

[714] Annex 60.

[715] EM, Vol. II, Annex 30, para. 28; the Report is cited at EM, paras. 1.15, 2.3, 2.18, 2.50, 3.61, 5.48, 6.107, 9.23, 9.62, 9.73.

poverty of indigenous communities in the northern border region, the lack of basic services, and the destructive effect of illegal logging.[716]

7.118. With respect to the preliminary note by the U.N. Special Rapporteur on the Right to Health of 4 March 2007, and the report of an "international observer mission" of April 2007, neither of these documents constitutes – and, indeed, neither purports to be – a scientific assessment of the effects of the fumigations. This is expressly recognized by the Special Rapporteur on the Right to Health when he states: "[T]he mission did not take samples or conduct laboratory tests, because it was not a scientific mission." It is also significant that the Special Rapporteur did not take a final stance on the matter but concluded as follows:

> "The Special Rapporteur will carefully consider all information received before taking a final stance regarding the issue of aerial spraying and the right to the highest attainable standard of health and before submitting his report to the Human Rights Council on the issue."[717]

In the event the Special Rapporteur never did submit a concluded report on the issue.[718]

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716 EM, Vol. II, Annex 30, paras. 27, 30, 35.

717 EM, Vol. II, Annex 31, para. 26.

718 According to the website of the Office of the High Commissioner for Human Rights, there has been no further report on this subject by the Special Rapporteurs. Paul Hunt was replaced by Anand Grover as from 1 August 2008 and the latter's reports (A/HRC/11/12 and A/64/272) do not deal with the matter of the sprayings.

7.119. Ecuador's Memorial also refers in passing to the report of what it terms an "international observer mission" which reported damage to human health in the area along the border in early 2007.[719] This document was filed as Annex 29 of Ecuador's Memorial. It is not a reproduction of the original, but a re-typed version of the first two pages of a document, without the cover page or any indication as to its source. This document is listed in Volume II of the Memorial as having been authored by "UNHCR et al." While it is impossible to ascertain the actual provenance of this document, it is clear from its contents that it does not concern an "international observer mission" and that it is not a UNHCR report.

7.120. According to the introductory paragraph of this document (which was not translated by Ecuador), this mission was carried out by the social concerns ministry of the Catholic parish of San Miguel of Sucumbíos and of the diocese of Mocoa-Sibundoy-Putumayo. A footnote indicates that the mission was accompanied by representatives of other organizations, including officials from the UNCHR in Putumayo and Sucumbíos. UNCHR played no substantial role in connection with this mission, and appears to have had no part in drafting of the document. In the circumstances, Ecuador's characterization of this report as an "international observer

[719] EM, para. 6.17, referring to Vol. II, Annex 29.

mission" and as having been co-authored by UNHCR would appear to be both incorrect and misleading.

7.121. In any event, judging from the very short excerpts of the document filed by Ecuador, this report contains no reliable information as to possible damage to human health as the document appears to be only based on hearsay and not on medical examinations or other scientific analysis. References are merely made to anonymous reports of "symptoms very similar to those of the flu" allegedly suffered by Colombian and Ecuadorian children in generic areas at unspecified times, i.e. "a few days after the fumigation passed". Perhaps the vagueness of the terms of this document is explained by the fact that the mission took place at a time – from 29 January to 2 February 2007 – when the sprayings had already been suspended in the relevant areas. The evidentiary weight of this document for the purposes for which Ecuador seeks to rely upon it is nil.

7.122. The Memorial also relies on a report of Okechukwu Ibeanu, the U.N Special Rapporteur on adverse effects on the illicit movement and dumping of dangerous products and waste of 5 May 2007 to support Ecuador's allegation that: "Reports indicate that spray mixture used by Colombia for drug interdiction contain much more glyphosate than is typically used in agricultural applications".[720] However, Ibeanu's report does

[720] EM, para. 5.13, citing EM Vol. II, Annex 32, para. 20.

not refer to the specific mix used by Colombia in its aerial sprayings. The report contains no reference to Colombia and its use of herbicides to destroy drug crops. Ecuador's reliance on this report is misplaced.

7.123. Finally, in its Memorial[721] Ecuador relies on the recommendations made to the National Narcotics Council[722] by the Colombian Office of the Ombudsman following a site visit conducted in Putumayo from 15 to 25 January 2001[723] and on a mission carried out in April 2008 in the same region by a team of Colombian NGOs investigating the human rights situation.[724] Neither of these documents provides any technical or scientific assessment of the health situation in the relevant areas, nor do they provide any valid findings as to the actual effects of the fumigations on human, animal health or the environment. Rather, they recount third-party after-the-fact accounts which at most warn of the alleged risks for human health, fauna and the environment of the sprayed mixture.

(b) Ecuador's witness statements

7.124. Ecuador purports to rely on a series of witness statements from Colombian and Ecuadorian nationals residing in the border area, concerning alleged damages caused by the sprayings.

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721 EM, paras. 5.106-5.107.
722 EM, Vol. II, Annex 92.
723 EM, Vol. II, Annex 91.
724 EM, Vol. IV, Annex 171, and see EM, para. 5.109.

7.125. All the statements of individuals filed by Ecuador are anonymous.[725] Ecuador does not explain how the witnesses were selected among the entire population settled along the border area, or the circumstances in which the statements were rendered, particularly in the case of witnesses supposedly residing in Colombian territory who were selected by Ecuadorian officials to render their statements before official Colombian notaries public.

7.126. A striking feature of those statements is the lack of any medical evidence or other substantiation in support of the allegations of adverse impacts supposedly caused by the aerial sprayings. Moreover the witness statements are studiously vague as to the timing of the sprayings and locations where the sprayings allegedly took place, making it impossible to check the assertions against the documented record of spray missions. Such statements can hardly be verified or falsified – unless, as with members of the Mestanza family, it is possible to show that at relevant times they lived somewhere else and that their affidavits were concocted.[726]

7.127. On several occasions, the Court has expressed reservations as to the evidentiary value of witness testimony of

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[725] See para. 1.38, note 100 above.

[726] See above, para. 1.37.

the kind produced by Ecuador in these proceedings. For instance, in the *Nicaragua v. Honduras* case, the Court said:

> "The Court notes, as to that latter category of evidence, that witness statements produced in the form of affidavits should be treated with caution. In assessing such affidavits the Court must take into account a number of factors. These would include whether they were made by State officials or by private persons not interested in the outcome of the proceedings and whether a particular affidavit attests to the existence of facts or represents only an opinion as regards certain events. The Court notes that in some cases evidence which is contemporaneous with the period concerned may be of special value. Affidavits sworn later by a State official for purposes of litigation as to earlier facts will carry less weight than affidavits sworn at the time when the relevant facts occurred. In other circumstances, where there would have been no reason for private persons to offer testimony earlier, affidavits prepared even for the purposes of litigation will be scrutinized by the Court both to see whether what has been testified to has been influenced by those taking the deposition and for the utility of what is said. Thus, the Court will not find it inappropriate as such to receive affidavits produced for the purposes of a litigation if they attest to personal knowledge of facts by a particular individual. The Court will also take into account a witness's capacity to attest to certain facts, for example, a statement of a competent governmental official with regard to

> the boundary lines may have greater weight than sworn statements of a private person."[727]

In the present case, the witness statements are given by persons interested in the outcome, long after the event, and were prepared for purposes of litigation. Unless independently corroborated, they are entitled to no weight, notably insofar as they purport to express any opinion as to causation.

7.128. Moreover, the witness statements submitted by Ecuador in the present case are not only uncorroborated by any contemporaneous evidence, they are also contradicted by other contemporaneous evidence emanating from Ecuadorian sources. To the extent that a time frame can be identified, the vast majority of the witness statements concern spraying episodes in the years 2000-2002, i.e., prior to the Ecuadorian official reports of June, August and December 2004 and January 2005, announcing that, through field visits and laboratory analyses performed in Ecuadorian territory by that country's own authorities, no effects were evidenced in Ecuador as a result of the aerial spraying in Colombia.[728] This makes it even less likely that the sprayings could have caused the extreme effects of which some of Ecuador's witnesses complain.

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[727] *Case concerning Territorial and Maritime Dispute between Nicaragua and Honduras in the Caribbean Sea (Nicaragua v. Honduras)*, Judgment of 8 October 2007, para. 244.

[728] See above, paras. 5.30-5.32, 5.37.

7.129. The witness statements submitted by Ecuador are also inconsistent with statements and communiqués issued by the Ecuadorian authorities themselves at the relevant time when the complaints arose. Such statements – rendered by representatives of the Ecuadorian Government with respect to the relevant boundary region in Ecuadorian territory – are in direct contradiction with the position adopted by Ecuador in these proceedings.[729] Similar statements have been held by the Court to amount to admissions against the interests of the party that made them. As observed by the Court in *Nicaragua v. United States of America*:

> "The Court takes the view that statements of this kind, emanating from high-ranking official political figures, sometimes indeed of the highest rank, are of particular probative value when they acknowledge facts or conduct unfavorable to the State represented by the person who made them. They may be construed as a form of admission."[730]

7.130. Ecuador's witness statements carry even less probative weight due to the fact that they were prepared in 2009, i.e., years after the alleged facts occurred, and were prepared for the purposes of this case. As noted above, in *Nicaragua v. Honduras* the Court, in examining affidavits rendered by State officials for purposes of litigation, noted that:

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[729] See above, paras. 5.31-5.32, 5.37-5.38, 5.45-5.61, 7.1-7.6, 7.112-7.113.

[730] *Military and Paramilitary Activities in and against Nicaragua (Nicaragua v. United States of America), Judgment, I.C.J. Reports 1986,* p. 41, para. 64

> "Affidavits sworn later by a State official for purposes of litigation as to earlier facts will carry less weight than affidavits sworn at the time when the relevant facts occurred. In other circumstances, where there would have been no reason for private persons to offer testimony earlier, affidavits prepared even for the purposes of litigation will be scrutinized by the Court both to see whether what has been testified to has been influenced by those taking the deposition and for the utility of what is said."[731]

7.131. For these reasons, Ecuador's witness statements should not be accorded any probative value. Moreover, a more detailed analysis of these statements shows that they are riddled with inconsistencies.

7.132. The witnesses residing in Sucumbíos province are Witnesses 2, 3, 5, 9, 20, 22 and 23. Witness 2[732] states that he is domiciled in the city of Nueva Loja, like all other witnesses from this area. He testifies that he lived from agriculture and that he suffered twice on account of the sprayings. The witness provides only an approximate temporal reference for aerial sprayings with respect to the first instance of drifts from sprayings which are said to have occurred "about seven or eight years ago", i.e. in about 2001 or 2002, given that the statement was made on 16 January 2009. No time frame is given for the

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[731] *Territorial and Maritime Dispute between Nicaragua and Honduras in the Caribbean Sea (Nicaragua v. Honduras), I.C.J. Judgment of 8 October 2007,* para. 244.

[732] EM, Vol. IV, Annex 190.

second instance of spraying, which is laconically described as: "when the sprayings returned". The symptoms which the witness testifies he experienced – bumps all over the body, headaches and dizziness – are said to have appeared "a few weeks after the planes came by spraying". In fact the temporary symptoms of exposure to the spray mixture, e.g., eye irritation, appear shortly after exposure, and not "a few weeks after";[733] they disappear within a day or so.

7.133. The account of Witness 2 is vague in the extreme, refers to no specific time-frame and does not attempt to show any direct link of causality between the specific alleged sprayings and the harm allegedly suffered. Furthermore, no medical reports are filed in support of the testimony as to the symptoms allegedly suffered and there is no evidence that medical assistance was ever sought.

7.134. The testimony of Witness 3 is similarly unhelpful.[734] Again, it only provides a vague temporal reference ("seven or eight years ago") for the time when the witness apparently saw planes fly over the San Miguel river and turn around to go back to Colombia, allegedly causing the chemicals to drift onto Ecuadorian territory. The symptoms of which complaint is made – which are likewise said to have appeared two weeks after the sprayings – are also similar. As in the case of Witness

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[733] See e.g., Annex 116, CICAD I, pp. 10-11, 52-53, 76.

[734] EM, para. 6.27; EM, Vol. IV, Annex 191.

2, no medical reports are appended and no mention is made of any medical consultation having been sought at the time or, for that matter, at any time. No attempt is made to substantiate a causal link between the alleged spraying and the harm allegedly suffered.

7.135. Witness 5 alleges in 2009 that 8 years earlier, in 2001 (no further specification is provided) Colombian planes entered Ecuadorian territory over Salinas and that the sprayings caused "an epidemic".[735] He also contends that, since these sprayings, his land "has remained affected and has low productivity". This statement is in direct contradiction with the tests conducted by Ecuadorian authorities upon water and soil samples in the general region, which showed no traces of glyphosate.

7.136. The same criticisms apply to the testimony of Witness 9 who states that "the soil is damaged and no longer produces as before the sprayings". Witness 9 also claims that the local schools were forced to close temporarily due to the fact that a number of children were sick for two weeks due to the sprayings.[736] According to this witness the schools were closed apparently following a decision taken by the teachers, without the intervention or involvement of the medical authorities.

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[735] EM, Vol. IV, Annex 193.

[736] *Ibid.*, Vol. IV, Annex 197.

7.137. Witnesses 20 and 23 recount similar experiences: sprayings allegedly occurred directly over Ecuadorian territory or spray mixture drifted with the wind, the occurrence of symptoms and damage to plants and animals that continued for a period of time.[737] They however claim that in their case the symptoms were immediate. Witness 22 has a very vague recollection of the timing of the sprayings, "since the year two-thousand and two, or thereabouts" and claims that for years nothing was harvested due to the sprayings.[738] All of this has nothing to do with the characteristics of glyphosate, which is eliminated from soils within, at most, a few weeks, and which allows almost immediate replanting.[739]

7.138. It is to be emphasized that absolutely no evidence is provided to support the very serious accusations made by these witnesses, particularly in light of the fact that, as explained in Chapter 4, the components of the spray mix are scientifically classified as non bio-accumulating, i.e., as having minimal and non-lasting effects. In spite of the severe and wide-spread symptoms allegedly suffered by such a large number of people – a full-scale epidemic according to at least one of the witnesses – none of them seems to have sought medical assistance, whether for themselves or for their children.

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[737] EM, Vol. IV, Annexes 206 and 209.
[738] *Ibid.*, Vol. IV, Annex 209.
[739] See Annex 116, CICAD I, pp. 22-23, 47, 78.

7.139. The picture is very similar for the witnesses residing in the Esmeraldas province around the town of Mataje: witnesses 30, 32, 33, 34, 36, 37, 38 and 39.[740] To the extent that a time frame can be ascertained, the testimonies concern spraying episodes dating back to the years between 2000 to 2004. Witness 32 in particular refers to three episodes in increasingly uncertain terms: the first episode in 2000, the second "a few years later" and the third "I think it was in 2004". Witness 31 (whose statement is not referred to at all in the Memorial) does not provide any date at all for the sprayings.

7.140. In some of these cases, the illnesses alleged were supposedly reported to health centres or nurses and medical assistance was apparently received. However, no documentation is provided in this regard, and in the absence of any medical reports and specific dates that can be matched to actual spraying episodes, it is impossible to establish what caused the symptoms reported or whether there is any connection with the aerial sprayings.

7.141. The same comments apply to the statements of the other witnesses annexed to Ecuador's Counter-Memorial, including the statements of Colombian nationals: to the extent that a temporal framework is provided at all, it is done in a vague and imprecise manner, no contemporary medical records or other

[740] EM, Vol. IV, Annexes 214, 216, 217, 218, 219, 220, 221 and 222.

scientific evidence are referred to or produced, and no attempt is made to substantiate the connection between specific instances of spraying and the injuries of which complaint is made.

7.142. In the absence of any direct studies or medical records supporting the allegations contained in the testimony of the various witnesses, Ecuador is forced to look elsewhere for substantiation. In this regard, it relies heavily on a 2001 field study report which is wholly unrelated to the witness statements filed with Ecuador's Memorial.[741] That report – prepared in 2001 by a Commission composed of representatives of Ecuadorian social organizations and NGOs – mentions complaints of alleged adverse impact of the fumigations provided orally to the members of the Commission by some residents in the border areas in the provinces of Esmeraldas, Carchi and Sucumbíos.

7.143. The complaints recorded are very similar to those made by the witnesses whose statements have been put forward by Ecuador and they suffer from the same flaws and shortcomings: they are not corroborated by any medical or scientific account or evidence, they refer to no specific instances of spraying, they provide no details as to the localities where the sprayings allegedly occurred and they offer no evidence of a causal link –

[741] EM, para. 6.14; Vol. IV, Annex 162.

or indeed any connection – between the sprayings and the symptoms allegedly experienced by the local population.

7.144. Similarly, the interviews of the hospital staff at Mataje, in the Esmeraldas region, conducted in 2001 by the Commission and cited in the Report, show that no connection between the sprayings and the symptoms complained of was ever established.[742] This is particularly significant since the interviews concern the same region and were carried out in 2001, and therefore correspond to one of the time periods when Ecuador's witnesses claim that they suffered health problems due to spraying.

7.145. Some of the doctors interviewed stressed the lack of infrastructure and medical personnel in the area which made it impossible to ascertain what had caused the ailments suffered by the populations of the border areas. Furthermore, the doctors interviewed also emphasized that no investigations of the symptoms reported had been conducted on the ground. The interviews, in Ecuador's English translation,[743] speak for themselves:

> "We have no reports of people being poisoned by the fumigations; we do not know what happened in Mataje. We received reports from volunteer collaborators indicating the presence of ARI (Acute Respiratory Infection), but they have not

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742 See paras. 7.144-7.146, above.

743 EM, Vol. IV, Annex 162.

told us if it is on account of the sprayings. An investigation should be carried out". (Dr. Dueñas, Epidemiologist)

"In October, we had a large number of children with conjunctivitis, skin lesions, respiratory problems and diarrhea. This was attributed to the insecticides from the palm plantations, but we do not have anything available here to work with or investigate. We have only three attending doctors and we had to bring in the rural doctors to assist at the hospital because they were not being fully utilized in their locations. There are brigades that go on visits, but they did not go there." (Dr. Merino)

"In the case of an epidemiological emergency, the auxiliaries notify us of changes in health circumstances, and we go take samples. The unit provides attention based on its means; it is an acute care hospital that cannot keep patients for more than two days. When we learned of what had happened, we went, but we could not take samples. We reported it, but that was as far as it went, no one came to investigate, not even the MAG, which is in charge of monitoring the palm plantations. The Red Cross came and took samples, and also investigators from television channels." (Dr. Dueñas)

"Our epidemiological monitoring system does not allow us to follow up on all of this. We have a laboratory for basic analysis and in Mataje we do not have the means to replace the light bulb of the microscope, which burned out months ago. Moreover, there is a serious lack of personnel. The doctors who reside here are from here, but those who come here have gone to Colombia, to Tumaco, where they earn US$1,200 a month." (Dr. Merino)

> "Rounds are done every two months in order to provide medical attention to the population, but they are not very effective. Normally, there is a doctor (for vaccinations), a dental surgeon (only extractions), and an obstetrician and assistant, but our primary health care rates are very low". (Dr. Dueñas)

7.146. A number of important conclusions can be drawn from these interviews:

- The medical staff working in hospitals located in the Esmeraldas region in 2001 stated that they had "no reports of people being poisoned by the fumigations";
- Moreover, while they had reports of acute respiratory problems, the doctors acknowledged that they had no reason to believe that the health problems allegedly occurring in the area at the time were due to the sprayings and in fact attributed some of the symptoms to the effects of insecticides used in spraying palm plantations;
- No samples were taken due to lack of resources and no investigations were carried out at the time;
- Basic health care in the border areas was inadequate; there was a lack of personnel and very limited means;

- There is every reason to believe that the same situation – shortage of human and financial resources and proper medical care, lack of adequate investigations – applied in subsequent years and still exists today.

7.147. Whether for these or other reasons, Ecuador does not seem to credit its own witnesses' allegations concerning human deaths. As discussed in Chapter 8, it does not rely on the alleged deaths as constituting a violation of right to life of individuals in the border regions, and only refers to the deaths as part of its claim in relation to alleged violations of the right to health. The reason seems clear. First, as shown above, the scientific evidence demonstrates that Colombia's aerial eradication program poses no significant risks to human health. Moreover in the section of the Memorial dealing with "The Harm to People",[744] references to deaths in the border region are curiously absent: the only comment is that "there are a number of reports of deaths among young children following early spray events in particular",[745] and the section as a whole confines itself to alleging "serious harm to human health",[746] an unwontedly restrained phrase if indeed there were as many deaths as the witness statements would suggest.[747] The truth is

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744 EM, paras. 6.7-6.53.

745 EM, para. 6.50.

746 EM, para. 6.7.

747 See above, para. 1.28. Elsewhere Ecuador is less restrained, but in a way which demonstrates its lack of knowledge of the facts: e.g. EM, para.

that, as opposed to the very detailed figures it provides for alleged events of fish and farm animal deaths,[748] Ecuador does not know the numbers or the causes of any of the deaths alleged by its own witnesses, a gap which it tries to fill by promising to provide detailed information at the quantum phase, once Colombia's responsibility is definitively established.[749] But in the context of responsibility for incidental transboundary harm, injury is the very essence of the wrongful act, and proof of injury (that is, of damage *caused* by the Respondent State) cannot be postponed in this way.[750]

7.148. In the circumstances, given the poor living and health conditions of the Ecuadorian population in the Colombia-Ecuador border areas, coupled with the problems relating to medical care and the lack of any investigation or other scientific assessment of the reported complaints, Ecuador has fallen far short of discharging the burden upon it of establishing a causal link between the aerial fumigations and injuries allegedly suffered by Ecuadorian residents. Ecuador's complaints of serious injury to health are not substantiated.

10.30 ("There have been deaths of numerous young children connected to the spraying episodes"). The adjective "numerous" is telling: Ecuador does not know how many deaths its witnesses allege to have occurred as a result of spray drift.

[748] EM Vol. I, para. 6.84, referring to Vol. II, Annex 165.

[749] See e.g., EM, paras. 10.3, 10.4, 10.20.

[750] See above, paras. 7.8-7.9; also, further below, paras. 8.37, 8.49, 8.122 (5).

(2) ANIMALS

7.149. The same considerations apply, *mutatis mutandis*, to Ecuador's claims of illnesses and death of animals, both domestic and wild. Even direct overspray could not produce the kind of injuries asserted, many years later, by Ecuador's witnesses.

7.150. In support of this claim that the spray mixture can cause significant risks to domestic animals, Ecuador cites the following US warning label for Roundup: "DOMESTIC ANIMALS… ingestion of this product or large amounts of freshly sprayed vegetation may result in temporary gastrointestinal irritation (vomiting, diarrhea, colic, etc.)."[751] This worst-case scenario, appropriate no doubt for a label, bears no relationship to Ecuador's claims. All the label predicts is "temporary gastrointestinal irritation". By contrast, what Ecuador asserts (at least so far as animals are concerned) is death.

7.151. Ecuador relies on a report prepared by the NGO *Acción Ecologica* of October 2002 for data of animal deaths for Sucumbíos alone and limited to the year 2001 as a precise 11,828, including 188 cows and 43 horses.[752] On what basis 188 cows and 43 horses in Sucumbíos in 2001 came to eat the

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751 EM, para. 5.57.

752 EM, para. 6.80, relying on an NGO report (Vol. IV, Annex 165).

necessary vast quantities of freshly sprayed vegetation is quite unclear and is not explained. What is however crystal clear from the 2002 report is that the data it contains is not actual data of animal deaths but rather corresponds to the claims made by *campesinos* from different Ecuadorian communities to the Office of Human Rights of the Ombudsman of Lago Agrio in 2001.[753] The report acknowledges that the data was never independently verified, since it states that: "no government official has traveled to the areas to check, in the field, the damage reported in this claim."[754] The allegations of the *campesinos* remain wholly unsubstantiated.

7.152. It is instructive to make a tally of animal victims from the numbered witness statements. The claims of injuries and death range from livestock and farm animals such as pigs and chickens to wild fish, birds and monkeys, which are said to have disappeared as a result of the sprayings near the border.[755] Specific numbers are not provided, but it is apparent that the statements wish to convey the image of large numbers of animals killed or seriously injured – "a heavy toll on animals, both domestic and wild".[756]

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753 EM, Vol. IV, Annex 165, p. 3.
754 Ibid.
755 EM, paras. 6.88-6.105.
756 EM, para. 6.82.

7.153. Illustrative examples include the following: "I found several dead chickens near the tree";[757] "[I]n recent years there has been a decline in some species such as the monkeys and *guatuzas*, … before there were many of them and now there are hardly any";[758] "I had forty chickens and nearly all of them died"[759]; "[W]e used to see a lot of monkeys and parrots… Now, one seldom sees a monkey or a parrot".[760] Some of the witnesses testify that fish – both wild and farm-raised – were particularly affected by the sprayings and state that they saw dead fish floating on the surface of the San Miguel River.[761] "The wild birds have disappeared, and they can no longer be heard singing in the mornings or the evenings".[762]

7.154. A complaint written by Mr. Victor Mestanza to the Ecuadorian Ministry for the Environment on 14 October 2002 is more specific as to the number of animals allegedly affected. Mr. Mestanza alleges that he suffered a huge financial loss due to the fumigations and states that he lost 30,000 fish in 2000, 60,000 fish in January 2002 and 400 ducks and 80,000 fish in September 2002.[763] However, quite aside from the fact that the scientific evidence shows that the mixture used for the sprayings

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757 Witness 4, EM, Vol. IV, Annex 192.
758 Witness 3, EM, Vol. IV, Annex 191.
759 Witness 9, EM, Vol. IV, Annex 197.
760 Witness 2, EM, Vol. IV, Annex 190.
761 EM, paras. 6.93-6.94 and 6.99-6.100.
762 EM, para. 6.87, citing Vol. IV, Annex 166 (President of the community of Monterrey).
763 EM, Vol. IV, Annex 237.

causes no significant effects on fauna in general and little chronic toxicity to fish in particular[764] and the vast number of fish claimed for, Mr. Mestanza's testimony is questionable.

7.155. Victor Mestanza is one of the individual plaintiffs in the *Dyncorp* case before the U.S. courts and a member of the same Mestanza family whose personal injury claims were found to be fabricated, with the result that three of them were dismissed with prejudice from the case.[765] In spite of the fact that in the questionnaire submitted in the U.S. proceedings Mr. Victor Mestanza claimed that he incurred over $600,000 in damages to his property, he has produced no business or farming records to support his claim.[766]

7.156. With respect to the other testimonies reporting harms to animals as a result of the aerial sprayings, there is no attempt, as was the case with alleged injuries to human health, to establish a causal link between the incidents reported and any specific sprayings and no independent verification of these allegations is made. The statements consist of mere assertions uncorroborated by any contemporaneous scientific or documentary evidence.

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764 See above, paras. 7.72-7.83.

765 See EM, Vol. IV, Annexes 153, 154. See above, para. 1.37.

766 See Annex 156: Defendants' Motion for Sanctions Against the Arias/Quinteros Plaintiffs for Violations of Discovery Orders, 26 January 2010, p. 24.

7.157. Ecuador further relies on the Menzie Report's statement that "[s]praying with glyphosate-based herbicides may also reduce the local food supply for domesticated animals, which may lead to decreased body condition and performance in livestock and other animals."[767] It may be noted what the Menzie Report does *not* say, viz., that the spray mix can cause the deaths of cows and horses. But even its more modest conclusion is directly contradicted by the scientific studies concerning the effects of the spray mixture on fauna.

7.158. As noted by Dr Dobson, empirical studies on human volunteers show that skin exposure to the concentrated formulation of glyphosate cause at most irritation and are "less irritant than a standard liquid dish washing detergent and a general all purpose cleaner."[768] Dr Dobson's conclusion is that: "The likely effects in domestic animals following exposure to spray drift are the same as those seen in humans: transient eye irritation and respiratory discomfort. I do not accept that these mild to moderate effects would impinge on growth or reproductive performance of these animals."[769]

(3) LAWFUL CROPS

7.159. An illustration of the confused claims made with respect to crops in Ecuador is the statement of Witness 1, who claimed:

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767 EM, Vol. III, Annex 158, Executive Summary.
768 Appendix – Dobson Report, p. 24.
769 *Ibid.*, p. 25.

> "Before the sprayings began in our area, I used to sell a lot of coffee. I had sixteen (16) hectares planted with coffee, and each hectare produced sixty (60) to eighty (80) quintals of the product annually. Now, I can barely harvest eight quintals of coffee per hectare each year."[770]

7.160. Other witnesses make similar claims. They allege that entire plantations were destroyed, trees and plants died and pastures were lost.[771] They also contend that the devastation continued months or years after the sprayings.[772] Mr. Mestanza claims that the sprayings are "practically liquidating my project and my finances, and, as a result the source of employment for many people in the area who work at my farm."[773] But Mr. Mestanza has so far produced no business or farming records to support his very extensive claim for property damage in the U.S. proceedings against Dyncorp.[774]

7.161. As demonstrated above, spray drift could not produce the damage alleged by Ecuador and its witnesses. Neither could direct overspray. Land sprayed with glyphosate is able to be replanted within days, or at most a few weeks, since the pesticide rapidly breaks down and does not bioaccumulate.[775] The obvious reason why a harvest might drop by 80% or more

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770 EM, para. 6.63; Vol. IV, Annex 189.

771 EM, Vol. IV, Witness 21, Annex 207 and Witness 8, Annex 196.

772 EM, Vol. IV, Witness 37, Annex 220 and Witness 32, Annex 216.

773 EM, para. 6.68; Vol. IV, Annex 237.

774 See Annex 156, p. 24.

775 See e.g. Annex 116, CICAD I, pp. 20-23, for the short half-life of glyphosate in tropical soils.

over some years is exhaustion of the soil, a common phenomenon in tropical soils and one of the factors underlying "slash and burn" agriculture.

7.162. Ecuador relies on the report prepared by the NGO *Acción Ecologica* in October 2002 for data concerning the alleged damages to agricultural crops.[776] The data reported by Ecuador for instance refers to 1,215 hectares of coffee, 785 hectares of grass and 185 hectares of bananas allegedly damaged due to the sprayings in 2001. However, as in the case of alleged harm to animals, these figures do not concern verified losses, but correspond to the claims filed by some local farmers with the Office of the Human Rights Ombudsman in Lago Agrio, claims that had not been officially checked on the ground.[777]

7.163. Ecuador also refers to the observations made by the International Federation of Human Rights, several NGOs and the Defensoría Nacional del Pueblo during a visit to Sucumbíos in 2005 as stating, in relevant part, that "All those living along the border agree that the sprayings have weakened the soil quality and its production capacity."[778] This is another example of Ecuador's selective interpretation of the documentary evidence: the same document, in a passage from the conclusions

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776 EM, para. 6.56, relying on Annex 165, p. 3 (Vol. IV).
777 EM, Vol. IV, Annex 165, p. 3.
778 EM, Vol. IV, Annex 169, p. 13.

not translated by Ecuador, while maintaining that there had been a change in the quality and its production capacity of the soil, acknowledges that: "there is no agreement about the harmful effects of the components of the sprayings announced by Colombia."[779] With respect to alleged damages to health, the document also admits as follows:

> "From 2003 until today we have detected some 40 patients a year for intoxications due to pesticides, but the cause, (domestic use or fumigations) has not been established."[780]

The same reasoning *a fortiori* must apply to plants and crops: any alleged damage could very well have been caused by other pesticides and by contamination from other sources, including, notably, the agrochemicals used for growing coca.

(4) NATIVE FLORA AND THE ENVIRONMENT

7.164. As shown above, scientific studies have determined that glyphosate has no long-lasting effect on soils.[781] Moreover, any effects are negligible beyond 50 metres downwind and there is no effect at all if the wind direction is away from the area of concern.[782] In the circumstances, there could have been no significant effects for non-targeted crops, flora and the environment of Ecuador as a result of accidental drift.

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779 EM, Vol. IV, Annex 169, p. 23.
780 *Ibid.*, pp. 8-9.
781 See above, paras. 7.84-7.88.
782 Annex 131-B, CICAD II, at p. 929.

7.165. Ecuador repeatedly alleges that glyphosate is "a powerful herbicide specifically designed to kill all plants upon contact (even in very small quantities)",[783] and asserts that they kill "virtually every plant they touch".[784] Ecuador argues that the fact that the spray mixture may have been released at a distance from the plant is immaterial and contends – on the basis of the warning written on the Roundup Pro label – that "even minute quantities of this product [Roundup] can cause severe damage or destruction to crops, plants."[785] This is incorrect and misleading. It confuses hazard (the potential to cause harm) with risk (the probability that harm actually occurs). Classification and labelling worldwide is hazard-based and takes no account of risk.

7.166. Of course glyphosate is an herbicide and as such it is supposed to kill plants; however, whether it kills a particular plant or not depends on the administered dose (application rate). Glyphosate kills after being absorbed into and transferred through the plant and requires exposed green parts of the plant to be available so that it can be absorbed and transferred. At high application rates, there is sufficient herbicide to kill the plant whereas at lower application rates, photosynthesis is inhibited and growth is reduced. When applied at lower rates, glyphosate is a plant-growth regulator; for example, it is used in

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783 EM, para. 1.17.
784 EM, para. 5.73.
785 EM, para. 6.79.

small quantities to ripen sugar cane.[786] Moreover, glyphosate has no lasting effect on soil, and plants that are planted following application will grow normally.[787]

7.167. If the implication is that glyphosate is so potent that a single drop drifting across the border into Ecuador would kill a plant, this is an absurd allegation. The application rate falls off very rapidly with distance downwind of the spray swath and no sub-lethal, let alone lethal, effects on plants are expected more than 50 metres from the spray swath.[788] Only a very small proportion of the spray drifts any great distance and this proportion represents very small droplets – the spray application is set up to maximise the droplet sizes to ensure most of the applied herbicide drops immediately. These fine droplets that drift represent a tiny proportion of the applied dose and a very low application rate.

7.168. Ecuador argues that the fact that the spray mixture may have been released at a distance from the plant is immaterial and contends – on the basis of the warning written on the Roundup

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[786] See, for instance: http://www.washingtonpost.com/wp-srv/liveonline/01/world/major_011201.htm (last visited 10 March 2010).

[787] United States Department of Agriculture, *"Effects of glyphosate on soil microbial communities and its mineralization in a Mississippi soil"*, published in the peer-reviewed journal *Pest Management Science*, in 2007, Abstract. Available at: http://www.ars.usda.gov/SP2UserFiles/Place/64022000/Publications/Weaver/Weaveretal07PMS63.pdf (last visited 10 March 2010)

[788] See Figure 1 of the Appendix – Dobson Report, and the accompanying analysis.

Pro label – that "even minute quantities of this product [Roundup] can cause severe damage or destruction to crops, plants."[789] This is incorrect for several reasons.

7.169. First of all, the Roundup Pro warning concerns that particular product, which is not used in Colombia's program for the eradication of illicit crops. Furthermore, it is the application rate of the herbicide that determines whether plants will be killed or not.[790] The application rate falls off very rapidly with distance downwind of the spray swath and no sub-lethal, let alone lethal, effects on plants are expected more than 50 metres from the spray swath.[791] Only a very small proportion of the spray drifts any great distance and this proportion represents very small droplets – the spray application is set up to maximise the droplet sizes to ensure most of the applied herbicide drops immediately. These fine droplets that drift represent a tiny proportion of the applied dose and a very low application rate.

7.170. The 19th Verification Mission (2009) reported an off-target average rate of 2.23%, with lower figures for Putumayo (1.04%) and Nariño (1.09%):

> "Drift was estimated with the Off-Target (OT) indicator, that calculates the percentage of vegetation cover other than coca that was

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789 EM, para. 6.79.

790 See Appendix – Dobson Report, Section 6.2, paras. 81-91.

791 See Figure 1 of the Appendix – Dobson Report, and the accompanying analysis.

> affected with regard to the coca plot subject to control. The average obtained in the verification mission was of 2.23%. This indicator allows for concluding that for every sprayed coca hectare, 0,022 hectares of a different [vegetation] cover were affected. This range falls within what is considered as acceptable in Record [1] of the Environmental Management Plan that foresees a range of 5."[792]

Virtually all of this overspray would have been deposited within tens of metres of the intended spray area.

7.171. Colombia has also adopted a rigorous methodology in the implementation of the PECIG program, precisely in order to avoid drift and minimize the risks to health and the environment. Colombia has produced as Annex 67 of this Counter-Memorial, a report by the Anti-Narcotics Direction of the Colombian National Police ("DIRAN") which explains the carefully monitored process governing the spraying operations.

7.172. The first step consists in the identification of the illicit crops through satellite imagery. Once the clusters of coca crops are identified, the sprayings take place under strict observance of safety strips and special management areas and the process is carried out in separate stage and in the respect of detailed guidelines. All spray aircraft are equipped with a satellite monitoring system which guarantees the accuracy of the operations and ensures that the sprayings are carried out on the

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[792] Appendix 1 to the Environment Ministry Report, Annex 70, p. 9.

areas targeted. Wind conditions are constantly monitored by the aircraft and if they are not within the parameters allowed, the mission is annulled or postponed.[793] Each operation is recorded in detail, including the place, hour, number of hectares sprayed, spraying locations, etc. The amount of products used in the operation (glyphosate and adjuvant) is also stated in the operational records.[794]

7.173. The operational parameters of the aerial spraying program were outlined in Chapter 4. They result from the various field tests conducted by the Colombian Agriculture and Livestock Institute ("ICA") in order to ensure the effectiveness of the Program while preserving the environment.[795] ICA also performs chemical analyses of both the glyphosate commercial formulation and the mix used in the sprayings in order to assess the proper concentration of pure active ingredient used therein. Routine unannounced visits are conducted to the operation base and samples of the mix are taken to be analyzed.[796]

7.174. The collateral effects, if any, of the sprayings on vegetation and lawful crops adjacent to the illicit crops sprayed are verified through a specific procedure which involves the cooperation of several specialized agencies. As part of this

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[793] Annex 67, p. 10.

[794] See above, para. 4.64.

[795] Annex 67, p. 7. See also, EM, Vol. II, Annex 15, Tenth Article and Part No. 1 (Program for Management of the Fumigation, second para.); CCM Annex 50, Table 1, Operational Parameters.

[796] Annex 65, p. 3; and see above, para. 4.24.

process, DIRAN also reviews the complaints filed by individuals for alleged damages to lawful crops during the aerial spraying operations.[797]

7.175. The results of analyses conducted on Colombian territory by the Colombian Ministry for the Environment, the agency charged with supervising the implementation of the Environmental Management Plan ("EMP"), confirm that there have been no effects on soil and water samples taken from areas of Colombian territory that were directly sprayed. As stated by the Ministry:

> "The Ministry for the Environment, Housing and Territorial Development... as supervisor of the implementation of the Environmental Management Plan of the Program for the Eradication of Illicit Crops by aerial spraying with Glyphosate Herbicide – PECIG, verifies and controls that the mixture used in the eradication of illicit crops, Gly-41, Cosmo-Flux 411F, and water, complies with the technical specifications stipulated under Resolution 099 of 2003, which relies upon the field studies carried out by the Colombian Agriculture and Livestock Institute – ICA , and that the PECIG program has followed the guidelines of the environmental regulations in force on the matter and has been subjected to adequate and continuous environmental controls. The results of environmental monitoring activities conducted as part of the EMP – including the laboratory analyses of the water and soil samples collected in monitored areas –, have shown that the implementation of the

[797] Annex 67.

> PECIG to date does not pose a risk to the environment or to human health, including that of the persons involved in the environmental monitoring who, on account of their tasks, are occasionally directly exposed to the spray mixture. None of them has reported adverse effects on their health as a result of such exposure."[798]

7.176. For these reasons, Ecuador's contentions of extensive harm to crops and native plants due to spray drift onto its territory have no basis. As seen above, strictly monitored procedures to preserve the environment and minimize the risks of drift beyond the illicit crops sprayed are used, buffer zones in relation to all water bodies are respected and routine analyses on water and soil samples taken from areas directly targeted by the sprayings are conducted.[799] The results of these analyses and environmental controls show no risk for human health or the environment. In the circumstances, Ecuador's allegations are groundless.

