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THE IMPACT OF TRADE LIBERALIZATION ON AGRICULTURAL BIOLOGICAL DIVERSITY

Domestic support measures and their effects on agricultural biological diversity

Note by the Executive Secretary

I. INTRODUCTION

1. The present note was prepared pursuant to decision VI/5 of the Conference of the Parties, on agricultural biological diversity. In paragraph 17 of this decision, the Conference of the Parties requested "the Executive Secretary to further study the impact of trade liberalization on agricultural biodiversity, in collaboration with the United Nations Environment Programme, the Food and Agriculture Organization of the United Nations, the World Trade Organization and other relevant organizations." Following this request, the Executive Secretary prepared a research outline in consultation with relevant international organizations. Comments on the research outline were provided by the United Nations Environment Programme, the Food and Agriculture Organization of the United Nations and the World Bank, as well as by the International Center for Trade and Sustainable Development (ICTSD), the Institute for European Environmental Policy (IEEP), IUCN – The World Conservation Union, the NAFTA Commission for Environmental Cooperation (CEC), the Organization for Economic Cooperation and Development (OECD) and the World Trade Organization (WTO).

2. National focal points for the Convention and the organizations enumerated above were invited, by notification 2003-026, to peer review the first draft of the present note. Comments were subsequently provided by the following Parties: Argentina, Austria, Belgium, the European Community, Finland, Netherlands, New Zealand. In addition, comments were provided by the following organizations: the Food and Agriculture Organization of the United Nations (FAO), the Organisation for Economic Co-operation and Development (OECD), the United Nations Environment Programme, the World Trade Organization (WTO), as well as Earth Track and the International Center for Trade and Sustainable Development (ICTSD).

* UNEP/CBD/COP/7/1 and Corr.1.

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3. The request of the Conference of the Parties in decision VI/5 came further to a note prepared by the Executive Secretary, entitled "Assessing the impact of trade liberalization on the conservation and sustainable use of agricultural biodiversity", which was prepared in response to decision IV/6, on agricultural biodiversity.

4. The earlier note gave a broad analysis of the different impacts trade liberalization may have on agricultural biological diversity, and drew some general conclusions. It gave a brief description of the extent of trade restrictions and distortions in the agricultural sector and of the trade liberalization agenda in the WTO Agreement on Agriculture, with its disciplines on market access restrictions, on export subsidies and on trade-distorting domestic support. This description served as a basis to extrapolate probable impacts of liberalization on changes in relative prices, and to further explore how changes in relative prices alter the allocation of resources within agricultural production. The impacts of altered allocations within agricultural production—in particular the alternations in land use and the level of production intensity—on biological diversity were then examined as a next step. This sequence allowed deducing the—largely indirect—impacts of trade liberalization on agricultural biodiversity. However, the higher occurrence of alien invasive species was also identified as an important direct trade effect on biodiversity. In addition, the profound restructuring of agricultural markets, leading to corresponding changes in product demand, production methods and transportation costs, was highlighted as an additional important impact factor for agricultural biodiversity, a factor which is independent from trade policy reform effects.

5. The present note complements this analysis and therefore adopts its general approach. Like the earlier study, the present note focuses on the farm sector, and the relationship between crop and livestock production and biodiversity. Moreover, it adopts the definition of agricultural biodiversity given in the earlier study. This study indicated that the broad concept of agricultural biodiversity adds to the complexity of assessing biodiversity impact of agriculture and, by referring to the appendix of decision V/5 of the Conference of the Parties, noted that agricultural biodiversity includes crops and domesticated livestock, their wild relatives as well as wild flora and fauna ecosystems, as well as numerous interacting species such as pollinators, symbionts, pests, parasites, predators and competitors. It also cautioned that, as the distribution of these components as well as possible impacts on them are different and uneven among regions, they may need different and mutually supportive policy approaches. 1/

6. In complementing the earlier study, the present note addresses in more detail the role of one of the items of the WTO trade liberalization agenda, namely, the *"substantial reduction of trade-distorting domestic support."* The further substantial reduction of trade-distorting domestic support is an important item addressed by the current negotiations in the Special Session of the WTO Committee on Agriculture. These negotiations, which also aim to achieve substantial improvements in market access and to reduce, with a view to phasing out, all forms of export subsidies, started in 2000 pursuant to the built-in negotiation provision of the Uruguay Round Agreement on Agriculture, and were further mandated by the Doha Ministerial Declaration. 2/

7. The earlier study had already underlined that the reduction of different support measures may have differing implications for agricultural biodiversity, but had not further elaborated this point. 3/ It is contentious in the ongoing agricultural negotiations at the WTO which, if any, types of domestic support measures are not (or only minimally) trade distorting and would therefore not fall under the reduction objective of the negotiations. It is therefore worthwhile to undertake an in-depth consideration of the impact of different types of domestic support measures, and of their removal or reform, on agricultural biodiversity.

1/ See UNEP/CBD/COP/6/INF/2, paragraphs 6 – 9.

2/ See below paragraph 27 for further discussion.

3/ See UNEP/CBD/COP/6/INF/2, paragraphs 47 – 48.

8. To focus on domestic support measures is also useful for another reason. Even while they are mainly applied by several major countries in the OECD area, its importance extends beyond these countries because of their magnitude and the subsequent trade distortions stemming from the impact of some types of support on output volumes and prices. As a result, trade-distorting agricultural support is frequently referred to as a major development obstacle in relevant international forums. 4/

9. The impact of any domestic support measure on biodiversity can be pictured as generating a specific incentive or disincentive for the conservation and sustainable use of biodiversity. The present study has therefore important linkages with the Convention's programme of work on incentive measures (see decision V/15 of the Conference of the Parties). Specifically, the Conference of the Parties has recognized that *"further work has to be undertaken on positive incentives and their performance, as well as on perverse incentives and ways and means for their removal or mitigation"* (decision VI/15, paragraph 4). 5/ As domestic support measures usually rely on transfers to the farm sector, such measures may fall, in principle, under the perverse or the positive incentive category. The present note seeks to further elucidate this incentive aspect of domestic support measures.

10. In choosing this particular topic for in-depth consideration with a view to complement the earlier study, it is necessary to raise a number of important *caveats*:

(a) In complementing the earlier study, the present note does not intend to present a complete picture of *all* impacts of *all* trade liberalization measures on agricultural biodiversity. All conclusions emanating from the present note should be read and interpreted in conjunction with the conclusions of the earlier study.

(b) In particular, the earlier study had already strongly underlined that it is very difficult, if not impossible, to draw clear-cut conclusions on a global level in regard to the impact of trade liberalization on agro-biodiversity. 6/ A major reason for this *caveat* is that the analysis frequently leads to the identification of both beneficial and detrimental effects, with an overall ambiguous outcome. Data gaps and methodological problems make it very difficult to give robust *empirical* assessments of the direction of such overall outcomes. This observation will also apply to the present note. Although empirical information will also be given when appropriate, the focus of the note will therefore on a *conceptual* analysis.