(5) THE "SPECIAL HARM" TO THE INDIGENOUS COMMUNITIES

7.177. Ecuador also creates a separate category of harms, relating to its complaint that the aerial sprayings severely disrupted the cultural well-being and natural environment of the indigenous people living in border regions of Ecuador.

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[798] Annex 70.

[799] Examples of soil and water analyses are at Appendices 2-5 of the Colombian Environment Ministry Report, Annex 70.

According to Ecuador, these communities have suffered "special harm" due to the impact of the sprayings on nature and the environment, on which they rely for their cultural traditions and religious beliefs.[800] Ecuador has submitted in support of its contentions nine witness statements of indigenous people and three "independent reports".

7.178. Starting with the witnesses, none of them provides any dates for the sprayings, with the exception of witnesses 11 and 17.[801] Witness 11 refers to a spraying episode that took place "at the beginning of the year two thousand and one" and suggests that more sprayings took place in subsequent years, but gives no indication as to the time, merely asserting: "When the planes returned, the disease returned."[802] This witness testifies that her daughter was directly sprayed ("My baby was with me at the farm when the planes came and the liquid fell on her") and attributes the death of the baby, which occurred on 25 September 2001, months after the alleged sprayings. Witness 11 also states that another one of her daughters died two years later, on 10 September 2003, "during a period of spraying".[803]

7.179. Witness 17 vaguely refers to an episode of spraying that occurred: "about six or seven years ago" and states that some of the alleged effects of the sprayings – skin rash, vomiting and

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800 EM, paras. 6.106-6.113.
801 EM, Vol. IV, Annexes 199 and 203.
802 EM, Vol. IV, Annex 199, lines 8-9.
803 *Ibid.*, lines 17-18.

fever – appeared some time later (days or weeks) and lasted several months.[804] He even states that he suffers to this day of severe headaches and dizziness.[805] It is highly unlikely that this condition is an effect of the sprayings. As noted above, to the extent that exposure to the mixture may cause temporary symptoms, such as eye or skin irritation, these appear immediately after exposure and disappear within a day or so.[806]

7.180. All nine indigenous people who have provided witness statements on behalf of Ecuador testify that, since the time when the sprayings started in Colombia, their traditional way of life has been severely disrupted, entire families have migrated and those who were left behind lived in fear, that the crops and the plants that the tribes use for food and religious rituals have died and entire animals species have disappeared. The statements provided by these witnesses describe an environmental disaster of epic proportions, but fail to provide any temporal framework or to establish any causal link between the damages complained of and the sprayings. None of these statements is accompanied by any contemporaneous corroborating evidence whatever. Moreover, given the vagueness of the witness statements, there is no way of verifying these accounts.

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804 EM, Vol. IV, Annex 203, lines 2-9.

805 *Ibid.*, lines 5-6.

806 See above, para. 7.127.

7.181. The "independent reports" to which Ecuador refers for its allegations of injuries on the indigenous peoples also fall short of substantiating Ecuador's claims since all they do is recount the complaints of the local populations. They are not corroborated by any independent evidence; those conducting the inquiries were not scientists, and no testing was done by them. In fact, some of the reports cited by Ecuador in support of its allegations clearly state that there is no agreement as to the harmful effects of glyphosate and that there is no established cause for the illnesses allegedly suffered by the local peoples.

7.182. For instance, the NGOs that visited Sucumbíos in 2005 – whose observations have been discussed above in connection with alleged damages to crops – observed that there was no agreement as to the harmful effects of the sprayings and that the cause of intoxications (domestic use or fumigations) reported from 2003 to 2005 as being due to pesticides had not been established.[807] This document also acknowledges, in a passage that Ecuador omitted to translate:

> "It is said that the illnesses reported in Chical are caused by glyphosate but so far no studies of any kind have been carried out."[808]

7.183. Another important aspect of the factual context that emerges from these reports is the extreme poverty of these indigenous communities living on the Colombia-Ecuador border

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807 See para. 7.160.

808 EM, Vol. IV, Annex 169, p. 6.

and the fact that they are abandoned to their own resources by the Ecuadorian Government. A number of the documents filed by Ecuador with its Memorial – including those that Ecuador cites in support of its claim of "special harm" to the native peoples – point to this deplorable state of affairs.

7.184. For instance, a November 2005 report by two NGOs which visited the province of Esmeraldas in the Summer of that year stated as follows, again in a paragraph which has not been translated by Ecuador:

> "State attention in these areas is deficient, and there are no real projects or programs for sustainable development. The infrastructure is obsolete, the people do not have any basic health service, potable water, sewage system, telephones, medical assistance, nutrition or education, that would allow them to have an adequate level of life. The communication routes leading to these territories are in a very bad state, due to which, access to these areas is either made on foot or by canoe."[809]

7.185. Similarly, the 2006 report of the U.N. Special Rapporteur on the Rights of Indigenous People on his visit to Ecuador, which is cited extensively in the Memorial, lists oil exploration and development as one of the main factors causing the degradation of the environment and living conditions of

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[809] Ecolex and Aida Environmental Report on the Impacts in Ecuador of the Fumigations under Plan Colombia, EM, Vol. IV, Annex 170, p. 3. (Excerpt not included in Annex 170; Colombia's translation)

these indigenous communities.[810] The report notes that some tribes "complain that oil activities have polluted their rivers and affected the health of the region's indigenous peoples."[811]

7.186. In the light of this generally recognized state of affairs, the "special harm" allegedly suffered by the indigenous people of the border areas, cannot be attributed to Colombia's aerial sprayings. Given the vague and unsubstantiated nature of Ecuador's witness statements and the reports on which Ecuador relies, as opposed to the scientific evidence and the rigorous methodology adopted by Colombia in the organization and management of the aerial sprayings program, it can be concluded that Ecuador's allegations are not only unsupported by any evidence, but are contradicted by the evidence on the record.

E. Conclusions

7.187. As shown in this chapter, Ecuador has failed to prove its allegations of harms due to Colombia's aerial sprayings in its territory for the following reasons:

- Ecuador has demonstrated neither actual risk, nor exposure, nor harm, nor causation.
- The available scientific evidence lends no support to Ecuador's case. There is no scientific evidence

[810] EM, Vol. II, Annex 30, paras. 18-25.
[811] *Ibid.*, para. 20.

of serious threats to human and animal health or the environment due to exposure to the spraying mixture used by Colombia in its PECIG program. On the contrary, scientific studies support Colombia's position that the PECIG program poses no significant risks to human or animal health and the environment. This is confirmed by the continuous scientific monitoring of sprayed areas in Colombia, conducted by the Colombian authorities with international technical support. The results revealed no evidence of glyphosate or glyphosate residues in water and soil samples collected in directly-sprayed areas.

- To the extent that "the fabric of life in the border region" is under threat as Ecuador alleges, this is because of the poverty, remoteness and governmental neglect that characterize this region, coupled with the presence of the FARC guerrillas. It has nothing to do with any alleged effects of Colombia's aerial sprayings.

- Colombia has adopted a cautious stance and has taken all reasonable precautions in order to ensure that the sprayings take place only in its own territory and that spray drift beyond the targeted areas is avoided. Strict protocols are followed to that effect before, during and after the operations

and no sprayings take place over human settlements, bodies of water or water courses which are considered exclusion zones;

- Analyses conducted by the Ecuadorian authorities themselves in 2004 on samples taken from rivers in the provinces adjacent to the Colombia-Ecuador border confirmed that no evidence of glyphosate was present in Ecuadorian water and soil;
- Ecuador has failed to prove that the sprayings were the cause of the injuries alleged.

7.188. Ecuador's case is so extreme that its credibility is undermined. Even assuming – *quod non* – that spray drift into Ecuador's territory occurred during Colombia's aerial sprayings, the quantities would have been minimal and any damage would have been negligible even for the most sensitive plants, let alone for humans and animals. It is simply not plausible, both in light of the facts and the scientific evidence that Ecuadorian nationals, flora and fauna suffered the kind of damages and injuries alleged by Ecuador.

Chapter 8

ECUADOR'S CLAIMS FOR TRANSBOUNDARY INJURY OR HARM

A. Introduction

8.1. In its Memorial, Ecuador accuses Colombia of "violation of a broad array of fundamental international norms".[812] For once, Ecuador does not exaggerate, at least insofar as it refers to a "broad array". Indeed, an armoury of treaties and other instruments is thrown at Colombia, with little reference to whether Colombia or Ecuador are parties, or even eligible to become parties, to them, and without regard to the clauses of these treaties which define their own application. New and aspirational instruments (such as the UN Declaration on the Rights of Indigenous Peoples) are combined, higgledy-piggledy, with established propositions such as that of the *Trail Smelter* arbitration[813] or the Court's dictum in the Advisory Opinion on *Legality of the Threat or Use of Nuclear Weapons* that:

> "The existence of the general obligation of States to ensure that activities within their jurisdiction and control respect the environment of other States or of areas beyond national control is now

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[812] EM, para. 6.134. Cf. EM, para. 6.6 ("the harms occasioned by Colombia's fumigations constitute an integrated, mutually reinforcing whole that have undone the very fabric of life in the border region").

[813] *Trail Smelter (United States of America v. Canada)*, Award of 11 March 1941, 3 RIAA 1905, p. 1965.

> part of the corpus of international law relating to the environment."[814]

8.2. Ecuador overstates the law almost as much as it does the facts – and unnecessarily so, since if the facts were as alleged in the Memorial, then the law, or that part of it concerned with the causing of transboundary harm, would largely follow. If the aerial spraying program had killed scores of people in Ecuador and thousands of farm animals, laid waste to old-growth forests and destroyed "thousands of hectares of valuable crops",[815] then any threshold in relation to the causing of transboundary harm would be exceeded. The heavy invocation of a wide range of human rights and indigenous rights would be unnecessary. On the other hand, if the facts and the science are as Colombia has shown – that, at most, there may have been some discernible drift of spray downwind from Colombian spraying operations, but if so it was harmless about 50 metres from the spray zone – then the case is quite different and most if not all of the norms relied on by Ecuador are irrelevant.

8.3. Colombia will nonetheless address Ecuador's legal arguments as such, and without regard to the realities of the aerial spraying operations as demonstrated in Chapters 4 and 7. It is proposed to do so under the following rubrics:

- breach of Ecuador's sovereignty;

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814 Advisory Opinion, ICJ Reports 1996, pp. 241-242, para. 29.

815 EM, para. 10.9.

- transboundary harm and the failure to cooperate;
- breaches of human rights;
- breaches of indigenous rights.

8.4. This Chapter will deal with the former category of obligations, i.e., those concerning alleged breach of sovereignty and alleged transboundary harm. Chapter 9 will deal with the superadded elements Ecuador seeks to bring to the dispute based upon the rights or claimed rights of people or groups within Ecuador.

8.5. Before turning to these questions, however, it is necessary to say something about the applicable law.

B. The Applicable Law

(1) TREATY AND CUSTOM IN INTERNATIONAL ENVIRONMENTAL LAW

8.6. An initial point to make is that the major modality for the development of international environmental law in modern times has been by treaty, bilateral and especially multilateral. Such customary international law rules as exist in relation to the environment are of a general and residual character. The point was made by the Court in its Advisory Opinion on *Legality of the Threat or Use of Nuclear Weapons*, when it referred to the "*general* obligation of States to ensure that activities within their

jurisdiction and control respect the environment of other States".[816]

8.7. Ecuador proceeds on the apparent assumption that customary international law relating to the environment develops at the pace of the fastest, most "advanced", treaty. Moreover it blithely cites as authority treaties which are not now in force and may never enter into force, and regional treaties (for example, those sponsored by the UN Economic Commission for Europe) which Colombia and Ecuador are ineligible to join even if they wanted to. It may be recalled that regional agreements or practices cannot become embodied in customary rules unless they are shown to be accepted by each State concerned;[817] *a fortiori* they cannot be exported to other regions of the world which may (as in the present case) face different problems and have a different level of socio-economic development. The environmental problems of Europe are not the same as those of South America.[818]

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816 Legality of the Threat or Use of Nuclear Weapons, Advisory Opinion, ICJ Reports 1996, pp. 241-242, para 29 (emphasis added).

817 *Asylum (Colombia v. Peru)*, *ICJ Reports 1950*, pp. 276-278.

818 As would be the case, for instance, of Andean Community Decision 505 of 2001 (Andean Cooperation Plan for the Control of Illegal Drugs and Related Offences). Indeed, the Program of Action, within the foreseen reinforcement of national strategies (Section I), includes a section on the technical eradication of illegal crops (Sub-section B.), para. 1 of which reads as follows:

"1. Build up national capacities to implement programs for the technical eradication of illegal crops by hand or by air, in the countries that need it, keeping in mind the environmental standards established by the competent authorities." (Emphasis added)

8.8. In its treatment of the applicable law, Ecuador relies on the following treaties to which Colombia and/or Ecuador are not parties (the list is not exhaustive):

- Convention on Long-range Transboundary Air Pollution, Geneva, 13 November 1979;[819]
- United Nations Convention on the Law of the Sea, Montego Bay, 10 December 1982;[820]
- Convention on Environmental Impact Assessment in a Transboundary Context, Espoo, Finland, 25 February 1991;[821]
- Convention on the Protection and Use of Transboundary Watercourses and International Lakes, Helsinki, 17 March 1992; [822]
- UN Convention on the Law of Non-Navigational Uses of International Watercourses, New York, 21 May 1997;[823]

Thus, in 2001, the Andean countries -Ecuador included- were in agreement with having aerial eradication in the countries that needed it, and went no further than to recommend that such countries "keep in mind" whatever environmental standards were set by their own domestic authorities.

[819] 1302 UNTS 217 (a UN ECE Convention); neither Ecuador nor Colombia eligible to be parties.

[820] 1833 UNTS 3; Colombia not a party.

[821] 1989 UNTS 309 (a UN ECE Convention); neither Ecuador nor Colombia eligible to be parties.

[822] 1936 UNTS 269 (a UN ECE Convention); neither Ecuador nor Colombia eligible to be parties.

[823] A/51/869 (not yet in force); neither Ecuador nor Colombia a party.

- Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters, Aarhus, 25 June 1998.[824]

8.9. On the other hand Ecuador fails to have proper regard for the treaties to which Ecuador is a party, notably the 1988 Narcotics Convention, and it assumes without demonstration that the standards for Colombia's eradication program are to be derived from non-binding texts (notably the ILC Draft Articles on Prevention of Transboundary Harm from Hazardous Activities of 2001), rather than the relevant treaty between the Parties. It is necessary to say something in turn about each of these points.

(2) THE SIGNIFICANCE OF THE 1988 NARCOTICS CONVENTION

8.10. Ecuador relies on the 1988 Convention for jurisdiction,[825] but it systematically ignores the implications of the Convention for the present case. The purpose of the Convention is stated in Article 2(1) as follows:

> "1. The purpose of this Convention is to promote co-operation among the Parties so that they may address more effectively the various aspects of illicit traffic in narcotic drugs and psychotropic substances having an international

[824] 2161 UNTS 447 (a UN ECE Convention); neither Ecuador nor Colombia eligible to be parties.

[825] EM, paras. 4.15-4.21.

> dimension. In carrying out their obligations under the Convention, the Parties shall take necessary measures, including legislative and administrative measures, in conformity with the fundamental provisions of their respective domestic legislative systems."

The emphasis is on more effective measures of enforcement, building on the base of the earlier treaties of 1961 and 1971.

8.11. The 1988 Convention deals expressly with eradication programs in Article 14(1)-(3). These provide:

> "1. Any measures taken pursuant to this Convention by Parties shall not be less stringent than the provisions applicable to the eradication of illicit cultivation of plants containing narcotic and psychotropic substances and to the elimination of illicit demand for narcotic drugs and psychotropic substances under the provisions of the 1961 Convention, the 1961 Convention as amended and the 1971 Convention.
>
> 2. Each Party shall take appropriate measures to prevent illicit cultivation of and to eradicate plants containing narcotic or psychotropic substances, such as opium poppy, coca bush and cannabis plants, cultivated illicitly in its territory. The measures adopted shall respect fundamental human rights and shall take due account of traditional licit uses, where there is historic evidence of such use, as well as the protection of the environment.
>
> 3. a) The Parties may co-operate to increase the effectiveness of eradication efforts. Such co-operation may, *inter alia*, include support, when appropriate, for integrated rural development leading to

> economically viable alternatives to illicit cultivation. Factors such as access to markets, the availability of resources and prevailing socio-economic conditions should be taken into account before such rural development programmes are implemented. The Parties may agree on any other appropriate measures of co-operation.
>
> b) The Parties shall also facilitate the exchange of scientific and technical information and the conduct of research concerning eradication.
>
> c) Whenever they have common frontiers, the Parties shall seek to co-operate in eradication programmes in their respective areas along those frontiers."

8.12. Ecuador reads Article 14(2) as incorporating by reference the corpus of international law rules, including treaty rules, concerning human rights and the environment, irrespective of whether Colombia is a party to those treaties.[826] But there are fundamental problems with such a reading of Article 14(2).

8.13. First, the 1988 Convention is neither a human rights treaty nor an environmental treaty, still less one for the protection of indigenous rights.[827] Rather its concern is that

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[826] Cf. EM, para. 9.11 ("imported directly into the present dispute"). See also EM, paras. 8.71-8.79.

[827] For the Convention's emphasis on effectiveness, see e.g. preambular paras. 4, 6, 7, 15, 16, Arts. 2(1), 3(6), 5(1), 7, 9(1), 14(3)(a), 24.

measures taken should be efficient and adapted to reducing the growing traffic in illicit drugs. Under Article 24:

> "A Party may adopt more strict or severe measures than those provided by this Convention if, *in its opinion*, such measures are desirable or necessary for the prevention or suppression of illicit traffic." (emphasis added)

Under Article 25:

> "The provisions of this Convention shall not derogate from any rights enjoyed or obligations undertaken by Parties to this Convention under the 1961 Convention, the 1961 Convention as amended and the 1971 Convention."

Neither under Article 24, nor under the 1961 and 1971 Conventions whose effect is preserved by Article 25, is there any provision even arguably incorporating human rights, indigenous rights or environmental obligations. A State accused of disregard for those obligations in taking some measure could simply say that it did so pursuant to the permission in Article 24, or the saving clause in Article 25. Colombia relies on both Article 24 and 25. In its opinion the aerial spraying program is "desirable or necessary for the prevention or suppression of illicit traffic". Furthermore it has a right to conduct the program on its territory pursuant to the 1961 Convention (to which both States are parties).[828] By contrast Ecuador's interpretation of

[828] Art. 26(2) of the 1961 Convention provides, *inter alia*, that the parties "shall destroy the coca bushes if illegally cultivated": see Single Convention on Narcotic Drugs, New York, 30 March 1961: 976 UNTS 105.

Article 14(2) is incoherent because it ignores Articles 24 and 25 of the 1988 Convention.

8.14. Furthermore there is no reference to human rights (still less any incorporation of human rights obligations) in other provisions of the 1988 Convention where such rights are more obviously relevant than they are in the context of Article 14(2). This is true, for example of Articles 3 (offences and sanctions), 5 (forfeiture), 6 (extradition) and 7 (mutual legal assistance). When the drafters of the Convention wished to take into account human rights considerations, they did so expressly, not by reference (e.g. in Articles 6(6) (discriminatory prosecution), 7(18) (certain protections of witnesses) and 17(5) (boarding at sea)). In general the Convention displays a pronounced deference to domestic law and jurisdiction, even in relation to those matters which might directly implicate human rights.[829]

8.15. Ecuador misrepresents the actual language of Article 14(2) by disregarding its syntax. Ecuador argues that:

> "it seems clear that the phrase 'respect for fundamental human rights ... as well as protection of the environment' used in Article 14(2) is intended to incorporate the relevant requirements of international environmental law [...] and with respect to human rights [...]".

[829] For the 1988 Convention's deference to domestic law and jurisdiction, see e.g. Arts. 2(3), 3(1)(c), 3(2), 3(9), 3(11), 4(3), 5(5)(a), 7(5)(c), 9(1)(c).

The relevant part of Article 14(2) reads:

> "The measures adopted shall respect fundamental human rights and shall take due account of traditional licit uses, where there is historic evidence of such use, as well as the protection of the environment."

Ecuador's ellipsis between the references to "fundamental human rights" and "protection of the environment" does violence to the actual language of the provision. On normal syntactical principles, the verb "respect" qualifies only "fundamental human rights", while "protection of the environment" is governed by the words "take due account of", which also applies to "traditional licit uses". Further, the words "as well as" connect "protection of the environment" to "traditional licit uses", rather than to "respect for fundamental human rights". The correct shortening of Article 14(2) should read "respect human rights and take due account of ... the protection of the environment".[830]

8.16. Ecuador further argues that the Court should adopt an "evolutionary interpretation" of Article 14(2) of the 1988 UN Narcotics Convention, so as to take account of intervening developments in international human rights and environmental law in the period since its adoption.[831] But "evolutionary interpretation" is not a principle which permits modification of

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[830] The same formulation is reflected in the French and Spanish texts of Art. 14(2).

[831] EM, paras. 8.75-8.77.

the essential effect of a provision; at most, it allows account to be taken of changes in the law, especially in the case of treaties of long standing. The 1988 Treaty represents current international policy on cooperation in the fight against drugs, and it expressly requires eradication programs, subject to certain safeguards. Ecuador exaggerates the extent and meaning of the safeguards and completely ignores the point of the provision, which is the effective eradication of illicit crops, a process in which, pursuant to Article 14(3)(d), it should itself have cooperated.

8.17. Ecuador also refers to the declaration made by Colombia on ratifying the 1988 Convention,[832] which it deems significant as "reflecting Colombia's recognition of the importance given to the protection of the environment and the rights of indigenous communities in the context of drug control".[833] Colombia's concern in making that declaration was, *inter alia*, to maintain a balance between criminalisation of coca cultivation and "a policy of alternative development, taking into account the rights of the indigenous communities involved and the protection of the environment". As demonstrated, Colombia does indeed maintain a policy of alternative development, and a concern for the protection of the environment.[834]

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832 EM, para. 4.17.
833 EM, para. 4.17.
834 See above, paras. 4.8-4.14, 4.35, 4.38-4.39.

8.18. A final reason why Ecuador's incorporationist interpretation of Article 14(2) cannot work is that it gives no guidance at all as to which treaties are incorporated by reference. Given that this is a multilateral treaty, they cannot be confined to treaties to which both Ecuador and Colombia are parties (or were parties at some point in time). Yet it cannot be supposed that the parties to the 1988 Convention, by a side-wind in Article 14(2), committed themselves to a whole range of new treaty obligations in the field of human rights and the environment. The natural interpretation of Article 14(2) is that general respect for human rights and the environment is called for in the context of the required eradication measures. Again, there is no basis for suggesting that Colombia or its officials did not comply with that obligation.

(3) THE 2001 ILC DRAFT ARTICLES ON PREVENTION OF TRANSBOUNDARY HARM FROM HAZARDOUS ACTIVITIES

8.19. In its Memorial, Ecuador relies heavily on the ILC Draft Articles on Prevention of Transboundary Harm from Hazardous Activities of 2001 (hereafter the ILC Prevention Draft Articles).[835] Particular issues concerning the ILC Draft Articles will be dealt with in Section D of this Chapter as they arise. But two general points should be made here, concerning first the

[835] See generally EM, Ch. VIII. The ILC's Prevention Articles are relied on in paras. 8.5, 8.6, 8.11, 8.14, 8.16, 8.18, 8.19, 8.25, 8.26, 8.27, 8.31, 8.38, 8.39, 8.43, 8.44, 8.47, 8.56, 8.67, 8.68.

reception of the Articles, and second, their application in principle in this case.

8.20. The ILC Prevention Draft Articles – and their counterpart text, the Draft Principles on the Allocation of Loss in the Case of Transboundary Harm rising out of Hazardous Activities of 2006[836] – are the product of a long and difficult evolution in the ILC, as is well-known. The 2006 Articles do not even purport to be anything other than an exercise in progressive development.[837] But there are at least four indications that much the same is true of the ILC Draft Prevention Articles.

8.21. The first indication is that in the ILC's debates in 2001, few speakers expressed the view that the Articles were reflective of general international law.[838] Responding to criticisms of the text the Special Rapporteur (P.R. Rao) noted that "[m]any States had also indicated that non-discrimination, information to the public and other aspects of emergency preparedness were elements of progressive development, rather than current

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[836] Report of the ILC on the Work of its 58th Session, A/61/10 (2006), p, 106 ff.

[837] See, in particular, the General Commentary to the Draft Principles, Report of the ILC on the Work of its 58th Session, A/61/10 (2006), pp. 110-114, in particular at 113 (para. 11): " As the draft principles are general and residuary in character they are cast as a non-binding declaration of draft principles."

[838] See 2675th Meeting, 11 May 2001; *ILC Yearbook 2001*, vol. I, p. 58 et seq.

practice in international law."[839] Professor Brownlie, with characteristic pungency, stated:

> "the draft was not about transboundary harm, but about the management of risk. It was in effect a new subject, and one that had proved difficult to deal with. As many members who had refrained from taking the floor at the current meeting were aware, the draft was creative, and in certain respects, indeed, radical."[840]

8.22. Second, the ILC's intention was that the Articles should form the basis for the elaboration of a convention,[841] and they are accordingly drafted in treaty form. In those circumstances, the wording used is naturally imperative, but this does not mean that any particular provision represents codification or rather constitutes an exercise in progressive development.

8.23. The third indication relates to the lukewarm reception accorded to the Draft Articles in the debate in the General Assembly's Sixth Committee in 2001. In the debate on the Draft Articles, 30 States made comments, representing the views of a total of 34 States.[842] No consensus position emerged, other

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[839] *Ibid.*, 66 (para. 55).

[840] *Ibid.,* para. 58.

[841] Report of the ILC on the Work of its 53rd Session, Yearbook of the ILC, Vol. II(2), p. 145 (para. 94).

[842] The statement by Sweden (A/C.6/56/SR.17, paras. 18-21) was also made on behalf of the other Nordic countries (Denmark, Finland, Iceland and Norway).

than to await results of the ILC's work on liability.[843] A few delegations (Netherlands, Mexico, Australia) expressed the view that the draft Articles "broadly reflected customary international law",[844] but most reserved their position. Some States, including Colombia, limited themselves to expressing the view that there exists an obligation of due diligence to prevent or minimize transboundary harm.[845]

8.24. The fourth indication is the even more lukewarm debate in the Sixth Committee in 2007. In 2006, the General Assembly by Resolution 61/36 took note of the ILC's draft principles on allocation of loss,[846] and resolved to include the topic of "Consideration of prevention of transboundary harm from hazardous activities and allocation of loss in the case of such harm" on the agenda of the next session. In 2007, both ILC texts were discussed: 14 States made statements, representing a total of 20 States.[847] There was little support for a general

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843 A/C.6/56/SR.11, A/C.6/56/SR.12, A/C.6/56/SR.13, A/C.6/56/SR.14, A/C.6/56/SR.15, A/C.6/56/SR.16, A/C.6/56/SR.17, A/C.6/56/SR.18, A/C.6/56/SR.22, A/C.6/56/SR.23, A/C.6/56/SR.24. A decision on further action was postponed: Resolution 56/82, A/RES/56/82 (the general Resolution on the Work of the ILC at its 53rd Session), para. 3.

844 See A/C.6/56/SR.16, para. 101 (Netherlands).

845 A/C.6/56/SR.16, para. 42 ("with regard to the fulfilment of the obligation of due diligence, which governed the principle of prevention, special consideration should be paid to the socioeconomic development of the parties, the scientific and technological facilities available and the practical realities of the context in which activities liable to cause transboundary harm were carried out").

846 A/RES/61/36, para. 2.

847 The statement made by New Zealand was made on behalf of the CANZ countries (Australia, and Canada): A/C.6/62/SR.12, paras. 12-15;

convention on either subject. China described the work of ILC on transboundary harm as "good examples of the progressive development of the relevant rules of international law".[848] The United States said that "both texts went beyond the current state of international law and practice. Both were designed to encourage national and international action in specific contexts rather than form the basis of a global treaty."[849] Although Japan expressly stated that "the obligation of prevention per se had become a part of customary international law", it also stated that Articles 6 and 12 as to prior authorization and exchange of information could not be said to be a codification of custom.[850] In the result the General Assembly commended the articles "to the attention of Governments, without prejudice to any future action", and postponed further debate until 2010.[851]

8.25. As regards the debates in both 2001 and 2007, it should be borne in mind that the Sixth Committee was concerned with the question whether the Articles should form the basis of a treaty. The occasional statements expressing the view that particular provisions should be strengthened, cannot, in the absence of a clear statement to that effect, be read as an

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Norway spoke on behalf of the other Nordic countries (Denmark, Finland, Iceland and Sweden): *Ibid.*, para. 16.

848 *Ibid.*, para. 21.

849 *Ibid.*, para. 29.

850 *Ibid.*, para. 36.

851 General Assembly Resolution 62/68, A/RES/62/68 ("Consideration of prevention of transboundary harm from hazardous activities and allocation of loss in the case of such harm"), paras. 3 and 6.

expression of opinion as to the content of customary international law or the extent to which the Articles accurately codify it. Rather they may be taken as relating to the need to ensure the effectiveness of any eventual treaty.

8.26. The fifth indication is the discrepancy between the formulations in the ILC Draft Articles of 2001 and the Court's own formulation of the position in *Threat or Use of Nuclear Weapons*, cited in paragraph 8.1 above. The Court did not articulate a category of "hazardous activity" but confined itself to affirming a general obligation to "respect the environment of other States".

8.27. Against this background there is no warrant for Ecuador to assume that the ILC's Prevention Draft Articles of 2001 reflect customary international law *en tant que tel*. But the Articles are important in helping to show the limits of the law: in light of the Court's formulation, provisions of the ILC Articles purporting to impose specific obligations can be assumed *not* to reflect custom. *A fortiori*, Ecuadorian arguments which would take the position still further must be rejected.

8.28. But even if, for the sake of argument, the ILC Articles were taken to reflect the existing state of international law, they would not apply to the aerial spraying program. Both the 2001 Prevention Articles and the Draft principles on allocation of loss

of 2006 are limited to "hazardous activities".[852] This is further qualified by Article 2(a), which defines "Risk of causing significant transboundary harm" to include "risks taking the form of a high probability of causing significant transboundary harm and a low probability of causing disastrous transboundary harm;".[853] It must be stressed that the ILC Articles do not proceed by deeming specific activities or classes of activities to be "hazardous"; the idea of a list of activities was expressly rejected.[854] Therefore the question is whether the *particular* activity, with its specific characteristics, meets one of the two criteria – "a high probability of causing significant transboundary harm" or "a low probability of causing disastrous transboundary harm". In the present case, for the reasons stated in Chapter 7, the spraying program meets neither of these criteria. There is no possibility of aerial spraying in Colombia causing "disastrous transboundary harm" in Ecuador, so the second criterion does not apply. Nor is there even "a high probability of causing significant transboundary harm" in Ecuador. The consequence is that, whatever their status, the ILC Prevention Draft Articles do not apply in the present case.

8.29. What does apply, after the two major treaties to which Colombia is a party have been taken into account, is the general

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[852] See Commentary to Art. 1, para. (2): ILC *Yearbook*. 2001, Vol. II (2) 149.

[853] *Ibid.*, 151-152, and see Commentary, paras. (3), (4).

[854] See Commentary to Art. 1, para. (3): ILC *Yearbook*. 2001, Vol. II (2) 149.

obligation of respect which the Court endorsed in *Legality of the Threat or Use of Nuclear Weapons*, cited already. Colombia certainly complied with that general obligation, as will be further demonstrated in this Chapter.

8.30. In the interests of responsiveness, Colombia will however deal, in Section D below, with Ecuador's arguments based on the ILC's Prevention Draft Articles. Nothing said in that discussion should be taken as an acceptance that the Prevention Draft Articles apply in terms of the present dispute.

C. Ecuador's Claim of Breach of Sovereignty

8.31. First, however, it is convenient to deal with Ecuador's arguments of breach of sovereignty. These are elaborated in Chapter VII of the Memorial. Essentially there are three complaints: (a) aerial spraying which results in the deposit of any detectable amount of the spray mixture on Ecuador's territory is a breach of its sovereignty; (b) aerial spraying which causes harm to Ecuador, its citizens or its environment is a breach of its sovereignty; (c) unauthorised overflight is a breach of its sovereignty. The first two points are connected and will be dealt with together.

(1) TRANSBOUNDARY EFFECTS AS A *PER SE* BREACH

8.32. In its Memorial, Ecuador argues that the "deposit of toxic herbicides on the territory of Ecuador (as well as their

dispersion in Ecuador's airspace) in quantities that are significant and harmful" is a violation of its sovereignty.[855] But – subject to questions about the threshold of significant harm – this aspect of the case is already covered by the obligation under general international law to exercise all due diligence not to cause to another State significant, proven, transboundary harm.[856] To describe the causing of such harm as a breach of sovereignty does nothing to further the analysis.

8.33. Ecuador relies in this context on Article 2(2) of the 1988 Narcotics Convention, which provides:

> "2. The Parties shall carry out their obligations under this Convention in a manner consistent with the principles of sovereign equality and territorial integrity of States and that of non-intervention in the domestic affairs of other States."

But the references in Article 2 to the principles of "sovereign equality and territorial integrity of States" and of "non-intervention in the domestic affairs of other States" do not have the effect of imposing any additional substantive obligations on the States Parties to the 1988 Convention. Rather, the ordinary meaning of the formulation used ("carry out their obligations […] in a manner consistent with") indicates that reference is made to those principles in order to define the way in which the

855 EM, para. 7.1.
856 See Section D below.

substantive obligations under the Convention are to be carried out, and in fixing the outer limits of those obligations.

8.34. However, Ecuador also seems to put its case in another way. It argues that:

> "Colombia's actions have violated Ecuador's right to determine for itself what acts may take place within its territory, and in particular Ecuador's right to determine the level and nature of any harmful pollution to which its territory, people and natural resources will be exposed. The spraying and drift of herbicides onto the territory and natural resources of Ecuador further violate Ecuador's permanent sovereignty over its natural and biological resources."[857]

8.35. This appears to be a claim that no detectable or measurable trace of the spray mix, no matter how small, should be allowed to enter Ecuador's waters, airspace or land territory. Such a claim would indeed be based on sovereignty. Indeed it would be a hermetic kind of sovereignty, the sovereignty of a King Canute, one which claims 100% national control over the environment within a State's territory. On this view, Colombia must refrain from the exercise of its own sovereignty on its own territory (elimination of illicit coca plantings) in order to ensure the absolute freedom of Ecuadorian territory from any trace of Colombian activity, whether or not any significant harm is caused. But it has long since been pointed out that where more

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[857] EM, para. 7.2.

than one sovereignty is engaged, reconciliation of conflicting interests is to be achieved, in general terms, by reference to considerations of reasonableness and proportionality.[858] This is the balance that the law relating to transboundary harm seeks to strike, in the context of alleged transboundary air pollution as much as of transboundary rivers. To use the term "sovereignty" to strike another balance, more favourable to the downwind or downstream State, is to beg the question.

8.36. Ecuador cites the Australian Memorial in the *Nuclear Tests* cases as authority for the proposition that a State is free to decide that no amount of any toxic substance should be deposited on its territory, however non-toxic the amount deposited may be.[859] And it implies that, through the combination of the provisional measures order and its final disposition of the two cases, the Court showed sympathy towards the "absolute exclusion" view.[860]

8.37. In fact what the Court said at the provisional measures phase of both cases was that:

> "Whereas for the purpose of the present proceedings it suffices to observe that the information submitted to the Court, including Reports of the United Nations Scientific

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[858] Cf. the approach of the Tribunal in the *Lac Lanoux* case, (1957) 12 UNRIAA 285, 315-316.

[859] EM, para. 7.9 ("independent right to determine what acts shall take place within its territory").

[860] EM, para. 7.10.

> Committee on the Effects of Atomic Radiation between 1958 and 1972, does not exclude the possibility that damage to Australia [New Zealand] might be shown to be caused by the deposit on Australian [New Zealand] territory of radio-active fall-out resulting from such tests and to be irreparable;"[861]

This does not imply that damage need not be shown in order to establish responsibility in the context of transboundary effects.

8.38. Nor do the Court's subsequent decisions in these cases add anything on this point.[862]

8.39. In any event the *Nuclear Test* cases concerned long-distance radioactive fallout from atmospheric nuclear testing, a very different proposition than incidental and marginal spray drift from lawful activities in the fight against illicit drugs. There are many uncertainties about the effects of radioactivity, and no "safe" dose. The radioactive elements concerned have a long half-life and the illnesses they appear to cause (the chain of causation is undetectable and unpreventable) are initially difficult to detect and expensive to treat. In all these respects, glyphosate and Cosmoflux are different: they have a half-life measured in days, they do not bioaccumulate, they present no disposal problem, they have minimal toxicity to humans and

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[861] Australia v France, Interim Measures of Protection, ICJ Reports 1973, p. 105, para. 29; to the same effect, New Zealand v. France, Interim Measures of Protection, ICJ Reports 1973, p. 141, para. 30.

[862] Cf. EM, para 7.10, citing New Zealand v. France, Judgment, ICJ Reports 1973, p. 457.

animals in the quantities used, and the minor irritation that direct exposure to spray may cause is obvious (principally mild irritation in the eyes or skin), temporary and easily treated.

8.40. For these and other reasons, there is no duty based on the principle of sovereignty not to cause any change at all in the chemical composition of the waters or atmosphere of a neighbouring State, and to the extent Ecuador suggests otherwise its position should be rejected.[863]

(2) OTHER ALLEGED BREACHES OF SOVEREIGNTY

8.41. Finally under this rubric, Ecuador refers to "instances of direct overflight into the airspace of Ecuador", to which it has never consented.[864]

8.42. In the absence of a treaty or other consensual arrangement, or when specific circumstances recognized under international law are not present, overflight of a State's territory would breach the sovereignty of the State which is overflown.[865]

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[863] To similar effect see ILC Prevention Articles, commentary to Art. 2, para. (5):

> "The ecological unity of the planet does not correspond to political boundaries. In carrying out lawful activities within their own territories, States have impacts on each other. These mutual impacts, so long as they have not reached the level of 'significant', are considered tolerable."

In ILC *Yearbook* 2001 Vol II Part 2, 152.

[864] EM, para 7.17.

[865] Cf. *Convention on International Civil Aviation*, Chicago, 7 December 1944 (as subsequently amended), ICAO Doc. 7300/9, Arts. 3-5.

A fortiori so would unauthorised aerial spraying actually conducted on another State's territory. Colombia does not claim otherwise.

8.43. It should be stressed that, even in relation to the period before 2004, Ecuador does not give any particularised examples of overflight, still less does it substantiate that any actual harm occurred as a result. As a result of enhanced technology introduced in 2004, as well as greater experience in conducting the program, the possibility of occasional error – if it ever occurred – in this regard has greatly diminished.

8.44. It may be observed that Ecuadorian agents seem to have entered Colombian territory, *inter alia*, with a view to taking statements from the Colombian witnesses included in its Memorial.[866] Colombia did not consent to this. The process of taking evidence on foreign territory is a breach of sovereignty.[867]

D. Ecuador's Claim concerning Non-Prevention of Transboundary Harm

8.45. The exposition of Ecuador's claims as regards transboundary harm is contained in Chapter VIII of the

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[866] See also the Ecuadorian admissions that its officials have entered Colombian territory to seek evidence in relation to the sprayings on at least two occasions: EM, paras. 6.14 and 6.15.

[867] *In re Westinghouse Electric Corporation* [1978] A.C. 547, 616 (Lord Wilberforce); 639-640 (Lord Diplock).