(c) Moreover, in addressing the topic of domestic support as a distinct item for the analytical purposes, the present note does *not* intend to suggest that this topic could or should be addressed as a separated, isolated item during the ongoing agricultural negotiations at the WTO. Market access restrictions, export subsidies and trade-distorting domestic support all form part of a well-coordinated package of agricultural policies in many countries and are therefore linked. 7/ Accordingly, the mandate for the agricultural negotiations puts all three elements on an equal footing.

4/ For instance, during the roundtables and partnership events of the World Summit on Sustainable Development. See the respective chairperson's summaries, p. 11-12 and p. 6. Note that, in focussing on domestic support, the present note will not address export subsidies.

5/ *Perverse incentives* induce unsustainable behavior that reduces biodiversity, often as unanticipated side effects of policies designed to attain other objectives. They can include government subsidies or other measures, which fail to take into account the existence of environmental externalities, as well as laws or customary practice governing resource use. A *positive incentive* is an economic, legal or institutional measure designed to encourage beneficial activities.

6/ See section IV of document UNEP/CBD/COP/6/INF/2, and in particular paragraphs 89, 93, 99, 105 and 109.

7/ For instance, Burfisher (2003) points to an important linkage by noting that an effective market price support programme requires trade policies to restrict imports and may require export policies, because *"in the absence of such a programme, domestic price support and storage programs would become too costly."* She concludes by noting that *"administered prices may create a strong incentive for governments to maintain effective trade barriers, and there can also be greater flexibility to lower trade barriers when administered price supports are constrained."* See Burfisher (ed.) (2003), 16.

11. Section II of the present note gives an overview of the key international agreement to liberalize agricultural markets, the Uruguay Round Agreement on Agriculture (URAA), giving special attention to the disciplines on domestic support. Section III summarizes the main developments after the URAA, again giving special focus to domestic support. Section IV sets out the general framework to analyze the impact of domestic support policies on agricultural biodiversity. Subsequent sections adopt the usual WTO approach to categorize specific support measures into "boxes". Section V addresses trade-distorting, Amber Box policies. Section VI deals with Green Box support, which is considered, in the Agreement on Agriculture, as being not or minimally trade-distorting. Section VII analyses payments under agri-environmental programmes. Such payments are part of the Green Box, but are of special interest for the purpose of this note and therefore merit a prominent treatment in an own section. Section VIII considers the special case of payments under the Blue Box. Section IX summarizes and concludes.

II. AGRICULTURAL TRADE LIBERALIZATION: THE URUGUAY ROUND AGREEMENT ON AGRICULTURE

12. The 1986-1994 Uruguay Round and its Agreement on Agriculture (URAA) established new international rules on key aspects of agricultural trade. It imposed constraints on market access restrictions, on export subsidies and on trade-distorting domestic support. As agricultural protection had previously either been accorded "special treatment" under GATT rules or had not been explicitly covered under GATT provisions, these new disciplines are usually said to be a major achievement of the Agreement.

A. Commitment on market access and export subsidies

13. On market access, member governments committed to the conversion of all existing non-tariff barriers into a tariff equivalent (the so-called *tariffication*) and to a subsequent reduction of tariffs. Developed countries were to cut tariffs by 36% on average for all agricultural products between 1995 and 2000, with a minimum cut of 15% per product, when compared with the base period (1986-88) level of protection. Developing countries are to cut tariffs by 24% on average over the period 1995-2004, with a minimum cut of 10% per product. These figures were targets used to calculate countries' legally binding schedules of commitments, meaning that each county's specific commitment level vary according to the outcome of the negotiations.8/ Furthermore, member governments commit to grant minimum access to domestic markets of 3%, later 5% of the base period domestic consumption.

14. With regard to export subsidies, developed countries committed to a reduction of subsidized export expenditure ("outlays") by 36%, and of subsidized quantities by 21% between 1995 and 2000, where reduction quota refer to the base-period 1986-1990 average. The corresponding reduction quotas of developing countries are of 24% for outlays and of 14% for export volumes, over the period 1995-2004.

B. Commitments on domestic support

AMS reduction commitments

15. The discipline on domestic support is sometimes characterized as being the single most innovative element of the URAA .9/ Member Governments committed themselves to a reduction in domestic support that encourages agricultural production and is therefore considered to distort potential trade flows (e.g., direct price support, payments that are tied to output or inputs). 10/ General reduction

8/ See WTO (2002), p. 12, for the following figures.

9/ OECD (2001b), p. 3

10/ For a concise summary of domestic support commitments see, e.g., IATRC (2001), p. 1-3.

quota are of 20% over the period 1995-2000 for developed countries, and of 13% over the period 2005 to 2004 for developing countries, with 1986-1988 being the base period. Again, these figures are targets used to calculate the legally binding schedules of commitments of individual countries. Individual bindings are established through the limits placed on the Total Aggregate Measurement of Support (AMS). Hence, a member is in compliance when its current AMS does not exceed the corresponding annual and final bound level specified in its schedule of commitments.

16. The AMS expresses the annual level of support, in monetary terms, provided for an agricultural product in favour of the producers of the basic agricultural products or non-product specific support provided in favour of agricultural producers in general. Its calculation includes product-specific market price support and non-exempt payments (see below on exemptions), as well as any other non-exempted and non-product-related support provided in favour of farmers, both at national and sub-national levels. Agricultural fees and levies are deducted from the AMS. Domestic support measures that are to be included in the calculation of Total AMS and, hence, are subject to reduction commitments are categorized under the so-called Amber Box of the URAA.

17. The URAA specifies a number of measures that need not be included in the calculation of Total AMS and are therefore not subject to reduction commitments.

De minimis percentages

18. For developed countries, product-specific support up to 5% of a member's total value of production of a basic agricultural product during the relevant year is excluded reduction commitments, as well as non-product-specific support of to 5% of the value of the member's total agricultural production. For developing countries, this *de minimis* percentage is 10% (URAA, Art. 6.4).

Developing countries' exemptions under Article 6.2

19. Recognizing that government measures of assistance to encourage agricultural and rural development are an integral part of the development programmes of developing countries, investment subsidies that are generally available to agriculture in developing country members and agricultural input subsidies generally available to low-income or resource-poor producers in developing country members are exempt from domestic support reduction commitments. Furthermore, domestic support measures to producers in developing country members aimed to encourage diversification from growing illicit narcotic crops are also exempt (URAA, Art. 6.2).

Blue Box

20. Furthermore, direct payments under production-limiting programmes are not subject to the reduction commitments if such payments are based on fixed area and yields, or such payments are made on 85% or less of the base level of production, or livestock payments are made on a fixed number of head (URAA, Art. 6.5). Domestic support measures meeting these requirements fall under the so-called Blue Box of the URAA.

Green Box

21. Support measures that meet a number of criteria set out in Annex 2 of the URAA are considered to have no, or at most, minimally trade distorting effects or effects on production and are therefore exempt from reduction commitments. They are supposed to be "decoupled" from output quantities and prices. These provisions constitute the so-called Green Box of the URAA. It is especially by these provisions that the URAA strikes a balance between agricultural trade liberalization and governments' desires to pursue legitimate agricultural policy goals, including non-trade concerns.

22. All measures for which exemption is claimed under the Green Box provisions have to conform to two basic criteria (URAA, Annex 2, para. 1):

- The support in question shall be provided through a publicly-funded government programme (including government revenue foregone) not involving transfers from consumers; and,

- The support in question shall not have the effect of providing price support to producers.

23. In addition, exempt support must meet the policy-specific criteria and conditions applying to the following categories of government programmes:

- General services (URAA, Annex 2, para. 2);

- Public stockholding for food security purposes (ibid, para 3);

- Domestic food aid (ibid, para. 4);

- Direct payments to producers (ibid, para 5);

- Decoupled income support (ibid, para 6);

- Government financial participation in income insurance and income safety-net programmes (ibid, para. 7);

- Payments for relief from natural disasters (ibid, para. 8);

- Structural adjustment assistance provided through producer retirement programmes, resource retirement programmes and investment aids (ibid, paras. 9-11);

- Payments under environmental programmes (ibid, para. 12);

- Payments under regional assistance programs (ibid, para 13).

24. Criteria for direct payments to producers, in addition to the general requirements set out in paragraph 1, are specified in paragraphs 6 through 13 when applicable; minimum criteria to be met are given in paragraph 6, on decoupled income support, when those other paragraphs are not applicable (see URAA, Annex 2, paragraph 5):

- The amount of such payments in any given year shall not be related to, or based on, the type or volume of production (including livestock units) undertaken by the producer in any year after the base period;

- The amount of such payments in any given year shall not be related to, or based on, the prices, domestic or international, applying to any production undertaken in any year after the base period;

- The amount of such payments in any given year shall not be related to, or based on, the factors of production employed in any year after the base period.

- No production shall be required in order to receive such payments.

25. Given the focus of this note, the criteria to be met by environmental programmes are of special interest (see URAA, Annex 2, paragraph 12):

- Eligibility for such payments shall be determined as part of a clearly defined government environmental or conservation programme and be dependent on the fulfillment of specific conditions under the government programme, including conditions related to production methods or inputs;

- The amount of payment shall be limited to the extra costs or loss of income involved in complying with the government programme.

Peace Clause

26. The URAA, in its Article 13, stipulates that measures fully conforming to Green Box provisions are non-actionable under rules that apply to non-agricultural subsidies; specifically, they are exempt from the imposition of countervailing duties. Other types of domestic support as well as export subsidies can be subject to countervailing duties only under some conditions, and "due restraint" shall be shown in initiating related investigations. This so-called Peace Clause expires at the end of 2003.

Built-in negotiations

27. Article 20 of the URAA committed members to start negotiations on continuing the reform one year before the end of the implementation period, under the long-term objective of *"substantial progressive reductions in support and protection resulting in fundamental reform."* In the negotiations, non-trade concerns (like environmental protection, food security, rural development etc) and special and differential treatment of developing country members are to be taken into consideration. 11/ These negotiations were initiated early 2000 and are now well under way. 12/ In the Doha Ministerial Declaration, WTO Members further committed to these negotiations and their objectives: *"substantial improvements in market access; reductions of, with a view of phasing out, all forms of export subsidies; and substantial reductions in trade-distorting domestic support."* Ministers agreed that special and differentiated treatment shall be an integral part of all elements of the negotiations, and confirmed that non-trade concerns will be taken into account in the negotiations. 13/

III. DEVELOPMENTS AFTER THE URAA

A. Market access

28. Compared with the pre-URAA period, the Agreement introduced important systemic changes to the GATT/WTO rules for agricultural trade. However, it achieved only a limited reduction in effective protection. Distortions to agricultural production and trade remain high, with average agricultural tariffs around 60% as compared to 10% or less for industrial tariffs. 14/ The flexibility that was given to countries by the aggregate nature of the formula for reducing tariffs reduced their real impact on reduction commitments. The bound rates as agreed on in the URAA often afforded higher protection levels than those of the base period. As a result, protection actually increased for a number of agricultural products. Tariff rates have also become more complex. The OECD concludes that *"much deeper cuts in tariffs, or larger increases in volumes admitted at lower tariffs, would be needed to improve market access significantly."* 15/

11/ URAA, Article 20.

12/ An overview of the negotiating positions of WTO members as per end-2002 is given in WTO (2002).

13/ Doha Ministerial Declaration, paragraph 13.

14/ OECD (2001b), 2.

15/ ibid, 3.

B. Domestic support

29. Overall levels of domestic support have been somewhat reduced in the relevant period, although this process stalled or was even temporarily reversed when market pressures in 1998 and 1999 led again to an increase in support. In the OECD, support to farmers (measured by the Producer Support Estimate or PSE) as a share of total farm receipts fell from 38% on average in 1986-88 to 31% in 2001. 16/ In absolute numbers, the total support estimate for OECD countries amounted to USD 311 billion in 2001. Furthermore, domestic supports remains highly concentrated. In 2001, the European Union, Japan and the United States account for 82% of total domestic support of the whole OECD area.

30. Many countries have been reporting current Total AMS levels that are small relative to their permitted levels. It can be concluded that WTO members, with a few exceptions, have been able to adjust their domestic support policies in order to comply with the URAA. However, it has also borne in mind that non-exempt domestic support measures were on a historic high for many countries in1986, falling into the base period of 1986-88 for the reduction commitments. 17/ For selected countries, the proportions of used to permitted Total AMS levels (in percentages) in 1997 are given below. 18/

Australia	25	Korea	95
Brazil	30	New Zealand	0
Colombia	4	Slovak Rep.	73
Costa Rica	0	South Africa	97
Czech Rep.	7	Thailand	79
EC	68	Tunisia	81
Japan	71	US	29

31. The URAA has reinforced the shift from non-exempt to exempt domestic support measures, which was under way in some countries even prior to the implementation of the Agreement. For selected countries, the development of domestic support by category is given below. 19/

	Green Box		Blue Box		Amber Box		Article 6.2		
	Base	1997	Base	1997	Base	1997	Base	1997	
Australia	60.85	91.18	n/a		0	39.15	8.82	n/a	0
Brazil	73.36	85.47	n/a		0	18.05	7.85	8.6	6.95
EC	11.14	18.17	n/a		20.44	88.86	50.19	n/a	0
Japan	30.78	45.23	n/a		0	69.23	54.77	n/a	0
Korea	42.74	68.89	n/a		0	56.96	30.66	0.3	0.45
New Zealand	25.5	100	n/a		0	74.5	0	n/a	0
US	48.62	87.92	n/a		0	51.38	12.08	n/a	0

32. As an important means to reduce AMS levels and meet reduction commitments, countries have re-designed domestic support policies with a view to shift them from the non-exempt Amber Box to the exempt Green and Blue Boxes. The gap between the PSE and the AMS is increasing over time. 20/ In 2001, 69% of support measures in OECD countries as measured by the PSE were in the form of market price support or output-based payments, down from 82% in 1986-88. Payments based on area planted or

16/ For the numbers that follow, see OECD statistical database, at www.oecd.org, if not indicated otherwise.