Memorial; these claims form the heart of the case. Ecuador's claims in that regard are grouped under essentially three headings, namely:

(1) breach of the obligation to prevent transboundary harm;

(2) breach of obligations of cooperation in relation to management of transboundary effects of spraying (including failure adequately to assess potential impacts of spraying; failure to inform and consult; and failure to cooperate in management of transboundary risks).

(3) failure to cooperate in relation to respect for the protection of the environment, in breach of Article 14(2) of the 1988 Narcotics Convention.

(1) PREVENTION OF TRANSBOUNDARY HARM

(a) Overview of Ecuador's arguments

8.46. Section I of Chapter 8 sets out Ecuador's arguments in relation to the obligation to prevent transboundary harm. The obligation to prevent transboundary harm is argued to exist not only as a matter of general international law, but is also argued to be "imported directly into these proceedings" by Article 14(2) of the 1988 Narcotics Convention.[868] This interpretation of the

[868] EM, para. 8.1; see also *Ibid.*, para. 8.2.

effect of Article 14(2) has already been discussed and rejected.[869]

8.47. Ecuador argues that Colombia has breached the posited obligation to prevent transboundary harm by:

- causing or failing to prevent spraying causing significant harm to persons, property, natural resources and the environment in Ecuador;
- failing to take precautionary measures to prevent and control the alleged harmful effects of spraying on the health, livelihood, private and family life and property of persons within Ecuador;
- failing to take precautionary measures to prevent and control the alleged harmful effects of spraying on the environment and natural resources within the territory of Ecuador.[870]

It may be noted that the second and third categories of alleged breach in fact concern the same breach, but in relation to different alleged harms; the reason would appear to be in order to allow the recycling of the claims as regards human rights arguments also under the heading of transboundary harm.

8.48. Ecuador seeks to preempt any argument of countervailing benefit, or that Colombia's obligations under the

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869 See above, paras. 8.11-8.18.

870 EM, para. 8.9.

1988 Narcotics Convention justify its alleged failure to take precautionary measures. It argues that spraying has not resulted in an overall reduction of coca production, and that other effective means of eradication, including manual eradication are available. It is accordingly argued that the harm to Ecuador outweighs any benefit to Colombia and that the lack of proportionality violates the equitable balance of interests required by Article 10 of the Draft Articles on Prevention.[871]

(b) Colombia's response: preliminary remarks

8.49. Colombia's principal response to all of this is straightforward. The spraying program on Colombian territory did not cause the harm attributed to it by Ecuador, or anything remotely like it. Indeed, it has not been shown to have *caused* any harm at all to Ecuador or its nationals. Moreover, Colombia took reasonable precautions, monitored the program throughout, modified it in light of further information (e.g. in 2004), and sponsored further scientific work on its impacts. In light of the substantial body of knowledge about glyphosate as a Class III substance (i.e. mildly toxic) already existing in 2000, Colombia was entitled to proceed with the spraying program in 2000. Subsequent studies, including in particular CICAD I and CICAD II confirm that Colombia was and remains entitled to continue its spraying program. The factual and scientific evidence underlying this response was dealt with

[871] See EM, para. 8.31.

comprehensively in Chapter 7 above. The following remarks are made without prejudice to that basic contention.

(c) The due diligence obligation of prevention

8.50. As already stated, Colombia accepts the Court's conclusion in the *Nuclear Weapons* Advisory Opinion that the general obligation of States "to ensure that activities within their jurisdiction and control respect the environment of other States or of areas beyond national control is now part of the corpus of international law relating to the environment."[872] But this is an obligation of means and not of result; it is an obligation of due diligence, not a form of strict liability.

8.51. This point was expressly accepted by the ILC in adopting the Draft Articles on Prevention of Transboundary Harm for Hazardous Activities on 2001. It is reflected in Article 3 of that text which provides simply that:

> "The State of origin shall take all appropriate measures to prevent significant transboundary harm or at any event to minimize the risk thereof."[873]

The commentary notes that:

> "The obligation of the State of origin to take preventive or minimization measures is one of due diligence. It is the conduct of the State of origin that will determine whether the State has

[872] Legality of the Threat or Use of Nuclear Weapons, Advisory Opinion, ICJ Reports 1996, pp. 241-242, para 29, relied on in EM, para. 8.3.
[873] ILC *Yearbook 2001* Vol II Part 2, 153.

> complied with its obligation under the present articles. The duty of due diligence involved, however, is not intended to guarantee that significant harm be totally prevented, if it is not possible to do so. In that eventuality, the State of origin is required … to exert its best possible efforts to minimize the risk. In this sense, it does not guarantee that the harm would not occur."[874]

8.52. As to the standard of due diligence, the commentary concludes:

> "The standard of due diligence against which the conduct of the State of origin should be examined is that which is generally considered to be appropriate and proportional to the degree of risk of transboundary harm in the particular instance. [...] Issues such as the size of the operation; its location, special climate conditions, materials used in the activity, and whether the conclusions drawn from the application of these factors in a specific case are reasonable, are among the factors to be considered in determining the due diligence requirement in each instance. […] [D]ue diligence in ensuring safety requires a State to keep abreast of technological changes and scientific developments."[875]

8.53. By contrast, Ecuador, having referred to the Commentary to Article 3 of the Draft Articles on Prevention as

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[874] ILC *Yearbook 2001* Vol II Part 2, 154, commentary to Art. 3, para. (7).

[875] ILC *Yearbook 2001* Vol II Part 2, 154, commentary to Art. 3, para. (11).

to the standard of due diligence,[876] seeks to transform it into a virtual guarantee. Representative is the following passage:

> "it is clear that a very high standard of care is called for when inherently hazardous activities such as aerial spraying of toxic herbicides are undertaken. The only appropriate standard of care in the circumstances of the present case is one that *eliminates all risk* of transboundary pollution caused by overflight or drift."[877]

For convenience this will be referred to as the "absolute prevention" thesis. It calls for a number of comments.

8.54. First, this passage confuses overflight and drift. Overflight has nothing to do with situations of transboundary harm, as has been seen; nor is the obligation not to fly without permission into the airspace of another State a matter of due diligence.[878]

8.55. As to drift, Ecuador articulates its "absolute prevention" thesis for the category of activity "aerial spraying of toxic herbicides", and it does so in the face of strong scientific evidence both as to toxicity and drift, which was summarised in the previous chapter. But as the ILC commentary makes clear, the standard is one of reasonableness in the *particular*

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[876] EM, para. 8.26 citing ILC *Yearbook 2001* Vol II(2), 154, commentary to Art. 3, para. (11).

[877] EM, para. 8.27 (emphasis added). See also EM, para. 8.29: "Colombia has a duty *to make certain* that transboundary pollution cannot and does not occur" (emphasis added).

[878] See above, para.8.42.

circumstances. Further, there is no basis for the suggestion that aerial spraying in Colombia was an inherently hazardous activity so far as concerns persons or the environment across the border in Ecuador (this was not the case even within Colombia). The information available – regularly updated – indicated no or none insignificant risk of deposition of the spray mixture in Ecuador.

8.56. Ecuador seeks to support its "absolute prevention" thesis by reference to the observation of the Court in *Gabčíkovo-Nagymaros Project* that:

> "in the field of environmental protection, vigilance and prevention are required on account of the often irreversible character of damage to the environment and of the limitations inherent in the very mechanism of reparation of this type of damage."[879]

But "vigilance and prevention" do not entail the elimination of all risk whatever. Moreover the spray mix does not cause "irreversible damage" to the environment, certainly it does not do so in Colombia (where the spraying actually occurs and where it is carefully monitored); it is biodegradable and disappears as harmless metabolites in the soil within weeks. However, the Court's dictum in *Nuclear Weapons*, a year earlier, is phrased solely in terms of an obligation to ensure "respect" for the environment of other States, and the word was

[879] EM, para. 8.27, citing Gabčíkovo-Nagymaros Project (Hungary/Slovakia), Judgment, ICJ Reports 1997, p. 78, para. 140.

no doubt carefully chosen. It is clear that the Court did not intend to establish a standard in which all risk of harm was excluded.

8.57. Ecuador's reliance on the precautionary principle does not take things further. The precautionary principle does not constitute as such an international obligation; it is usually formulated by international tribunals in adjectival terms, and as an "approach" rather than a "principle". It may be seen as providing guidance as to how States should conduct themselves in matters concerning sustainable development.[880] There is no reason to think that it modifies the substantive law as concerns transboundary harm. The authorities relied upon by Ecuador as supporting the contrary view either concerned the interpretation of specific treaty-based obligations of prevention, or of EU legislation in environmental matters which imposes specific obligations of prevention.

8.58. Ecuador refers to Article 14(1)(d) of the 1992 Convention on Biological Diversity, although it does not as such appear to argue that spraying violates that provision.[881] In any

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[880] Cf. EM, para. 8.18: "The precautionary principle has become one of the central concepts for *organising, influencing and interpreting* contemporary international environmental law and policy" (emphasis added).

[881] See EM, para. 8.25; see also *Ibid.*, para. 8.36, fn. 670. Cf. the later references to the 1992 Biological Diversity Convention in the context of the claim as to the alleged failure to assess risk from the spraying, discussed below, paras. 8.69-8.72: see in particular, EM, paras. 8.51-8.52 cf. *Ibid.*, 8.54.

case, the scope of the obligation imposed by Article 14(1)(d) is overlooked. It provides:

> "1. Each Contracting Party, as far as possible and as appropriate, shall:
>
> […]
>
> (d) In the case of imminent or grave danger or damage, originating under its jurisdiction or control, to biological diversity within the area under jurisdiction of other States or in areas beyond the limits of national jurisdiction, notify immediately the potentially affected States of such danger or damage, as well as initiate action to prevent or minimize such danger or damage."

Quite apart from the qualification ("as far as possible and as appropriate"), the obligation only applies in cases of "imminent or grave danger or damage", and it is an obligation "to prevent *or minimize* such danger or damage." It does not support Ecuador's "absolute prevention" thesis.

8.59. To summarise, it may be accepted that the State of origin has an obligation of due diligence, i.e., to take all appropriate measures to prevent significant harm or at least to minimize the risk of such harm (and Colombia did adopt such measures). But Colombia is not required to "eliminate [...] all risk of transboundary pollution caused by [...] drift".[882]

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[882] Cf. EM, para. 8.27.

(d) Colombia complied with the obligation of prevention

8.60. As has been demonstrated in earlier Chapters, Colombia has exercised due diligence throughout in establishing and implementing the aerial spraying program. The following points are relevant:

(1) The program is conducted on the basis of an Environmental Management Plan prepared under the relevant Colombian law;[883]

(2) An integral part of the program is the use of modern equipment and technology, including GPS and computerised mapping;[884]

(3) The composition of the spray mixture is public and is kept under review (an improved version was adopted in 2004);[885]

(4) There are strict parameters of aircraft height and speed, wind speed, buffer zones for rivers and human habitation, etc;[886]

(5) There is careful planning of each mission in accordance with these parameters;[887]

(6) Individual plots are sprayed once, at most twice, a year;[888]

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883 See above, paras. 4.8-4.14, 4.23-4.27.
884 See above, paras. 4.59-4.64.
885 See above, paras. 4.42-4.56.
886 See above, paras. 4.57-4.60.
887 See above, paras. 4.61-4.64.

(7) The program is subject to continuous scrutiny by the Ministry of the Environment[889] and also to external audit;[890]

(8) There has been continued scientific review of the program, in particular CICAD I (2005) and II (2009);[891]

(9) The National Health Institute monitors health effects of the program in Colombia and deals with complaints; it has not found any evidence of injury to humans arising from the spraying.[892]

8.61. For these reasons, Colombia has from the inception of the program acted with due diligence to prevent or minimize such transboundary harm as could result from aerial spraying of illicit coca plantations.

(2) OBLIGATIONS OF COOPERATION

8.62. In Chapter VIII, Section II, Ecuador alleges a number of breaches grouped under the heading of cooperation. In particular, it is alleged that the obligation of cooperation has been breached by:

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888 See above, para. 4.66.
889 See above, para. 4.26-4.27.
890 See above, para. 4.28-4.29.
891 See above, paras. 3.50-3.58, 4.15-4.19.
892 See above, paras. 7.64, 7.91.

(a) Colombia's failure to assess the potential transboundary effects of aerial spraying of herbicides on the territory, people and environment of Ecuador;

(b) Its failure to ensure that communities within Ecuador likely to be affected were informed and consulted; and

(c) Its failure to cooperate with Ecuador in the control of the transboundary risks arising from aerial spraying, *inter alia*, by refusing to share information as to the chemicals in use and their likely effects on public health and the environment.[893]

8.63. In that regard, it observes that "the obligation of States to cooperate through notification, consultation and negotiation permeates" the Draft Articles on Prevention and the 1992 Rio Declaration, and that the obligation is "clearly articulated in the *Lac Lanoux* arbitration as well as in various regional treaties", including the 1991 UNECE Convention on Environmental Impact Assessment in a Transboundary Context (the Espoo Convention).[894] Reference is made to Article 9 of the Draft Articles on Prevention as support for an obligation requiring

[893] EM, para. 8.40.
[894] EM, para. 8.38.

States "to cooperate in negotiating an equitable balance of interests".[895]

8.64. These alleged breaches falling under the umbrella of "cooperation" are conveniently examined separately, although the Memorial displays a certain tendency to allow the arguments to bleed into one another (and, indeed, into Ecuador's argument as to the obligation of prevention).

(a) Failure to assess potential transboundary effects

(i) Ecuador's claim

8.65. The first alleged breach relied upon by Ecuador under the heading of cooperation is the failure to assess the potential transboundary effects of the aerial spraying. In this regard, Ecuador portrays the obligation as one integrally linked to other alleged obligations to notify, consult and cooperate with neighbouring States, and to protect communities likely to be affected, stating that

> "Without an environmental impact assessment ('EIA') there can be no meaningful notification, consultation and cooperation with neighbouring States, nor can adequate steps be taken to protect communities likely to be affected."[896]

Ecuador alleges that Colombia failed properly to assess in advance the potential impact of the spraying on the territory,

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895 EM, para. 8.39.

896 EM, para. 8.41.

people, natural resources and environment of Ecuador, that it did not provide Ecuador with information as to the potential risks associated with spraying and that it did not inform or consult communities in Ecuador likely to be affected.[897]

8.66. It then baldly states that "[i]nternational law provides that activities likely to cause significant transboundary pollution or harm must be subject to EIA by the State in which these activities are to be conducted", relying in this regard on Article 7 of the Draft Articles on Prevention.[898]

(ii) Colombia's response

8.67. The EIA claim raises two questions: (a) what was Colombia required to do in 2000, or subsequently, in the matter of an EIA, and (b) what did it in fact do.

8.68. As to the first question, there is no equivalent to the Espoo Convention in Latin America. Among universal conventions, Article 206 of the Law of the Sea Convention (to which Colombia is not a Party) requires "assessment" of projects which may cause "substantial pollution of or significant and harmful changes to the marine environment", but only "as far as practicable".[899] This is a relatively high threshold, and

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897 EM, para. 8.41.

898 EM, para. 8.43.

899 N. Craik, *The International Law of Environmental Impact Assessment* (Cambridge: CUP, 2008) p.88 comments that the indeterminacy of Art. 206 "leaves States with a broad discretion".

even then the requirement is qualified by considerations of practicality.

8.69. The only treaty provision binding upon Colombia to which Ecuador refers in this context is Article 14(1) of the 1992 Convention on Biological Diversity,[900] which provides as follows:

> "1. Each Contracting Party, *as far as possible and as appropriate*, shall:
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> (a) Introduce *appropriate procedures* requiring environmental impact assessment of its proposed projects that are likely to have significant adverse effects on biological diversity with a view to avoiding or minimizing such effects and, where appropriate, allow for public participation in such procedures;
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> [...]
>
> (c) Promote, on the basis of reciprocity, notification, exchange of information and consultation on activities under their jurisdiction or control which are likely to significantly affect adversely the biological diversity of other States or areas beyond the limits of national jurisdiction, by encouraging the conclusion of bilateral, regional or multilateral arrangements, as appropriate;
>
> (d) In the case of imminent or grave danger or damage, originating under its jurisdiction or control, to biological diversity within the area under jurisdiction of other States or beyond the limits of national jurisdiction, notify immediately the potentially affected States of such danger or

[900] 1760 UNTS 79.

> damage, as well as initiate action to prevent or minimize such danger or damage; …" (emphasis added)

8.70. Apart from referring to Article 14 of the Convention on Biological Diversity, Ecuador does not suggest that Colombia was under any treaty obligation to conduct an EIA in 1999-2000 in relation to potential transboundary impacts of the spray program on Ecuador. Instead, such an obligation is apparently to be inferred from the ILC's Draft Articles on Prevention, the 1992 Rio Declaration, and on provisions of other, non-applicable treaties (notably the Espoo Convention); i.e. as a matter of customary international law.

8.71. Turning first to the Biodiversity Convention, Ecuador is understated in its reliance on Article 14; as noted above, it is not at all clear that Ecuador even alleges a breach of Article 14.[901] The reason is clear. The *chapeau* to paragraph (1) contains the qualifier "as far as possible and as appropriate". N. Craik

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[901] Above, para. 8.58. In the section relating to assessment, Ecuador limits itself to stating that "Information on the herbicide spraying programme should also have been made available to Ecuador in accordance with Article 14 of the 1992 Convention on Biological Diversity" and that "interpreted in accordance with the precautionary principle, and in the circumstances of the present dispute, compliance with all of these requirements was both 'possible and appropriate', within the terms of the chapeau to Article 14" (EM, para. 8.51). In the conclusions on the claim relating to the alleged failure to assess the potential transboundary effects of the spraying (EM, para. 8.54), Ecuador merely asserts that Colombia "should have carried out an EIA first, and communicated the results to Ecuador, in accordance with the requirements of international law set out above. In failing to do so it has violated its duty to assess transboundary risks, has failed to act with due diligence, and has failed to cooperate with Ecuador as required by international law." There is no allegation of breach of the 1992 Convention.

comments that this qualifier introduces "a degree of discretion inconsistent with a formal notion of bindingness".[902] Moreover, the scope of these provisions is distinctly limited. Article 14(1)(a) envisages "appropriate procedures" only in relation to projects likely to have "*significant adverse effects* on biological diversity". Article 14(1)(c) promotes notification, exchange of information and consultation in relation to activities "which are likely to *significantly affect adversely* the biological diversity of other States or areas beyond the limits of national jurisdiction", as to which it is expressly envisaged that performance will be achieved through the conclusion of bilateral regional or multilateral arrangements. Finally, the obligation of notification under Article 14(1)(d) is limited to "imminent or grave danger or damage [...] to biological diversity".

8.72. Ecuador asserts that the relevant obligations have been incorporated into Colombia's Environmental Code.[903] But the Memorial is misleading, and doubly so insofar as it misrepresents not only the terms of Colombia's Environmental Code but also the terms of the Biodiversity Convention. In relation to the suggestions that the Code provides for "'prior and reciprocal communication' with bordering States regarding actions taken in one State that may harm the environmental rights or interests of another State", the relevant provision of the Environmental Code relied upon is framed in exhortatory terms

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902 Craik, *op. cit.*

903 EM, para. 8.52.

(mirroring those of Article 14(1)(c)) of the 1992 Convention): it requires the Government "to seek to complement" existing international obligations, or to negotiate further agreements. Similarly, the suggestion that the Code provides for "'reciprocal and permanent' exchange of information to facilitate the management of shared resources" is misleading, given that the Code likewise calls upon the government to seek to complement existing international agreements, or to negotiate others.[904]

8.73. As to the existence of a free-standing obligation to conduct an EIA, it is a sufficient answer to point out that the keystone of Ecuador's argument, Article 7 of the ILC's Draft Articles, encourages but does not actually require an EIA.[905] Article 7 reads:

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[904] The relevant provision of the Code (Art. 10 of Decree 2811/74) provides in full :

"To prevent or solve environmental problems and to regulate the use of renewable natural resources shared with bordering countries, and without prejudice to the treaties currently in force, the government shall seek to complement the existing stipulations or to negotiate others which deal with:

(a) The reciprocation and permanent exchange of necessary information for the planning of development and the optimal use of said resources and elements;

(b) The reciprocation and prior communication of alterations or environmental imbalances which can arise from works or projected works of the governments or inhabitants of the respective countries, far enough in advance that said governments can take the pertinent actions when they believe their environmental rights and interests could suffer impairment;"

See EM, Vol. II, Annex 10.

[905] For the status of the ILC's Prevention Articles, see above, paras. 8.19-8.28.

> "*Assessment of risk*
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> Any decision in respect of the authorization of an activity within the scope of the present articles shall, in particular, be based on an assessment of the possible transboundary harm caused by that activity, including *any* environmental impact assessment."[906]

8.74. What this provision requires is risk assessment: an EIA is identified as a form of risk assessment, but that is all. Moreover the commentary stresses that the modalities of assessment (who should conduct it, its content, etc.) are left to "the domestic laws of the State conducting such assessment".[907] This reflects a major difficulty with Ecuador's customary international law argument: there cannot be an obligation to conduct an EIA unless international law defines an EIA, which presently it does not do.[908]

8.75. Indeed such a definition would in practice be a conventional one, laid down by treaty. Ecuador's reliance on the 1991 Espoo Convention is misplaced; neither Ecuador nor Colombia are parties to that instrument, which was concluded under the auspices of the UN Economic Commission for Europe.[909]

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906 *ILC Yearbook 2001*, Vol. II (2), p. 157 (emphasis added).

907 *Ibid.*, 158-9 (paras. (5)-(7)).

908 Craik, *op. cit.*, 123-125 with references to the literature.

909 Cf. Espoo Convention, art. 16: "This Convention shall be open for signature [...] by States members of the Economic Commission for Europe as well as States having consultative status with the Economic Commission for Europe [...]". An amendment to allow other UN Member States to become

8.76. Ecuador relies on five decisions of this Court or of the Law of the Sea Tribunal which have "involved alleged failures to undertake a transboundary EIA", not for the actual decisions themselves (none of which turned on the point) but for instances of "State practice" supporting its customary law claim.[910] This raises the question whether arguments before an international court or tribunal can constitute State practice for this purpose: if they do, it would only be where the argument was accepted by the other side in such a way as to manifest *opinio juris*.

8.77. In any event, the cases are distinguishable from the present one.

8.78. *Request for an Examination of the Situation*: the application brought by New Zealand sought to reactivate the proceedings in *Nuclear Tests (New Zealand v. France)* pursuant to paragraph 63 of the Court's 1974 judgment. New Zealand sought a declaration by the Court that France's proposed course of action in undertaking a series of 8 underground nuclear tests would "constitute a violation of the rights under international law of New Zealand, as well as of other States", and further or in the alternative, that it would be…

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parties to the Espoo Convention was adopted in 2001 (ECE/MP.EIA/4, 27 February 2001), but is not yet in force.

[910] EM, para. 8.45.

> "unlawful for France to conduct such nuclear tests before it has undertaken an Environmental Impact Assessment according to accepted international standards. Unless such an assessment establishes that the tests will not give rise, directly or indirectly, to radioactive contamination of the marine environment the rights under international law of New Zealand, as well as the rights of other States, will be violated."[911]

8.79. The Court disposed of the application on the narrow basis that New Zealand's request did not fall within the situation foreseen by paragraph 63 of the Court's 1974 judgment. The Court accordingly did not reach the merits of New Zealand's subsidiary claim for a declaration that such tests would be unlawful unless preceded by an EIA.[912] The principal ground for the New Zealand EIA claim was Article 16 of the Noumea Convention of 1986, which requires assessment "within the capabilities of the parties", and consultation with the public and other affected States "where appropriate".[913] In reply France relied on its margin of appreciation in determining the appropriateness of an EIA for its resumed testing program.[914]

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[911] Request for an Examination of the Situation in Accordance with Paragraph 63 of the Court's Judgment of 20 December 1974 in the Nuclear Tests (New Zealand v. France) Case, ICJ Reports 1995, p. 291, para. 6.

[912] *Ibid.*, pp. 305-306, paras. 62- 63.

[913] *Ibid.*, p. 291, para. 6, referring to Convention for the Protection of the Natural Resources and the Environment of the South Pacific Region, Noumea, 24 November 1986, 26 ILM 38.

[914] CR 95/20, 12 September 1995, and see Craik, *Op. cit.*, 142-143.

8.80. *Gabčíkovo-Nagymaros Project*: Ecuador's characterisation of the case as one concerning the failure to carry out an EIA prior to the construction of the hydroelectric installations is, to say the least, disingenuous.[915] In fact the case was dealt with on the basis of the general propriety of the original barrage project, and the Court made no criticism of the decision to proceed with the original project. The Court's observation, relied upon by Ecuador, that new environmental standards and norms had to be taken into account[916] was made in a situation in which Articles 15 and 19 of the 1977 Treaty imposed continuing obligations upon the parties in relation to water quality and the protection of nature; as discussed above, the Court held that those provisions had to be interpreted on an evolutionary basis, such that new treaty norms relating to the environment had to be taken into account.[917] The decision is, to say the least, not authority for any general customary obligation to undertake an EIA.

8.81. *MOX Plant*: the claim was brought on the basis of UNCLOS 1982, alleging breach of various obligations under UNCLOS relating to the protection of the marine environment; the prevention and control of pollution, co-operation in relation to the risk of harms resulting discharges of mixed oxide fuel into

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915 EM, para. 8.45.

916 EM, para. 8.45, quoting Gabčíkovo-Nagymaros Project (Hungary/Slovakia), Judgment, ICJ Reports 1997, p. 78, para. 140.

917 Gabčíkovo-Nagymaros Project (Hungary/Slovakia), Judgment, ICJ Reports 1997, pp. 67-68, paras. 114, and p. 78, para. 140.

the Irish sea and related movements of radioactive material through the Irish Sea, and storage of radioactive materials at the Sellafield site. Ecuador relies only upon the 2001 provisional measures decision of ITLOS, rendered prior to constitution of the Annex VII tribunal, and in particular does not rely on the decision as to Provisional Measures embodied in the Order No. 3 of the Annex VII tribunal of 24 June 2003.

8.82. The 2001 ITLOS decision on provisional measures is based on the relevant provisions of UNCLOS, including Article 206. Given various undertakings given by the United Kingdom that there would be no additional marine transportation of radioactive waste as a result of the commissioning of the plant and that there would be no import or export of waste until October 2002, ITLOS rejected the request for provisional measures in the terms sought by Ireland.[918] However, ITLOS considered that:

> "the duty to cooperate is a fundamental principle in the prevention of pollution of the marine environment under Part XII of the Convention and general international law."[919]

On that basis it stipulated provisional measures requiring the Parties to cooperate, including by exchanging information as to possible risks for the marine environment arising out of the commissioning of the MOX plant, monitoring the risks or

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[918] ITLOS, *MOX Plant (Ireland v. United Kingdom)*, Provisional Measures, Order of 3 December 2001, para. 81.

[919] *Ibid.*, para. 82.

effects of the operation of the MOX plant on the Irish Sea, and devising appropriate measures to prevent pollution of the marine environment arising from operation of the MOX plant.[920] The decision did not turn on whether or not there had been an EIA and was reached in the specific context of the obligation of cooperation in relation to pollution of the marine environment under UNCLOS.

8.83. *Land Reclamation*: the case was brought by Malaysia against Singapore in relation to land reclamation measures in the Straits of Johor which were said to violate various provisions of UNCLOS. As in *MOX Plant,* provisional measures were sought from ITLOS prior to constitution of the Annex VII arbitral tribunal. ITLOS relied on the passage quoted above from its decision in *MOX Plant* as to the fundamental role of cooperation in relation to the prevention of pollution under UNCLOS.[921] Having noted that Singapore had not undertaken a prior assessment of the effect of the land reclamation works upon waters under Malaysian jurisdiction,[922] it concluded that "it cannot be excluded that, in the particular circumstances of this case, the land reclamation works may have adverse effects on

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[920] ITLOS, *MOX Plant (Ireland v. United Kingdom)*, Provisional Measures, Order of 3 December 2001, paras. 84, 89(1).

[921] ITLOS, *Land Reclamation by Singapore in and Around the Straits of Johor (Malaysia v. Singapore)*, Provisional Measures, Order, 8 October 2003, para. 92, quoting ITLOS, MOX Plant (Ireland v. United Kingdom), Provisional Measures, Order of 3 December 2001, para. 82.

[922] *Ibid.*, para. 95.

the marine environment",[923] and expressed the view that there had been insufficient cooperation between the Parties prior to the commencement of the proceedings.[924] ITLOS granted provisional measures, essentially requiring the parties to cooperate in assessing the effects of Singapore's land reclamation program.[925] The claim before the Annex VII arbitral tribunal was subsequently settled by agreement.[926] Again, although there had in fact been no prior EIA, that was not the ground for the provisional measures decision, which was based on the express UNCLOS obligation of cooperation in relation to pollution of the marine environment.

8.84. *Pulp Mills*: The dispute essentially concerns alleged violations by Uruguay of the 1975 Statute of the River Uruguay, resulting from the authorization by Uruguay of the construction of two paper mills. Issues about environmental assessment revolved around the adequacy of the assessment carried out and interpretation of the Statute. Colombia will reserve comment on the case pending the Court's judgment. It is worth recalling though, that "in the absence of any evidence of imminent harm

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[923] ITLOS, Land Reclamation by Singapore in and Around the Straits of Johor (Malaysia v. Singapore), Provisional Measures, Order, 8 October 2003, para. 96.

[924] *Ibid.*, para. 97

[925] *Ibid.*, para. 106(1).

[926] See ITLOS, Land Reclamation by Singapore in and Around the Straits of Johor (Malaysia v. Singapore), Award on Agreed Terms, 1 September 2005.

to the environment,"[927] the Court refused Argentina's application for provisional measures.

8.85. On analysis, only *Request for an Examination* concerned a claim of *per se* violation of customary international law as the result of a failure to carry out an EIA, and then only in the alternative to reliance on an express treaty provision;[928] the Court was able to avoid ruling on that claim for other reasons. In each of the other cases, the failure to carry out an EIA (or the failure to carry out an adequate EIA) was relied upon in relation to breaches of specific treaty obligations concerning actual harm caused or threatened. As is implicitly admitted later in the Memorial,[929] in *Pulp Mills* and *MOX Plant*, an EIA had in fact been carried out, and the claim was that the EIA was inadequate.

8.86. As to the *Southern Bluefin Tuna* cases, some comment needs to be made about Ecuador's presentation of what the Tribunal actually said.[930] Rather than saying that harm "could not be excluded" (a quotation taken from *Land Reclamation*[931]), what the Tribunal said was that:

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927 Boyle A. et al, *International Law and the Environment*, 3rd ed., Oxford Univ. Press, 2009, p. 140.

928 Request for an Examination of the Situation in Accordance with Paragraph 63 of the Court's Judgment of 20 December 1974 in the Nuclear Tests (New Zealand v. France) Case, ICJ Reports 1995, p. 291, para. 6.

929 EM, para. 8.48.

930 EM, para. 8.48.

931 ITLOS, Land Reclamation by Singapore in and Around the Straits of Johor (Malaysia v. Singapore), Provisional Measures, Order, 8 October 2003, para. 96.

> "there is scientific uncertainty regarding measures to be taken to conserve the stock of southern bluefin tuna and that there is no agreement among the parties as to whether the conservation measures taken so far have led to the improvement in the stock of southern bluefin tuna."[932]

To the extent that the Memorial might suggest that *Southern Bluefin Tuna* concerned an EIA, it is misleading.

8.87. Ecuador presents arguments as to the supposed requirements under general international law as to the content of an EIA in an attempt to provide some substance to the alleged free-standing obligation to carry out an EIA.[933] First, to the extent that it relies on the Espoo Convention in supporting the supposed required content of an EIA, it must be stressed again that this is a regional convention, to which neither Ecuador nor Colombia is party. As to Ecuador's reliance on the 1987 UNEP EIA Goals and Principles, they are a non-binding instrument, drafted by a Working Group of Experts and adopted by the Governing Council of UNEP.[934] They provide guidance but not more. The ILC, by contrast, was clear that the modalities of any assessment were a matter for the law of the proponent State.[935]

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932 ITLOS, *Southern Bluefin Tuna (New Zealand v. Japan; Australia v. Japan)*, Provisional Measures, Order of 27 August 1999, para. 79.

933 EM, para. 8.54, see also paras. 8.43-8.51.

934 Decision 14/25 of the Governing Council of UNEP, 17 June 1987.

935 See above, para. 8.74.

8.88. In short, there is no free-standing obligation under customary international law to conduct a transboundary EIA prior to commencing a project or program. Nor was Colombia under a treaty obligation to do so. Even assuming that it imposes some obligation to act, and to the extent that its breach is actually relied upon by Ecuador,[936] Article 14(1) of the Biodiversity Convention has no application in this case, since the marginal and localised effect of spray drift (limited, at most, to a few hundred metres) could not possibly have had "significant adverse effects on biological diversity".

8.89. At most, Colombia had to conduct an assessment, under the terms of the applicable Colombian law, as to whether its spraying program risked causing significant transboundary harm, and if so, what mitigation measures were appropriate. Moreover, such an assessment was not a one-off exercise; it involved keeping the situation under continuous review. In the ordinary course, any issues that might have arisen from the initial assessment could be addressed by subsequent inquiry and consultation.

8.90. What Colombia actually did was described in some detail in Chapters 4 and 6 above.[937] In particular:

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936 See above, para. 8.71.

937 See especially above, paras. 4.8-4.14, 4.23-4.30, 6.2-6.39.

(1) The PECIG program, though new, was based on earlier Colombian experience duly authorised under the Law on the Environment of 1993.[938]

(2) Colombia explained its intentions at international level on numerous occasions in 2000-2001 but did not consider it necessary to consult Ecuador specifically.[939] However, when contacted by Ecuador, Colombia proposed, first a workshop to provide detailed information about the program, then a Joint Commission which met 4 times.[940]

(3) The Law on the Environment, the relevant Colombian law in force in 1999, allowed for, but did not require, an Environmental Management Plan for the spraying program. Nevertheless, in fact such a Plan was directed to be produced for the PECIG program, entailing an assessment of the situation.[941]

(4) The EMP is under continuous review and still applies to the Project in amended form.[942]

(5) The spray mixture was duly approved and published; it was improved in 2004.[943]

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938 See above, paras. 4.8-4.10.
939 See above, paras. 5.5-5.6.
940 See above, paras. 5.10, 5.18.
941 See above, paras. 4.11-4.14.
942 See above, para. 4.13.
943 See above, paras. 4.45-4.46, 6.2-6.21.

(6) The process of assessment is a continuing one, including scientific review of newly identified issues: see e.g. CICAD I (2005) and CICAD II (2009).[944]

(7) A careful appraisal is conducted twice a year by qualified scientists with full access to information.[945]

8.91. In the circumstances, this entails full compliance with whatever obligations of assessment existed under customary international law at relevant times.

(b) Failure to inform and consult potentially affected communities in Ecuador

8.92. The second alleged breach of the obligation of cooperation concerns the failure to inform and consult communities in Ecuador likely to be affected by the spraying.

(i) Ecuador's claim

8.93. In support of the existence of the obligation to consult as a matter of international environmental law, reliance is placed on Principle 5 of UNEP's EIA Goals and Principles and Article 13 of the Draft ILC Articles on Prevention.[946] The commentary to draft Article 13 is said to support the argument that this

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944 See above, paras. 3.5-3.58, 4.15-4.19.

945 See above, para. 4.26.

946 EM, para. 8.56. Reference is also made to the 1998 Aarhus Convention.

obligation also applies as regards the population of other States.[947] Finally, reference is made to Principle 10 of the 1992 Rio Declaration and the 1998 Aarhus Convention as supporting the "right to information and public participation in EIA and authorisation processes".[948]

8.94. In conclusion, Ecuador alleges that:

> "these precedents show that Colombia failed in its duty to inform and consult those likely to be affected by its aerial spraying activities, violating both the requirements of customary international law with respect to environmental impact assessment and the rights of those Ecuadorians whose health, private life and property have been harmed or put at risk."[949]

(ii) Colombia's response

8.95. Here again, the short answer to Ecuador is that, having regard to what was and is known about the risks associated with the components of the spray mix, the risk of spray drift and the modalities laid down for spraying operations, Colombia had no reason to consult the Ecuadorian public, and certainly no international obligation to do so.

8.96. Ecuador's argument as to the supposed obligation to inform and consult communities in Ecuador is problematic. Is it

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947 EM, para. 8.56.
948 EM, paras. 8.60-8.61.
949 EM, para. 8.62.

to be supposed that State A is required to conduct what (under some national procedures) would be a formal public inquiry on the territory of State B as to the future exercise of sovereign authority within its own territory by State A? What would be the significance of statements by members of the public of State B welcoming an activity officially opposed by the Government of State B? What would be the significance of local opposition to a project which the Government of State B had officially approved? Is State A required or even entitled to refer to local opinion in such cases? Even accepting, *arguendo*, that this might be possible by agreement between two friendly States on some matter of common interest, it can hardly be *required* by law.

8.97. Heavy reliance is placed on the UNEP Goals and Principles of Environmental Impact Assessment and the ILC Draft Articles on Prevention. But on this point these texts certainly do not reflect customary international law. The UNEP Goals and Principles are overt guidelines, using the verb "should" throughout. The ILC's commentary to draft Article 13 says that:

> "This article is inspired by new trends in international law, in general, and environmental law, in particular, of seeking to involve, in the decision-making processes, individuals whose lives, health, property and environment might be affected by providing them with a chance to

> present their views and be heard by those responsible for making the ultimate decisions."[950]

This proclaims Article 13 to be an exercise in "progressive development", *a fortiori* as concerns consultation with the public of the other State in a transboundary situation.[951]

8.98. The texts relied on in the commentary to illustrate these "new trends", while they encourage consultation, do not support the idea of a legal obligation to consult a foreign public. To take just two examples, Principle 10 of the Rio Declaration[952] deals exclusively with consultation "[a]t the national level" and below; it does not mention transboundary issues. Article 6 of the Framework Convention on Climate Change[953] provides that the Parties, in their role as promoters of the Convention, shall "facilitate at the national and, as appropriate, subregional and regional levels, and in accordance with national laws and regulations, and within their respective capacities" consultation on a number of matters including "public participation in addressing climate change and its effects and developing adequate responses". Quite apart from the sequence of provisos in the chapeau of Article 6, this is very far from the present case.

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950 *ILC Yearbook 2001* Vol. II(2), 165, para. (3).

951 See also the observations of the Special Rapporteur (PS Rao) in the debate in the ILC in 2001: 2675th Meeting, 11 May 2001; *ILC Yearbook 2001*, Vol. I, p. 66 (para. 55) (quoted above, para. 8.21).

952 Cited in *ILC Yearbook 2001* Vol. II(2),, 166 (para. 4).

953 Cited *Ibid.* (para. 5).

8.99. The weakness of Ecuador's non-consultation claim is evidenced by its attempt to recycle its arguments as to human rights obligations as evidence of practice showing the existence of an obligation of foreign public consultation as a matter of customary international law. But the recognition of the right to information in each of the cases cited was based on interpretation of the substantive provisions of the human rights instrument in question, some of which are not applicable as between the parties to the dispute. Moreover none of the cases involved transboundary harm. In at least some of them (e.g., *Öneryildiz v. Turkey* before the European Court of Human Rights[954]), the relevant observations were made only in passing, in circumstances in which the principal concern of the case was violation of an entirely different substantive right (e.g. the right to life) which had actually taken place.

8.100. Ecuador concludes that "these precedents show that Colombia failed in its duty to inform and consult those likely to be affected by its aerial spraying activities".[955] The "precedents" show nothing of the kind. At most they show that, on the one hand, certain States in Europe have taken a conscious decision to enter into treaty obligations requiring them to provide information and to consult with potentially affected

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[954] ECHR (GC), Judgment of 30 November 2004, cited EM, para. 9.104; it may also be noted that *Öneryildiz* did not in fact concern environmental harm as such, but activities potentially hazardous to human life.