17/ OECD (2001b), 4.

18/ See IATRC (2001), 31; WTO (2000), document G/AG/NG/S/1.

19/ IATRC (2001), 32; WTO (2000) documents G/AG/NG/S/1 and G/AG/NG/S/1/Corr.1.

20/ OECD (2001c).

livestock numbers (under the Blue Box) represent 13% of total support to farmers (up from 7% in 1986-88), and payments based on input use represents 8% of support in 2001 (down from 9% in 1986-88).

33. For instance, the United States Federal Agriculture and Improvement and Reform (FAIR) Act of 1996 reduced direct market intervention while preserving support to domestic farm income. The new Farm Security and Investment Act of 2002 foresees an 80% increase on spending for environmental programmes. 21/ However, the new Farm Act is also expected to provide US$ 73.5 billion in additional support to agriculture over the next decade, over and above the expenditure baseline of the FAIR Act of 1996. 22/

34. In Europe, the so-called Agenda 2000 for reform of the European Union's Common Agricultural Policy (CAP) foresees gradual reductions in market price support and an increasing reliance on direct payments for fostering rural development and agri-environmental programmes, under the so-called "second pillar" of the CAP. In June 2003, European farm ministers agreed to a compromise, in accordance with the overall budgetary framework for the enlarged Union set until 2013, that foresees, *inter alia*: the introduction of a single farm payment for farmers that is independent from production (limited coupled elements may be maintained to avoid abandonment of production); the linkage of this payment to compliance with environmental, food safety, animal and health and animal welfare standards, ("cross-compliance"); a reduction in direct payments ("modulation") for bigger farms to finance the new rural development policy; and some revisions to the market policy of the CAP.

35. Recent legislation in Japan and the Republic of Korea also puts stronger emphasis on direct payments instead of price support. 23/

36. Evidence from 23 developing country case studies, collected in a recent publication of the FAO, suggests that the WTO disciplines have not proved constraining to the domestic support policies that developing countries want to implement. Most countries simply reported that their domestic support outlays conformed to the exempted categories (green box, special and differentiated treatment, or *de minimis*). Furthermore, the AMS levels have been well below the committed or permitted levels for most countries for which more detailed date were available. Budgetary restrictions as well as previous commitments under structural adjustment programmes appear to be much more important in limiting these domestic support interventions. 24/

37. Payments to farmers under environmental programmes still account for only a small share of total transfers to producers. However, overall payments in OECD countries have increased since the mid 1980s from 1% to 3% of OECD support to producers. 25/ For a large number of OECD countries there has been an overall rapid increase in public agri-environmental expenditure during the 1990s. This expenditure varies widely across countries, reflecting differences in agri-environmental concerns and priorities. 26/

21/ OECD (2003c).

22/ OECD (2002), 18. It is noted that, to some extent, this increase may be caused by the inclusion into the Farm Act of extraordinary emergency payments (market loss assistance), which were already provided, on an ad hoc basis, since 1998 (see OECD 2002; Mayrand et al. 2003). However, calculations undertaken by the OECD for 1999-2001 show that hypothetical support payments under the 2002 Farm Act would still be somewhat higher than actual payments given for that period under the 1996 Farm Act and the market loss assistance programme. Corresponding PSE figures are 24.9% vs. 23.4%, respectively. See OECD (2003c), 62.

23/ See IATRC (2001), 6, for a summary.

24/ See FAO (2003). The following countries were included in the case studies: Bangladesh, Botswana, Brazil, Costa Rica, Cote d'Ivoire, Egypt, Fiji, Guyana, Honduras, India, Indonesia, Jamaica, Kenya, Malawi, Morocco, Pakistan, Peru, Philippines, Senegal, Sri Lanka, Thailand, Uganda, Zimbabwe.

25/ OECD (2003c).

26/ For illustration, the percentage change in payments under environmental programmes between 1993 and 1998 is +2857 for Italy, +1149 for Spain, +665 for Switzerland, +150 for France, +10 for the US, -35 for Portugal (base year 1994). See OECD (2001a), 20, for details.

38. Hence, the changes that were observed in the structure of domestic support policies pursuant to the implementation of the URAA, when compared with the 1986-1988 base period, can be summarized as follows:

- A slight *overall reduction* of support as measured by the OECD Producer Support Estimate (PSE);
- A *reduction* in trade-distorting Amber Box support;
- An *increase* in "decoupled" Green Box support considered to have no, or at most, minimally trade distorting effects or effects on production (direct payments to farmers); and in particular
- An substantial *increase* in payments under environmental programmes, as part of the Green Box;
- An important *increase* in Blue Box measures.

This list will serve to structure the following sections. They will provide a conceptual analysis of the impact on agricultural biodiversity, in terms of direction and relative magnitude, of these different types of domestic support policies. The next section will first discuss the general analytical framework and will then proceed to address these different types in more detail.

IV. THE IMPACT OF DOMESTIC SUPPORT POLICIES ON AGRICULTURAL BIODIVERSITY: GENERAL ANALYTICAL FRAMEWORK

39. It is generally accepted that the most significant part of the relationship between trade liberalization and the environment passes indirectly through effects and pattern of production and consumption. In consequence, the overall environmental effects of trade restrictions and distortions are also likely to be indirect and not readily identifiable in general terms. 27/

40. Several impact channels can be identified that lead from changes in domestic support policies, along the lines of paragraph 38, to changes in the level and mix of agricultural production and the mix and level of agricultural inputs. Specifically, any reform can have three basic types of impacts: 28/

(a) *Output substitution impacts* could, for instance, imply a production shift from those crops particularly affected by a reduction of payments to crops which are less affected by such a reform, or to crops whose production is less subsidized from the outset.

(b) *Input substitution impacts* would be most directly observed when input subsidies like fertilizer of pesticide subsidies were reduced or removed. However, input substitution might also result from a reduction in output-oriented payments. While it can be expected that farmers use all inputs less intensively as a result of such a reduction, the optimal mix of inputs might also change. Studies indicate that chemical fertilizer and pesticide applications are strongly correlated with producer price incentives, while the primary factors of production (land, capital, labor) are less responsive to such reductions. 29/

(c) *Output price impacts* are based on the wedge between the market price and the so-called producer price that is driven by any trade-distorting subsidy. The market price is the price that consumers pay for an agricultural product, while the producer price is the payment a domestic farmer actually

27/ See WTO (1997), 1-2; UNEP/CBD/COP/6/INF/2.

28/ See Batie (1996).