[955] EM, para. 8.62.

individuals in certain circumstances. On the other, they show that human rights monitoring bodies have interpreted certain substantive human rights obligations as implying, subsidiarily, a need for provision of information and consultation with individuals. But what Ecuador must show is the existence of an obligation binding on Colombia that consultation with and provision of information to Ecuadorian nationals is positively required of it *in circumstances such as the present*. This it has failed to do.

(c) Failure to cooperate in the control of transboundary risks

8.101. Finally, Ecuador puts forward a catch-all claim alleging failure to cooperate in the control of transboundary risks arising from the aerial spraying.

(i) Ecuador's claim

8.102. Ecuador asserts that much of the harm alleged could have been prevented if Colombia had cooperated with Ecuador "by notifying it of the intended operation, sharing information on the chemicals in use and their likely effects on public health and the environment, and on ways to reduce or eliminate the risk to Ecuadorian territory and its inhabitants".[956] It is alleged that Colombia failed to cooperate in any of these ways.[957] The allegation of failure to provide information or notification to

[956] EM, para. 8.63.
[957] EM, para. 8.63.

individuals in Ecuador is recycled as showing a breach, and it is further alleged that Colombia failed to "consult with Ecuador as required by international law at an early stage, or in good faith, or at all."[958]

8.103. In support of the existence of a general obligation to cooperate, it is argued that

> "Case law, multilateral and bilateral treaties, the 1988 Narcotics Convention, ILC codifications, and the Rio Declaration, as well as elementary considerations of humanity referred to in the *Corfu Channel* case, all point to the conclusion that neighbouring states have a duty in international law to cooperate in order to control and minimize the risk of transboundary harm. They must give each other prior notice of the activity, provide adequate information about the substances used, and the risks to health, property or the environment. They must consult and negotiate in good faith in order to identify means of preventing or minimizing the risk of transboundary harm."[959]

However, that submission is immediately followed by a *caveat*:

> "even if *quod non* notification and consultation in cases of transboundary risk are not independent customary rules, non-compliance with them is strong evidence of a failure to act diligently in protecting other States from harm under Rio Principle 2."[960]

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958 EM, para. 8.63.
959 EM, para. 8.68.
960 EM, para. 8.68.

8.104. As to breach, it is asserted that "in the course of Ecuador's repeated attempts to negotiate a solution Colombia did not cooperate in good faith".[961] Reference is made to Colombia's undertaking to provide advance notification of any further planned spraying in the border area, and the position taken by Colombia in the bilateral scientific commission.[962]

(ii) Colombia's response

8.105. Yet again, most of what needs to be said on these issues has been said in Chapters 3-6 above. It has been shown that Colombia did respond to Ecuador's initial approach, that it did provide information including information about the spray mix, and that it even voluntarily suspended spraying in the border region – to its considerable cost. Assuming, *arguendo*, a freestanding obligation to cooperate with Ecuador, Colombia in fact did cooperate – it being understood that there was no obligation to agree and that Ecuador had no veto over the conduct of the spraying program on Colombian territory.

8.106. Further, Ecuador's argument that much of the alleged damage "could have been avoided or minimised had Colombia cooperated with Ecuador at the outset"[963] presupposes that Colombia was required to bow to Ecuador's demands that aerial spraying should not take place within a buffer zone along the

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961 EM, para. 8.70.
962 EM, para. 8.71.
963 EM, para. 8.63.

border. However, Colombia was not required as a matter of international law to accede to any such demands in relation to activities carried out within its own territory and which did not cause any significant harm within Ecuador.

8.107. In *Lac Lanoux*, the Tribunal expressly rejected the suggestion that, as a matter of customary international law or as a general principle of law France's proposed project was subject to any prior agreement with Spain, and held that such a requirement could only be imposed by treaty.[964]

8.108. Ecuador emphasises the Tribunal's holding that conflicting interests had to be reconciled by "negotiation and mutual concession" and that France was required to give "a reasonable place to Spain's interests in the solution finally adopted".[965] In fact, as to the question of negotiation and mutual concession, the Tribunal simply observed that, even if it were accepted that there is an obligation prohibiting an upstream State on an international river from altering the waters in such a way as seriously to prejudice a downstream State (a question it did not decide):

> "En realité, les Etats ont aujourd'hui parfaitement conscience de l'importance des intérêts contradictoires, que met en cause l'utilisation industrielle des fleuves internationaux, et de la nécessité de les concilier les uns avec les autres

964 *Lac Lanoux (Spain/France)*, *RIAA*, vol. XII, p. 281, 308 (1957).

965 EM, para. 8.65.

> par des concessions mutuelles. La seule voie pour aboutir à ces compromis d'intérêt est la conclusion d'accords, sur une base de plus en plus compréhensive."[966]

That is a statement recognizing the practical necessity of concluding agreements reconciling the interests of the States involved rather than a statement of an obligation under international law to do so. The Tribunal continued:

> "La pratique internationale reflète la conviction que les Etats doivent tendre à conclure de tels accords; il y aurait ainsi une obligation d'accepter de bonne foi tous les entretiens et les contacts qui doivent par une large confrontation d'intérêts et par une bonne volonté réciproque, les mettre dans les meilleures conditions pour conclure des accords."

That comes closer to an acceptance of an obligation to negotiate, but it must be read in the light of the Tribunal's earlier observations. By way of preface to its discussion of whether there was a treaty obligation to reach an agreement prior to commencing the works, the Tribunal rejected the Spanish suggestion that there existed any rule of international law giving one State the right of veto over works of another on its own territory on the basis that it might affect the interests of the first State. In that context it observed that:

> "la pratique internationale recourt de préférence à des solutions moins extrêmes, en se bornant à obliger les Etats à rechercher, par des tractations préalables, les termes d'un accord, sans subordonner à la conclusion de cet accord

966 *Lac Lanoux (Spain/France)*, *RIAA*, vol. XII, p. 281, 304 (1957).

> l'exercice de leurs compétences. On a ainsi parlé, quoique souvent d'une manière impropre, de 'l'obligation de négocier un accord.' En réalité, les engagements ainsi pris par les Etats prennent des formes très diverses et ont une portée qui varie selon la manière dont ils sont définis et selon les procédures destinées à leur mise en oeuvre; mais la réalité des obligations ainsi souscrites ne saurait être contestée et peut être sanctionnée, par exemple, en cas de rupture injustifiée des entretiens, de délais anormaux, de mépris des procédures prévues, de refus systématiques de prendre en considération les propositions ou les intérêts adverses, plus généralement en cas d'infraction aux règles de la bonne foi."[967]

8.109. There is of course a difference between the law of international rivers and transboundary air pollution: the former is much more developed, whereas the latter is embryonic – as the Chernobyl accident showed. In consequence the Economic Commission for Europe has been active in pursuing treaty solutions, including important protocols to earlier texts. But this treaty practice finds little echo in other regions.

8.110. Ecuador's complaint about non-cooperation has to be seen in context. Far from seeking to mitigate risk, from the first and without any evidence, Ecuador raised questions about the very need for the existence of the spraying program.[968] As far as the record shows, at no stage did it acknowledge or appear to

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967 *Ibid.*, 306-307.

968 See above, para. 5.2-5.3.

take into account the enormous social, environmental and economic problems presented by the illicit drug trade for Colombia. (It does not do so in the Memorial either.)[969] By contrast, other States (notably the United States, Colombia's partner in the spraying program) and international organisations (UNODC, OAS-CICAD) have been supportive.[970]

8.111. Subsequent developments have included the following:

(1) Colombia pressed for the creation of a Joint Scientific and Technical Commission on Aerial Spraying and sought to facilitate its work.[971] But Ecuadorian members failed to attend 7 of 8 proposed site visits.[972]

(2) In November 2003, Colombia gave Ecuador copies of relevant documents, including the revised EMP.[973]

(3) Subsequent Colombian offers for Ecuador to observe spray missions were declined.[974]

(4) So too was an offer to Ecuador, within the framework of the Commission, to test the impact

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969 See above, paras. 5.2-5.44, 5.64-5.108; and cf. EM, paras. 2.54-2.56.

970 See above, paras. 3.41-3.58.

971 See above, para. 5.18-5.19.

972 See above, para. 5.29.

973 See above, para. 5.19, and for the list of documents see Annex 9.

974 See above, para. 5.66.

of aerial spraying from the Colombian side of the border.[975]

(5) The proceedings of the Second Joint Commission were pre-empted, then aborted, by Ecuador.[976]

(6) Ecuador complains that it was not involved from the beginning as a co-sponsor of the CICAD study.[977] That study covered the whole of Colombia, and Colombia had no obligation to involve its neighbour in this way. But it did inform Ecuador, at the highest level, of the proposed CICAD study, did invite its participation, and did separately inform it of the outcome.[978]

(7) In September 2006, Colombia invited Ecuador to participate in CICAD II;[979] CICAD itself had also extended that invitation in August 2006.[980] Again Ecuador declined.[981]

8.112. In the circumstances, Colombia is at least as justified in claiming non-cooperation as Ecuador. What Ecuador really sought – and still seeks – is a veto over spraying near the border.

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975 See above, para. 5.65.
976 See above, para. 5.94-5.102.
977 See EM, para. 3.36.
978 See above, paras. 4.15-4.19.
979 See Annex 24.
980 See Annex 24, at p. 2, and Annex 25.
981 See Annex 25.

Quite apart from evidentiary considerations, this is not a claim that can be based on an obligation to cooperate, as the Tribunal in *Lac Lanoux* made clear.[982]

(3) BREACH OF ARTICLE 14(2) OF THE 1988 NARCOTICS CONVENTION

8.113. One of the features of Ecuador's Memorial is that it repeatedly relies on assertions about customary international law when there is an applicable treaty between the parties dealing precisely with the substance of the claim. In relation to cooperation, the relevant treaty is the 1988 Narcotics Convention. As noted, the purpose of the Convention is "to promote co-operation among the Parties so that they may address more effectively the various aspects of illicit traffic in narcotic drugs and psychotropic substances having an international dimension". Most of the provisions of the Convention deal with modalities of cooperation, including cooperation in eradication of illicit coca production.

8.114. It is significant that in Section II of Chapter VIII, dealing with Ecuador's non-cooperation claim, the 1988 Convention is mentioned only once, a brief and generic reference as part of a list of sources.[983] But the explicit legal basis for cooperation between the parties was not the inapplicable treaties of the

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982 *Lac Lanoux (Spain/France)*, *RIAA*, vol. XII, p. 281, 308 (1957); above, para. 8.107.

983 EM, para. 8.68.

UNECE: it was the 1988 Convention.[984] Ecuador has an entirely selective approach to the 1988 Convention, relying on it for jurisdiction and for the incorporation by reference of environmental and human rights norms, but virtually ignoring it for all other substantive purposes. This becomes most obvious in Section III of Chapter VIII of the Memorial, when Ecuador – having struggled in Section II to construct from disparate materials an obligation to cooperate focusing only on its concerns – specifically turns to the 1988 Convention.

8.115. Section III of Chapter VIII is headed "Cooperation and Respect for Fundamental Human Rights and Protection of the Environment as Required by the 1988 Narcotics Convention". Though a reasonable summary of Ecuador's case, this is already a curious reading of the Convention, which is treated as if it were a human rights or environmental law treaty.

8.116. Not merely does Ecuador focus on Article 14 out of context from the Convention as a whole; it focuses on Article 14(2) out of context from Article 14 as a whole. Significantly, Article 14 is entitled "Measures to Eradicate Illicit Cultivation of Narcotic Plants and to Eliminate Illicit Demand for Narcotic Drugs and Psychotropic Substances". It provides in full as follows:

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[984] See also the Preamble, which emphasises that "eradication of illicit traffic is a collective responsibility of all States and that, to that end, co-ordinated action within the framework of international cooperation is necessary".

"1. Any measures taken pursuant to this Convention by Parties shall not be less stringent than the provisions applicable to the eradication of illicit cultivation of plants containing narcotic and psychotropic substances and to the elimination of illicit demand for narcotic drugs and psychotropic substances under the provisions of the 1961 Convention, the 1961 Convention as amended and the 1971 Convention.

2. Each Party shall take appropriate measures to prevent illicit cultivation of and to eradicate plants containing narcotic or psychotropic substances, such as opium poppy, coca bush and cannabis plants, cultivated illicitly in its territory. The measures adopted shall respect fundamental human rights and shall take due account of traditional licit uses, where there is historic evidence of such use, as well as the protection of the environment.

3. a) The Parties may co-operate to increase the effectiveness of eradication efforts. Such co-operation may, *inter alia*, include support, when appropriate, for integrated rural development leading to economically viable alternatives to illicit cultivation. Factors such as access to markets, the availability of resources and prevailing socio-economic conditions should be taken into account before such rural development programmes are implemented. The Parties may agree on any other appropriate measures of co-operation.

b) The Parties shall also facilitate the exchange of scientific and technical information and the conduct of research concerning eradication.

> c) Whenever they have common frontiers, the Parties shall seek to co-operate in eradication programmes in their respective areas along those frontiers.
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> 4. The Parties shall adopt appropriate measures aimed at eliminating or reducing illicit demand for narcotic drugs and psychotropic substances, with a view to reducing human suffering and eliminating financial incentives for illicit traffic. These measures may be based, *inter alia*, on the recommendations of the United Nations, specialized agencies of the United Nations such as the World Health Organization, and other competent international organizations, and on the Comprehensive Multidisciplinary Outline adopted by the International Conference on Drug Abuse and Illicit Trafficking, held in 1987, as it pertains to governmental and non-governmental agencies and private efforts in the fields of prevention, treatment and rehabilitation. The Parties may enter into bilateral or multilateral agreements or arrangements aimed at eliminating or reducing illicit demand for narcotic drugs and psychotropic substances.
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> 5. The Parties may also take necessary measures for early destruction or lawful disposal of the narcotic drugs, psychotropic substances and substances in Table I and Table II which have been seized or confiscated and for the admissibility as evidence of duly certified necessary quantities of such substances."

8.117. The relevant obligation of cooperation here is in Article 14(3)(c): the parties are obliged to "seek to co-operate in eradication programmes in their respective areas along those frontiers". In fact, not only does Ecuador not cooperate with the

PECIG program: it has not been able to prevent its territory being used by armed groups linked to the drug trade, and provides a major route for getting coca leaf processed and traded out of the region.[985]

8.118. Ecuador accepts that cooperation is required when carrying out drug eradication in accordance with the 1988 Narcotics Convention, referring in particular to Articles 14(3)(b) and (c).[986] But the bulk of Section III is devoted to its argument that any breach of obligations under environmental law in the course of an eradication program such as PECIG necessarily breaches Article 14(2) of the Convention.[987] These arguments have already been fully discussed.[988]

8.119. Article 14(2) refers to "*respect* [for] fundamental human rights", and to taking "*due account* of traditional licit uses, where there is historic evidence of such use, as well as the protection of the environment". To the extent that these stipulations refer to human and indigenous rights, they will be discussed in Chapter 9. As to the requirement to take "due account" of the protection of the environment, this is subsumed under the general international law relating to transboundary harm; a State which exercises due diligence in accordance with

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985 See the findings of the Commission on Transparency and Truth for the Angostura Case, Quito, December 2009, as summarised quoted, paras. 2.23-28.

986 EM, para. 8.71.

987 EM, para. 8.71 et seq.

988 See above, paras. 8.10-8.18.

the international law standard will thereby respect the protection of the environment.

8.120. Ecuador also alleges that Colombia has breached other provisions of the 1988 Convention (Articles 14(3)(b) and (c)), but it does so only briefly.[989] It is noticeable that no reference is made to breach of any provision other than Article 14(2) in the conclusions of Chapter VIII.[990]

8.121. Obviously, the formulation of neither provision provides a firm basis for making a credible claim of breach by Colombia. Article 14(3)(b) speaks merely of facilitating the exchange of information and technical data, while Article 14(3)(c) uses the formulation "seek to cooperate". For the reasons already given,[991] Colombia has complied with its obligations under these provisions. Whether Ecuador has done so is another question.

E. Conclusions

8.122. This chapter reaches the following conclusions:

(1) The principal source of applicable law in this case is the 1988 Narcotics Convention, notably Article 14, which expressly deals with eradication of illicit coca crops. Article 14

989 EM, para. 8.72.
990 EM, para. 8.84.
991 See above, paras. 8.113-8.121.

simply requires the State concerned to "respect fundamental human rights and … take due account of traditional licit uses, where there is historic evidence of such use, as well as the protection of the environment".

(2) The ILC Articles on Prevention do not, as a general matter, reflect customary international law, and their reception has been luke-warm at best. In any event, they do not apply in the present case, since the threshold criteria in Article 2(a) are not met.

(3) The principle of sovereignty does not mean that States are completely immune from transboundary effects of activities carried out on the territory of other States. The threshold in this context is a real risk of causing significant harm.

(4) Colombia has strictly complied with its international obligations under the treaties to which it is a party, notably under Article 14 of the 1988 Narcotics Convention.

(5) Colombia's aerial spraying program was adopted and implemented with all due diligence. Further, it has not been shown to have caused any harm to Ecuador or its nationals.

(6) The only treaty obligation of Colombia to conduct an EIA was contained in Article 14(1) of the Convention on Biological Diversity. That provision did not, on any view, require an EIA in the present case.

(7) At most, Colombia had to conduct an assessment, under the terms of the applicable Colombian law, as to whether its spraying program risked causing harm, and if so, what mitigation measures were appropriate. Such an assessment involved keeping the situation under continuous review. Colombia did all of these things.

(8) Having regard to the facts, Colombia had no reason to consult the Ecuadorian public, and no international obligation to do so.

(9) In any event, Colombia did not fail to cooperate with Ecuador in the implementation of the aerial spraying program. What Ecuador really sought was a veto over any spraying near the border, to which it was not and is not entitled.

Chapter 9

ECUADOR'S CLAIMS BASED ON HUMAN AND INDIGENOUS RIGHTS

A. Introduction

9.1. Ecuador, not content with relying on a multitude of environmental law instruments as a basis of obligation, doubles up by extensive reliance on human rights treaties (incorporating the rights to life, health, food, water, a healthy environment, property, humane treatment, private life, and information) and on treaties concerning indigenous rights.[992] This raises serious issues of principle as to the relations between established or *de lege ferenda* standards of interstate conduct – e.g. with respect to transboundary air pollution or international watercourses – and standards concerning individual or peoples' rights. It must be stressed again that the people of Ecuador are not the targets of the aerial spraying program: the target is illicit coca crops in Colombia. Ecuador's claim is that spray drifts across the boundary, causing significant harm in Ecuador. That claim has not been established as a matter of fact; it is inconsistent with the scientific evidence, and it is unsustainable under the applicable treaties – the 1988 Narcotics Convention and the

[992] EM, Chapter IX.

1992 Biodiversity Convention (to the extent that there is a claim of violation of that latter treaty) – or under customary international law. That being so, the key point is that a bad environmental claim does not become any better by being re-presented as a human rights or indigenous rights claim. The factual underpinning for the claim is still the same, with exactly the same defects and lacunae.

9.2. It is proposed to illustrate this fundamental point in further detail under each rubric, starting with the alleged breaches of human rights.

B. Alleged Breaches of Human Rights

9.3. For the reasons already given, and despite the vagueness and generality of the language used, it will be assumed here that Ecuador is only claiming on behalf of Ecuadorian nationals whose alleged injuries occurred in Ecuador.[993]

(1) RELATIONSHIP OF HUMAN RIGHTS AND ENVIRONMENTAL CLAIMS

9.4. At the outset, Ecuador asserts that the aerial spraying violates obligations in "three distinct but interrelated areas of international law": protection of the environment; human rights, and the protection of indigenous peoples.[994] It goes on to assert that the "relationship between these three distinct areas of

[993] See above, paras. 1.14-1.25.
[994] EM, para. 9.1.

international law lies at the heart of this case": the interrelationship is said to arise from the fact that the aerial spraying has "significantly harmful consequences for the health and well-being of the people, natural resources and environment in the affected areas of Ecuador".[995]

9.5. In principle it is of course true that the same conduct can breach international obligations in different fields. But there are two important qualifications.

9.6. First, each breach has to be independently established: it has to be proved as a matter of fact. The conclusion that particular conduct may have breached the obligation of prevention of transboundary harm does not entail there has been a breach of the human rights of those allegedly affected.

9.7. Secondly, however, the conclusion that conduct is lawful under general international law has implications for its lawfulness as a matter of international human rights Respect should be paid to the principle of speciality identified by the Court in a related context in the Advisory Opinion on *Legality of the Threat or Use of Nuclear Weapons.* There it was alleged that the threat or use of nuclear weapons in any circumstances (even in self defence) would violate the human right to life. The Court stated that the *content* of that human right could not be

[995] EM, para. 9.2.

determined independently of the most relevant applicable law, the law relating to the means and methods of war. The Court observed:

> "that the protection of the International Covenant of Civil and Political Rights does not cease in times of war, except by operation of Article 4 of the Covenant whereby certain provisions may be derogated from in a time of national emergency. Respect for the right to life is not, however, such a provision. In principle, the right not arbitrarily to be deprived of one's life applies also in hostilities. The test of what is an arbitrary deprivation of life, however, then falls to be determined by the applicable *lex specialis*, namely, the law applicable in armed conflict which is designed to regulate the conduct of hostilities. Thus whether a particular loss of life, through the use of a certain weapon in warfare, is to be considered an arbitrary deprivation of life contrary to Article 6 of the Covenant, can only be decided by reference to the law applicable in armed conflict and not deduced from the terms of the Covenant itself."[996]

The same is true here, *mutatis mutandis*.[997] A new set of norms and balances concerning transboundary harm is not to be "deduced from the terms of the Covenant itself", when international law already lays down the relevant standard.

9.8. International human rights law has a distinct function from international environmental law, and overlap between

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[996] *Legality of the Threat or Use of Nuclear Weapons, Advisory Opinion, I.C.J. Reports 1996*, p. 240, para. 25.

[997] On the relation between nuclear weapons and the environment cf. *Ibid.*, 243 (para. 33).

them is incidental, not integral. It is not the function of international human rights law to protect the environment as such, though in certain serious cases harm to the environment may impair the human right to life or property. However, in such circumstances, and given the facts of the present case, Ecuador's assertion that the breaches alleged by it constitute "an integrated, mutually reinforcing whole"[998] is a mere construct.

(2) APPLICABILITY OF HUMAN RIGHTS OBLIGATIONS TO TRANSBOUNDARY CLAIMS

9.9. Ecuador relies on a great variety of international human rights instruments in this part of its case. These include:

- the International Covenant on Civil and Political Rights ("ICCPR");
- the International Covenant on Economic, Social and Cultural Rights ("ICESCR");
- the American Convention on Human Rights ("ACHR");
- the 1989 Convention on the Rights of the Child ("CRC");
- the Convention on the Elimination of All Forms of Discrimination Against Women ("CEDAW");
- the 1988 Additional Protocol to the ACHR in the Area of Economic, Social and Cultural Rights

[998] EM, para. 6.6.

(the Protocol of San Salvador) ("the ACHR ESCR Additional Protocol"); and

- ILO Convention No. 169 Concerning Indigenous and Tribal Peoples in Independent Countries ("ILO Convention No. 169");

9.10. Ecuador accepts that the human rights treaties it relies upon "generally require a State Party to guarantee the relevant rights and freedoms for every person within its territory".[999] But it asserts that those treaties:

> "are not, however, limited in their territorial scope; they impose obligations which are violated when Colombia authorises actions in its own territory that have consequences across the boundary, particularly where – as in the present case – Colombia and Ecuador are part of the shared legal space to which these instruments apply."[1000]

9.11. Ecuador's reference to the fact that Ecuador and Colombia "are part of the shared legal space to which these instruments apply" recalls the comment of the European Court as to the "*espace juridique*" of the European Convention in its decision on admissibility in *Banković*.[1001] Quite apart from whether that remark formed part of the *ratio* of the Court's

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[999] EM, para. 9.9.

[1000] EM, para. 9.9.

[1001] *Banković v. Belgium and 16 Other Contracting States* (App. no. 52207/99), Decision on Admissibility of 12 December 2001; ECHR 2001-XII [GC], para. 80.

decision,[1002] it is an open question whether the *Banković* principle applies to the human rights treaties to which Colombia and Ecuador are actually parties.

9.12. But in any case, *Banković* was not a case of alleged transboundary harm caused in State B by a lawful activity carried out entirely on the territory of State A. The question of the applicability of the various human rights treaties has to be considered in light of the facts of each case: here, the claim concerns incidental transboundary harm allegedly caused by aerial spraying *in Colombia*. It is to be emphasised that the present case does not concern allegations of extra-territorial State action: the actions of Colombia are intra-territorial, and it is only the alleged *effects* of those actions which are extra-territorial. Thus the first question is whether the various human rights treaties apply to this case – whether human rights drift across the boundary rivers with the (alleged) residual spray.

9.13. Put more generally, the question is whether a new international law of transboundary harm is secreted in the interstices of the ICCPR and other human rights instruments.

[1002] As to which, see the various subsequent cases concerning State action outside the territory of the Contracting States: see e.g. *Issa, Omer, Ibrahim, Murty Khan, Muran and Omer v. Turkey* (App. no. 31821/96), judgment of 16 November 2004 (Turkish action in Iraq); *Pad and Others v. Turkey* (App. No. 60167/00), decision on admissibility of 28 June 2007 (Turkish action in Iran); and *Al-Saadoon and Mufhdi v. United Kingdom* (App. No. 61498/08), decision on admissibility of 30 June 2009 (United Kingdom action in Iraq).

That raises an issue of principle. Colombia's aerial spraying program is not directed at individuals or groups in Ecuador. If they are affected by it (*quod non*), this is merely incidental to its actual and intended target, the cultivation of illicit hard drugs in Colombia. That program may or may not be unlawful under the international law relating to transboundary harm, its prevention and mitigation. If it is unlawful there is no need to refer to human rights or the rights of indigenous peoples. If (as demonstrated in Chapter 8) it is internationally lawful, then it does not have to survive independent scrutiny under the international law of human or indigenous rights. As an external actor acting on its own territory in the public interest, Colombia cannot be presumed to have obligations to individuals or groups within Ecuador which exceed its obligations to Ecuador itself.

9.14. Ecuador wants to have it both ways. It wants to represent the people (including the indigenous people) of Ecuador before this Court. But it wants those people (including the municipalities, which are organs of the State) to be treated as individuals with independent rights which it can invoke on their behalf, and which they can simultaneously invoke before foreign courts.[1003] As the Court implied in the *Advisory Opinion on Legality of the Threat or Use of Nuclear Weapons*, the international law of human rights does not provide a ground for

[1003] For the *Dyncorp* litigation (in which international law provides, supposedly, the cause of action) see above, paragraph 1.35.

completely rewriting the law of interstate relations.[1004] That is true of the *jus ad bellum* and the *jus in bello*. It is equally true of those aspects of the law of peace which deal with transboundary harm occurring incidentally in the course of otherwise lawful activities of a State on its own territory. That law strikes a certain balance between the rights and interests of the two States, and therefore of the national communities they represent. In respect of conduct not targeted at individuals or groups within the State but merely incidentally affecting them, the international law of human rights or indigenous rights does not supervene. For example, if the international law of the sea gives State A the right to intercept a foreign ship on the high seas, then that right is not taken away because passengers on board the ship are thereby affected in terms of their human right to freedom of movement. The balance, having been struck between the relevant interests of two States and their respective communities, does not have to be recalibrated by reference to the potentially disparate interests of individuals within one of those two States.

9.15. For these reasons, in Colombia's view the incidental effects (if any) on individuals or groups in Ecuador of the internationally lawful conduct of Colombia in its own territory do not in principle raise issues of the human rights of those

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[1004] *Legality of the Threat or Use of Nuclear Weapons, Advisory Opinion, I.C.J. Reports 1996*, p. 240, para. 25. Cf., as to the environment, *Ibid.*, pp. 242-243, paras. 30-33.

persons or groups. But in any event, the substantive provisions of the applicable treaties do not purport to apply to the incidental extra-territorial effects of the conduct of a foreign State acting otherwise lawfully on its own territory. This will now be demonstrated, using as examples the ICCPR, the IACHR and the ICESR.

(a) ICCPR

9.16. Both Ecuador and Colombia are party without reservation to the ICCPR and to Optional Protocol 1. Article 2 of the ICCPR, governing the scope of its application, provides:

> "Each State Party to the present Covenant undertakes to respect and to ensure to all individuals within its territory and subject to its jurisdiction the rights recognized in the present Covenant, without distinction of any kind, such as race, colour, sex, language, religion, political or other opinion, national or social origin, property, birth or other status."

9.17. Ecuador selectively quotes the Court's Advisory Opinion on *The Wall* in support for the proposition that the human rights treaties on which it relies are not limited in their territorial scope. However, the Court's approach must be read in its proper context. The Court addressed the interpretation of Article 2 in considering the applicability of the substantive provisions of the ICCPR (as well as of the ICESCR and CRC) to Israel's actions in the Occupied Palestine Territories (OPT). It framed the issue as follows:

> "whether the two international Covenants and the [CRC] are applicable only on the territories of the States parties thereto or whether they are also applicable outside those territories and, if so, in what circumstances."[1005]

9.18. The Court observed:

> "This provision can be interpreted as covering only individuals who are both present within a State's territory and subject to that State's jurisdiction. It can also be construed as covering both individuals present within a State's territory and those outside that territory but subject to that State's jurisdiction."[1006]

The Court preferred the latter construction, observing that:

> "while the jurisdiction of States is primarily territorial, it may sometimes be exercised outside the national territory. Considering the object and purpose of the International Covenant on Civil and Political Rights, it would seem natural that, even when such is the case, States parties to the Covenant should be bound to comply with its provisions."[1007]

The Court concluded that

> "the [ICCPR] is applicable in respect of acts done by a State *in the exercise of its jurisdiction outside its own territory*."[1008]

1005 *Legal Consequences of the Construction of a Wall in the Occupied Palestinian Territory, I.C.J. Reports 2004,* p. 178, para. 107.

1006 *Ibid.*, p. 179, para. 108.

1007 *Ibid.*, p. 179, para. 109.

1008 *Ibid.*, p. 180, para. 111 (emphasis added).

9.19. In accordance with the Court's observations in *The Wall*, the alleged victim either is on the territory of the State and thus within its authority, or else is outside the State's territory but is nevertheless subject to the State's jurisdiction as a result of the actions of the State's agents "in the exercise of its jurisdiction". The Court does not seem to have envisaged any other possibility: in particular, there is no mention of the situation in which an individual is outside the State's territory (and outside its "jurisdiction", as that term is normally understood), but nevertheless is injured as a by-product of lawful action taken by the State within its own territory.

9.20. To summarize, the clear import of the Court's Opinion in *The Wall* is that the two conditions of territory and jurisdiction in Article 2 are to be interpreted disjunctively: it is sufficient either that an individual is on a State's territory, or that he is "subject to its jurisdiction". Given that individuals in Ecuador are not "within [Colombia's] territory", the crucial question remains whether they may be said to be "subject to [Colombia's] jurisdiction". Given the Court's reference in *The Wall* to the "primarily territorial" character of jurisdiction, the words "subject to its jurisdiction" in Article 2 require some "exercise of jurisdiction", in the sense in which that term is normally understood in public international law, before applicability of the ICCPR is engaged.

9.21. Ecuador relies on the decisions of the Human Rights Committee in *López Burgos* and *Celiberti*, but these are of little assistance. Both cases again concerned the extra-territorial actions of State agents and the Committee's reasoning on its face has no bearing on the question whether or not an individual in a State A is able to complain of the effects of the action of another State, State B, taken in its own territory which may incidentally have some impact on the exercise of that individual's rights. The PECIG program has been carried out in Colombian territory.

9.22. The mere fact that actions of Colombia within its own territory could arguably have some effects on individuals across the border within Ecuador is not sufficient to render them "subject to its jurisdiction" for the purposes of Article 2 ICCPR.

9.23. Since the Court's Advisory Opinion in *The Wall*, the Human Rights Committee has expressed its views as to the scope of Article 2 in *General Comment No. 31*. As regards the applicability of the ICCPR, the Human Rights Committee has said:

> "Article 2 defines the scope of the legal obligations undertaken by States Parties to the Covenant. A general obligation is imposed on States Parties to respect the Covenant rights and

> to ensure them to all individuals in their territory and subject to their jurisdiction."[1009]

Later on, it observed:

> "States Parties are required by article 2, paragraph 1, to respect and to ensure the Covenant rights to all persons who may be within their territory and to all persons subject to their jurisdiction. This means that a State party must respect and ensure the rights laid down in the Covenant to anyone *within the power or effective control of that State Party, even if not situated within the territory of the State Party*. As indicated in General Comment 15 … the enjoyment of Covenant rights is not limited to citizens of States Parties but must also be available to all individuals, regardless of nationality or statelessness, such as asylum seekers, refugees, migrant workers and other persons, who may find themselves in the territory or subject to the jurisdiction of the State Party. This principle also applies to those within the power or effective control of the forces of a State Party acting outside its territory, regardless of the circumstances in which such power or effective control was obtained, such as forces constituting a national contingent of a State Party assigned to an international peace-keeping or peace-enforcement operation."[1010]

9.24. As in the Committee's previous decisions in *López Burgos* and *Celiberti*, the emphasis is on whether an individual is within a State's "power or effective control" within the

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[1009] General Comment No. 31; *Nature of the General Legal Obligation Imposed on States Parties to the Covenant*, 29 March 2004, CCPR/C/21/Rev. 1/Add.13, para. 3.

[1010] *Ibid.*, para. 10.

context of extended operations such as peace-keeping operations. There is no indication that the notion of jurisdiction for these purposes encompasses a situation such as that at issue in the present case.

9.25. Colombia is not aware that any of the global or regional international human rights instruments has been interpreted in such a way that they would apply to the present circumstances. The most important decision is probably that of the Grand Chamber of the European Court of Human Rights in *Banković*,[1011] which concerned the meaning of the formulation "within their jurisdiction" in Article 1 of the European Convention, and which, by extension, is illuminating as to the meaning of the similar notion of "subject to its jurisdiction" in Article 2 of the ICCPR.

9.26. In *Banković,* the argument that State action could "affect" human rights extraterritorially was explicitly rejected by the European Court of Human Rights in circumstances in which the State action in question (the bombing of a TV station) was much more obviously targeted on the victims of those actions than in the present case.

[1011] *Banković v. Belgium and 16 Other Contracting States* (App. no. 52207/99), Decision on Admissibility of 12 December 2001; ECHR 2001-XII [GC].

9.27. The applicants in *Banković* had argued in the alternative that the relevant actions were not only the actual dropping of the bombs which hit the television station, but also the authorisation of the operation and the giving of the relevant commands (i.e. that the alleged violations resulted from the extraterritorial effects of intra-territorial acts).[1012] The Grand Chamber appears not to have regarded that factor as affecting the outcome. It said:

> "the real connection between the applicants and the respondent States is the impugned act which, wherever decided, was performed, or had effects, outside of the territory of those States ('the extra-territorial act'). It considers that the essential question to be examined therefore is whether the applicants and their deceased relatives were, as a result of that extra-territorial act, capable of falling within the jurisdiction of the respondent States.[1013]

It could not have made a difference in *Banković* if the harm had been caused by a missile fired from the territory of a NATO member, as distinct from being dropped by a bomber flying from that territory.

9.28. As to the interpretation of Article 1, the Grand Chamber observed that the words "within their jurisdiction" in Article 1 of the European Convention had to be interpreted in accordance

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[1012] *Banković v. Belgium and 16 Other Contracting States* (App. no. 52207/99), Decision on Admissibility of 12 December 2001; ECHR 2001-XII [GC], para. 53.

[1013] *Ibid.*, para. 54.

with the normal rules of interpretation set out in the Vienna Convention.[1014] In that regard, it observed:

> "As to the 'ordinary meaning' of the relevant term in Article 1 of the Convention, the Court is satisfied that, from the standpoint of public international law, the jurisdictional competence of a State is primarily territorial. While international law does not exclude a State's exercise of jurisdiction extra-territorially, the suggested bases of such jurisdiction (including nationality, flag, diplomatic and consular relations, effect, protection, passive personality and universality) are, as a general rule, defined and limited by the sovereign territorial rights of the other relevant States."[1015]

9.29. The Grand Chamber added:

> "In keeping with the essentially territorial notion of jurisdiction, the Court has accepted only in exceptional cases that acts of the Contracting States performed, or producing effects, outside their territories can constitute an exercise of jurisdiction by them within the meaning of Article 1 of the Convention."[1016]

9.30. Having discussed *Drozd and Janousek* and the cases holding that the Convention was applicable to Turkey as regards the actions of the TRNC in Northern Cyprus, in which jurisdiction was held to subsists as a result of the "effective

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[1014] *Banković v. Belgium and 16 Other Contracting States* (App. no. 52207/99), Decision on Admissibility of 12 December 2001; ECHR 2001-XII [GC], para. 56.

[1015] *Ibid.*, para. 59.

[1016] *Ibid.*, para. 67.

control" exercised by Turkey over the territory, the Grand Chamber observed that :

> "the case-law of the Court demonstrates that its recognition of the exercise of extra-territorial jurisdiction by a Contracting State is exceptional: it has done so when the respondent State, through the effective control of the relevant territory and its inhabitants abroad as a consequence of military occupation or through the consent, invitation or acquiescence of the Government of that territory, exercises all or some of the public powers normally to be exercised by that Government."[1017]

9.31. Turning to the question whether the applicants could be said to be "within the jurisdiction" of the respondent States, the Grand Chamber rejected the applicant's reliance on a modified "effective control" test according to which the applicability of the substantive obligations under the Convention could be "divided and tailored" according to the level of control in fact exercised by the State.[1018] Of particular interest for present purposes is the Grand Chamber's observation that:

> "the applicants' notion of jurisdiction equates the determination of whether an individual falls within the jurisdiction of a Contracting State with the question of whether that person can be considered to be a victim of a violation of rights guaranteed by the Convention. These are separate and distinct admissibility conditions, each of

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[1017] *Banković v. Belgium and 16 Other Contracting States* (App. no. 52207/99), Decision on Admissibility of 12 December 2001; ECHR 2001-XII [GC], para. 71.

[1018] *Ibid.*, para. 75.

> which has to be satisfied in the afore-mentioned order, before an individual can invoke the Convention provisions against a Contracting State."[1019]

9.32. Those observations are equally apt as regards the ICCPR; it is necessary first to ascertain whether the ICCPR is applicable, and whether substantive obligations are thus owed to individuals, before assessing whether particular conduct can be said to amount to a breach.

9.33. Another relevant admissibility decision of the European Court of Human Rights is *El Mahi and Others v. Denmark*.[1020] There an individual and two associations in Morocco brought a case against Denmark alleging breach of their right to religion under Article 9, together with the prohibition of discrimination in Article 14, as a result of the decision of the Danish authorities not to bring any prosecution in relation to the publication of the infamous cartoons depicting the prophet Mohammed in the *Jyllands-Posten* newspaper. They also alleged breaches of their right to freedom of expression under Article 10 and of Article 17 (prohibition of abuse of rights).

[1019] *Banković v. Belgium and 16 Other Contracting States* (App. no. 52207/99), Decision on Admissibility of 12 December 2001; ECHR 2001-XII [GC], para. 75.

[1020] *El Mahi and Others v. Denmark* (App. no. 5853/06), Decision on Admissibility of 11 December 2006, ECHR 2006-XII (5° Section/C).

9.34. The Court held that the application was inadmissible on the basis that the applicants were not "within the jurisdiction" of Denmark within the meaning of Article 1 of the European Convention. The Court reasoned that the concept of "jurisdiction" in Article 1:

> "must be considered to reflect the term's meaning in public international law. Thus, from the standpoint of public international law, the words 'within their jurisdiction' in Article 1 of the Convention must be understood to mean that a State's jurisdictional competence is primarily territorial and also that jurisdiction is presumed to be exercised normally throughout the State's territory. Only in exceptional circumstances may the acts of Contracting States performed outside their territory or which produce effects there ('extra-territorial acts') amount to an exercise by them of their jurisdiction within the meaning of Article 1 of the Convention...
>
> Here the applicants are, respectively, a Moroccan national resident in Morocco and two Moroccan associations which are based in Morocco and operate in that country. The Court considers that there is no jurisdictional link between any of the applicants and the relevant member State, namely Denmark, [n]or that they can come within the jurisdiction of Denmark on account of any extra-territorial act. Accordingly, the Court has no competence to examine the applicants' substantive complaints under the Articles of the Convention relied upon."[1021]

[1021] *El Mahi and Others v. Denmark* (App. no. 5853/06), Decision on Admissibility of 11 December 2006, ECHR 2006-XII (5º Section/C), pp. 8-9.

9.35. Admittedly, the decision is not on all fours with the present case, given that the breach was as an alleged breach of positive obligations to protect the right to religion, rather than direct State action alleged to result in a breach. However, the decision is authority for the proposition that, if an applicant is not on the territory of a State (and therefore within its jurisdiction on that account), and if there is no extraterritorial act, then the substantive provisions of the European Convention are simply not engaged, whatever the effects that State action (or inaction) may have upon the rights of an applicant. Similar reasoning is equally applicable under the ICCPR.

9.36. Reference may also be made to the Court's 2008 Order on Provisional Measures in *Application of the International Convention on the Elimination of All Forms of Racial Discrimination (Georgia v. Russia)*, in which the Court rejected Russia's argument that Article 2 and 5 of CERD were not applicable to the extraterritorial actions of Russian troops in South Ossetia and Abkhazia.[1022] That provisional conclusion related to a treaty containing no express limitation on its applicability and concerned specific provisions phrased in broad terms. It is not authority in relation to jurisdictional provisions such as those in Article 1 ICCPR.

[1022] *Application of the International Convention on the Elimination of All Forms of Racial Discrimination (Georgia v. Russia), Request for the Indication of Provisional Measures*, *Order of 15 October 2008,* para. 109.

(b) ACHR

9.37. Both Colombia and Ecuador are parties to the American Convention on Human Rights without reservation. The English text of Article 1 of the ACHR provides:

> "The States Parties to this Convention undertake to respect the rights and freedoms recognized herein and to ensure to all persons subject to their jurisdiction the free and full exercise of those rights and freedoms, without any discrimination for reasons of race, color, sex, language, religion, political or other opinion, national or social origin, economic status, birth, or any other social condition."

9.38. The formulation of Article 1 ACHR differs from that of Article 2 ICCPR (there being no reference to persons "within the territory" of the States Parties).

9.39. The Inter-American Court has not yet pronounced on the interpretation of Article 1 in relation to extra-territorial State action (or intra-territorial State action having extra-territorial effects). On the other hand, the Court has emphasised the distinction in Article 1 between the obligation not to violate human rights ("respect") and the obligation to "ensure" the full and free enjoyment of human rights,[1023] in terms which suggest that the obligation "to ensure" at least is limited to persons "subject to their jurisdiction".

[1023] See e.g. *Velázquez-Rodríguez v. Honduras*, Merits, I-ACtHR, Series C, No. 4, Judgment of 29 July 1988, paras. 164 ff.

9.40. By contrast, the Inter-American Commission has had occasion to deal with the issue. In *Saldaño v. Argentina*,[1024] it was argued by the applicant, on behalf of her son who had been condemned to death in the United States, that Argentina was under an obligation to present an inter-State case on his behalf in respect of alleged violations of his right to a fair trial under the American Declaration on the Rights and Duties of Man and the ACHR. The Commission declared the application inadmissible. Having cited Article 1(1) ACHR, the Commission observed:

> "Accordingly, States Parties have undertaken to respect and ensure the substantive guarantees enshrined in the Convention in favour of persons 'subject to their jurisdiction.' As implicitly established by the case law of the Commission and the Inter-American Court, this protection must extend to all human beings present within their national territory, irrespective of their nationality or status."[1025]

The Commission continued:

[1024] *Saldaño v. Argentina*, I-ACmHR, Report No. 38/99, 11 March 1999.

[1025] *Ibid.*, para. 16. The reference to the jurisprudence of the Inter-American Court is to Advisory Opinion OC-2/82, *The Effect of Reservations on the Entry into Force of the American Convention on Human Rights (Articles 74 and 75)*, I-ACtHR, Series A, No. 2, 24 September 1982, para. 33, where the Inter-American Court observed:
"Viewed in this light and considering that the Convention was designed to protect the basic rights of individual human beings irrespective of their nationality, against States of their own nationality or any other State Party, the Convention must be seen for what in reality it is: a multilateral legal instrument of framework enabling States to make binding unilateral commitments not to violate the human rights of individuals within their jurisdiction." (emphasis added).

> "The Commission does not believe, however, that the term 'jurisdiction' in the sense of Article 1(1) is limited to or merely coextensive with national territory. Rather, the Commission is of the view that a state party to the American Convention may be responsible under certain circumstances for the acts and omissions of its agents which produce effects or are undertaken outside that State's own territory."

9.41. Having referred to the decision of the European Commission on Human Rights in the first *Cyprus v. Turkey* inter-State case, in which the European Commission had held that States Parties to the European Convention "are bound to secure the said rights and freedoms to all persons under their actual authority and responsibility, whether that authority is exercised within their own territory or abroad".[1026] The Inter-American Commission continued:

> "This understanding of jurisdiction – and therefore responsibility for compliance with international obligations – as a notion linked to authority and effective control, and not merely to territorial boundaries, has been confirmed and elaborated on in other cases decided by the European Commission and Court."[1027]

[1026] *Saldaño v. Argentina*, I-ACmHR, Report No. 38/99, 11 March 1999, §18, citing *Cyprus v. Turkey* (App. Nos. 6780/74 and 6950/75) 2 DR 125 (1975), para. 8.

[1027] *Saldaño v. Argentina*, I-ACmHR, Report No. 38/99, 11 March 1999, para 19 (reference omitted). In that regard, the Inter-American Commission also referred to, inter alia, the decision of the European Court in *Loizidou v. Turkey, Jurisdiction* (App. No. 15318/89), Series A, No. 310 [GC] (1995) and the decisions of the European Commission in *X v. United Kingdom* (App. No. No. 7547/76) 12 DR 73 (1977), *Bertrand Russell Peace Foundation v.*

The Inter-American Commission dismissed the application as inadmissible, on the basis that "the claims filed refer to the alleged violation of the rights of a person who is not subject to Argentine jurisdiction under the terms of Article 1(1)".[1028]

9.42. The decision of the Inter-American Commission in *Saldaño* is strong authority both for the proposition that both limbs of Article 1(1) apply only to persons "subject to [the] jurisdiction", and that such jurisdiction will exist in relation to extra-territorial action only when the State in question exercises "authority and effective control".

9.43. In such circumstances, it is an essential requirement for applicability of the ACHR that the individuals in question should have been "subject to the jurisdiction" of Colombia. The express reliance in *Saldaño* on the jurisprudence of the European Court and European Commission relating to "authority and effective control" supports that conclusion. The PECIG program carried out in Colombian territory cannot be understood as an "exercise of authority or effective control" in Ecuador.

United Kingdom (App. No. 7597/76) 14 DR 117 (1978); and *Mrs W v. United Kingdom* (App. No. 9348/81), 32 DR 190 (1983).

[1028] *Saldaño v. Argentina*, I-ACmHR, Report No. 38/99, 11 March 1999, para. 23.

(c) ICESCR

9.44. Both Colombia and Ecuador are parties to the ICESCR without reservation.

9.45. The ICESCR contains no express provision concerning its applicability. The closest it comes is Article 2, which provides:

> "1. Each State Party to the present Covenant undertakes to take steps, individually and through international assistance and co-operation, especially economic and technical, to the maximum of its available resources, with a view to achieving progressively the full realization of the rights recognized in the present Covenant by all appropriate means, including particularly the adoption of legislative measures.
>
> 2. The States Parties to the present Covenant undertake to guarantee that the rights enunciated in the present Covenant will be exercised without discrimination of any kind as to race, colour, sex, language, religion, political or other opinion, national or social origin, property, birth or other status.
>
> 3. Developing countries, with due regard to human rights and their national economy, may determine to what extent they would guarantee the economic rights recognized in the present Covenant to non-nationals."

9.46. In its Advisory Opinion in *The Wall*, the Court was called upon to determine the applicability of the ICESCR to the actions of Israel in the OPT. The Court observed:

> "The International Covenant on Economic, Social and Cultural Rights contains no provision on its scope of application. This may be explicable by the fact that *this Covenant guarantees rights which are essentially territorial*. However, it is not to be excluded that it applies both to territories over which a State party has sovereignty and to those over which that State exercises territorial jurisdiction. Thus Article 14 makes provision for transitional measures in the case of any State which 'at the time of becoming a Party, has not been able to secure in its metropolitan territory or other territories under its jurisdiction compulsory primary education, free of charge'."[1029]

9.47. Having referred to the views of the Committee on Economic, Social and Cultural Rights to the effect that "the State party's obligations under the Covenant apply to all territories and populations under its effective control"[1030], as noted above, the Court observed that

> "the territories occupied by Israel have for over 37 years been subject to its territorial jurisdiction as the occupying Power. In the exercise of the powers available to it on this basis, Israel is bound by the provisions of the International Covenant on Economic, Social and Cultural Rights."[1031]

[1029] Legal Consequences of the Construction of a Wall in the Occupied Palestinian Territory, Advisory Opinion, ICJ Reports 2004, p. 181, para. 112 (emphasis added).

[1030] *Ibid*.

[1031] *Ibid*.

9.48. Thus the ICESR "guarantees rights which are essentially territorial".[1032] It was only held to apply to Israel's actions in the OPT on the basis of Israel's "territorial jurisdiction" over those territories as a consequence of its occupation.

(d) Conclusion as to territorial application

9.49. To summarise, the various human rights instruments, and in particular those which limit their scope to persons "within" or "subject" to the jurisdiction of the Respondent State, do not apply to the case of alleged injury caused incidentally by spray drift from lawful activities of a State on its own territory.

9.50. In the interests of economy this point will not be repeated in relation to each of the human rights treaties discussed below. It is, however, maintained with respect to each of them.

(3) HUMAN RIGHTS OBLIGATIONS AND ARTICLE 14(2) OF THE 1988 NARCOTICS CONVENTION

9.51. This issue has already been discussed in relation to Ecuador's environmental claims.[1033] It can therefore be dealt with here very briefly.

[1032] Similar considerations apply to the CRC, the CEDAW and the ACHR ESCR Additional Protocol, which likewise do not contain any express provision as to their applicability, but are likewise "essentially territorial" in their application.

[1033] See above, paras. 8.113-8.121.

9.52. Ecuador's arguments in this regard consist chiefly of a cross-reference to the discussion in Chapter VIII as regards environmental matters.[1034] However, perhaps perceiving the potential weaknesses of its arguments as to applicability of the various human rights instruments relied upon, it also argues that:

> "Article 14(2) is not limited to fundamental human rights within the territorial jurisdiction of the State concerned but applies equally to respect for the fundamental rights of persons beyond its borders who are affected by the measures in question. On that basis Ecuador's case is that Colombia has violated not only applicable provisions of *inter alia* the 1966 UN Covenants on Civil and Political Rights and on Economic, Social and Cultural Rights, the 1969 Inter-American Convention on Human Rights, and the 1989 ILO Convention No. 169 Concerning Indigenous and Tribal Peoples in Independent Countries, but additionally or alternatively the 1988 Narcotics Convention, Article 14(2)."[1035]

9.53. But Ecuador cannot have it both ways. Either the human rights obligations in question are incorporated by reference, in which case they must have the same scope *ratione loci* as they do in the original treaty, or they are not, in which case Article 14(2) is reduced to a provision requiring only "respect" in general terms for unspecified human rights as a condition of certain measures to implement the 1988 Convention. Even if Ecuador's arguments as to the effects of the Article 14(2) are

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1034 EM, para. 9.11.

1035 EM, para. 9.11.

accepted, those human rights obligations cannot be rendered applicable merely by incorporation by reference in another treaty, especially where that treaty does not as such concern human rights. If obligations do not arise for Colombia under the treaties themselves, they cannot rise under the 1988 UN Narcotics Convention.

(4) THE SCOPE OF HUMAN RIGHTS ALLEGEDLY BREACHED

9.54. In Section II of Chapter IX, Ecuador alleges violations of a catalogue of human rights, in particular, the rights to life, health, food, water, healthy environment, property, humane treatment, private life, and information. As already demonstrated, the various human rights instruments relied on by Ecuador are simply not applicable to any extraterritorial effects of Colombia's actions on the facts of the present case. However, in addition to the primary response that it has not been shown by Ecuador that spraying has had any transboundary effects within Ecuador's territory, Colombia has specific legal and factual answers to each of these individual allegations, and without prejudice to the general points of principle made above, the allegations will be dealt with individually in their turn.

(a) The right to life

(i) Ecuador's position

9.55. As regards the alleged violation(s) of the right to life, Ecuador relies on Article 6(1) ICCPR, Article 6 CRC and Article 4 ACHR.[1036] It asserts that it is a universal right (relying also on the African Charter and European Convention), and that "it is unquestionably part of general international law.[1037]

9.56. In attempting to elucidate the content of the right to life, Ecuador refers to the Inter-American Court's *Street Children* decision[1038] and its reiteration in, *inter alia*, the decision in *Yakye Axa*,[1039] where:

> "the Court concluded that lack of access by indigenous peoples to traditional means of subsistence, as well as to use and enjoyment of the natural resources necessary to obtain clean water and to practice traditional medicine to prevent and cure illnesses, resulted in a breach of the right to a decent existence, as recognised in Article 4 of the American Convention."[1040]

9.57. Ecuador concludes that:

[1036] EM, para. 9.43.

[1037] EM, para. 9.43.

[1038] EM, para. 9.44, referring to "*Street Children Case*" , *Villagran Morales et al. v. Guatemala, I-ACtHR, Series C No. 77,* Judgment of 19 November 1999, para. 144.

[1039] Indigenous Community *Yakye Axa v. Paraguay,* I-ACtHR, Series C, No. 125, Judgment of 17 June 2005.

[1040] EM, para. 9.47, citing Indigenous Community *Yakye Axa v. Paraguay,* I-ACtHR, Series C, No. 125, Judgment of 17 June 2005, paras. 162-168, 176.

> "Pollution from Colombian spraying of toxic herbicides poses a well-documented risk to life and human health. The evidence shows that it has harmed access to food and clean water, and denied those living in affected border areas of Ecuador the decent existence to which they are entitled."[1041]

and that as a result, Colombia has breached the relevant provision of the ICCPR, ACHR and CRC.

(ii) Colombia's response

9.58. Article 4(1) ACHR provides:

> "Every person has the right to have his life respected. This right shall be protected by law and, in general, from the moment of conception. No one shall be arbitrarily deprived of his life."

The remainder of Article 4 ACHR is concerned with provisions relating to capital punishment and the death penalty.

9.59. Article 6(1) ICCPR provides:

> "Every human being has the inherent right to life. This right shall be protected by law. No one shall be arbitrarily deprived of his life."

The remainder of Article 6 ICCPR is likewise concerned with issues relating to the death penalty.

9.60. Article 6 CRC provides:

> "1. States Parties recognize that every child has the inherent right to life.

[1041] EM, para. 9.48.

> 2. States Parties shall ensure to the maximum extent possible the survival and development of the child."

9.61. As noted elsewhere in this Counter-Memorial, it is striking that, in the section of Chapter 8 devoted to the right to life, Ecuador does not allege any breach of the right to life as such (i.e. the causing of deaths of persons), although it does make reference to a number of allegations of deaths in the section devoted to the right to health.[1042] In particular, Ecuador does not as such explicitly endorse, adopt or rely upon the allegations of a number of its witnesses[1043] and the allegations made in a number of the documents contained in the Annexes,[1044] that the spraying has directly caused deaths or serious long-term illnesses.

9.62. Rather, its allegation is of a more diffuse breach of ancillary obligations which it says are to be read into the provisions in question, relating to access to food and clean water, and ensuring the conditions for a "decent existence" and which are said to protect a right to "a decent life". Ecuador's

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[1042] EM, paras. 9.53, 9.54; and cf. EM, para. 10.9: "Colombia's chemical spraying has caused damage and injury to human health, including illness and death among the people who inhabit the border region".

[1043] See e.g., EM, Vol. IV, Annex 194 (Witness No. 6); Annex 199 (Witness No. 11); Annex 201 (Witness No. 13); Annex 202 (Witness No. 14).

[1044] See e.g., EM, Vol. IV, Annex 161, p. 9 (Acción Ecologica); Annex 162 (CONAIE), pp. 12-14, 20; Annex 166, pp. 4, 12, 15, 18 and 20 (Ecuadorian Ministry for the Environment); Annex 166 (Ecuadorian Congress), pp. 4 and 5; Annex 169 (FIDH et al), p. 12.

claims are unsupported by evidence; still less can they be described as "well documented". Moreover, the ancillary obligations on which Ecuador here relies are the positive obligations of a territorial sovereign, and thus the exclusive responsibility of Ecuador.

9.63. Further, Ecuador's allegations of breach of the right to life (or rather, the alleged right to a "decent life") in effect recycle its claims as to the right to food and the right to water, as well as its claims as to the rights of indigenous peoples.

9.64. As to the dictum of the Inter-American Court in *Yakye Axa*, that pronouncement was made in a case involving a very different factual situation, viz., action of a State affecting an indigenous population located on its own territory. That reasoning cannot simply be extended to a situation of alleged extra-territorial effects of State action carried on within its own territory. The essentially territorial nature of the Inter-American Court's reasoning is apparent from the terms used to define the scope of its enquiry:

> "whether the State generated conditions that worsened the difficulties of access to a decent life for the members of the Yakye Axa Community and whether, in that context, it took appropriate positive measures to fulfill that obligation".[1045]

[1045] Indigenous Community *Yakye Axa v. Paraguay*, I-ACtHR, Series C, No. 125, Judgment of 17 June 2005, para. 163.

(b) The right to health

(i) Ecuador's position

9.65. As to the right to health, Ecuador relies on Article 12(1) ICESCR, Article 12 CEDAW, Article 24 CRC and Article 10 ACHR ESCR Additional Protocol.[1046] It argues that the right to health is not limited to health care, relying on General Comment No. 14 of the Committee on Economic, Social and Cultural Rights, in which the Committee observed:

> "the right to health embraces a wide range of socio-economic factors that promote conditions in which people can lead a healthy life, and extends to the underlying determinants of health, such as food and nutrition, housing, access to safe and potable water and adequate sanitation, safe and healthy working conditions, and a healthy environment."[1047]

9.66. Relying on Article 12(2)(b) ICESCR, it argues that that provision "imposes a positive obligation on the parties to take appropriate measures aimed at "the improvement of all aspects of environmental…hygiene,"[1048] and in that regard again refers to General Comment No. 14 in which the Committee opined that that provision includes an obligation of

> "prevention and reduction of the population's exposure to harmful substances such as radiation and harmful chemicals or other detrimental

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1046 EM, para. 9.49

1047 EM, para. 9.50, citing General Comment No. 14, para. 11.

1048 EM, para. 9.50.

> environmental conditions that directly or indirectly impact upon human health".[1049]

9.67. Ecuador next argues that "[v]iolations of the right to food and the right to water [...] also engage a breach of the obligation to respect the right to health,"[1050] alleging a violation of the right to health by "exposure to toxic herbicides, by the contamination of drinking water sources, and because of the destruction of crops that constitute the basis of their nutrition and medicine."[1051] In that regard, reliance is placed on the reports of the UN Special Rapporteur on the Right to Health.[1052]

(ii) Colombia's response

9.68. Article 12 ICESCR provides:

> "1. The States Parties to the present Covenant recognize the right of everyone to the enjoyment of the highest attainable standard of physical and mental health.
>
> 2. The steps to be taken by the States Parties to the present Covenant to achieve the full realization of this right shall include those necessary for:
>
> (a) The provision for the reduction of the stillbirth-rate and of infant mortality and for the healthy development of the child;
>
> (b) The improvement of all aspects of environmental and industrial hygiene;

1049 EM, para. 9.50, citing General Comment No. 14, para. 15
1050 EM, para. 9.56
1051 EM, para. 9.56.
1052 EM, para. 9.56.

(c) The prevention, treatment and control of epidemic, endemic, occupational and other diseases;

(d) The creation of conditions which would assure to all medical service and medical attention in the event of sickness."

9.69. Article 24 CRC provides:

"1. States Parties recognize the right of the child to the enjoyment of the highest attainable standard of health and to facilities for the treatment of illness and rehabilitation of health. States Parties shall strive to ensure that no child is deprived of his or her right of access to such health care services.

2. States Parties shall pursue full implementation of this right and, in particular, shall take appropriate measures:

(a) To diminish infant and child mortality;

(b) To ensure the provision of necessary medical assistance and health care to all children with emphasis on the development of primary health care;

(c) To combat disease and malnutrition, including within the framework of primary health care, through, inter alia, the application of readily available technology and through the provision of adequate nutritious foods and clean drinking-water, taking into consideration the dangers and risks of environmental pollution;

(d) To ensure appropriate pre-natal and post-natal health care for mothers;

(e) To ensure that all segments of society, in particular parents and children, are informed, have access to education and are supported in the use of basic knowledge of child health and nutrition, the advantages of breastfeeding, hygiene and environmental sanitation and the prevention of accidents;

(f) To develop preventive health care, guidance for parents and family planning education and services.

3. States Parties shall take all effective and appropriate measures with a view to abolishing traditional practices prejudicial to the health of children.

4. States Parties undertake to promote and encourage international co-operation with a view to achieving progressively the full realization of the right recognized in the present article. In this regard, particular account shall be taken of the needs of developing countries."

9.70. Article 12 CEDAW provides

"1. States Parties shall take all appropriate measures to eliminate discrimination against women in the field of health care in order to ensure, on a basis of equality of men and women, access to health care services, including those related to family planning.

2. Notwithstanding the provisions of paragraph I of this article, States Parties shall ensure to women appropriate services in connection with pregnancy, confinement and the post-natal period, granting free services where necessary, as well as adequate nutrition during pregnancy and lactation."

9.71. Article 10 ACHR ESCR Additional Protocol provides:

> "1. Everyone shall have the right to health, understood to mean the enjoyment of the highest level of physical, mental and social well-being.
>
> 2. In order to ensure the exercise of the right to health, the States Parties agree to recognize health as a public good and, particularly, to adopt the following measures to ensure that right:
>
> a. Primary health care, that is, essential health care made available to all individuals and families in the community;
>
> b. Extension of the benefits of health services to all individuals subject to the State's jurisdiction;
>
> c. Universal immunization against the principal infectious diseases;
>
> d. Prevention and treatment of endemic, occupational and other diseases;
>
> e. Education of the population on the prevention and treatment of health problems, and
>
> f. Satisfaction of the health needs of the highest risk groups and of those whose poverty makes them the most vulnerable."

9.72. The ICESCR, CRC and the ACHR ESCR Additional Protocol are all "essentially territorial" in their application, and therefore impose obligations on the territorial State. So much is clear from the various references to the fact that States "shall take appropriate measures" (CRC, Art. 24(2)); States shall "adopt the following measures to ensure that right" (Additional Protocol, Art. 10(2); that "States Parties shall take all

appropriate measures to eliminate discrimination against women in the field of health care" (CEDAW, Art. 12(1)), as well as the catalogue of "steps to be taken by the States Parties" (ICESCR, Art. 12(2). The measures listed are all steps which by their nature are only applicable to the territorial State within its own territory.

9.73. As regards the ICESCR, despite Ecuador's strong reliance upon it, the same is clear from General Comment No. 14, which clearly envisages the right to health as being primarily a right opposable to the territorial State. For instance, in the General Comment, the Committee states variously that

> "The Committee recognizes the formidable structural and other obstacles resulting from international and other factors *beyond the control of States that impede the full realization of article 12 in many States parties*."
>
> "The right to health in all its forms and at all levels contains the following interrelated and essential elements, the precise application of which *will depend on the conditions prevailing in a particular State party* [...]"[1053]

9.74. Article 12 CEDAW, is concerned with the elimination of discrimination in relation to women in the field of health care. Ecuador presents no colourable basis on which it to base any claim of discrimination against women in relation to spray drift from aerial spraying.

[1053] General Comment No. 14, paras. 5 and 12.

9.75. As to the general allegations of symptoms allegedly suffered by individuals in Ecuador and that "the nature and extent of these symptoms of toxic spraying indicate Colombian responsibility for failing to respect the right to health of the affected populations in Ecuador", the general point as to Ecuador's claims as a whole obtains: Ecuador has not demonstrated that those symptoms have in fact occurred – the only evidence put forward is the statements of a handful of witnesses, and there are no independently verified expert reports which demonstrate that the symptoms in question were in fact suffered by individuals in the border area. Further, Ecuador has not demonstrated any causal link between the sprayings and the occurrence of the symptoms in question, if they did in fact occur. Rather, the independent scientific evidence shows that the majority of such symptoms could not have been caused by the spraying, and certainly not at the chronic levels alleged.

9.76. As mentioned above, it is notable that, although allegations of deaths caused by spraying are not relied upon by Ecuador as violations of the right to life of individuals, they surface as regards the right to health. However, they are relied upon selectively and Ecuador appears not to fully endorse the allegations of the witnesses in question.

9.77. The evidence of these witnesses is of doubtful weight. To take one example, Witness 11, explicitly relied upon by

Ecuador, resident in San Francisco II, alleges that two of her children died as the result of spraying: one, following spraying in early 2001, died many months later, in September 2001; the other died an unspecified period after spraying, in September 2003.[1054] Ecuador also refers to the statement of Witness 12, also resident in San Francisco II, who alleges spraying in 2002 and 2004, and notes that four children died in that small community – of only 20 families – in 2002, all of them within a week of the sprayings.[1055] The stories are mutually incompatible, quite apart from the fact that they do nothing to establish causation.

9.78. Further, Ecuador's admission that there is "inadequate health care" in "these impoverished areas" underlines the lack of any proof of a causal link between the alleged spraying and its alleged consequences. The symptoms described are fully consistent with other causes in such "impoverished areas"; the "inadequate health care" and poor infrastructure in those areas, responsibility for which can only be laid at the door of Ecuador, is more likely a cause of the symptoms in question.

9.79. Finally, Ecuador attempts to recycle its allegations of violation of the rights of indigenous peoples, as well as the alleged violations of the rights to food and water, under the heading of the right to health. Those allegations are denied for

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[1054] EM, Vol. IV, Annex 199.
[1055] EM, Vol. IV, Annex 200.

the reasons set out in this chapter; they add nothing to the alleged violation of the right to health.

(c) The right to food

(i) Ecuador's position

9.80. As regards the right to food, Ecuador relies upon Article 11(2) ICESCR, Article 27 CRC and Article 12 ACHR ESCR Additional Protocol, alleging that that right is "[c]losely related to the right to life and the right to health".[1056] In that regard, it refers to the ESCR Committee's General Comment No. 12 on the right to adequate food, which it states is an "authoritative interpretation" of Article 11 ICESCR.[1057] In this regard, Ecuador argues:

> "General Comment No. 12 indicates that this right's core content implies the availability of food in a quantity and quality sufficient to satisfy the dietary needs of individuals, free from adverse substances and acceptable within a given culture. This right imposes an obligation on Colombia to respect, protect and fulfil the right to food, including in areas outside its jurisdiction."[1058]

9.81. Ecuador's allegation of breach, relying on the factual allegations contained in Chapter VI, is that aerial spraying has allegedly "degraded and in some cases destroyed the normal

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1056 EM, para. 9.57.
1057 EM, para. 9.58.
1058 EM, para. 9.59 (citations omitted)

subsistence foodstuffs of local communities in Ecuador".[1059] It is further alleged that the spraying has had effects on domesticated animals, fish in local rivers and wild animals used as food sources.[1060] In this regard, reliance is placed on official reports from the Director of Environmental Management for the Ecuadorian Ministry of Agriculture and Livestock, the Director of the National Directorate for the Defence of the Rights of Indigenous Peoples (DINAPIN), the office of the National Ombudsman of Ecuador, and representatives of the Provincial Government of Sucumbíos, alleging "extensive damage to plantations of maize, plantain, rice, coffee, cacao, and other staple foods of the local communities, such as yucca."[1061] It is further stated that there have been reports of loss of animals.[1062] Ecuador alleges that these "extensive losses in Ecuador are consistent with the damage that has been described on the Colombian side of the border."[1063]

(ii) Colombia's response

9.82. Article 11 ICESCR provides:

> "1. The States Parties to the present Covenant recognize the right of everyone to an adequate standard of living for himself and his family, including adequate food, clothing and housing, and to the continuous improvement of living

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1059 EM, para. 9.59.
1060 EM, para. 9.60.
1061 EM, para. 9.61.
1062 EM, para. 9.61.
1063 EM, para. 9.61.

conditions. The States Parties will take appropriate steps to ensure the realization of this right, recognizing to this effect the essential importance of international co-operation based on free consent.

2. The States Parties to the present Covenant, recognizing the fundamental right of everyone to be free from hunger, shall take, individually and through international co-operation, the measures, including specific programmes, which are needed:

(a) To improve methods of production, conservation and distribution of food by making full use of technical and scientific knowledge, by disseminating knowledge of the principles of nutrition and by developing or reforming agrarian systems in such a way as to achieve the most efficient development and utilization of natural resources;

(b) Taking into account the problems of both food-importing and food-exporting countries, to ensure an equitable distribution of world food supplies in relation to need."

9.83. Article 27 CRC provides:

"1. States Parties recognize the right of every child to a standard of living adequate for the child's physical, mental, spiritual, moral and social development.

2. The parent(s) or others responsible for the child have the primary responsibility to secure, within their abilities and financial capacities, the conditions of living necessary for the child's development.

3. States Parties, in accordance with national conditions and within their means, shall take

> appropriate measures to assist parents and others responsible for the child to implement this right and shall in case of need provide material assistance and support programmes, particularly with regard to nutrition, clothing and housing.
>
> 4. States Parties shall take all appropriate measures to secure the recovery of maintenance for the child from the parents or other persons having financial responsibility for the child, both within the State Party and from abroad. In particular, where the person having financial responsibility for the child lives in a State different from that of the child, States Parties shall promote the accession to international agreements or the conclusion of such agreements, as well as the making of other appropriate arrangements."

9.84. Article 12 ACHR ESCR Additional Protocol provides:

> "1. Everyone has the right to adequate nutrition which guarantees the possibility of enjoying the highest level of physical, emotional and intellectual development.
>
> 2. In order to promote the exercise of this right and eradicate malnutrition, the States Parties undertake to improve methods of production, supply and distribution of food, and to this end, agree to promote greater international cooperation in support of the relevant national policies."

9.85. As with Ecuador's reliance on the right to health, it bears emphasising that the obligations imposed by the various instruments in relation to the right to food are essentially territorial and envisage action by the territorial State in order to

ensure the rights in question to their population. By Article 11(1) ICESCR the States Parties undertake that they "will take appropriate steps to ensure the realization of this right", and by Article 11(2), in particular, they undertake to "take, individually and through international co-operation, the measures, including specific programmes, which are needed" in order to "improve methods of production, conservation and distribution of food" and to "ensure an equitable distribution of world food supplies in relation to need". Those provisions essentially impose obligations in relation to a State's own population; to the extent that they impose wider obligations applicable outside the State's own territory, those obligations are ones of international cooperation.

9.86. Similar considerations apply in relation to Article 12 of the ACHR Additional Protocol, pursuant to which the States Parties undertake "to improve methods of production, supply and distribution of food, and to this end, agree to promote greater international cooperation in support of the relevant national policies."

9.87. The understanding of Article 11 ICESCR set out above is confirmed by the ESCR Committee's "authoritative interpretation" of that provision, contained in General Comment No. 12, in which the Committee expressed the view that

> "Every State is obliged to ensure for *everyone under its jurisdiction* access to the minimum

> essential food which is sufficient, nutritionally adequate and safe, to ensure their freedom from hunger."[1064]

9.88. Similarly, the Committee recognized the essentially territorial nature of State obligations in relation to the right to food when it observed that

> "The most appropriate ways and means of implementing the right to adequate food will *inevitably vary significantly from one State party to another*."[1065]

9.89. Likewise, Ecuador's reliance on the Committee's enunciation of the obligation to "respect, protect and fulfil" in General Comment No. 12 is misplaced; the paragraph in question clearly envisages that it is the territorial State which is under an obligation to take such steps.

9.90. Similar considerations apply in relation to Article 27 CRC, which, it is to be noted, is concerned not with the right to food as such, but with the right of every child to an adequate standard of living; it is notable that Article 27(2) recognizes that the parent(s) or others responsible for a child have the primary obligation, and, pursuant to Article 27(3), the obligation of the State is to "take appropriate measures" to assist them. Those obligations can only be incumbent upon the territorial State in

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[1064] ESCR Committee, General Comment No. 12, para. 14 (emphasis added).

[1065] ESCR Committee, General Comment No. 12, para. 21 (emphasis added).

which the child and his or her parents or other responsible persons are located.

9.91. Further, Ecuador's suggestion that Colombia is obliged "to respect, protect and fulfil the right to food, including in areas outside its jurisdiction" is misleading to the extent that it suggests that the ESCR Committee so stated in General Comment No. 12. In fact, although the obligation "to respect, protect and fulfil" the right to food has been enunciated by the Committee, it did not express the view that those obligations applied outside a State's jurisdiction. Indeed, as noted above, it said exactly the opposite, limiting the applicability of the obligations in that regard to persons "within its jurisdiction".[1066] As is clear from the accompanying footnotes in the relevant passage of Ecuador's Memorial, the only support which Ecuador provides for its extraterritorial applicability of Article 12 is the views of the Special Rapporteur, which are in no way "authoritative", and go well beyond what the ESCR Committee has been prepared to endorse.

9.92. As to the evidence relied upon by Ecuador, although it attempts to give the impression that there are a multitude of bodies and reports which have pronounced upon the question,

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[1066] See above, 9.88.

the only source it cites is a single report from the Ecuadorian Ministry for the Environment.[1067]

9.93. As regards reliance on the reports of the UN Special Rapporteurs on the Right to Food and on the Rights of Indigenous People, those reports are based on allegations of individuals in the relevant areas, and have no scientific basis. To take but one example, the suggestion by the Special Rapporteur on the Rights of Indigenous People that the spraying has resulted in "the diminishing of soil quality"[1068] is clearly contradicted by the scientific evidence; the products used in Colombia's spray mix have negligible effect on the soil, insofar as they are broken down within a few days. More probable causes for degradation of the soil and the damage to plants in the border areas are the practices of "slash and burn" agriculture and the array of highly toxic chemicals used in the cultivation and processing of coca crops to produce cocaine.[1069]

9.94. Finally, it is notable that Ecuador seeks to make a virtue out of the extremely fragile situation of the population in the border areas. Conditions of chronic malnutrition were present there long before the sprayings began.[1070] As acknowledged in

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[1067] EM, Vol. IV, Annex 166.

[1068] EM, para. 9.62.

[1069] See above, paras. 3.28-3.39, 7.98, note 678.

[1070] EM, para. 9.66, after the quote, citing the report of the Ecuadorian Scientific Commission: "It is worth recalling that this region was already characterised, before the sprayings began, as one having 'a higher level of malnutrition among the school-age population than in the same population

the Memorial, "a 2001 Ecuadorian Government study found that nearly one-third of all the residents in rural areas of Esmeraldas, Carchi and Sucumbíos, including children, suffered from chronic malnutrition."[1071] The fact that those areas have high levels of malnutrition is once again a matter for which Ecuador, and Ecuador alone, bears responsibility. Ecuador cannot seek to shift the blame for the parlous condition of the population in areas adjacent to the border by alleging, without any solid proof or scientific basis, that the situation of those individuals is caused by Colombia's spraying programme.

(d) The right to water

(i) Ecuador's position

9.95. Ecuador relies on Article 14(2)(h) CEDAW and Article 24(2)(c) CRC as embodying the right to water.[1072] In addition, it notes that in General Comment No. 15, the ESCR Committee stated that Articles 11(1) (right to an adequate standard of living) and 12(1) (right to an adequate standard of health) ICESCR embody a right to water, as follows:

> "The human right to water entitles everyone to sufficient, safe, acceptable, physically accessible and affordable water for personal and domestic uses. An adequate amount of safe water is

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over 20 km away from the border.'" (EM, Vol. III, Annex 153: Ecuadorian Scientific Commission, *The Plan Colombia Aerial Spraying System and its Impacts on the Ecosystem and Health on the Ecuadorian Border* (hereinafter "Ecuadorian Scientific Commission Report") (April 2007), p. 53.)

[1071] EM, para. 2.23.

[1072] EM, para. 9.67

> necessary to prevent death from dehydration, to reduce the risk of water-related disease and to provide for consumption, cooking, personal and domestic hygienic requirements."[1073]

9.96. Ecuador alleges that communities in the border region have no access to running water (i.e., processed and treated tap water) and that they rely on local rivers "to cook, drink, wash, bathe or raise domestic animals".[1074]

9.97. By way of conclusion, Ecuador alleges:

> "The evidence demonstrates that Colombia is responsible for failing to protect the right of access to safe and healthy water. By polluting the rivers and springs from which the affected farmers and indigenous peoples in Ecuador draw their essential livelihoods Colombia has endangered the health and well-being of the most vulnerable populations living along the Ecuador-Colombia border, and significantly interfered with their rights to water, life, health, property and private life."[1075]

(ii) Colombia's response

9.98. Article 14(2)(h) CEDAW provides:

> "2. States Parties shall take all appropriate measures to eliminate discrimination against women in rural areas in order to ensure, on a basis of equality of men and women, that they

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[1073] EM, para. 9.69, citing ESCR Committee, General Comment No. 15, para. 2.

[1074] EM, para. 9.70.

[1075] EM, para. 9.74.

participate in and benefit from rural development and, in particular, shall ensure to such women the right:

[...]

(h) To enjoy adequate living conditions, particularly in relation to housing, sanitation, electricity and water supply, transport and communications."

9.99. Article 24(2)(c) CRC provides:

"States Parties shall pursue full implementation of this right and, in particular, shall take appropriate measures:

[...]

(c) To combat disease and malnutrition, including within the framework of primary health care, through, *inter alia*, the application of readily available technology and through the provision of adequate nutritious foods and clean drinking-water, taking into consideration the dangers and risks of environmental pollution;".

9.100. Article 11(1) ICESCR provides:

"The States Parties to the present Covenant recognize the right of everyone to an adequate standard of living for himself and his family, including adequate food, clothing and housing, and to the continuous improvement of living conditions. The States Parties will take appropriate steps to ensure the realization of this right, recognizing to this effect the essential importance of international co-operation based on free consent."

while Article 12(1) provides:

> "The States Parties to the present Covenant recognize the right of everyone to the enjoyment of the highest attainable standard of physical and mental health."

9.101. As regards the right to water, the core point to be made is that despite repeated testing by Colombia and even by Ecuador, the boundary rivers have *never* been found to be polluted by glyphosate: in other words, no significant amounts of the spray mix (in most cases no detectable amounts) have been found in the relevant rivers.[1076]

9.102. The simple answer to this complaint is that, whatever obligations in the realm of human rights or otherwise Colombia may be under in relation to transboundary waters, there is not the slightest independent evidence of breach. And this is not surprising given that the scientific evidence shows that the ingredients of the spray mix have a short residence time and are innocuous to humans and animals – a fortiori when further diluted and dispersed by river waters.[1077]

9.103. In relation to Article 14(2)(h) CEDAW, the same point is to be made as regards Ecuador's other claims based on CEDAW, namely that Ecuador has provided absolutely no evidence of any Colombian discrimination against women, whether in Ecuador or in Colombia.