29/ Anderson (1991).

receives per output unit. Without such a subsidy or another market intervention, producer and market prices would coincide, and this differentiation would be meaningless. 30/

41. The reduction of trade-distorting domestic support, mostly used by developed countries, would directly reduce producer prices for domestic farmers in those countries that implement such reductions. Lower producer prices, in turn, lead to lower incentives for production. In consequence, agricultural output is usually expected to fall in implementing countries as a result of such reduction. 31/

42. In contrast, agricultural production in other, mainly developing countries is usually expected to increase pursuant to such reductions. 32/ The reduction of domestic support given to farmers in developed countries, while reducing production incentives for domestic producers because of lower producer prices, would increase market prices for the relevant agricultural products, 33/ which would generate further production incentives for farmers in those countries that did not use, or to a far lesser extent, trade-distorting domestic support, and that have a comparative advantage in agriculture.

43. As a result of these changes in locational patterns of agricultural production, it is often said that the environment in developed countries, on average, would benefit from trade liberalization policies because of the reduced agricultural production. By contrast, developing countries are expected to face negative environmental impacts due to the increased agricultural production in these countries. 34/ The following sections take this "conventional wisdom" as a starting point and explore in more detail the potential impacts of different domestic support measures and their reform on agricultural biodiversity.

44. A recent analysis of OECD country studies suggests that most of the linkages identified between agriculture and biodiversity derive from agriculture's role as a habitat for flora and fauna. A number of country studies present evidence that species may benefit from the existence of specific agricultural production systems, for instance organic farming, 35/ and underline the importance of low or medium-intensive production systems. 36/ However, as regards aggregated, quantitative information, it is also pointed out that the impact of agricultural trade liberalization on environmental amenities like wildlife habitats and biodiversity is site-specific, and that the development of agri-environmental indicators and underlying datasets is not sufficiently advanced to allow for appropriate impact evaluations and cross-country comparisons. 37/ For these reasons, the following sections will focus on a conceptual analysis, although empirical information will also be given when appropriate.

45. It was indicated above that a reduction of trade-distorting domestic support would change the geographical pattern of agricultural production. More generally, one or both of the following events will reflect the change of agricultural output:

30/ See OECD (2000b), 13.

31/ Lankoski (1997), 13, 17; see also Anderson (1991); Lutz (1992); Anderson and Strutt (1996); Ervin (1997); UNEP/CBD/COP/6/INF/2, page 9. For instance, according to Ervin (1997), production would decrease by 15 – 50% in Japan and the European Union, while other regions would increase their production by 5 – 20%. Note that the *overall* effect of trade liberalization measures would depend on the national policy package in place prior to liberalization efforts, and on the specific design of liberalization policies.

32/ ibid

33/ Empirical assessments usually predict, on average, a price increase on world agricultural markets as an overall effect of comprehensive trade liberalization. For instance, according to Burfisher (ed., 2001), complete agricultural trade liberalization would increase world prices by about 12%. The full elimination of domestic support would increase prices by 3.6% (see UNEP/CBD/COP/6/INF/2, pages 8-9, for a discussion of this issue). However, OECD *aglink* projections indicate that production changes due to technical progress and general economic development are in general much more pronounced than those brought about by an extension of the URAA commitments on agricultural trade liberalization. See OECD (2000e), 35.

34/ Lankoski 1997, 17.

35/ See paragraph 88 below.

36/ Abler (2001), 20-22.

37/ OECD (2000e), 32.

(d) A change in land use patterns, that is, an expansion or contraction of land used for agricultural purposes;

(e) A change of agricultural production on given acreage, through changes in cropping or livestock regimes, pest management practices and mechanization.

46. These effects, in turn, will have specific impacts on agricultural biodiversity, discussed below.

V. THE REDUCTION OF AMBER BOX SUPPORT

A. Impact of Amber Box support reductions in implementing countries

47. As explained above, it is mainly developed countries that use trade-distorting domestic support measures. The reduction of such support is usually expected to lead to a reduction of agricultural production in countries that implement such reduction, which affects the use of production inputs in several ways.

(a) First, because of lower producer prices, all factors of production will be used less intensively. This is the output price effect. This effect will imply, in varying shares, a contraction of agricultural land as well as a less intensive utilization of other inputs (e.g., fertilizer, pesticides, machinery) per acreage;

(b) Second, lower producer prices will also lead to a change in the input mix chosen by individual farmers. As explained above, inputs like pesticides and fertilizer are most responsive to price changes. It can therefore be expected that their share in the input mix will decline pursuant to a decline in producer prices. This is the (indirect) input substitution effect;

(c) Third, a reduction of input payments will induce a *direct* change in the chosen mix of inputs, to the disadvantage of formerly subsidized inputs (direct input substitution effect).

48. The *reduction of agricultural production on given acreage* through, for instance, a decline in application of fertilizers and other agricultural chemicals or a decline in irrigation, 38/ is usually said to have positive effects for agricultural biodiversity. Positive effects include, *inter alia*,

(a) A reduced eutrophication of water ecosystems trough agricultural run-off resulting from fertilizer use, with positive impact on inland waters biodiversity;

(b) Reduced waterlogging and restored groundwater tables, with positive repercussions in particular for wetlands;

(c) A positive impact on soil biodiversity through, *inter alia*, a reduced soil compression by heavy machinery, less erosion, decreased salinity, and less biocides in the soil;

(d) A reduced intoxication or killing of pollinators and other non-target wildlife species through pesticide use;

(e) The use of more crop varieties as a means to reduce risk of pests.

49. There may, however, be a countervailing impact, because of the output substitution effect and subsequent changes in agricultural land use. For instance, a reduction in payments may also induce a shift

38/ See UNEP/CBD/COP/6/INF/2, paragraphs 72-80, and included references, for a more extensive analysis of the effects of the use of agro-chemicals.

of the area to the production of even more input-intensive crops, with possible negative effects for agricultural biological diversity. 39/ The extent of this effect clearly depends both on the design of domestic support policies as well as on the design of the overall policy reform package. Different levels of subsidization among crops or different levels in reducing crop-specific payments will exacerbate this output substitution effect.

50. A number of empirical studies confirm the prediction that the elimination of support relating to agricultural production and input use would lead to positive effects on the environment and agricultural biodiversity. 40/ In the case of New Zealand, which virtually eliminated Amber Box support after 1984, substantial environmental improvements were observed through decreases in the use of agricultural chemicals and in lifestock as well as though the idling of marginal land. 41/

51. It is noteworthy, however, that there is empirically an intricate interplay between the genuine effects of specific trade liberalization policies and the impacts of other independent variables such as autonomous technological development, social change and other policy interventions. To isolate the impacts of domestic support policies from the broader policy and environment context is challenging, because of, for instance, inconsistencies in the level of aggregation between environmental and trade-related data sets. 42/

52. Another challenge is to disentangle the short-term from long-terms effects and to assess their direction and their relative magnitude. For instance, the positive effect of dropping prices and lower intensification could be counterbalanced, in the longer term, by technological changes that induce further specialization (like mono cropping) and concentration (like concentration of livestock). 43/

53. The *contraction of agricultural land*, by converting or idling specific areas, is often said to have positive biodiversity impacts, especially when agricultural production on these areas was highly technified and specialized, and when effective environmental and conservation policies are in place to restore the initial, non-agricultural habitats (e.g., wetlands). 44/ A crucial precondition of a successful long-term restoration is that the conversion has to be irreversible, which may warrant the use of specific legal or economic tools within such conservation policies. However, a complete restoration may prove impossible within a reasonable timeframe. 45/

54. The biodiversity effects of land contraction are sometimes said to be more ambiguous when the affected areas are located in extensive farming regions. It is argued that in many such areas, specific traditional farming practices have played an important role in creating site-specific biodiversity, soil properties and landscape amenities. 46/ They often include semi-natural areas and features such as hedges, walls, trees and buffer zones, which were created as an integral part of the management of agricultural production. Hence, in such regions, a rich agricultural biodiversity may actually depend on the continued application of these traditional farming practices. Furthermore, such agricultural activities have also been associated with land conservation and related ecosystem services, like the avoidance of landslides and flooding.

39/ OECD (2001a), p. 19.

40/ See OECD (2000e).

41/ See OECD (1996), Meiser (2001).

42/ See UNEP/CBD/COP/6/INF/1 or Mayrand et al (2003) for further discussion and additional references.

43/ For instance, in New Zealand, fertilizer and pesticide use increased again in recent years as farm incomes started to rise. See OECD (1996), Meiser (2001).

44/ George and Kirkpatrick (2003).

45/ See UNEP/CBD/COP/6/INF/2, paragraphs 61-64, for a discussion.

46/ Preliminary projections in OECD (2000e) do not suggest substantial changes in agricultural land pursuant to further agricultural trade liberalization. However, the analysis does not allow to draw firm conclusion with regard to biodiversity, because the projections did not consider environmentally sensitive areas like pastures and marginal agricultural land.

55. Such farming systems embodying a high level of agricultural biodiversity may often be located on marginal land, that is, land which would be taken out of production first when producer prices decrease. In such cases, negative effects on agricultural biodiversity would result, with subsequent losses of related ecosystem services. 47/ The question is then, whether such biodiversity loss could be prevented by adequate mitigating measures even while accepting the loss of such traditional farming systems. This issue will be further explored below, in sub-section VII C.

56. If, however, agricultural biodiversity is closely tied to the prevalence of such traditional farming techniques on marginal land, the policy challenge, from this perspective, appears to be to keep such marginal lands under production and to preserve such traditional farming practices while taking out of production those *infra-marginal* lands whose conversion into natural habitats might yield important positive impacts on biodiversity. Under this viewpoint, a reduction in Amber Box support alone might appear to not be specific enough to meet this challenge.

57. It is noteworthy, however, that this observation does not lead to a strong argument in favour of Amber-Box support in general. A recent OECD study shows that most of production-based support goes to the larger farms, which are often the richer farms; and that only 25% of market-price support ends up as a net income gain for the farmers anyway. 48 However, if it is mainly poorer farmers on small farms that use traditional farming techniques on marginal land, such support will not be very efficient in preserving their production. Rather, it may actually give larger farms an unfair competitive advantage over small farms. In consequence, other, more targeted agri-environmental policy measures may be warranted. 49/

B. Impact of Amber Box support reductions in other countries

58. As explained above, the reduction of output-oriented subsidies, mostly used by developed countries, would increase market prices of relevant products, thus generating further production incentives for farmers in those countries that do not apply such support measures (mainly, but not exclusively developing countries). These production incentives, in turn, would translate into an incentive to use more of all production factors (output price effect) as well as in a change in the input mix in favour of those inputs which are most responsive to changes in output prices (input substitution effect).

59. As discussed above, it is difficult to empirically disentangle the genuine effects of specific trade liberalization policies from the impact of other independent variables such as autonomous technological development and social change, (see paragraphs 51 and 52). Furthermore, the scope of further production incentives will differ among regions and among countries with different socio-economic status.

60. For instance, many low-income developing countries already receive preferential treatment through multilateral agreements such as, for instance, the Lomé Agreement. 50/ However, the competitive advantages of such treatment would be lost under *general* trade liberalization. In general, it is said that countries with more diversified market structures and trading partners are likely to adapt quickly to incentive signals, while countries with weak market infrastructures that rely on few export commodities will show only limited trade gains. 51/

47/ OECD (2000e), 28-29.

48/ See OECD (2003a).

49/ Such measures may possibly include payments under agri-environmental programmes. See section 7 for further discussion.

50/ See Shapouri, S. and M. Trueblood (2001), 95.

51/ ibid

61. Bearing in mind these *caveats*, these other countries, due to agricultural expansion, are often expected to face negative impacts on the environment in general and on biodiversity in particular. 52/ Such voices point both to the agricultural intensification on given areas (see paragraph 48 for a list of possible effects) and to the expansion of agricultural land into natural ecosystems, leading to habitat degradation and fragmentation especially in frontier areas like forests, savannahs, wetlands, mountains and arid areas. 53/ A further adverse effect may occur through the creation of new pathways for the introduction of exotic species.

62. Higher market prices may sometimes induce a shift from food to export crops, with uncertain effects on agricultural biodiversity (output substitution effect). In this regard, it is often argued that the most likely groups to benefit from the reduction of trade barriers in foreign markets and the expansion of exports are large-scale commercial producers. Small farmers especially in developing countries may not be able to participate in growing export markets and may experience higher competition in accessing resources, marginalizing their position even further. 54/ Negative effects on agricultural biodiversity are often expected further to such developments, for two reasons:

(a) First, if large-scale commercial production methods reveal to be less environmentally friendly, negative effects for biodiversity would result without further policy intervention. For instance, the increased production of commercial crops cultivated in monoculture could accelerate soil nutrient depletion and erosion; 55/

(b) Second, the further marginalization of poor farmers may induce them to overuse agricultural resources, which may put further stress on biological diversity.

63. FAO points out that whether the position of the poor worsens of not under more open agricultural trade policies also depends on factors outside the agricultural sector, such as the availability of non-farm employment in rural areas and the functioning of rural labor markets. In consequence, the existence and scope of negative impacts on biodiversity stemming from further marginalization of poor farmers would also depend on such factors. 56/

64. Moreover, it is sometimes said that negative impacts would be partially or totally offset by the income effect that results from improved production incentives in developing countries. In particular, increasing crop yields due to commercialisation may also reduce pressure for land conversion, deforestation and degradation of marginal land. However, George and Kirkpatrick (2003) point out that in practice, deforestation and other conversion have continued despite past increases in yields, and conclude that increasing yields may do little to slow the changes. Unless significant progress is achieved in reducing poverty, agricultural pressures on natural habitat are likely to remain. Indeed, the second argument given in paragraph 62 implies that, *if* small farmers are able to participate in growing export markets at least to some extent and gain additional income, they may actually have an *increased* incentive to use agricultural resources in a more sustainable way.

65. It is sometimes said that the higher revenue for agricultural products would also facilitate the introduction of domestic policies to foster production techniques that are more environmentally friendly, and would also increase the long-term return of conservation investments. 57/

52/ Lankoski (1997), 17; George and Kirkpatrick (2003).