[1076] See above, paras. 5.31, 7.24.

[1077] See Annex 116, CICAD I, pp. 91-94; Appendix – Dobson Report, pp. 6-7, 28.

9.104. As regards Article 24(2)(c) CRC, the specific CRC obligation relied on requires the provision of infrastructure so as to provide clean drinking water. It is for Ecuador, not Colombia, to provide such infrastructure: responsibility for funding basic sanitary facilities and piped water is not to be transferred to Colombia on the basis of an allegation that it contributes a minor fraction of the chemical load carried by the boundary rivers.[1078]

9.105. As regards the ICESCR, the Committee's General Comment No. 15, in discussing "accessibility" as a necessary component of the right to water, states:

> "Water and water facilities and services have to be accessible to *everyone* without discrimination, *within the jurisdiction of the State party*."[1079]

More specifically, as regards "physical accessibility", the Committee observed that:

> "water, and adequate water facilities and services, must be within safe physical reach for all sections of the population."[1080]

[1078] Annex 118, CICAD I, Toxicology of Substances used in the Production and Refining of Cocaine and Heroin: A Tier-Two Hazard Assessment, p. 19.

[1079] ESCR Committee, General Comment No. 15, para. 12(c) (emphasis added).

[1080] ESCR Committee, General Comment No. 15, para. 12(c)(i); see also para. 12(c)(iii) "Water and water facilities and services must be accessible to all, including the most vulnerable or marginalized sections of the population, in law and in fact, without discrimination on any of the prohibited grounds"; and see para. 14.

9.106. It is true that General Comment No. 15 goes further, suggesting that:

> "To comply with their international obligations in relation to the right to water, States parties have to respect the enjoyment of the right in other countries. International cooperation requires States parties to refrain from actions that interfere, directly or indirectly, with the enjoyment of the right to water in other countries. Any activities undertaken within the State party's jurisdiction should not deprive another country of the ability to realize the right to water for persons in its jurisdiction."[1081]

As to this comment, it must be said, first, that there is no evidence that Colombia is in breach of such an obligation, if it indeed arises under the ICESR, and, secondly, that such general language cannot be regarded as rewriting the provisions of the many international watercourse agreements, or for that matter the 1997 UN Convention, that regulate use of shared watercourses on a State-to-State basis. No breach by Colombia of applicable rules governing non-navigational uses of international watercourses has been established.

9.107. As to the supposed evidence relied upon by Ecuador as establishing the breach of a right to water, the principal evidence is that of individual witnesses, together with the reports of the Ecuadorian Ministry for the Environment, the Commission of

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[1081] ESCR Committee, General Comment No. 15, para. 31.

the Ecuadorian Congress and of the Confederation of Indigenous Nationalities of Ecuador ("CONAIE").

9.108. The report compiled by the Ecuadorian Ministry for the Environment in 2003[1082] is based on testimony taken from residents, with no scientific analysis. The report of the Ecuadorian Congressional Committee is based on the collection of testimony taken from residents of the area following a visit in December 2003 and likewise is not backed up by any scientific evidence.[1083] The report by CONAIE, an advocacy group, likewise merely produces the hearsay testimony of local residents.[1084]

9.109. In the absence of scientific studies conducted immediately after any given alleged instance of spraying, Ecuador has provided no evidence other than the assertion of local residents that the spraying is actually the cause of the problems allegedly experienced. It cannot be excluded that any pollution of water sources could be due to other causes, in particular contamination resulting from the use of chemicals in the cultivation and processing of coca on Ecuadorian

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1082 EM, Vol. IV, Annex 166.
1083 EM, Vol. IV, Annex 167.
1084 EM, Vol. IV, Annex 162.

territory.[1085] Similar doubts must be raised as to the reports of the two UN Special Rapporteurs.

(e) The right to a healthy environment

(i) Ecuador's position

9.110. As to Ecuador's claims in relation to "right to a healthy environment" (or a "healthy and decent environment"[1086]) it relies on Article 11 of the ACHR ESCR Additional Protocol.[1087] It acknowledges that "[w]hat constitutes a healthy environment must be determined by reference to the natural, social, economic and cultural character of the region in question",[1088] and refers to the case-law of the Inter-American Court and the Colombian Constitutional Court. Having acknowledged that the Inter-American Court has not been able to rule directly on the question given the jurisdictional limitation in Article 19 of the Additional Protocol,[1089] it notes that the Inter-American Court has considered the scope of the right "in connection with" other rights, including in *Yakye Axa*,[1090] where the Court had regard to Article 11 in determining whether the State had generated conditions which had "worsened the difficulties of access to a

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1085 Annex 118, CICAD I, Toxicology of Substances used in the Production and Refining of Cocaine and Heroin: A Tier-Two Hazard Assessment (2005), pp. 27-28.

1086 EM, para. 9.75.

1087 EM, para. 9.75.

1088 EM, para. 9.76.

1089 EM, para. 9.77.

1090 EM, para. 9.77.

decent life for the members of the Yakye Axa Community",[1091] and concluded that the right to a decent life had been violated.

9.111. Ecuador concludes that:

> "protection of the right to a healthy environment does not amount to restricting the State from taking any action that impacts the environment. However, the State, in order to protect human rights, must exercise due care, take necessary preventive measures, allow informed participation of the concerned population, and provide for adequate monitoring mechanisms".[1092]

9.112. As to breach, Ecuador asserts that none of those requirements have been complied with by Colombia, emphasising, *inter alia*, the connection of the indigenous peoples in the area to the natural environment.[1093]

(ii) Colombia's response

9.113. Article 11 of the ACHR ESCR Additional Protocol provides:

> "1. Everyone shall have the right to live in a healthy environment and to have access to basic public services.

[1091] EM, para. 9.77, citing Indigenous Community *Yakye Axa v. Paraguay,* I-ACtHR, Series C, No. 125, Judgment of 17 June 2005, para. 163.

[1092] EM, para. 9.82.

[1093] EM, para. 9.83.

> 2. The States Parties shall promote the protection, preservation, and improvement of the environment."

9.114. As regards the interpretation of Article 11, the basic point is that that provision is essentially territorial, as is demonstrated by the reference to "access to basic public services": only the territorial state can be obliged to ensure access to public services, and it is for the territorial state to ensure that individuals enjoy a healthy environment.

9.115. As to Ecuador's reliance on the *Yakye Axa* decision of the Inter-American Court, two points can be made: first, the right to a healthy environment was but one of a whole catalogue of rights referred to by the Court in elucidating its conception of the right to a "decent life".[1094] Second, as noted above, the case concerned a very different situation to that at issue in the present case, given that it involved State actions in relation to an indigenous community located on its own territory.

9.116. A similar observation may also be made as to the *Saramaka* case which also involved State action in relation to a group residing on its own territory. In any event, despite Ecuador's attempt to portray that case as one confirming the right to a healthy environment, the case principally concerned violations of the right to property of the applicant indigenous

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[1094] Indigenous Community *Yakye Axa v. Paraguay*, I-ACtHR, Series C, No. 125, Judgment of 17 June 2005, para. 163.

people under Article 21 ACHR, together with other ancillary rights, including the right to juridical personality and the right to judicial protection. Indeed the Court did not so much as mention the right to healthy environment contained in Article 11 of the ACHR ESCR Additional Protocol.

9.117. Ecuador relies on the decision of the African Commission in the *Ogoniland* case, which it treats it as if it were a decision in relation to the right to a healthy environment under Article 11 of the ACHR ESCR Additional Protocol.[1095] In fact it concerned the right of peoples (rather than of individuals) to a "generally satisfactory environment favorable to their development" under Article 24 of the Banjul Charter, a right that has no equivalent in the Inter-American system.

9.118. As to breach, even if it were accepted that Colombia is under any obligation as regards the right of individuals resident in Ecuador to a healthy environment, the simple response is that Colombia has not committed any of the breaches alleged by Ecuador; Ecuador has simply not proved that any of the alleged harms in fact took place. The fact that Ecuador resorts to exaggeration and hyperbole, going so far as to allege that Colombia has destroyed "peoples' 'most basic conditions of

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[1095] See in particular EM, para. 9.81 "With regard to the content of the right to a healthy environment, the Commission ruled that [...]" and "Compliance with the right to a healthy environment also includes obligations related to the right to information and to taking other preventive measures [...]", and para. 9.82 "As established by the African Commission, protection of the right to a healthy environment [...]

survival'"[1096] does nothing to conceal the fact that Ecuador has not even begun to discharge its burden of proof in that regard.

(f) The right to property

(i) Ecuador's position

9.119. As to the right of property, Ecuador refers to Article 21 of the Universal Declaration of Human Rights and Article 21 ACHR. It notes that under the latter provision,

> "the right to the use and enjoyment of property may be limited, but only according to a legal mandate; a person may only be deprived of his or her property for reasons of "public utility or social interest, and in the cases and according to the forms established by law".[1097]

9.120. Ecuador notes that many families near the border "own little more than a small plot of land, the crops they cultivate and the few animals they raise." In that regard, it alleges that:

> "The loss of crops and animals occasioned by Colombia's aerial spraying of herbicides has brought irreparable harm to many families, especially to those located closer to the border. Over a period of nearly nine years, in many cases, the soil has not recovered and the productivity of farms has decreased significantly"[1098]

as well as alleging impact on income resulting in an inability to repay loans.

1096 EM, para. 9.84.
1097 EM, para. 9.85.
1098 EM, para. 9.86.

9.121. As to breach, reference is simply made to the alleged harms set out in Chapter VI of the Memorial. It is alleged that:

> "Subsistence crops have been destroyed or damaged, and domestic animals have died. As a result, many families have lost a great deal of their property or livelihood, and many have been forced to move to other areas."[1099]

This is baldly said to implicate a violation by Colombia of its obligation to respect the right of property.[1100]

(ii) Colombia's response

9.122. Article 21 ACHR provides:

> "1. Everyone has the right to the use and enjoyment of his property. The law may subordinate such use and enjoyment to the interest of society.
>
> 2. No one shall be deprived of his property except upon payment of just compensation, for reasons of public utility or social interest, and in the cases and according to the forms established by law.
>
> 3. …"

9.123. Again, the key point is that Ecuador has not substantiated its claims of property damage. It simply makes vague general claims in that regard without providing any specification of the damage allegedly suffered. For the indirect

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1099 EM, para. 9.87.

1100 *Ibid*.

impacts of aerial spraying in Colombia to even begin to raise an issue under Article 21, the deprivation would have to be substantial, yet the scientific evidence strongly indicates that spray drift at a distance cannot have such an effect.[1101]

9.124. For the reasons set out in Chapter 7, Ecuador has failed to provide any evidence substantiating its claims of property damage. The majority of the statements made by Ecuador's witnesses are vague as to the date, or even as to the year in which the spraying causing damage is alleged to have taken place. There are a large number of inconsistencies in the witness evidence.

9.125. Ecuador's allegations as to the effect of the spray mixture on soil are contradicted by all available scientific evidence. There is no evidence that the spray mixture causes degradation of the soil and thus there is nothing from which the soil must "recover".[1102] Rather, the scientific evidence is clear that the spray mix is broken down into harmless compounds within a short time, and that it does not accumulate in soils or water.[1103] Tropical soils decline under a regime of "slash and burn" agriculture for well-understood reasons, which have nothing to do with Colombia's aerial spraying in its own territory.

[1101] See above, paras. 7.16-7.30.
[1102] EM, para. 9.86.
[1103] See above, para. 7.84-7.85.

(g) Right to humane treatment

(i) Ecuador's position

9.126. Ecuador's claim in relation to alleged violation of the right to humane treatment is based on Article 5 ACHR.[1104] Ecuador alleges that…

> "the right to psychological integrity of the Ecuadorian population in the border region has been violated because people have been subject to severe emotional distress caused by the direct impacts of Colombia's aerial fumigations on their lives."[1105]

9.127. In that regard, Ecuador alleges that illnesses and other harms to health and livelihood have had "a severe psychological impact on the population".[1106] Reference is made to certain of the witnesses who testify as to effects of the spraying upon them.[1107] Further, Ecuador places reliance on the Report of the UN Special Rapporteur on the Right to Health who stated that there is "credible, reliable evidence" that the aerial spraying damages their mental health"[1108]

9.128. Ecuador further argues, that "the right to humane treatment, as recognised in Article 5 of the American Convention, requires protection from other sources of distress",

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1104 EM, para. 9.88.
1105 EM, para. 9.89.
1106 EM, para. 9.89.
1107 EM, paras. 9.89-9.91.
1108 EM, para. 9.92.

referring to the decision of the Inter-American Court in the *Moiwana* case as to the distress caused to indigenous peoples by being "deprived of the right to continue to live in their traditional lands".[1109]

(ii) Colombia's response

9.129. Article 5 ACHR provides (so far as relevant):

> "1. Every person has the right to have his physical, mental, and moral integrity respected.
>
> 2. No one shall be subjected to torture or to cruel, inhuman, or degrading punishment or treatment. All persons deprived of their liberty shall be treated with respect for the inherent dignity of the human person."

9.130. Even assuming that Article 5 ACHR is applicable to the alleged indirect effects in Ecuador of Colombia's conduct in law enforcement on its own territory, a certain degree of severity is necessary before a violation of Article 5 will occur, as Ecuador itself recognizes. Ecuador has provided no proof of any particular psychological harm which any individual has suffered.

9.131. In that regard, at least some of the witnesses relied upon by Ecuador are unreliable. For example, the mother who describes the anguish she allegedly suffered as the result of the

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[1109] EM, para. 9.93 citing *Moiwana Community v. Suriname*, Preliminary Obections, Merits, Reparations and Costs, I/ACtHR, Series C, No. 124, Judgment of 15 June 2005, paras. 101-103

deaths of two of her daughters is none other than Witness 11. As set out above, given, the inconsistency of Witness 11's evidence with that of other witnesses, the Court should harbour strong reservations as to its accuracy.

9.132. The opinion of the Special Rapporteur on the Right to Health that there is "credible, reliable evidence" that spraying damages the mental health of individuals in the border area would appear to be no more than his account of conversations with local residents as to distant events. The Special Rapporteur gives no indication of the precise damage which has supposedly been caused, nor does it appear that any efforts were made to verify the accounts of the residents. The Special Rapporteur is of course entitled to express his views, but his assessment as to the quality of the evidence is non-judicial and adds nothing to what he was told by his informants. In addition it is not supported by any scientific evidence.

(h) Right to private life

(i) Ecuador's position

9.133. As regards the right to private life, Ecuador alleges that

> "the spraying of toxic chemicals on the border area has severely disrupted the lives of local communities over many years, to the point that their lives have been transformed. These sprayings have interfered with their most

> intimate aspects of life, affecting their choices and the way they lead their daily existence."[1110]

It further argues that the sprayings have resulted in the destruction of means of subsistence and poor health, and that this has caused families to abandon their homes.[1111] Ecuador relies in particular on Article 17 ICCPR, although noting that similar obligations are contained in Article 11 ACHR and Article 16 CRC.[1112]

9.134. Ecuador alleges that "freedom from arbitrary or unlawful interference includes having one's home and family life free from significant pollution",[1113] relying on the jurisprudence of the European Court of Human Rights, in particular the decisions in *López Ostra v. Spain* and *Guerra v. Italy*.[1114]

9.135. Ecuador alleges that individuals in the border areas were periodically exposed to herbicides, with the result that "farmers and indigenous peoples have found it difficult to work their fields, to make use of the river, to send their children to school, to lead their daily lives undisturbed and to enjoy their home lives in a manner to which they are entitled."[1115] It is further alleged that families have been forced to leave their homes and relocate away from the border, with some families being

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1110 EM, para. 9.95.
1111 EM, para. 9.95.
1112 EM, para. 9.96.
1113 EM, para. 9.98.
1114 EM, para. 9.98.
1115 EM, para. 9.99.

separated as a result.[1116] Specific reference is made to the alleged effects on indigenous peoples, in relation to which the spraying is said to have caused the abandonment of ancestral lands, resulting in "an end to enjoyment of homes" and "the disintegration of families".[1117]

(ii) Colombia's response

9.136. Article 17 ICCPR provides:

> "1. No one shall be subjected to arbitrary or unlawful interference with his privacy, family, or correspondence, nor to unlawful attacks on his honour and reputation.
>
> 2. Everyone has the right to the protection of the law against such interference or attacks."

9.137. Article 11 ACHR provides:

> "1. Everyone has the right to have his honor respected and his dignity recognized.
>
> 2. No one may be the object of arbitrary or abusive interference with his private life, his family, his home, or his correspondence, or of unlawful attacks on his honor or reputation.
>
> 3. Everyone has the right to the protection of the law against such interference or attacks."

9.138. Article 16 CRC provides:

> "1. No child shall be subjected to arbitrary or unlawful interference with his or her privacy,

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1116 EM, para. 9.100.

1117 EM, para. 9.101.

> family, or correspondence, nor to unlawful attacks on his or her honour and reputation.
>
> 2. The child has the right to the protection of the law against such interference or attacks."

9.139. Despite the various matters referred to by Ecuador, it appears only to rely upon the right to private life as regards the alleged displacement of individuals.[1118]

9.140. Even assuming that the right to respect for private life and home under the various instruments is applicable in principle in the present case, the facts relied upon by Ecuador do not disclose any breach of that right.

9.141. Ecuador relies on decisions of the European Court of Human Rights in order to support its argument that aerial spraying such as that in the present case is capable of giving rise to a violation of the right to respect for home and private life. However, the two leading cases, *López-Ostra*[1119] and *Guerra*,[1120] concerned situations very different from that in the present case; in both cases, the applicant was resident on the territory of the respondent State and alleged that the State had not taken sufficient steps to protect the applicant against pollution emanating from third parties, not from the State itself. The cases thus concerned alleged breach of a positive obligation to take

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[1118] Cf. EM, para. 9.102.

[1119] *López Ostra v. Spain* (App. No. 16798/90), Judgment of 9 December 1994, Series A, No. 303-C.

[1120] *Guerra v. Italy* (App. No. 14967/89), Judgment of 19 February 1998, *Reports 1998-I.*

measures to ensure respect for the right to home and private life, rather than direct interference by the State.

9.142. Further, even assuming that the approach under Article 8 of the European Convention can be transposed to provisions which are phrased in very different terms, the European Court was careful to emphasise that only "*severe* environmental pollution" is capable of interfering with the rights of individuals under Article 8 of the European Convention.[1121] There is no basis for the claim that occasional local spray drift of the spray mix crosses this threshold: indeed, it would not do so even in the context of direct overspray, given that a particular plot is sprayed at most twice a year and that the spray is not persistent in air or soils.[1122] *De minimis* pollution (even assuming it occurred) cannot be said to interfere either with enjoyment of home or private life.

9.143. In the present case, for the same reasons as in relation to Ecuador's claims in relation to transboundary harm, Ecuador has simply not established that aerial spraying in Colombia has resulted in any significant drift of spray mixture into Ecuador, or that such drift as may have occurred has resulted in any

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[1121] See *López Ostra v. Spain* (App. No. 16798/90), Judgment of 9 December 1994, Series A no. 303-C, para. 51 and *Guerra v. Italy* (App. No. 14967/89), Judgment of 19 February 1998; *Reports 1998-I*, para. 60 (emphasis added).

[1122] See above, paras. 4.79, 7.84-7.85.

harm.[1123] *A fortiori* it cannot meet the standard of "severe environmental pollution".

(i) The right to information

(i) Ecuador's position

9.144. Finally, as regards alleged breach of the right to information, Ecuador alleges that Colombia…

> "has persistently failed to provide adequate information concerning the aerial sprayings. Information has been withheld on timings and locations, and on the chemical composition of the materials that have been used in the sprayings. Even now the Government of Ecuador and the local population in the affected areas have not been informed about the specific composition of the herbicide compound Colombia has used over time in the aerial sprayings, the concentration of the chemicals within the mixture, or the location or times of the spray campaigns."[1124]

9.145. In support of the supposed right to information, Ecuador relies on a number of decisions of the European Court of Human Right, including *Öneryildiz v. Turkey* and *Taskin v. Turkey*, as well as the decision of the African Commission in the *Ogoniland* case.[1125] As regards the Inter-American system, Ecuador alleges that it has long been recognized that:

> "the failure to engage in 'meaningful consultation' with indigenous communities in

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1123 See above, para. 7.16-7.30.
1124 EM, para. 9.103.
1125 EM, para. 9.104.

> connection with activities affecting their traditional lands will result in a violation of various human rights"[1126]

and that consultation with indigenous peoples and participation in decision-making are also required by Article 6 of ILO Convention No. 169 and Article 27 ICCPR.[1127]

9.146. As to the alleged breach of the right to information, Ecuador simply asserts that there was no consultation with local inhabitants about the spraying programme, and that the failure to provide even a minimum of information meant that the population was left entirely uninformed.[1128]

(ii) Colombia's response

9.147. Ecuador's claim as to the supposed right to information is not only a reprise of its argument that international environmental law condemns a failure to provide information; it is also just another way of putting its claims as to the rights to life, private and family life under ILO Convention 169 and "applicable articles" of the ICCPR.

9.148. The foundation upon which Ecuador seeks to build this supposed right to information in relation to the various substantive rights is shaky. It relies on decisions of the European Court and the African Commission, but not to any

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1126 EM, para. 9.105.
1127 EM, para. 9.105.
1128 EM, para. 9.106.

decision by the Inter-American Court of the Human Rights Committee. Further, the decisions relied on are not on point.

9.149. The observations of the European Court in *Öneryildiz* were made in relation to the public's right to information as part of procedures for the licensing, setting up, operation, security and supervision of hazardous activities carried out within the respondent State.[1129] Further, in *Öneryildiz*, the Court was concerned with a situation in which death of the victims had already occurred as the result of an accident in the operation of a hazardous activity, with the result that the Court was concerned to examine the positive obligation "to take all appropriate steps to safeguard life for the purposes of Article 2"; in that regard, the Court took the view that the positive obligation "entails above all a primary duty on the State to put in place a legislative and administrative framework designed to provide effective deterrence against threats to the right to life".[1130] It was in that context that the Court made its observations as to the public's right to information

9.150. Similarly, the European Court in *Taskin v Turkey* was faced with a situation in which an EIA had in fact been carried out in relation to a particular activity; the Court emphasised the importance of public access to such information, but it did not

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[1129] *Öneryıldız v. Turkey* (App. No. 48939/99), Judgment of 30 November 2004, *Reports 2004-XII* [GC], para. 90.

[1130] *Ibid.*, para. 89.

formulate the question of access as a freestanding right; rather it was a factor which should be taken into account in determining whether the decision-making process as a whole had been fair.[1131]

9.151. Finally, in the *Ogoniland* case, the African Commission was concerned with the right of peoples to "a generally satisfactory environment favorable to their development". It is hardly surprising that the African Commission felt able to identify a requirement that the people in question should be provided with information and consulted. Such an approach is not transposable to the present case.

9.152. As to the alleged breaches of the right to information, Ecuador seems to be in two minds as to whether the breach is one caused by the lack of information provided to Ecuador, or the lack of information provided to the individuals in the area in question.[1132] That indecision is telling insofar as it reveals what appears to be the true motivation behind Ecuador's claim, namely to provide an alternative vehicle for its own demands that it be provided with information. Even at a point when there is no longer any spraying near the border, Ecuador seems to continue to insist on its own asserted right (rather than that of the individuals) to know the composition and concentration of

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[1131] *Taskin v. Turkey* (App. No. 46117/99), Judgment of 10 November 2004; *Reports 2004-X*, paras. 118-119.

[1132] Cf. EM, para. 9.103.

the spray mix and the location and times of spraying. Colombia was under no obligation to provide information to Ecuador with regards to the timing of flights, in particular taking into account evident security concerns associated with production of illicit narcotics. Nonetheless, Colombia cooperated with Ecuador and provided information about the spraying program, as demonstrated above.[1133]

C. Alleged Breach of Indigenous Rights

(1) ECUADOR'S RELIANCE UPON INDIGENOUS RIGHTS

9.153. In its Memorial, Ecuador places heavy emphasis upon the rights of indigenous peoples living in Ecuador which, it says, have been particularly affected by the aerial spraying. For example it claims

> "serious disruption of the traditional way of life of indigenous communities who live, farm and hunt in the affected areas. Pollution damage has significantly harmed the natural resources and environment on which these communities depend. It has displaced some communities from their homes, deprived them of traditional medicines, interfered with their right to use and enjoy their property, and denied them the right to enjoy own culture."[1134]

It also endorses descriptions given by a number of witnesses. For example, according to Witness 40:

[1133] See above, paras. 5.9-5.16, 5.27-5.28, 5.35-5.44, 8.105-8.106 and 8.111-8.112.

[1134] EM, para. 9.37.

> "The third time they sprayed was fatal for our community. …All the plants, big and small, were destroyed. … I estimate that at least some thirty species of plants that died were used by us in the Awá traditional medical treatments. … We no longer had anything to eat. Our diet depended on the plants that we sow and those that are in nature, which have been affected by the fumigations."[1135]

In short, Colombia's aerial spraying has been said to produce for a significant group of indigenous people the "impossibility of continuing with their traditional lives".[1136]

(2) COLOMBIA'S RESPONSE ON THE FACTS

9.154. The short answer to this argument is that the evidence of differential impact of the spraying on indigenous Ecuadorians is exiguous. Ecuador's evidence of special harm to its indigenous peoples was reviewed in Chapter 7.[1137] It takes the familiar form of vague, generic assertions relating to events years before, unaccompanied by medical or other material evidence. On what basis aerial spraying in Colombia could threaten the lifestyle of indigenous peoples occupying a substantial range of territory Ecuador does not explain. In no way can it be said to have made it impossible to continue with "their traditional lives".

1135 EM, para. 6.117, citing Annexes, Vol. IV, Annex 223.
1136 EM, para. 9.23.
1137 See above, paras. 7.177-7.186.

9.155. Colombia has conducted aerial spraying exclusively on its own territory. It is entitled to do it, as Ecuador accepts.[1138] There is no suggestion that it has targeted persons in Ecuador, still less the indigenous peoples of Ecuador. There is no proof that the real and urgent problems of those peoples had any causal relation to aerial spraying.

9.156. This being so, the controversial subject of the extent of indigenous rights in international law does not arise. Nonetheless the following remarks are offered.

(3) ALLEGED BREACH OF INDIGENOUS TREATY RIGHTS

9.157. Ecuador relies on three treaties as a basis for its claim on behalf of its indigenous peoples. These will be dealt with in turn.

(a) ICCPR, Article 27

(i) Ecuador's position

9.158. First, Ecuador alleges that Colombia is in breach of Article 27, ICCPR, which provides:

> "In those States in which ethnic, religious or linguistic minorities exist, persons belonging to such minorities shall not be denied the right, in community with the other members of their group, to enjoy their own culture, to profess and

[1138] E.g., EM, paras. 7.18, 8.36.

> practice their own religion, or to use their own language."[1139]

It goes on to stress the importance of indigenous links with the land, and of traditional fishing and hunting.

(ii) Colombia's response

9.159. A first and obvious point is that in principle the status of a given minority (indigenous or otherwise) is relative to the society in which they live. The primary obligations towards that people are obligations on the part of the State to which they belong. The New Zealand Maori are not indigenous peoples in relation to, say, Australia, nor the Australian Aboriginal peoples to New Zealand. This is expressly recognised in Article 27 by the phrase "[i]n those States in which ethnic, religious or linguistic minorities exist". It is Ecuador which is responsible under Article 27 for protecting the rights and interests of its indigenous people.

9.160. Secondly, Article 27, which applies to indigenous groups if and to the extent that they can be regarded as ethnic or linguistic minorities, is deliberately formulated in negative terms ("shall not be denied the right"). In fact nothing that Colombia has done has denied the indigenous peoples of Ecuador the three enumerated rights.

[1139] EM, paras. 9.18-9.23.

9.161. Thirdly, the rights attributed to minorities by Article 27 are limited ones – insofar as relevant here, the right to "enjoy their own culture". If the people concerned have abandoned their culture, this is likely to be for a range of reasons, including the cash economy, indiscriminate logging, the exploitation of oil, the influx of persons from outside, the introduction of alcohol and western foods, etc. It is absurd to single out occasional aerial spraying as the decisive cause of a story of decline that has been repeated on so many occasions, both within the region and outside it.

(b) ILO Convention 169

(i) Ecuador's position

9.162. Secondly, Ecuador alleges that Colombia is in breach of ILO Convention169, Articles 4, 5, 6, 7, 13 and 15, relying on the same witness statements and reports. The United Nations Declaration of the Rights of Indigenous Peoples of 7 September 2007[1140] is also relied on, and presented as a restatement of principles and rights reflected in ILO Convention 169– a considerable understatement since there is much in the Declaration which is new. In fact the Declaration was explicitly adopted as "a standard of achievement to be pursued in a spirit

[1140] UNGA Res 61/295, 13 September 2007 (adopted 143-4:11).

of partnership and mutual respect", i.e. as an aspirational document.[1141]

(ii) Colombia's response

9.163. Again, there is an issue as to whose obligations are engaged. The point is explicitly addressed in ILO Convention 169, the Convention concerning Indigenous and Tribal Peoples in Independent Countries of 27 June 1989,[1142] as it was in its predecessor Convention, ILO Convention 107. ILO Convention 169 has not been widely ratified (only 20 States parties), but it has been ratified by both Ecuador and Colombia and is in force between them.

9.164. Article 1 of ILO Convention 169 defines its scope of application by contrast with "other sections of the national community", or by reference to their descent from peoples who "inhabited the country, or a geographical region to which the country belongs, at the time of conquest or colonization or the establishment of present state boundaries".[1143] In respect of a

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[1141] It is unnecessary to take any position on whether and to what extent the provisions of the 2007 Declaration reflect existing international law. For the view that they do not, see e.g., S. Allen, "The UN Declaration on the Rights of Indigenous Peoples: Towards a Global Legal Order on Indigenous Rights?" in A. Halpin & V. Roeben (eds). *Theorizing the Global Legal Order* (Hart Publishing, Oxford, 2009), available at SSRN: http://ssrn.com/abstract=1400665.

[1142] 1650 UNTS 383.

[1143] Art. 1 provides:

1. This Convention applies to:

(a) tribal peoples in independent countries whose social, cultural and economic conditions distinguish them from other sections of the national

given indigenous or tribal people in an independent country, it is the Government of that country which assumes primary responsibility for the fulfilment of the obligations under the Convention. This is clear, for example, from the key provision of the Convention, Article 2, which provides:

> "1. Governments shall have the responsibility for developing, with the participation of the peoples concerned, co-ordinated and systematic action to protect the rights of these peoples and to guarantee respect for their integrity.
>
> 2. Such action shall include measures for:
>
> (a) ensuring that members of these peoples benefit on an equal footing from the rights and opportunities which national laws and regulations grant to *other members of the population*;
>
> (b) promoting the full realisation of the social, economic and cultural rights of these peoples with respect for their social and cultural identity, their customs and traditions and their institutions;
>
> (c) assisting the members of the peoples concerned to eliminate socio-economic gaps that may exist between indigenous and

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community, and whose status is regulated wholly or partially by their own customs or traditions or by special laws or regulations;
(b) peoples in independent countries who are regarded as indigenous on account of their descent from the populations which inhabited the country, or a geographical region to which the country belongs, at the time of conquest or colonisation or the establishment of present state boundaries and who, irrespective of their legal status, retain some or all of their own social, economic, cultural and political institutions."

> *other members of the national community*, in a manner compatible with their aspirations and ways of life."[1144]

The only provision dealing with transboundary issues is Article 32, entitled "Contacts and Co-Operation across Borders", which is irrelevant to the present case.[1145]

9.165. Indigenous communities in Ecuador have not been affected by aerial sprayings in Colombia. Their economic and social conditions are the exclusive responsibility of the Government of Ecuador.

9.166. This appears from the most relevant of the articles of ILO Convention 169 cited by Ecuador, Article 7, which provides:

> "3. Governments shall ensure that, whenever appropriate, studies are carried out, in co-operation with the peoples concerned, to assess the social, spiritual, cultural and environmental impact on them of planned development activities. The results of these studies shall be considered as fundamental criteria for the implementation of these activities.

[1144] Emphasis added. See also Arts. 6(1)(b), 7(1), 9(1), 14(3), 19, 26, 28(2), 29, 31.

[1145] Article 32 provides:
"Governments shall take appropriate measures, including by means of international agreements, to facilitate contacts and co-operation between indigenous and tribal peoples across borders, including activities in the economic, social, cultural, spiritual and environmental fields."

> 4. Governments shall take measures, in co-operation with the peoples concerned, to protect and preserve the environment of the territories they inhabit."

Clearly it is the territorial sovereign which has to perform these functions; only the State in question can engage in "planned development activities".

9.167. It may be noted that Article 29 of the 2007 UN Declaration also deals with the environment:

> "1. Indigenous peoples have the right to the conservation and protection of the environment and the productive capacity of their lands or territories and resources. States shall establish and implement assistance programmes for indigenous peoples for such conservation and protection, without discrimination.
>
> 2. States shall take effective measures to ensure that no storage or disposal of hazardous materials shall take place in the lands or territories of indigenous peoples without their free, prior and informed consent.
>
> 3. States shall also take effective measures to ensure, as needed, that programmes for monitoring, maintaining and restoring the health of indigenous peoples, as developed and implemented by the peoples affected by such materials, are duly implemented."

Again it is a matter for Ecuador to take responsibility for such matters as assistance programmes for its own indigenous peoples, the storage of hazardous materials on Ecuadorian territory and the provision of health service programmes there.

Neither Article 29, nor any other provision of the Declaration, deals with transboundary harm from another State. In the event, even the most advanced instrument at the international level in the field of indigenous rights, the 2007 Declaration, does not deal with the subject of the present dispute.

(c) ACHR, Article 21

(i) Ecuador's position

9.168. Thirdly, Ecuador invokes Article 21 of the American Convention on Human Rights, the property provision, and emphasises the progressive stand taken by the Inter-American Court in giving effect to it.[1146] It accuses Colombia of having "fractured these vital anthropological and cultural relationships through its chemical fumigations",[1147] thereby impairing the right of indigenous people to their property, i.e. their traditional lands.

(ii) Colombia's response

9.169. It is, of course, for Ecuador, acting in conformity with its human rights obligations, to recognise the land rights of indigenous groups on its territory. These rights have not been affected in any way by aerial sprayings in Colombia and for this reason as well as those already given, there is no factual basis for alleging a breach of Article 21 ACHR by Colombia.

[1146] EM, paras. 9.30-9.36, citing, *inter alia*, *Mayagna (Sumo) Awas Tingni Community v. Nicaragua*, IACHR, 31 August 2001.

[1147] EM, para. 9.30.

D. Conclusions

9.170. The aerial spraying program in Colombia has not violated human rights in Ecuador, or the rights of its indigenous peoples.

9.171. Article 14(2) of the 1988 Convention does not purport to impose independent obligations as regard fundamental human rights or indigenous rights. Rather, it is concerned with imposing an obligation upon States to adopt measures to prevent illicit cultivation of plants containing narcotic or psychotropic substances, subject to the qualification that such measures respect or take into account the considerations mentioned.

9.172. Moreover, the obligations derived from human rights instruments invoked by Ecuador are the exclusive responsibility of the states parties to those instruments to individuals falling within their own jurisdiction. They do not apply to the case of alleged injury in Ecuador as a consequence of the aerial spraying program carried out by Colombia within its own territory.

9.173. What Ecuador's materials do show is the serious responsibility attributable to it due to its abandonment and neglect of the communities – among them, indigenous

communities – residing in the border area with Colombia in the provinces of Sucumbíos, Carchi and Esmeraldas. This situation has deteriorated further due to the oil exploration and exploitation activities that have long been carried out in these areas.

Chapter 10

THE REMEDIAL SITUATION

A. Ecuador's Proleptic Approach to Injury

10.1. In Chapter X of the Memorial, Ecuador repeats its claims that "Colombia's actions have caused grave, continuing and long-lasting harms to Ecuador: to its sovereignty, to its people and property, including indigenous peoples, and to its environment."[1148] It goes on to specify the remedies sought, drawing a sharp distinction between what it needs to establish in order to obtain declaratory relief and what damages it intends eventually to prove. Relying on the Court's approach in *Armed Activities on the Territory of the Congo*, Ecuador states that it…

> "does not propose at this stage of the proceedings to 'demonstrate and prove the exact injury that was suffered' as a result of specific actions of Colombia; Ecuador is evaluating all the damages that have been suffered and will tender specific and complete evidence on all the harms, together with a detailed claim for monetary compensation, in the next phase of these proceedings."[1149]

10.2. There are a number of difficulties with this approach.

[1148] EM, para. 10.2.

[1149] EM, para. 10.4, citing *Armed Activities on the Territory of the Congo (Democratic Republic of Congo v. Uganda), Judgment, ICJ Reports 2005*, p. 93, para. 260.

- First, it amounts to a confession – albeit a confession of something which is obvious to a reader of the Memorial – that Ecuador has not yet evaluated the damages it claims to have suffered. Ecuador covers up the lack of such an evaluation with generalised assertions of harm, and by repeating the word "toxic" 119 times. But, as demonstrated above, the gist of Ecuador's claim is that Colombia has failed in its duty of due diligence not to cause significant transboundary harm; Colombia denies it has failed to show due diligence, but it also denies that its aerial spraying has caused transboundary harm. This Colombian claim has very substantial scientific support. Faced with the scientific evidence, Ecuador cannot simply postpone to the quantum phase the proof of a material element of its principal claim. Given that actual damage is the gist of this ground of responsibility, if Ecuador cannot prove such damage, it is entitled to no remedy at all. In particular, Colombia should not be put to the trouble and expense of a second phase of the case on the basis that some harm *might* have been caused and *might* have been linked to aerial spraying. If all Ecuador can show are these small "mights", then Ecuador has failed to make out its case and Colombia is entitled to a declaration to that effect. It would be an odd quantum phase that in effect held there was no

liability on the merits of the principal claim, yet there is a real risk of this, on Ecuador's approach to the matter.

- The point is all the stronger in that, if Ecuador had been injured as alleged, this could be very easily proved. Ecuador would not be reduced to such claims as the following:

> "the extent to which these threats have become reality remains unknown precisely because so many of Colombia's fumigations have been conducted adjacent to undisturbed primary ecosystems. In some cases, there are no human witnesses to perceive the impacts in those regions."[1150]

The Court is apparently required to intuit harm rather than having it proved.

- Thirdly, Ecuador does not explain how– other than through mere assertion in still further unsupported affidavits – it proposes to "evaluate" transient harms which allegedly occurred between 6 and 10 years ago. How to establish causation at such a distance of time? The effort is likely to be disproportionate to the result. For example, it may be asked, what records of injury exist in the Lago Agrio hospital to which Dr Sánchez did not have access when he

[1150] EM, para. 6.105.

produced his statement?[1151] What tests of water purity were conducted at relevant times and remain undisclosed? The Court can infer from Ecuador's unwillingness to engage with specific facts of actual and substantial harm that the answer to such questions is: none.

10.3. There are also acute difficulties of method, which Ecuador's "wait and see" approach conceals. For example, on any view, the other problems of the region – malnutrition, poverty, lack of basic infrastructure, presence of illegal armed bands, large-scale use of noxious chemicals in coca processing – will account for far more of the injuries of which Ecuador complains than hypothetical and occasional drift of spray from the Colombian side. Colombia has no responsibility for the most likely local causes of injury to the population and the environment. Yet just how these other, much more serious, elements are to be factored in to a damages calculation Ecuador does not begin to explain.

10.4. Even more objectionable is the suggestion that the Court should order guarantees against non-repetition in the absence of proof of any wrongful act on the part of Colombia – i.e. in the absence of the proof of damage in a case where the principal claim has damage as a necessary component of the cause of

[1151] Cf. above, para. 1.33, note 85.

action.[1152] The Court has already demonstrated considerable reticence in the matter of assurances and guarantees of non-repetition.[1153] The need for caution is even greater in a case where harm is the gist of the wrong and the Claimant effectively admits that it has yet to evaluate the harm allegedly caused.