53/ See UNEP/CBD/COP/6/INF/2, paragraphs 52-60.

54/ See FAO (2003).

55/ WTO (1997), 15; George and Kirkpatrick (2003).

56/ See FAO (2003).

57/ Lankoski (1997), 17; Munasinghe and Cruz (1995). Note that secure property rights are necessary to ensure that farmers have an incentive to make long term investments in sustainable land use.

66. However, a sequencing problem may possibly arise because of time lags between the generation of revenue from developments harmful to biodiversity and the implementation of appropriate domestic policies to foster conservation and sustainable production techniques. When these policies kick in, a substantial amount of biodiversity may already be lost. However, the restoration of biodiversity is usually difficult. Sometimes, biodiversity loss is even irreversible.

67. Agricultural intensification is especially harmful when being based on over-mechanization and an inappropriate reliance on monoculture, and when being accompanied by excessive dependence on agro-chemicals and external energy and water inputs. However, especially when starting from low productivity levels, a moderate use of mechanical and agro-chemical input may yield important productivity gains with only relatively minor negative impacts on biodiversity. 58/ Such medium-level intensification would also reduce pressure on natural habitats for conversion into arable land.

68. Furthermore, agro-ecological forms of intensification (intercropping, use of diverse species, integrated pest management) and beneficial mixes of land use can also raise resource efficiency while keeping existing biodiversity intact and even raising its overall level in agricultural landscapes. 59/ Policies that ensure the effective participation in particular of small and subsistence farmers in developing countries may further contribute to such environmental-friendly intensification of agriculture.

C. Impact of Amber Box support reductions – conclusions

69. With regard to a *reduction of Amber Box support measures*, a number of repercussions on agricultural biodiversity were identified pursuant to subsequent changes in land use and the level of intensification.

(a) In countries implementing reductions in Amber Box support, the subsequent decrease of agricultural production on given acreage is expected to have positive effects on biological diversity, although some adverse impact could be expected because of possible output substitution effects (see paragraphs 48 to 49). The subsequent contraction of agricultural land in implementing countries is expected to have positive impacts on biological diversity if previous agricultural production was highly technified and specialized (see paragraph 53). In those cases, it appears that the overall effects of removing *Amber Box support policies* for agricultural biodiversity would be positive in implementing countries. It can therefore be concluded that, in such cases, Amber Box support measures would fall under the category of *perverse incentives* for biodiversity conservation and sustainable use; 60/

(b) The contraction of agricultural land in implementing countries is expected by many to have rather negative impacts if previous production relied on traditional, extensive farming practices on marginal land, that are important for creating and maintaining semi-natural areas with high levels of biodiversity (see paragraphs 54 to 58). While this observation does not lead to a strong point in favour of Amber box support in general, well-designed and targeted additional policy measures may be warranted to preserve such traditional farming techniques in those cases in which they prove to be indispensable to maintain biodiversity and related ecosystem services;

58/ OECD (2000e), 21.

59/ See Decision III/11, on conservation and sustainable use of agricultural biological diversity, Annex 1, Section A.

60/ As per established terminology, perverse incentives induce unsustainable behaviour that reduces biodiversity, often as unanticipated side effects of policies designed to attain other objectives. In the case of agricultural support, such an objective may be, for instance, to provide income support to poor farmers. The abandonment of perverse incentives or the mitigation of their negative impacts through appropriate means is needed to ensure the conservation of biodiversity and the sustainable use of its components. Recall in this context that Amber Box support seems to be rather inefficient in meeting the goal of supporting poor farmers. See OECD (2003) and paragraph 57 above for further discussion.

(c) The effects of the subsequent expansion of agriculture in other countries is sometimes expected to have rather negative impacts on agricultural biodiversity. The scope of the overall effect depends: (i) on the level and type of induced intensification and land use change; (ii) on the role and extent of income effects and other socio-economic factors such as off-farm employment options; and (iii) on the design and implementation of additional policy measures, especially for poverty alleviation (see paragraphs 58 to 67). It is also said that, starting from low productivity levels, moderate, agro-ecological forms of intensification may be expected to have no or only minor negative effects while reducing incentives for habitat conversion. Again, additional policy measures may be warranted to encourage such forms of intensification in these countries.

70. In the case of agriculture, the environmental effects of specific choices of agricultural inputs and production technologies are often external to the economic calculus of the individual farmer. The discussion of possible negative effects not only in extensive farming areas of implementing countries, but in particular in other countries made clear that unfettered market forces cannot be expected to automatically give rise to biodiversity-friendly agricultural production systems. Under the circumstances explained above, additional policy measures may be warranted.

VI. GREEN BOX SUPPORT

A. The concept of decoupled measures

71. Under the Green Box of the URAA, support measures that meet a number of criteria are supposed to be "decoupled" from output quantities and prices, and are therefore considered to have no, or at most, minimally trade distorting effects or effects on production. As minimum requirements, the amount of direct payments shall not relate to or be based on type or volume of production, domestic or international prices, or factors of production. Furthermore, no production shall be required in order to receive such payments (see URAA, Annex 2, paragraph 5). 61/ This concept and its limitations has become a major issue in the international discussion on agricultural and trade policies.

72. More or less restrictive definitions of decoupled measures or policies are used in the literature. For instance, OECD work relies on a distinction initially suggested by Cahill: 62/

(a) A policy is fully decoupled if production decisions of farmers are not influenced by that policy, thus not interfering with the free market determination of prices and quantities. Neither the equilibrium values nor the adjustment process are influenced by the policy;

(b) A policy is effectively fully decoupled if it results in production and trade that does not exceed the level that would exist in the absence of the policy. This concept is exclusively centered on the equilibrium values. Readjustment after an external shock would lead to different equilibrium values than would result under a fully decoupled policy. 63/ Specifically, introduction of the policy may also lead to a lower level of production. Empirical studies usually use this less restrictive concept. 64/

73. It is noteworthy that a set of tightly coupled policy measures could have a zero effect on production and trade even if individual policy measures have a significant impact. Hence, it is the policy package that matters. Any assertion on coupling or decoupling requires a detailed analysis of all elements included. Abstract statements on general types of measures needs to be interpreted with care. For

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61/ In the URAA, the term decoupled is applied to only one specific policy category, namely *"decoupled income support"*. However, the concept is clearly embodied in the idea of having *"no, or at most minimal, trade-distorting effects or effects on production."* See OECD (2000b), 6.

62/ Cahill (1997), OECD (2000b), 12.

63/ See OECD (2000b), 9.