10.5. Further, the claims for compensation, contained in Chapter X of the Memorial, only attempt to substantiate damage claimed in relation to certain of the alleged violations of human rights and the rights of indigenous peoples (right to life and health; damage to property and livelihood). Ecuador reserves the right to supplement the heads under which it claims compensation at a later date.[1154] In effect, then, Colombia has not yet been told, even at the level of principle, the damages claim it has to meet.

10.6. In these circumstances, there is in Colombia's respectful view no point in yet another general account of the law relating to full reparation, and no need to swap dicta from cases decided on their own facts which are quite unlike those of the present case. For instance, Ecuador relies on the environmental damage decision issued by the UNCC, which it describes as "the modern approach", in disparaging contrast with the outdated *Trail*

[1152] EM, paras. 10.11-10.13.

[1153] See e.g. LaGrand (Germany v. United States of America), Judgment, ICJ Reports 2001, pp. 508-514, paras. 117-127; Avena (Mexico v. United States of America), Judgment, ICJ Reports 2004, p. 69, para. 150.

[1154] EM, para. 10.58. See also para. 9.110.

Smelter award with its emphasis on direct and proven damage.[1155] But the analogy between incidental drift of a glyphosate mixture in the course of a lawful program on the territory of a State, on the one hand, and the wanton destruction of oilfields and the causing of deliberate environmental harm following an invasion in breach of the UN Charter, on the other hand, is not immediately obvious. Likewise the analogy between the determination of reparation by this Court after a full forensic process, on the one hand, and the assessment of damage by a non-court pursuant to a Security Council resolution laying down a unilateral process, on the other hand, is not apparent.

10.7. For these reasons, Colombia will address all issues of legal consequences, including quantification, if and when they may arise and in light of the Court's actual findings of fact at that stage.

B. Ecuador's Attempt to Restrict Colombia's Sovereignty over its Own Territory

10.8. One issue that does require discussion, however, is Ecuador's claim that Colombia be ordered not to conduct aerial spraying operations on Colombian territory "near" the border.[1156]

[1155] EM, para. 10.18. The UNCC is referred to repeatedly: see EM, paras. 10.19, 10.33, 10.37, 10.42, 10.44, 10.47, 10.48, 10.52, 10.55.

[1156] EM, para. 10.13 ("at, near or across the border with Ecuador"); see also Submissions, p. 413, para. C (vi) ("on or near any part of its border with Ecuador").

10.9. The diplomatic exchanges between the parties on the question of a buffer zone were recounted in Chapter 5.[1157] Whenever the issue was raised, Ecuador sought a 10 kilometre "no spray" zone along the Colombian side of the border. Eventually, Colombia acceded to this request, voluntarily and without prejudice to a resumption of spraying activity as might be necessary. In consequence, Colombia suspended operations in that area of the border between December 2005 and December 2006, and again, since February 2007 up to the present. In fact, as has been seen, maintaining the 10 km zone has been expensive in the lives of the manual eradicators and costly in terms of the success of the struggle against illicit drugs.[1158] It has led to a significant concentration of illegal activity in the 10 km zone.

10.10. In its Memorial, Ecuador is surprisingly vague on this front. It now says:

> "To the extent that aerial herbicide spraying continues, the damage to the territory, population and environment of Ecuador described in Chapter VI will continue. Accordingly, Ecuador seeks an order from the Court that Colombia should fulfil its international obligation to Ecuador by refraining from further aerial spraying activities

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[1157] See above, paras. 5.20, 5.34, 5.36, 5.64-5.71, 5.86-5.92.

[1158] See above, paras. 4.4 (and note 46), 4.37 (and note 293), 4.34, 4.75, 5.81-5.84, 5.87, 5.109 (6).

> that deposit herbicides *at, near or across* the border with Ecuador."[1159]

10.11. An initial point is that Colombia does not claim any right to spray across the border. Its position is that the spraying activity must occur on Colombian territory, with due diligence shown to prevent spray drift across the border in such a way as to risk causing significant harm. Furthermore, as described in Chapter 4, no spraying occurs in a 100m buffer zone from the boundary rivers, and Colombia does not propose to change that existing regulation. In Colombia's view and for the reasons already given, such a buffer zone is perfectly adequate to prevent spray drift reaching Ecuadorian waters or territory.

C. Conclusion

10.12. For the reasons already given, however, the issue of remedies does not arise. It is a sufficient answer to Ecuador's claims for the Court to hold that neither has significant harm been proved, nor has it been proved that any such harm was caused by aerial spraying. Colombia has exercised due diligence in the prevention of transboundary harm. That being so, there can have been no failure to respect human rights or the rights of indigenous people in Ecuador. Ecuador's claims relating to assessment, cooperation, consultation and the provision of information likewise fail.

[1159] EM, para. 10.13 (emphasis added). See also Submissions, para. C(vi), EM, p.413 ("on or near any part of its border with Ecuador").

SUBMISSIONS

For the reasons set out in this Counter-Memorial, Colombia requests the Court to adjudge and declare that the claims of Ecuador, as set out in the Memorial of 28 April 2009, are rejected.

Colombia reserves the right to supplement or amend the present submissions.

JULIO LONDOÑO PAREDES
Agent of Colombia

The Hague, 29 March 2010

APPENDIX

DR STUART DOBSON, "EVALUATION OF CHEMICALS USED IN COLOMBIA'S AERIAL SPRAYING PROGRAM, AND HAZARDS PRESENTED TO PEOPLE, PLANTS, ANIMALS AND THE ENVIRONMENT IN ECUADOR" MENZIE ET AL. (2009)
[EM, VOL. III] ANNEX 158

Birchtree Consultants Ltd.

Critique of

"Evaluation of chemicals used in Colombia's aerial spraying Program, and hazards presented to people, plants, animals and the environment in Ecuador"

Menzie et al. (2009) Annex 158

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1 Terms of reference and qualifications

1. I am asked to independently evaluate the science of "Evaluation of chemicals used in Colombia's aerial spraying program, and hazards presented to people, plants, animals and the environment in Ecuador" written by Menzie et al. (2009) and presented as Annex 158 to Ecuador's Memorial before the International Court of Justice.

2. Since the Menzie et al. (2009) report is itself a critique of the CICAD Report (Solomon et al. 2005), critical evaluation of this second document was also included in the terms of reference.

3. Scientific papers referred-to in the Menzie et al. (2009) report were obtained and evaluated.

4. Science published since the Menzie et al. (2009) report, including a collection of scientific papers comprising the follow-up to the CICAD Report (CICAD2), was also evaluated.

Qualifications

5. My specific expertise is on the risk assessment of chemicals related to effects on organisms in the environment and human health. I have had 30+ years authoring, co-authoring and evaluating chemical risk assessments for a wide range of substances in UK national and international programmes whilst working for the UK Natural Environment Research Council. I retired from the Council in 2009 and am currently working as a private consultant through Birchtree Consultants Ltd., of which I am a Director.

6. I have been a member of UK government Advisory Committees since 1986, most recently as a member of the Advisory Committee on Hazardous Substances for the Department of Food, Environment and Rural Affairs (DEFRA) for 7 years until my retirement last year. I am Chair of the Risk Assessment Steering Group of the International Programme on Chemical Safety (IPCS) which is a joint activity of the World Health Organisation (WHO), the United Nations Environment Programme (UNEP) and the International Labour Organisation (ILO). I also currently chair a scientific advisory group for UNEP. I am currently a permanent member of the Final Review Board for the IPCS Concise International Chemical Assessment Document project. I have been a regular member, rapporteur and occasional chair of Expert Task Groups convened by WHO on chemical risk assessment for 30 years.

7. Specifically on the substances of relevance to this report:

- I chaired the Expert Task Group which finalised the WHO assessment of glyphosate (WHO, 1994);
- I co-authored a review of glyphosate and its formulations published in the scientific literature (Giesy et al. 2000).

2 Introduction

8. The determination of effects of chemicals on human health or the environment requires three steps: hazard assessment, exposure assessment and risk assessment.

9. Hazard assessment involves the identification of toxic endpoints associated with the chemical, hazard identification, and the establishment of dose-response. Dose response determines the amount of the chemical associated with any particular toxic endpoint; ideally, it also establishes 'no-observed-effect', the highest dose at which the particular toxicity is no longer manifest. Regulation of chemical use requires the testing of the substance at doses much higher than are likely to be encountered in normal use to establish the type of toxicity the chemical might exhibit. No-observed-effect establishes whether the effect will actually occur in use.

10. Exposure assessment looks at the use of the chemical and establishes the amount of the substance likely to be received by humans or organisms in the environment related to the specific use pattern of the chemical. Different routes of exposure are considered, ingestion, inhalation or dermal exposure for humans, concentrations in the environmental media appropriate for different organisms in the environment.

11. Risk assessment then compares the two. If exposure leads to a dose sufficient to cause a specific toxic effect, risk is present. Again, ideally, risk is quantified and would state that exposure is x times greater than or y times lower than the no-observed-effect. Sometimes this is not possible and qualitative estimates of risk are made: high, medium or low.

12. Hazard assessment, therefore, covers possibilities whilst risk assessment determines probabilities of adverse effects.

13. The Menzie et al. (2009) report describes itself as a hazard assessment. However, it seldom mentions dose response. Much of the report emphasises the severity of the hazard (the possible) without considering whether or not the effects are probable. It is, therefore, largely hazard identification rather than hazard assessment. No attempt is made by the Menzie et al. report to assess risk.

14. Consideration of hazard in isolation from exposure and risk will give a misleading picture of the real effects of the chemical on either human health or organisms in the environment.

15. Despite its major deficiencies in methodology, the Menzie et al report does raise issues which need to be addressed:

- Has the potential for drift of applied spray been underestimated in the assessments done for the eradication programme for coca and opium poppies in Colombia?
- Is the specific spray used more damaging than formulations used in agriculture?

- Is exposure from spray drift sufficient to cause reported health effects in people across the border in Ecuador?
- Is there an adverse effect on agricultural crops in Ecuador?
- Is there an adverse effect on domestic animals including farmed fish?
- Do natural vegetation, animals including insects and amphibians, and soils comprising a sensitive and highly diverse ecosystem in Ecuador suffer damage from spray drift?

These issues will be addressed in this report.

3. The chemicals used in Colombia's aerial spraying programme

16. I am somewhat confused by this section of the Menzie et al. (2009) paper which suggests that the glyphosate spray used in Colombia is a mystery.

17. The spraying in Colombia currently uses a mixture of a commercial formulation of glyphosate (Glyphos as Gly41) which represents 44% of the spray mixture, Cosmo-Flux 411F which is added as an adjuvant to the tank mix at 1% and the remaining 55% is water (US Department of State, 2002, Hewitt et al., 2009). The formulation 'Roundup' was previously used. It is my understanding that no re-formulation of glyphosate has ever taken place; commercial formulations have always been used. The only addition is the adjuvant.

18. Of the commercial formulations of glyphosate, 15% is surfactant; the exact surfactant used varies from formulation to formulation. The Glyphos formulation uses predominantly POEA as its surfactant, in common with Roundup, the formulation most commonly used in toxicity testing, though the POEA content of Glyphos/Gly41 is lower than in Roundup. Other surfactants are used in some formulations in minor amounts. One of these, Silwet L-77 is an organosilicone surfactant which might be solely responsible for one aspect of the formulation's toxicity, the effects on insects and mites (see Section 6.5); there are also reports of another organosilicone product 'Pulse' as being present in some glyphosate formulations. I am informed that Gly41 does not contain organosilicones of this type. Other than the organosilicones, all of the surfactants present in the formulations have comparable toxicity: they are mild to moderate skin irritants and more significant eye irritants.

19. All other eco-toxicological effects of any of the commercial formulations are likely to be represented reasonably by the Roundup formulation. The POEA surfactant present in this formulation was used in the risk assessment performed by Giesy et al. (2000) because "the least POEA LC_{50} … is at the upper end of the toxicity range for surfactants"; that is, it is a worst case for surfactant toxicity. Conclusions based on testing of Roundup will, therefore, overestimate effects of Glyphos/Gly41.

20. In addition, there is a preservative added. Bradberry et al. (2004) regards the preservative Proxel (benzisothiazolin-3-one) as responsible for the occasional reports of photo-contact dermatitis. Menzie et al. (2009) mention formaldehyde as a possible

component of formulations. I can find no basis for this but would assume its addition would be as a preservative. Although formaldehyde has high hazard and the potential for toxicity, its presence in low volume as a preservative would not be manifest as risk.

21. Speculation on the presence of: other herbicides, fungal plants pathogens or other additives, by Menzie et al. (2009) seems unfounded based on published information on the spray mixtures actually used.

4. Potential for spray drift

22. Hewitt et al. (2009) studied the potential for spray drift of the glyphosate formulation used in coca control. Droplet size spectra were determined in a wind tunnel. The results were used as input parameters for the accepted model for determining spray drift along with conditions appropriate to the local environment in Colombia (temperature, relative humidity, aircraft type, height and speed etc.). A plot of likely deposition rates (expressed as glyphosate) was generated (Figure 1).

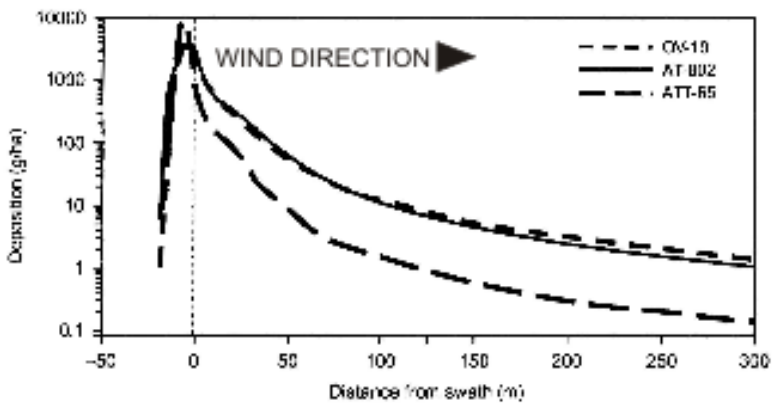

Figure 1 : Taken from Hewitt et al. (2009). Deposition rates for spray drift (g/ha on a log scale) for different aircraft types at representative flight speeds.

23. As can be seen from the plot, the dose received on the ground reduces very quickly with distance. It should be emphasised that the vertical axis of the graph is plotted on a log scale with each major division a factor of ten lower than its predecessor. At 300 metres from the edge of the spray swath, received dose at ground level is about 5000 times less than the peak delivery at the intended area for spraying. Almost all deposition is downwind from the spray swath with the fall to one five-thousandth of the dose within 20 metres upwind.

24. This result is not incompatible with the observations reported in the studies cited by Menzie et al (2009) (Currier et al, 1982; Murray & Vaughan, 1970, Robinson & Fox, 1978) and many more which could be cited. These studies measured spray drift by detecting

droplets dyed with fluorescent dye on collecting sheets placed at varying distances from the application. Droplets were detected at distances of 4 to 10 miles. The long tail in the plot in Figure 1 predicts that a very small proportion of the spray, the finest droplets, will drift for long distances. However, in assessing effects of this drift, the very much reduced deposition rate (dose to those on the ground) has to be taken into account.

25. Most of the environmental factors listed by Menzie et al. (2009) are included as parameters in the model used by Hewitt et al. (2009). Relative humidity was further modelled by Hewitt et al. who demonstrated that increasing relative humidity from 70% to 90%, more typical of one area in the spray programme, decreased spray drift. Very local factors mentioned, such as wind circulation and thermal inversions, could alter the result but, I believe, would not alter the overall conclusions on risk drawn later. I am not an expert on spray drift but I consider the authors of the Hewitt et al. (2009) paper to be experts; the predictions of this model would have to be substantially wrong to alter conclusions drawn in the risk assessment and I consider this highly unlikely.

5. Effects on human health

26. Irritation of the eyes and skin are indeed the most common and consistent effects reported by people claiming exposure to glyphosate sprays, not only in Ecuador and Colombia but also globally. The exposure is to a combination of glyphosate and surfactants found in commercial formulations plus the extra adjuvant in the Colombian spray programme.

27. Maibach (1986), cited by Menzie et al. (2009), conducted tests on human volunteers who had undiluted glyphosate formulation (Roundup) applied to normal and abraded skin. A general purpose household cleaner, domestic dishwashing detergent and baby shampoo were tested in parallel. Mild skin irritation was seen with the herbicide formulation described by Maibach as “less irritant than a standard liquid dishwashing detergent and general all purpose cleaner”; for non-abraded skin, the herbicide was also less irritating than baby shampoo. Further tests showed no sensitisation, photoirritation, allergic or photoallergic contact dermatitis. The statement by Menzie et al. (2009) that “adverse effects from dermal contact that have been reported for glyphosate formulations including skin irritation and occasional reports of contact dermatitis”, referenced as coming from the Maibach paper, is unjustified by that study.

28. Whilst eye irritation from glyphosate formulations is more significant than skin irritation, the “periorbital oedema” and other signs and symptoms reported in a sprayer by Temple & Smith (1992) and cited by Menzie et al. resulted from wiping Roundup concentrate into the eye. Temple & Smith report that the effects “settled down over 48 hours and required no specific treatment”. Exposure through spray drift would not lead to eye irritation of this severity.

29. The Goldstein et al. (2002) paper cited by Menzie et al. (2009) examined 815 calls from the public reporting adverse effects of glyphosate spray in California. The study was prompted by the unusually high numbers of calls relating to this herbicide compared to other pesticides. The majority of calls recorded topical irritation of the eye (399 cases), skin (250 cases) upper airway (7 cases) or a combination of these sites (32 cases). Of 187 'systemic' cases (signs or symptoms elsewhere in the body than those parts directly sprayed), 22 were regarded as probably or definitively related to glyphosate exposure. Each of these cases is reviewed in the study. All but one, the firefighter referred-to in Menzie et al., were applicators exposed either to the concentrated formulation or to the spray solution by accident or failure of spray equipment. Symptoms were mild including: headache, nausea, sore throat, burning sensation on the skin. The study concluded that reporting of adverse effects in large numbers does not reflect either the probability or severity of the outcome. In all cases, even with inhalation exposure of the spray mix, the respiratory effects were mild.

30. More severe effects are seen following ingestion of glyphosate. Bradberry et al. (2004) (cited elsewhere in the Menzie et al. paper but not in this section) reviewed cases of glyphosate formulation exposure from Poison Control Centres and hospitals. Talbot et al. (1991) had similarly reviewed cases dealt with in hospitals in Taiwan; the study was followed up by Lee et al (2000). It is the Taiwanese studies which were the basis for Bradberry's conclusions on effective dose. Talbot et al. state that patients ingesting mean volumes of 17 ± 16 ml of concentrate were asymptomatic, those ingesting 58 ± 52 ml showed mild symptoms, 128 ± 114 ml moderate and only those ingesting 185 ± 70 ml showed severe symptoms. The large errors (the ± values) in these estimates reflect the low numbers of cases investigated and should not be misinterpreted; the headline value represents the most likely mean with the errors representing the 95% likelihood limits for that mean. Bradberry et al. describe "greater than 85 ml ingestion" as "likely to lead to significant toxicity in adults" which is a fair reflection of the lower error limit on the Talbot et al. value of 185 ml. To receive this dose orally, a person would have to ingest <u>all</u> of the formulation sprayed over 230 square metres of ground directly under the spray swath. This is clearly impossible, even for a child where the dose required would be proportionately smaller. Diarrhoea, even in malnourished populations, is unlikely to be an outcome from exposure to drifted spray.

31. Menzie et al. (2009) raise POEA, a component of the glyphosate sprays, separately. The effects described above, and the dosages, are based on Roundup formulation which contains POEA. The conclusions, therefore, take any POEA exposure into account.

32. The only component of the mixture sprayed for coca control not covered in the exposures above is Cosmo-Flux 411F. It is a mixture of common surfactants in an isoparaffin mixture as solvent. It is added to the tank mix at 1%, whilst the glyphosate formulation represents 44% (Hewitt et al., 2009). An additional 1% of surfactant above the approximately 15% (Giesy et al, 2000) already in the formulation is highly unlikely to affect the conclusions drawn. Isoparaffin acute toxicity is low with moderate skin irritation and slight eye irritation; it is unlikely to contribute to adverse effects of glyphosate spraying (Mullin et al., 1990).

6. Effects on organisms in the environment and ecosystems

33. The thrust of the argument in Menzie et al. (2009) related to environmental effects is:

- Species relevant to the area of Colombia and Ecuador are not included in the risk assessment conducted by Colombia. Local species may be more sensitive to the spray.
- The added adjuvant (Cosmo-Flux) increases the toxicity of the spray beyond that of commercial agricultural formulations tested on organisms as Roundup. The risk assessment might be flawed as a result.
- The drifted spray is sufficient to cause adverse effects on local flora and fauna, both agriculturally and in the natural environment.
- Overall, the risk assessment conducted in Colombia (Solomon et al. 2005) is insufficiently precautionary.

34. On the first bullet point, this is an oft repeated contention but no evidence has been presented either by Menzie et al. (2009) or other proponents of the view. The scientific evidence is to the contrary. A recent systematic study (Maltby et al., 2005) concluded that there was no statistical difference in species sensitivity distributions between aquatic organisms originating from Nearctic (cold and temperate North America), Palearctic (Europe, North West Africa and North Asia) and tropical regions for 16 insecticides. Further studies on Colombian amphibians conducted since the Menzie et al. report and considered below confirm that this general conclusion holds specifically for these species. I conclude that there is no basis for believing that Ecuadorian or Colombian species are more sensitive.

35. The other bullet points will be considered below against each of the species groups and assemblages raised by Menzie et al. (2009).

6.1 Amphibians

36. How do we establish risk to organisms in the environment from the use of a chemical?

37. First we establish the sensitivity of a range of species by conducting toxicity tests in the laboratory. These tests are usually conducted under conditions which maximise exposure of the organisms and, therefore, likely adverse effects, rather than testing under conditions which simulate actual exposure in the field. They are worst-case. A sensitivity curve is then plotted and the most sensitive species identified. If we have enough test results, which is the case for glyphosate and its formulations, we can then estimate a dose of the chemical (usually a concentration in water) which does not significantly affect species.

38. We then compare the estimated protective concentration against the concentration we measure or expect in the environment – the exposure estimate. If the exposure estimate is

greater than the protective concentration then adverse effects are expected. For pesticides, the exposure estimate will always be greater than the protective concentration for the target organisms – pesticides are designed to kill target species. It may or may not be greater for non-target organisms.

39. In the case of aerially applied chemicals, we can then further ask 'at what distance from the point of spraying does the exposure estimate fall below the protective concentration?' This gives us a distance in metres from the point of application beyond which we expect no adverse effects – the effects margin.

40. This process is illustrated graphically in Figure 2.

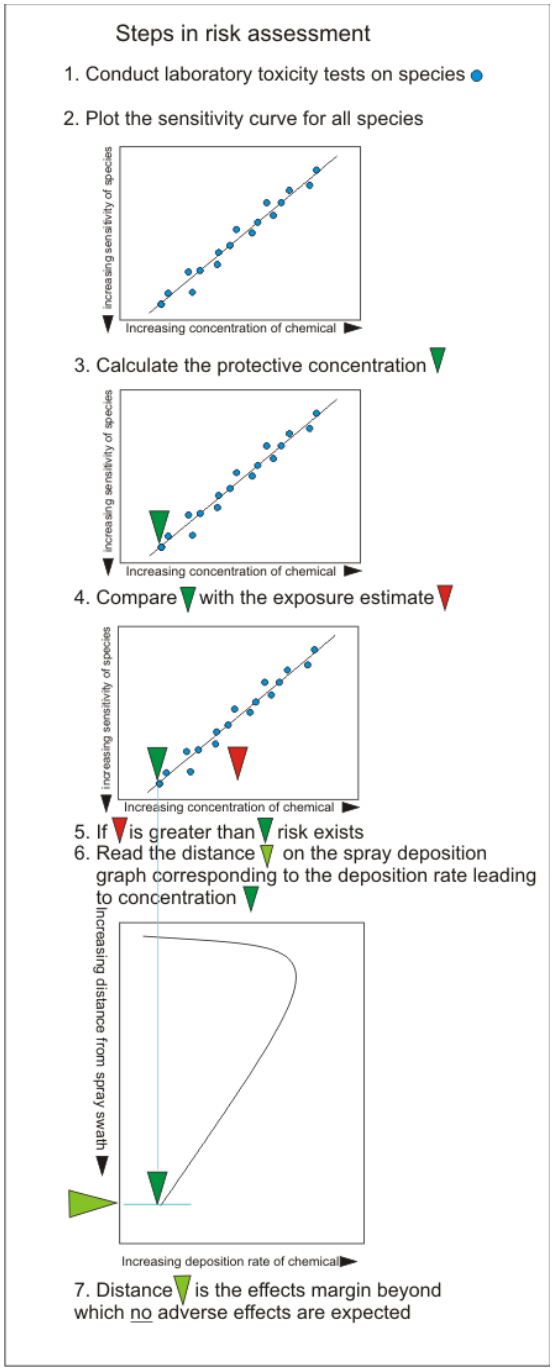

Figure 2: Steps in the risk assessment process

41. The Menzie et al. (2009) report criticises the original CICAD report (Solomon et al. 2005). The Solomon et al. report identified data gaps and areas with insufficient information to conclude a risk assessment satisfactorily and outlined a further programme of research to fill these gaps. A second CICAD report has now been published as a series of scientific papers. I will, therefore, examine the Menzie et al. (2009) criticisms against the newly published updated risk assessment rather than the original Solomon et al. report.

42. The update includes extra test results on particular species as well as a re-worked risk calculation.

43. Bernal et al. (2009a) conducted acute (3 day) toxicity tests (for lethality) on tadpoles of eight species of amphibians found in the region of Colombia where coca control takes place. These species were exposed to the glyphosate formulation Glyphos with Cosmo-Flux added, as used in the Colombian coca-control programme. Results were compared to similar tests conducted on other amphibian tadpoles using the Roundup formulation of glyphosate (Figure 3); this sensitivity curve for larval amphibians represents step 2 in Figure 1.

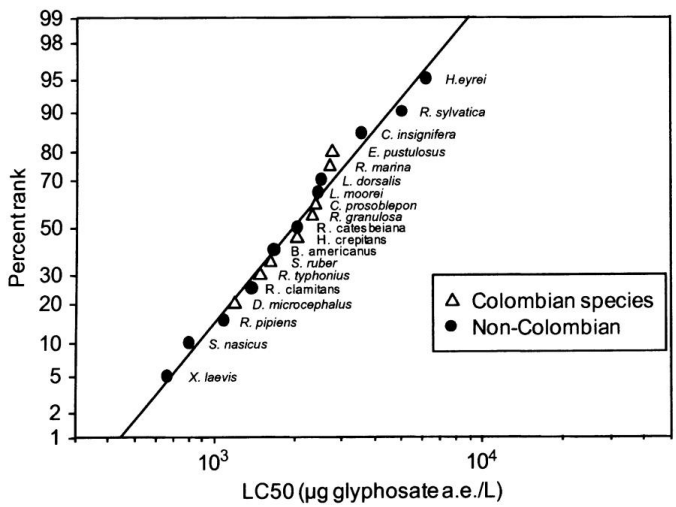

Figure 3 : Taken from Bernal et al (2009a). The plot shows sensitivity of Colombian and non-Colombian amphibian tadpoles to glyphosate formulations. The Colombian species were exposed to the formulation Glyphos with Cosmo-Flux added as used in coca control. Other species were exposed to the Roundup formulation. The formulations Glyphos and Roundup are similar.

44. Glyphos and Roundup are similar in terms of glyphosate content and both contain the POEA surfactant which has been identified as a major contributor to the aquatic toxicity of glyphosate forumations (Giesy et al., 2000). Colombian species were neither more nor less sensitive than other species. There is also no indication that addition of Cosmo-Flux, leading to overall greater concentration of surfactant in the exposure, increases the toxicity of glyphosate formulations to amphibians. A complementary study exposed terrestrial stages of frogs, also species local to Colombia (Bernal et al., 2009b). The adult frogs were oversprayed

with the mixture of Glyphos formulation and Cosmo-Flux surfactant. LC_{50} values (the exposure concentration killing 50% of test frogs) are plotted in Figure 4; this sensitivity curve represents step 2 in Figure 1 but for adult rather than larval amphibians. Here exposure is expressed as kilograms of glyphosate per hectare; that is in terms of the application rate.

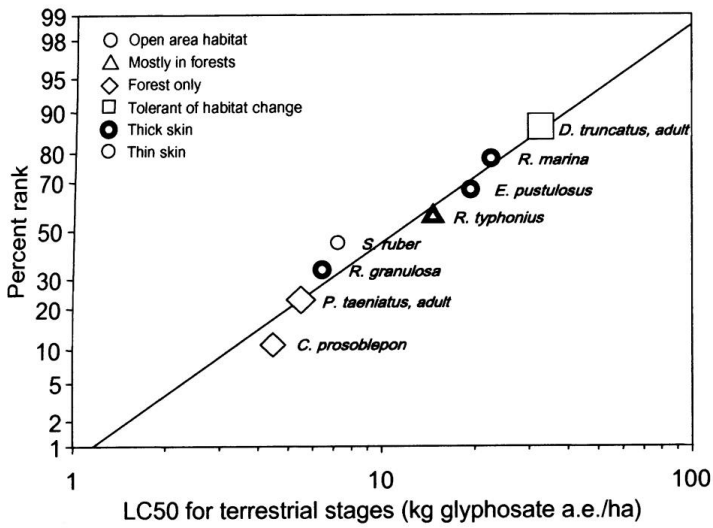

Figure 4: Taken from Bernal et al 2009b. Relative sensitivity of adult frogs from Colombia to overspraying with glyphosate formulation (Glyphos) with added Cosmo-Flux surfactant.

45. Menzie et al. (2009) cite several specific studies on amphibian larvae. How do these particular studies fit with the overall relationship between dose and effect plotted in Figure 3?

46. The Relyea (2005b) study cited is the second of two published studies from this author (the first is not mentioned). The first study, (Relyea, 2005a) conducted laboratory tests of the Roundup formulation of glyphosate on the aquatic larvae of 6 species of amphibians from the Midwestern United States. The LC_{50} values reported range from 0.6 to 2.5 mg glyphosate/litre. These values fit into the mid section of the graph in Figure 2; that is, these species showed average sensitivity to the glyphosate formulation. The second study (Relyea 2005b), as cited in Menzie et al. (2009), then chose a dose which they predicted would cause 93%, 94% and 92% mortality to leopard frogs, American toads and gray tree frogs respectively and applied this to mesocosms (simplified artificial environments which represent the real environment for experimental purposes). The aim of the study was to see if the formulation showed similar toxicity in the wild as it did in the laboratory. They found the 96%, 100% and 98% respective mortality cited by Menzie et al (2009), confirming to the authors that the laboratory tests accurately predicted field mortality. Of more interest in the Relyea study, though not mentioned by Menzie et al, is a second experiment conducted with terrestrial amphibians from North America. High mortality, ranging from 68 to 86% was found in three species directly oversprayed with a Roundup formulation at recommended field application rate (approximately equal to those used in coca control at 3.7 kg/ha). Only

one dose was used in the experiment, precluding the calculation of an LC_{50}, so that the results cannot be plotted in Figure 4. However, mortality rates greater than 50% at exposure doses approximately equal to the lowest LC_{50} in Figure 3 suggest that Colombian amphibians are less rather than more sensitive to the glyphosate formulations than temperate species and that the Cosmo-Flux formulation is no more toxic to terrestrial amphibians than a standard agricultural formulation.

47. Smith (2001) claimed that "relatively low concentrations for a short period of time … appears to induce high mortality in tadpoles" as quoted by Menzie et al. (2009). The doses given in the original paper, and partially cited by Menzie et al., range from one part per 10,000 (incorrectly quoted by Menzie et al. as 1 part per billion) to one part in ten of the Kleenaway formulation (0.75% glyphosate); these correspond to doses rising from 7.5 mg/litre (=7,500 µg/litre, the units used in Figure 2) glyphosate to an astonishing 0.75 grammes/litre (=750,000 µg/litre). Since the lowest concentration used (7.5 mg/litre) is close to the LC_{50} for the <u>least</u> sensitive amphibian plotted in Figure 2 and approximately 5 times higher than the predicted concentration in water after application for coca control, it is certainly not a "relatively low concentration" and it is surprising that any of the exposed tadpoles survived. The Smith (2001) study does not alter the conclusions to be drawn from Figure 3. The final sentence in the paragraph on the Smith (2001) study in the Menzie et al. (2009) paper, although referenced as Smith, actually covers material from the Howe et al. (2004) study covered in the following paragraph.

48. Howe et al. (2004) studied several amphibian species; their findings are already plotted in Figure 3 so change no conclusions. Howe et al. looked at a range of species, different formulations (but not Kleenaway as stated by Menzie et al.) and some individual components of the formulations. Howe et al.'s findings confirm that the toxicity of glyphosate formulations reflect the surfactants rather than the herbicide content. They, and Menzie et al. (2009), raise an important issue; are tadpoles surviving the test concentration damaged to the point where their survival longer-term will be affected? Howe et al (2004) did find sub-lethal effects (tail damage, reduced tail length, rate of development, proportion of animals reaching metamorphosis, gonadal abnormalities and alteration in a genetic marker for thyroid hormones (required for metamorphosis in amphibians) in larvae which survived. This will be considered further below.

49. None of the scientific studies cited by Menzie et al. (2009) throw any doubt on the range of species sensitivity plotted by Bernal et al. (2009a) and we can regard this as representative.

50. We now move on to step 3 of the risk assessment (Figure 2) and calculate a 'protective concentration'. This, in theory, would be a point at the left hand end of the species sensitivity plots (Figures 3 & 4) which reflects zero effect on the most sensitive species. From the straight line graphs of Figures 3 and 4, this appears easy. It is not. Both graphs are plotted with log scales both horizontally and vertically; the result of this is to straighten the plotted line. If the vertical scale was not expressed in logs, the curve would be 'S'-shaped with the slope reducing increasingly the further to the left we move. In theory, such curves have no

defined end; the slope keeps reducing to infinity but never disappears completely. Since the 'end' cannot be defined, it is usual to define a point further along the curve which can be calculated. This is often the 5% point, or sometimes the 1% point. In terms of protection of species, these equate to the exposure which protects 95% or 99% of species respectively from adverse effects. Regulatory systems for chemicals globally accept the 95% point as being reasonably protective of species in the environment.

51. Using the data plotted in Figure 3, Hewitt et al. (2009) in a follow-up to the Solomon et al. (2005) risk assessment of the Colombian spraying programme, have calculated the 95% protection concentration for amphibian larvae at 917 µg/litre in surface waters. This is plotted as the dark green arrow in Figure 5 below; this represents step 3 of the risk assessment process in Figure 1. This predicts a 5% or lower chance of there being known or unknown species not protected at this exposure.

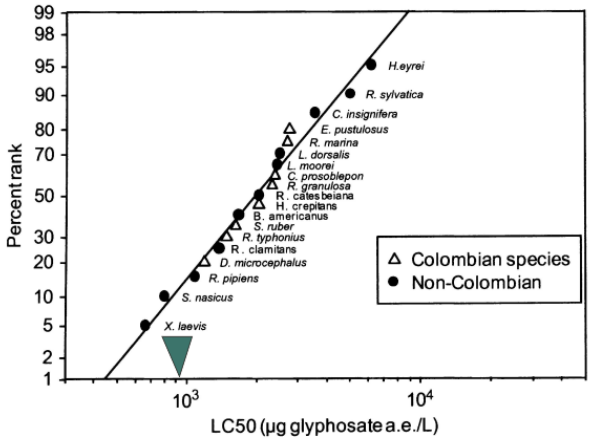

Figure 5: The calculated protective concentration for 95% of species of amphibian larvae (green arrow) at 917 µg/litre glyphosate (from Hewitt et al. 2009), step 3 in the risk assessment process from Figure 2.

52. How precautionary is this approach?

53. The protection concentration is based on individuals being killed or adversely affected. Ecotoxicology usually states its aims as protecting populations of organisms rather than individual organisms. A stable population in the wild produces, on average, one pair of offspring which survive to reproduce from each breeding pair. More than this and the population grows, less than this and the population declines. Most organisms in the wild produce large numbers of offspring to cope with the large losses from predation and starvation, the two largest sources of mortality. Killing individuals, even in large numbers, through human activity such as spraying of pesticides does not necessarily add to overall mortality in the wild. Both predation and starvation are 'density dependent', that is as numbers fall both reduce in intensity; the lower the number of individuals in the area, the

lower the likelihood that any individual will either fall prey or starve. If I kill some individuals by spraying pesticides, the survivors are less likely to fall prey or starve. If I kill all individuals in a specific area, populations can still recover through immigration from surrounding areas. Protecting individuals is, therefore, very precautionary for species with high reproductive rates. Some species have evolved a different strategy; they produce smaller numbers of offspring but protect and nurture them better to reduce losses. Some amphibian species in the area of coca spraying use this strategy. Here there will still be some natural mortality; they also, in a stable population, would expect to lose all but two offspring in a lifetime of breeding. Protecting individuals is still precautionary but less so than for species with high reproductive output.

54. Balanced against the inherent precaution of the estimate of the protective concentration, we must consider:

- There are two known species showing greater sensitivity in Figure 3: *Xenopus laevis* (from South Africa) and *Scinax nasicus* (from sub-tropical South America). Whilst this is not unusual in 95% protection values (which do, obviously, allow for 5% of species to be more sensitive), it looks less than fully protective. Regulatory systems sometimes shift the value to the concentration representing the known most sensitive species as a precaution. Others increase the level of protection to 99% or apply an arbitrary 'safety factor'

- The value is calculated from LC_{50} values (killing 50% of tested animals), rather than no-effect-concentrations, so individual animals will still be killed at this concentration. It is not usual to conduct species sensitivity distribution protection values based on acute toxicity studies (LC_{50}s) without correction. Some regulatory systems allow correction of LC_{50} values whilst others do not.

- Even if we lowered the value to account for the mortality below the 50% level of the most sensitive species, we still need to cover possible initially sub-lethal effects which might later adversely affect survival (Howe et al., 2004).

55. Scientifically, the protective concentration derived by Hewitt et al. (2009) should be adequate to prevent significant ecological effects. Intuitively, this might not appear to be the case and I will come back to this later.

56. We now move on to step 4 of the risk assessment process (Figure 2) which compares the protective concentration with estimated exposure concentration.

57. Predicted concentration (from Solomon et al., 2005) is given in Figure 6 (for surface waters immediately following application of spray, assuming a 15 cm water depth) as a red arrow; actual application rate is indicated by a similar arrow in Figure 7 for terrestrial amphibians. The two arrows represent the same application expressed differently for the two different media (water concentration for aquatic amphibian larvae and application rate in kg/ha for terrestrial adults).

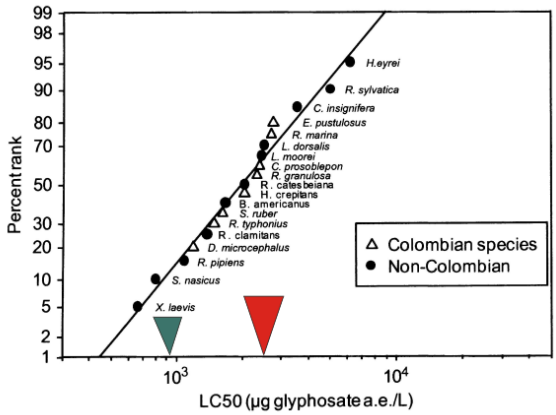

Figure 6: Comparison of the protective concentration derived by Hewitt et al. (2009)(Figure 5) with the predicted exposure concentration (from Solomon et al. 2005) for larval amphibians; step 4 of the risk assessment process in Figure 1.

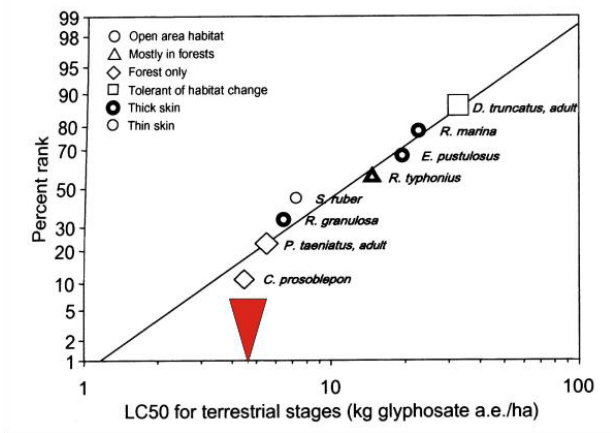

Figure 7: Comparison of the species sensitivity distribution for adult amphibians (Bernal et al. 2009, Figure 3) with the predicted exposure concentration.

Since in Figure 6 the predicted exposure concentration is greater than the protective concentrations (step 5 of the risk assessment process in Figure 2) for larval amphibians and risk is indicated, we move on to step 6. Adults are less sensitive than larvae with LC_{50} values equal to or to the right of the actual application rate (Figure 7); the normal application rate for coca control at 3.7 kg/ha corresponds approximately to the LC_{50} for the most sensitive species tested (*Centrolene prosoblepon*). Adults will, therefore, be protected to a greater extent than larvae in the derived effects margin and we do not need further calculations of risk for adults.

58. How precautionary is the exposure estimation?

59. Exposure has been overestimated throughout the risk assessment; no account has been taken of mitigating factors such as interception by vegetation or lessened availability to organisms of the active substances over time. Predicted concentrations in surface waters tend to overestimate measured concentrations following spraying (see Giesy et al., 2000). Rapid dissipation of glyphosate itself from water through adsorption to sediment and suspended particulates is often used to justify a lack of need to assess chronic effects of the substance. However, the toxicity of formulations of glyphosate is largely due to the surfactants rather than the glyphosate and it is, therefore, the persistence of the surfactants which needs to be considered. Whilst surfactants also adsorb to sediments, adsorption is weaker than for glyphosate. Dissipation is usually rapid for surfactants since they are biodegraded under aerobic conditions within a few days. Chronic toxicity is also, therefore, unlikely for surfactants.

60. Risk assessment divides the exposure concentration by the effect concentration. This multiplies precaution. For example, an over-estimation of exposure by a factor of 10 and an under-estimation of the protective concentration by a factor of 10, when divided, lead to precaution by a factor of 100.

61. Overall the approach is highly precautionary.

62. Step 6 of the risk assessment process (Figure 2) converts the protective concentration into a deposition rate and reads a distance from the spray swath from Figure 1 to establish an effects margin beyond which no adverse effects are expected.

63. Hewitt et al. (2009) relate their protection value to actual deposition of spray. For their protective concentration value of 917 µg/litre and based on a water depth of 15 cm, they estimate that a deposition rate of approximately 1350 g/ha (read from the graph) would lead to this concentration in water. This deposition rate occurs approximately 5 metres from the edge of the spray swath. They conclude that all amphibian larvae would be protected outside this area downwind of the spray.

64. Assumptions about depth of water receiving the spray affect the toxic outcome. The assumed depth used in the Solomon et al. (2005) and Hewitt et al. (2009) risk assessment has been criticised by Menzie et al. (2009) as excessive because larval amphibians tend to live in shallower water than this and are also found in Colombia and Ecuador in very low volume bromeliad 'ponds'. This also needs to be balanced against the general highly precautionary approach. Scientifically, it is probable that the risk values derived indicate little or no effects ecologically beyond the effects margin calculated by Solomon et al and Hewitt et al.

65. Their results are summarised in Figure 8 below.

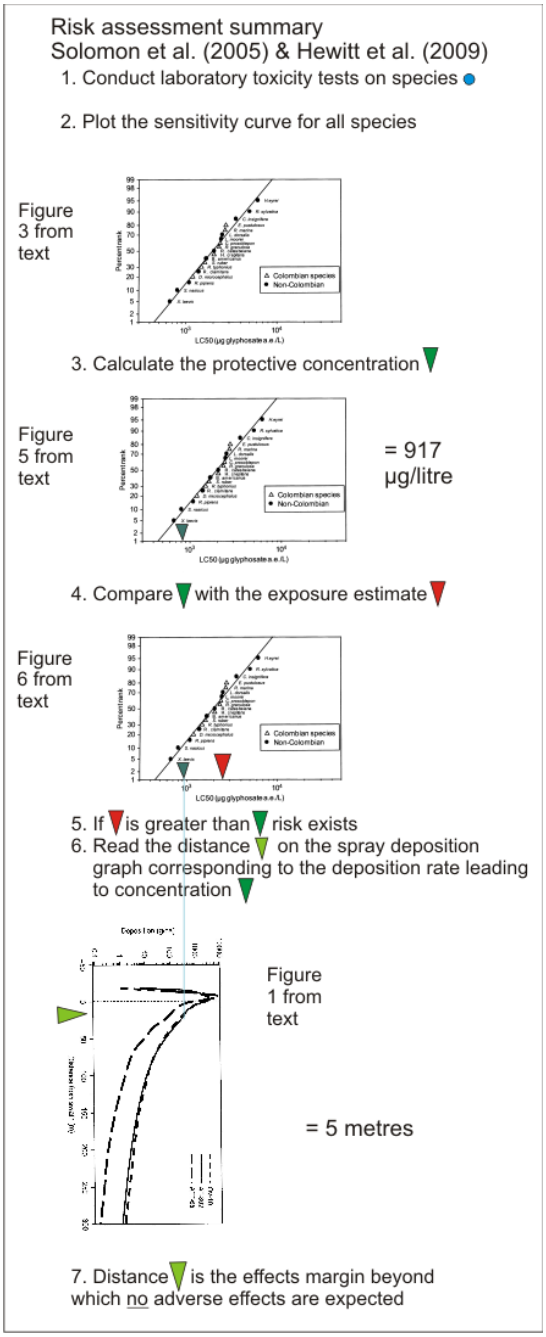

Figure 8: Summary of the risk assessment calculations and conclusions for larval amphibians from Solomon et al. (2005) and Hewitt et al. (2009)

66. How can these results be translated into likely effects in the field at the point of the application of the glyphosate formulation spray and in the adjacent areas?

67. At the point of application of the spray, the area has been cleared of natural vegetation for the planting of coca. Further, damage has been done to the immediately adjacent natural forest by the coca production through human activity in general and the application of pesticides to the coca crop in particular. No further ecological damage is likely in the coca fields themselves.

68. About half of the tested Colombian species aquatic larvae fall to the left of the red arrow in Figure 6 with the remainder to the right of it. This suggests significant mortality for all Colombian species, likely total mortality of the most sensitive species and approaching 50% mortality for the least sensitive species, in the band of natural vegetation immediately adjacent to the coca fields and still directly over-sprayed at the full dose. The Howe et al. (2004) study also suggests that some of the immediate survivors would be adversely affected to the point where their longer-term survival was compromised. Terrestrial adult amphibians are less sensitive than larvae (Figures 4 and 7). In the worst case, about half of the most sensitive species would be killed, with mortality reducing for species further to the right of the red arrow in Figure 7. I would expect no mortality in the least sensitive species.

69. The level of damage falls to insignificance within 5 metres according to the Solomon/Hewitt risk calculations.

70. The degree of precaution in Solomon et al. (2005) has been criticised as inadequate by Menzie et al. (2009). This criticism would remain for the Hewitt et al. (2009) update of the risk assessment since the assumptions remain the same. Menzie et al. (2009) offer no alternative degree of precaution since they make no attempt at the risk assessment calculations which are needed to derive it; this is not helpful.

71. How precautionary should we be?

72. There is no definitive answer to this question because, although informed by the scientific evidence, the answer is not entirely a scientific one.

73. Legislation on chemical regulation globally uses different levels of precaution depending on the circumstances. Several different levels are possible:

- Ideally, no change for any species in the environment should result from the use of chemicals. This is unworkable if any human activity with chemicals is undertaken and it has never been incorporated into regulatory law

- No adverse change resulting in effects at the level of populations or communities of organisms. This equates to no structural changes in ecosystems. It is applied, with some arbitrary added precaution, to the use of industrial chemicals on the ground that there is no intention of adding the substances to the environment and no benefit gained by doing so.

- No adverse change resulting in effects at the level of populations or communities of organisms. This equates to no structural changes in ecosystems. It is applied with no additional precaution (realistic worst case) for agricultural use of pesticides on the grounds that the substance is intentionally applied to the environment and there is some benefit from doing so.

- Some adverse change but no change in ecosystem services. This is applied to areas commercially exploited and seeks to maintain sustainability in the exploitation.

- Significant adverse change acceptable. This would be applied to areas such as disease vector control *in extremis* (for example displaced human populations from natural disaster or political upheaval) where substantial benefit to human life is balanced against environmental damage.

The Solomon/Hewitt approach equates to the third bullet point. The Menzie et al. criticism would imply either the second or even the first bullet points.

74. Which level of precaution to use is clearly a key decision for the court to make. What I can do is calculate an effects margin for a higher level of precaution to inform that decision making.

75. If I take the species sensitivity curve (Figure 3) and apply 99% of species protection instead of the 95% used above, I generate a protective concentration at 473 µg/litre (Figure 9). To generate the 99% value, I was obliged to read the data points from the Bernal et al. (2009) curve since the test results are not tabulated by them. To ensure that I read them correctly, I also re-ran the 95% protection calculation and came up with a value comparable to theirs at 797 µg/litre (the result will not be absolutely identical to theirs since I used a slightly different curve-fitting program). I will also divide the derived value by 10 to increase precaution and account for any sub-lethal effects as postulated by Menzie et al. (2009) and shown experimentally by Howe et al. (2004). This gives a protective concentration at 47.3 µg/litre. This figure is lower (i.e. more protective) than the hypothetical LC_{50} of 100-200 µg/litre proposed by Menzie et al. (2009) for Colombian amphibians based on their reading of relative toxicity of formulations.

76. Increasing the protection level in this way leads to an estimate of the effects margin at 18 metres downwind of the spray swath.

77. Menzie et al. also criticised the water depth used by Solomon/Hewitt in their calculations as being too deep to be representative of water depths favoured by larval amphibians and pointed to amphibian larvae living in bromeliad ponds. If I reduce water depth in the calculations to 7.5 cm rather than the 15 cm used by Solomon et al. (2005), the effects margin is extended to 50 metres from the spray swath. The order of magnitude is still tens of metres.

78. In other words, increasing protection to levels which regulatory law would consider over-precautionary and beyond the implied precaution suggested by Menzie et al. (2009) still

does not change the overall conclusion that effects as far away as Ecuador are highly improbable.

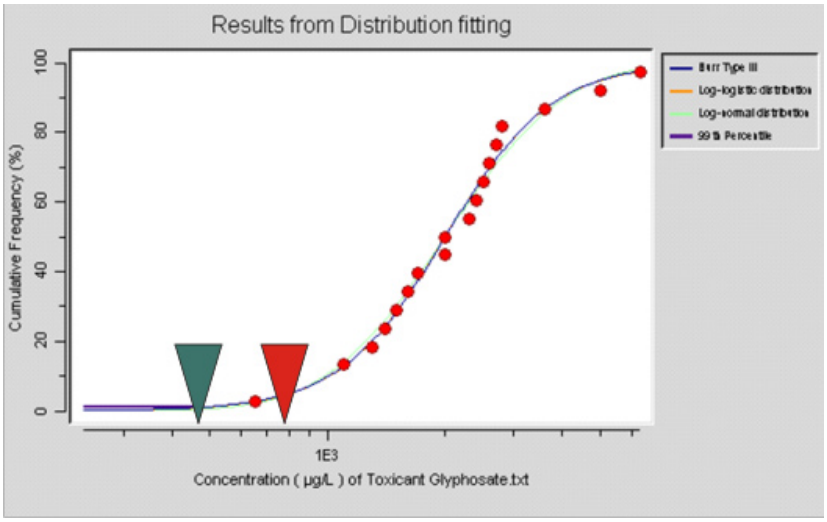

Figure 9: Calculation of the 99% protection value with 50% certainty at 473.3 µg/litre (green arrow) for amphibian larvae based on data plotted in Figure 2 (using the Burrli-Oz software, ANZECC-ARMCANZ, 2000). The 95% protection value with 50% certainty is shown as the red arrow for comparison.

79. Does the possibility remain of a highly localised, very sensitive species of amphibian larvae being eradicated by the spraying? Lynch & Arroyo (2009) investigated this possibility related to the direct spraying of the coca-growing areas in Colombia using geographical analysis of the distribution of species compared to the distribution of coca growing and eradication. They believe that several species of frogs are at risk from the coca growing itself (habitat destruction and use of a range of pesticides), possibly with a contribution from the eradication programmes. The chances of similar risk to species in Ecuador exposed only to drifted spray is much lower and, in my opinion, negligible.

80. The same principles used for amphibians can be applied to other organisms in the environment.

6.2 Plants and soils

81. The section of Menzie et al. (2009) on direct effects on plants is confusing. They state, correctly, that the addition of extra surfactant Cosmo-Flux (as an adjuvant in the tank mix) increases the potency of the glyphosate formulation to coca plants fourfold. They also state, correctly, that the increased potency is due to surfactant effects on the waxy cuticle of the coca leaf; glyphosate penetrates to the sensitive inner tissues of the plant via the damaged cuticle. They also state, correctly, that plants other than coca will, therefore, be more susceptible to the herbicide spray enhanced with the adjuvant. However, they then imply that

the increased potency increases the effect of the spray on all plants four-fold, which is not the case. Plants with cuticular protection comparable to the coca will be killed more effectively with the enhanced spray; with increased potency of approximately fourfold. Those with greater protection than coca would show a less than four-fold increase in potency and might show little or no increased toxicity. Those with no protective coating on the leaves would show no increased toxicity – it is only possible to die once and the application rate of spray in terms of the glyphosate itself remains constant for all formulations/adjuvants.

82. The question is, therefore, given a range of plants, some susceptible to the original glyphosate formulation and some only susceptible to the enhanced formulation, what is the safe exposure for plants in general?

83. Hewitt et al. (2009) obtained toxicity data on 21 plant species tested against formulated glyphosate from the USEPA ectotox database. A species sensitivity distribution was plotted (reproduced in Figure 10).

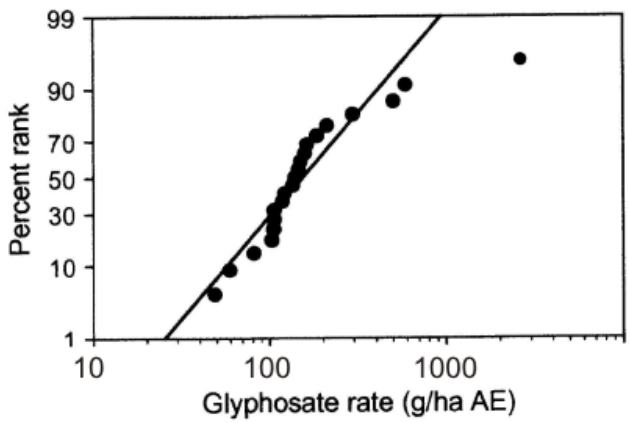

Figure 10: Taken from Hewitt et al. (2009). The plot shows sensitivity of plant species to glyphosate formulations.

84. In contrast to the equivalent amphibian data, these tests looked at sub-lethal effects on the plants measuring growth or development. One value, for *Magnoliophyta spp.*, is an outlier (top right of the graph) and was not used by the authors to derive the plotted line. With the exception of this species, all other plants plotted are crop plants, including maize, with little cuticular thickening or waxing which would be protective against glyphosate formulations. The outlier is interesting because it suggests that the *Magnoliophyta spp.* might have thickened cuticles similar, but not necessarily equivalent, to that of coca. If we apply the four-fold increase in potency observed with the Cosmo-Flux enhanced spray for coca to the outlying result, this moves the plotted point to the left and very close to the plotted line. It still leaves it as the least sensitive species in the distribution.

85. Hewitt et al. (2009) calculated a 95% protection rate (this time expressed as g/ha application rate for the glyphosate content of the formulation) at 43 g/ha. The criticisms applied to their calculations for amphibian larvae do not apply here (sub-lethal rather than lethal endpoints and dilution not a factor) with one possible minor exception. The values are EC_{25}s, the Effective Concentration causing a reduction to 25% of the control level, in this case of growth or development. A reduction to 25% is not a reduction to zero. However, estimating effects on growth or development of plants down to, say, 5% is difficult and the result will not affect risk calculations significantly.

86. For worst case spray drift (the worst aircraft and nozzle type), plants more than 50 metres away from the spray swath would be unaffected.

87. If there are no sub-lethal effects on plants at this distance, there can be no long-term effects.

88. The studies cited by Menzie et al. (2009) as supporting long-term effects of glyphosate refer to direct application of glyphosate to forests to control non-productive vegetation and are not relevant to likely effects of spray drift.

89. Giesy et al. (2000) reviewed the then available studies on the effects of glyphosate and the Roundup formulation on soil microorganisms and soil function. Effects covered included: nitrogen fixation, nitrification, dehydrogenase activity, immobilisation of ammonia, urea hydrolysis, denitrification, degradation of cellulose, starch and protein, and degradation of leaf litter. The no-observed-effect concentration in soil for the most sensitive of these tests corresponded almost exactly with the concentration in soil following Roundup application; this indicates no risk at realistic soil concentrations.

90. The denitrification reported by Tenuta & Beauchamp (1996), cited by Menzie et al. (2009) occurred following complete kill of a grass sward with the herbicide. The effect was linked by the authors to increased nitrate and soil moisture resulting from the death of the vegetation. The paper reviews other causes of denitrification which include hand hoeing of weeds. This secondary effect of large amounts of dead plant material in soil is relevant to the areas directly sprayed for coca control but not to areas outside the 50 metre protective zone.

91. The studies cited by Menzie et al. (2009) on effects on fungi could be relevant to risk. The application concentrations are within expected deposition rates. The Johal & Rahe (1988) study placed drops of Roundup directly onto the hypocotyls (early leaf) of beans. The study was a mechanistic one. The Beyrle et al. (1995) study similarly used realistic concentrations on orchids. However, these concentrations would only occur close to the spray swath and fungal effects would not occur beyond 50 metres.

6.3 Domestic animals

92. It is difficult to take this section of the Menzie et al. (2009) paper seriously. It is the perfect example of the dangers of expressing hazard (the possibility) without reference to exposure and risk (the probability) of something adverse occurring.

93. Menzie et al. cite Bradberry et al. (2004) as support for their statement that there are "even greater concerns about effects on mammals and birds …. related to compounds added to the tank mix to enhance foliar penetration". Bradberry et al. regard the primary toxicity seen with glyphosate formulations as related to the surfactants present; they discuss only POEA and certainly say nothing about other potential surfactants or adjuvants to increase foliar penetration. Bradberry et al. (2004) state that dermal exposure to ready-to-use-glyphosate formulations (that is the concentrate) "can cause irritation …. severe skin burns are very rare". Maibach (1986) describes skin irritation following direct application of the Roundup concentrate to the skin of human volunteers as "less irritant than a standard liquid dishwashing detergent and a general all purpose cleaner". It is difficult to reconcile these descriptions of the effects of the concentrated formulation with Menzie et al.'s picture of severely irritated domestic animals abrading their own skin, producing "self-inflicted wounds" and getting secondary infections following exposure to the spray of diluted formulation some distance from the application site. The Menzie et al. (2009) argument seems to be that hypothetical additives would have greater irritancy than the surfactants already present in the commercial formulations. In fact only Cosmo-Flux is added to the commercial formulations and the components of Cosmo-Flux are no more irritating, and probably less irritating, than the POEA already there.

94. In contrast to the Menzie et al. statement, POEA has been tested on birds (Giesy et al., 2000) since it is a component of the Roundup formulation. Bobwhite quail, mallard and zebra finches fed on a diet containing 5620 or 8064 mg/kg Roundup for 5 days (with a further 3 days of observation) showed no toxicity; the dose is equivalent to 843 and 1210 mg/kg POEA in the diet. Predicted concentration of glyphosate in food for grazing birds such as mallard would be 400 mg/kg diet directly under the spray following aerial application of a formulation (EPPO, 2003); this would be approximately equivalent to 150 mg/kg diet for POEA. No overt toxicity would, therefore, be expected following spraying for coca control.

95. The Oliviera et al. (2007) paper cited by Menzie et al. also dosed mallard with POEA as a component of Roundup. They dosed by gavage (directly to the stomach) at doses of 5 and 100 mg/kg body weight (or 0.75 and 15 mg/kg body weight POEA) for 15 days; since no lower doses were used, a no-effect dose cannot be established for the effects on circulating testosterone, the epididymus and the testis. These doses are within the range of total daily intakes likely from contaminated food following spraying with glyphosate. It is unusual to dose by gavage for this type of experiment and regular dosing for 15 days exceeds likely field exposure but the effect warrants further study. Whilst these effects could be seen directly under the spray, they are unlikely to occur from the exposure via spray drift at some distance away.

96. The introduction of ethylene oxide as a possible contributor to overall toxicity of the glyphosate formulations here is ludicrous. Ethylene oxide is indeed a highly dangerous chemical with severe effects on humans at low exposure concentrations. However, it is present as a contaminant of POEAs (and other detergents) at less than 10 ppm (parts per million) as stated in the Manufacturer's Safety Data Sheet and by WHO (2003). Given that POEA represents 15% of the formulation, this gives a total of 1.5 mg of ethylene oxide in a 1

litre bottle of the concentrate. Application of the formulation at 3.7 kg/ha as glyphosate would apply ethylene oxide at no more than 15 mg/ha and deposit it at a maximum of 1.5 $\mu g/m^2$ in the area of direct spraying. Assuming all of this ethylene oxide is available in the breathing zone of humans or domestic animals and is breathed-in within a few breaths, exposure would be to 1.5 $\mu g/m^3$ over a period of minutes. Average concentration of ethylene oxide in uncontaminated outdoor air in Canada is 0.34 $\mu g/m^3$ with the highest measured concentration at 4.9 $\mu g/m^3$; average concentration in indoor air in houses is 0.17 $\mu g/m^3$ with a single maximum value at 4 $\mu g/m^3$. These concentrations are breathed in by Canadian residents 24 hours a day, 365 days per year. Peak concentrations experienced by workers showing spontaneous abortion were at 458 mg/m^3 (WHO, 2003) approximately 300,000 times the peak exposure directly under the glyphosate formulation spray and experienced over a longer period. Ethylene oxide can, with complete confidence, be ruled out as contributing to the toxicity of the glyphosate sprays.

97. The Campbell & Chapman (2000) book on poisoning in dogs does not give dose. However, a comparable study on 31 cases of acute poisoning in dogs by Burgat et al. (1998) make clear that the vomiting and other signs in dogs follows ingestion of the concentrate or spray tank mixture of the glyphosate formulation. These effects are not relevant to indirect, or even direct, exposure to the spray in the field. In quoting Bradberry et al. (2004), Menzie et al. (2009) report reduced weight gain in mammalian species possibly caused by unpalatibility without completing the quotation; Bradberry et al. say "since very high dietary concentrations were used in some of these studies, this effect may have been due to unpalatibility and reduced calorific intake". These very high dietary concentrations (my emphasis) make the relevance of the findings to field exposure highly unlikely. Similarly, the chronic dietary exposure to glyphosate formulations referred-to in the product label will not be seen in the field from spray-drift. Systematic risk assessments of glyphosate formulations have consistently concluded that there is little or no risk to mammals (WHO, 1994; Williams et al., 2000).

98. The likely effects in domestic animals following exposure to spray drift are the same as those seen in humans: transient eye irritation and respiratory discomfort. I do not accept that these mild to moderate effects would impinge on growth or reproductive performance of these animals.

6.4 Fish

99. Without going into detail again, the effects on fish of direct spraying over water will be comparable to, though less severe than, those on amphibians. Fish show lower toxicity to glyphosate formulations than amphibian larvae. Fish exposed to the spray formulation as used in Colombia (including the Cosmo-Flux adjuvant) show greater toxicity than to the formulation alone. However, this toxicity is lower than for the most sensitive amphibian species included above in the risk assessment. Water depth greater than the 7.5 cm assumed as worst case amphibians is appropriate for fish since they tend to live in deeper water than amphibian larvae. The distance of 18 metres associated with no-effect for amphibians (at a

water depth of 15cm) will be protective for fish. I would expect no effects on fish exposed to spray drift at distances greater than this.

100. Fish kills could only occur following direct overspraying of aquaculture ponds at the full application strength. This effect would be either from the direct toxicity of the surfactants in the spray mix or from indirect effects due to oxygen depletion caused by biodegradation of dead plant material. The latter, by definition, only occurs where plants have been killed. Dead plants will only occur within 50 metres of the spray swath which is protective of any adverse effects on plants (see above). Widespread killing of fish outside the area of direct spraying, attributed by Menzie et al. (2009) to the Columbian spraying programme, is, therefore, highly improbable.

6.5 Terrestrial arthropods (insects and mites)

101. Cowles et al (2000), as cited by Menzie et al. (2009) studied the effects of one class of surfactant on mites, the organosilicones. Their study was conducted in response to previous studies suggesting direct toxicity of these surfactants to both mites and insects. Its aim was to determine the relative roles of reduced surface tension caused by the surfactant and other factors (interaction with other components of the applied formulations and environmental media such as leaf surface waxes). They found that reduced surface tension was the principle, if not only, reason for toxicity. Further, they determined the surface tension associated with lethality. Trisiloxanes, including the Silwet L-77 correctly identified as a component of some glyphosate formulations by Menzie et al., caused high mortality in mites whilst other organosilicone surfactants did not. The authors quote Imai et al. (1995) as stating that trisiloxanes have "unequalled wetting properties" (= reduction in surface tension). The Goodwin & McBrydie (2000) paper, also cited by Menzie et al., oversprayed and fed honeybees with 11 different surfactants. Two of these, Pulse and Boost, caused honeybee deaths at recommended rates of application; both of these surfactants are organosilicones (Pulse is described on the internet as being a component of Roundup). A tallowamine surfactant similar to the POEA included in glyphosate formulations did kill bees but only at doses more than 10 times the recommended application rate. The remaining surfactants were not toxic to bees. Oral toxicity was seen with the tallowamine surfactant at 0.5% in sugar syrup; no indication was given as to how realistic this dose was.

102. The Cowles et al. study, therefore, does not support the Menzie et al. statements that effects on insects (and presumably mites) would be "fairly unpredictable from laboratory tests" or that "the addition of special surfactants could also result in increased toxicity to insects over and above that for Roundup". Field effects are predictable from surface tension reduction induced by particular surfactants and the most potent class of surface-tension reducers are already included in some commercial formulations of glyphosate but not in Cosmo-Flux. The apparent quotation or citation "at sub-lethal surfactant exposures, this can result in disorientation and altered behaviour, as exposed insects react to the injury to the exoskeleton and respiratory system" ascribed to Goodwin & McBrydie (2000) by Menzie et al. does not appear in the Goodwin paper and is, presumably, speculation on the part of Menzie et al. themselves. The Goodwin & McBrydie (2000) results support the view of

Cowles et al. (2000) that the organosilicone surfactants are the most potent insect and mite killers and also show that the POEA component of glyphosate formulations does not kill insects.

103. Hislop & Prokopy (1981), cited by Menzie et al. exposed the predatory mite *Amblyseius fallacies* to glyphosate using the same technique as Cowles et al. (2000) where adult mites are stuck onto microscope slides, or placed on leaves, and then dipped into a solution of the herbicide. Although this is stated by Menzie et al. to be "glyphosate" it is, in fact, a formulation. The formulation given in Hislop & Prokopy is an emulsifiable concentrate which seems unlikely for glyphosate. I would assume that, like all glyphosate formulations of which I am aware, it actually contained surfactants which were responsible for the effect.

104. How severe would the effects of surfactants on insects and mites be? When would they occur? What is a safe distance from the spray swath for prevention of the effect?

105. Directly within the spray swath, effects could be severe, even if the particularly potent surfactants are a small part of the formulation. I would expect significant kills. To kill the arthropods, the solution of the surfactant needs to wet the surface of the insect or mite in the same way it would the surface of a leaf. All of the experiments have submerged the arthropod in the solution. Direct exposure to spray droplets, exposure to droplets remaining after spraying on leaves or the soil surface would provide such wetting. As droplets reduce in number and size with distance from the spray swath, exposure becomes less likely and more arthropods would survive. Deposition has fallen by a factor of 1000 within 50 metres of the spray swath and falls by a further factor of at least10 within the next 75 metres. Whilst an exact safe distance cannot be suggested, it seems reasonable to assume that the highly precautionary safe distance for amphibians at 50 metres would be more than protective for direct toxicity to arthropods. Since the highly toxic trisiloxanes are probably not present in Gly41, this conclusion is highly precautionary for the spray applied in Colombia.

106. I was surprised to see Cox (1995) referenced in a serious scientific report. The Journal of Pesticide Reform is an overtly anti-pesticide website not a scientific journal. Ms Cox is highly selective in what she takes from the scientific papers she cites. I checked all of the original papers cited in the Cox (1995) reference.

- Brust (1990) tested the relative contributions of direct toxicity to insects (carabid beetles) and the indirect effects due to loss of plant habitat. They state that there was no toxic or repellent effect of any herbicide, including glyphosate, when tested in the laboratory. The herbicides did not have acute or chronic effects on longevity or food consumption of beetles over a year in greenhouse trials. However, the beetle population fell following field application; the beetles "responded to destruction of plant material". Populations returned to normal after 28 days.

- Asteraki et al. (1992) ascribed all of the decline in populations of carabid beetles following Roundup treatment of hedgerows to reduction in the plant community on which they depended.

- Hassan et al. (1988) conducted laboratory tests on Roundup toxicity to 18 species of insect pests, predators, spiders or mites. For 13 species, Roundup was classified as "harmless", for 4 species as "slightly harmful" and for 1 species as "moderately harmful".

- Santillo et al. (1989) studied small mammal populations following the use of glyphosate formulation to clear ground of vegetation; they found significantly reduced numbers of invertebrates on cleared ground.

- Mohamed et al. (1992) found reduced survival of the woodlouse *Hemilepistus reaumuri* kept on filter paper dipped in Roundup at 25 mg/litre or 50 mg/litre in the laboratory. At the lower exposure dose, 90% of males and 60% of females survived; at the higher dose 50% of both males and females survived. Whilst it is difficult to equate soil concentrations to those on filter paper (glyphosate is strongly adsorbed onto soil particles reducing its availability to organisms), the predicted soil concentration following glyphosate use is 15 mg/kg (Giesy et al., 2000). These seem high doses.

107. Menzie et al. (2009) then cite further studies but give incomplete coverage of their conclusions:

- Jackson & Pitre (2004) state that "the Roundup Ready soybean system, including applications of glyphosate, had no detrimental effects on pest and beneficial insects in wide-row soybean plantings". They also state that "no significant differences in *G. punctipes* numbers between glyphosate-treated and nontreated soybean demonstrated that glyphosate had no direct effect on *G. punctipes* densities in 1997 or 1998. Glyphosate indirectly influenced *G. punctipes* densities in 3 of 11 weeks. Densities were correlated with weed cover in the crop, not with glyphosate application.

- Guiseppe et al. (2006) is actually a review of the literature on effects of herbicide use directly and indirectly on ecosystems. They conclude "indirect effects of glyphosate herbicide by means of reduced herbaceous plant, shrub and deciduous tree cover, on insects, birds, small mammals and large mammals can result in short term reduction in abundance but usually not a decline in species richness or species diversity"

- The study on pine tip moth referenced by Menzie et al. as Guiseppe et al. is by Nowak et al. (2003), reviewed by Guiseppe et al. The Nowak et al. study is the only one of more than 30 studies reviewed by Guiseppe et al. which suggests direct toxicity of glyphosate on arthropods rather than indirect ones.

108. The overwhelming view of researchers in this area is that effects on arthropod populations are an <u>indirect</u> effect of the use of glyphosate following on from its herbicidal action. The arthropods using plants as food, refuge, or as sources of prey are likely to decline following herbicide use; those feeding on dead plant material are likely to increase in numbers. The literature shows that these generalisations are not universally true; there is sometimes little or no population decline. These indirect effects can only, by definition, occur

where significant proportions of the plant community have been killed. They are, therefore, highly unlikely to occur beyond 50 metres of the spray swath as for effects on plants.

7. Summary and conclusions

109. Consideration of hazard (the potential to cause harm) in isolation from exposure and risk (the probability that the hazard will be realised in practice) will give a misleading picture of the real effects of chemicals on either human health or the environment. This is certainly true of the Menzie et al. study.

The spray

110. The constituents of the spray used for coca control in Colombia are clear. A commercial glyphosate formulation, Glyphos (Gly41), is mixed with an adjuvant, Cosmo-Flux 411F and water prior to application. The exact nature of the surfactants which form part of the formulation changed over time as Roundup was replaced with Gly41. However, all of the surfactants used throughout the spraying programme have similar toxicology and ecotoxicology. The most common, and most toxic to aquatic organisms, surfactant used is POEA which is present in the Roundup formulation, the most tested. Roundup test results are precautionary for other formulations since Gly41 contains less POEA than Roundup.

111. One surfactant present in Roundup but probably not present in Gly41 has significant ecotoxicity above the general; this has relevance for possible effects on insects and mites.

112. Preservatives may also play a significant role in specific effects on humans.

113. The Cosmo-Flux adjuvant has similar properties to the general surfactants in the formulation and its addition simply increases the dose of surfactants to humans and organisms in the environment. Surfactants play the principal role in the environmental toxicity of formulations of glyphosate and the Colombian spray mix; they are probably key in symptoms in humans.

Spray drift

114. Droplet distribution has been measured under conditions relevant to the Colombian environment and spray drift modelled. This indicates that the vast majority of deposition occurs within 100 to 200 metres downwind of the spray swath. Only minor deposition will occur further away.

Effects of human health

115. Published analyses globally of reports of exposure to glyphosate formulations and their spray indicate that short-term eye irritation, minor skin irritation, mild respiratory effects and sore throat are the most common symptoms of exposure to spray. More serious effects are restricted to direct exposure to the concentrated formulation or the spray mix being applied and have only been seen in spray applicators themselves (with the exception of a

single individual who was oversprayed). It is, therefore, highly unlikely that serious effects could be related to drifted spray.

Effects on organisms in the environment and ecosystems

116. The scientific evidence shows that tropical species are neither more nor less sensitive to pesticides than species from temperate or cold areas. Recent testing has confirmed that this is specifically the case for Colombian amphibians.

117. Toxicity directly under the spray swath will be high for a number of groups of organisms: amphibian larvae, to a lesser degree amphibian adults and fish, plants, insects and other arthropods. Populations of the most sensitive organisms could be eliminated directly under the spray. However, the ecology of coca fields will have already been largely destroyed by the coca growing; adverse effects are, therefore, restricted to the margins of coca fields still directly over-sprayed.

118. Risk has been assessed for each group of organisms and 'safe' distances downwind of the spray swath suggested for each.

119. For amphibian larvae, the most sensitive of the aquatic species tested, the Colombian risk assessment suggests no adverse effects would be seen more than 5 metres from the spray swath. This conclusion is justified by the science and the level of precaution is consistent with those used in chemical regulatory legislation globally.

120. To inform decision making, I have calculated the distance using a more precautionary approach as suggested by the Menzie et al. (2009) report. Even at a very high level of precaution, no adverse effects would be seen at a distance downwind of the spray swath of 50 metres.

121. Adult amphibians are less sensitive than the larvae and would also be protected at this distance.

122. For plants, neither acute not chronic sub-lethal effects would be seen at more than 50 metres from the spray swath. There are no reports of effects on soil function or fungi at soil concentrations expected directly under the spray. There is, therefore, no risk for soils.

123. Domestic animals would be affected in comparable ways to humans with mild to moderate transient effects on eye, skin or respiratory system. No significant harm is expected.

124. Fish would be killed by direct overspray. However, they show lower sensitivity to the glyphosate formulation than amphibians and 18 metres from the spray swath would be protective for fish using the highly precautionary approach. Indirect effects caused by oxygen depletion resulting from decaying plant matter would, by definition, only occur if plants were killed; the 50 metre protection value for plants would also protect fish from indirect effects.

125. The organosilicone surfactant constituent of some commercial formulations is toxic to insects and mites, and probably to other terrestrial arthropods. This toxicity would occur directly under the spray. Whilst an exact safe distance cannot be established, I would expect

arthropods to be fully protected beyond 50 metres. Since the formulation currently used in Colombia (Gly41) does not contain organosilicones of the type causing these effects, this risk estimate is again highly precautionary.

126. Indirect effects on arthropod populations will certainly occur at doses of the herbicide spray which kill plants. Beyond 50 metres, where no plants are adversely affected, no effects are expected.

Environmental effects and effects on crop plants

127. No environmental effects or effects on crop plants would be seen more than 50 metres downwind of the spray swath even taking a highly precautionary approach. There should, therefore, be no adverse ecological effects in Ecuador.

1 February 2010

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Annex 2 Note Nº E-934 from the Colombian Ambassador in Quito to the Ecuadorian Defence Minister, 16 August 2001.

Annex 3 Note Nº E-931 from the Colombian Ambassador in Quito to Valerio Greffa Uquiña, Ecuadorian Congressman, 20 August 2001.

Annex 4 Note Nº E-962 from the Colombian Ambassador in Quito to the President of the National Congress of Ecuador, 23 August 2001.

Annex 5 Diplomatic Note Nº 72523/2001-SG/SSN from the Ecuadorian Foreign Minister to the Colombian Foreign Minister, 12 September 2001.

Annex 6 Note Nº E-1313 from the Colombian Ambassador in Quito to the Ecuadorian Minister of Agriculture, 15 November 2001.

Annex 7 Note Nº E. 455/90 from the Colombian Ambassador in Quito to the Colombian Foreign Minister, 26 March 2003, enclosing the non-paper given to the Ambassador by Ecuadorian authorities at the meeting held on the same date.

Annex 8 Note Verbale VRE Nº 32759 from the Colombian Foreign Ministry to the Ecuadorian Embassy in Bogotá, 18 September 2003.

Annex 9 Note Verbale DBR/CAL unnumbered from the Colombian Foreign Ministry to the Ecuadorian Embassy in Bogotá, 13 November 2003.

Annex 10 Diplomatic Note Nº 4-2-336/03 from the Ecuadorian Foreign Ministry to the Colombian Foreign Ministry, 10 December 2003.

Annex 11 Note Nº CMFS-46-2004 from the President of the Ecuadorian Scientific and Technical Commission to the Acting Director of the Anti-Narcotics Direction of the Colombian National Police, 18 March 2004.

Annex 12 Diplomatic Note DPM/CDR Nº 20125 from the Colombian Acting Foreign Minister to the Ecuadorian Foreign Minister, 7 April 2004.

Annex 13 Note Nº SARE-142 from the Director of the National Narcotics Directorate of Colombia to the President of the Scientific and Technical Commission of Ecuador, 14 April 2004.

Annex 14 Diplomatic Note VRE/DAA/CAL Nº 18067 from the Colombian Vice-Minister of Foreign Affairs to the Ecuadorian Vice-Minister of Foreign Affairs, 14 April 2004.

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Annex 27 Note from the President of Colombia to the President of Ecuador, 21 December 2006.

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Annex 65 Report by the Colombian Agriculture and Livestock Institute (ICA), 29 January 2010.

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Annex 70 Report by the Ministry for the Environment, Housing and Territorial Development on the Program for the Eradication of Illicit Crops by Aerial Spraying with Glyphosate Herbicide – PECIG, February 2010.

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