64/ OECD (2000b), 11.

instance, in the case of a coupled payment, its production effect may be offset by a quantity restriction. Furthermore, programmes covering a wide variety of agricultural commodities tend to have smaller effects. For instance, area payments that are equal across different land uses would have no production effect if total land supply is fixed and land is perfectly substitutable between commodities.65

74. It is important to underline that the conceptualizations given above focus on policies that have *"no, or at most minimal, trade-distorting effects or effects* on production*"* (emphasis added). They therefore do not focus on the consumption side and, more generally, do *not* address possible impacts on welfare efficiency.66 It is therefore conceivable that a fully decoupled policy fails to realize efficiency gains or, conversely, that a policy that achieves efficiency gains is not fully decoupled or effectively fully decoupled from production in the sense above. 67/

B. Limitations

75. It would appear that measures or policy packages that fulfill the requirements of annex 2 of the URAA at least meet the less restrictive definition of an effectively fully decoupled policy. 68/ For instance, direct income support, whose level is not based on input (including land), production quantities or prices, would appear to fulfil the requirement to have *"no, or at most minimal, trade-distorting effects or effects on production"*. At first glance, decoupled payments would therefore appear to not increase the use of production inputs and, in accordance with the analysis given above, would appear to qualify as generally being neutral with regard to agricultural biodiversity. 69/ In consequence, the process of decoupling, that is, the shifting of support from Amber Box to Green Box measures, would appear to have positive effects for agricultural biodiversity. Moreover, Green Box payments whose levels are based on biodiversity-related performance indicators may also have positive effects for agricultural biodiversity on their own. This latter aspect will be further discussed below, when addressing agri-environmental programmes.

76. However, it is recognized now that even lump-sum payments (in the sense given in the previous paragraph) are not entirely decoupled once real-world phenomena like market imperfections, risk and political dynamics are taken into consideration. 70/

(a) When farmers face debt or labor constraints due to imperfections on capital and labor markets, even lumps sum payments with no requirements to farm have an impact on their production decisions and may also affect their decision whether to stay in the agricultural sector or (the so-called entry/exit decision). For instance, under imperfect capital markets, any kind of income support would be partially reinvested in agriculture, generating additional production in the years to come; 71/

(b) When farmers are risk-averse, both a wealth and an insurance effect would arise pursuant to government payments. 72/ First, the payments affect the wealth of farmers. However, if wealthier farmers are ready to assume more risks (assuming decreasing absolute risk aversion) and, hence produce more, the payments affect the farmers' production decisions. Second, government policies that aim to

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65/ OECD (2000b), 8-9.

66/ OECD (2000b), 7, 12.

67/ See IATRC (2001), 19, for a discussion. See also OECD (2000a), 10; and OECD (2000b), 7-8, for related discussions of the concept of *"trade distortion"*.

68/ OECD (2000b).

69/ Note that this neutrality statement would refer to the decoupled payment alone, and not to the active process of decoupling, that is, the *shifting* of support from coupled to (more) decoupled payments.

70/ See OECD (2000b) for a more extensive discussion.

71/ Rude (1999). In the case of labour constraints, the OECD finds, however, that the effect of lump sum payments on production would be negative under standard assumptions. See OECD (2000b), 17, 20-21, for further discussion.

72/ Hennessy (1998).

reduce the risks faced by farmers through insurance schemes (e.g., price stabilization programmes) would also lead to an increased production;

(c) Expectations about future policies may also affect present production decisions, even under formally decoupled policies. Farmers may perceive that the probability of receiving future payments depends on present production, and may therefore decide to strategically hold current production levels or even opt for production increases, even while economic circumstances would dictate otherwise. 73/

77. The OECD points out that all these effects are cumulative and can occur simultaneously in response to specific policy measures, and concludes that *"it seems difficult to design a policy measure not having some production or trade effects"* under the broader analytical framework presented here.74 It is an empirical question whether such effects go beyond the requirement of the URAA of being *"at most minimal trade-distorting.*" Existing empirical contributions estimate modest production effects through the risk mechanism. 75/ However, it is also often stressed that policy measures that each have only a small impact may add up to a large aggregate trade-distortion if there is, for specific agricultural commodities, a large number of such policies. Again, it would be the whole policy package that matters.

C. The impacts of direct payments on biodiversity

78. Hence, even support measures that qualify as being decoupled under the Green Box appear to increase, to more or less extent, the use of production inputs. The magnitude of such increase would have to be assessed empirically. *Conceptually*, the different impact channels of Green Box support measures on agricultural biodiversity could then be analyzed analogously to those arising under Amber Box support measures (see section IV B). In particular, analogous to the reasoning in paragraphs 47 to 53, negative impacts on agricultural biodiversity would then result from an increase in Green Box measures taken alone. The arguments forwarded in paragraphs 54 to 67, indicate that positive effects may also result, but also point to additional, well-designed and targeted policy measures as a possibly more effective means to achieve such positive effects.

79. However, compared with Amber Box policies that *directly* target market prices and/or quantities, the production effects given in paragraph 76 are more indirect. It could therefore be argued that, starting from the same baseline, the impact on production of a given amount of (formally decoupled) income support would be quantitatively less important than the impact of a similar amount of an amber box support payment. In consequence, any negative impact on biodiversity stemming from indirect production effects of such formally decoupled support would also be more restrained. Hence, the process of decoupling, that is, of *shifting* domestic support from Amber to Green Box categories has the potential to generate positive effects for agricultural biodiversity.

VII. PAYMENTS UNDER ENVIRONMENTAL PROGRAMMES

7.1 General considerations

80. Payments under environmental programmes are a specific part of the Green Box exemptions of the URAA. According to paragraph 12 of annex 2 of the URAA, payments under environmental programmes are considered to have no, or at most, minimally trade distorting effects or effects on production, and are therefore exempt from reduction commitments, provided that

73/ OECD (2001), 21-22.

74/ OECD (2000b), 23.

75/ See OECD (2000b), 19, for further discussion.

(a) the eligibility for such payments shall be determined as part of a clearly defined government environmental or conservation programme and be dependent on the fulfillment of specific conditions under the government programme, including conditions related to production methods or inputs; and that

(b) the amount of payment shall be limited to the extra costs or loss of income involved in complying with the government programme.

81. It is often argued that biodiversity conservation and the services or amenities provided by specific agricultural ecosystems (e.g., flood and erosion control) represent positive external effects of agricultural production provided by the individual farmer to other farmers or to the public at large. In most cases, it is neither possible to exclude individuals from the consumption of the service, nor would it be appropriate to do so, because they do not rival in the consumption of the service. In consequence, such services or amenities often bear characteristics of public goods. In the absence of additional policy interventions, farmers are not remunerated appropriately for their provision, and these services are typically underprovided. Payments under agri-environmental programmes would ensure appropriate remuneration and would therefore contribute to internalize the positive externalities into farmers' decision-making. 76/

82. Several aspects underlying this reasoning are worth highlighting.

(a) First, the question arises whether such services or amenities can only provided by farmers, or by farmers who implement specific agricultural production systems. This issue will be further discussed in sub-section VII C;

(b) Second, to identify these eco-system services as positive externalities that merit remuneration presupposes a specific design and distribution of property and land rights. Specifically, such an approach assumes that farmers would have legal latitude to switch to the cultivation of crops or to production methods that would no longer provide the amenities or eco-system services, or only to a far lesser extent. An ethical argument could be made in this context with regard to the right of the public to a diverse and non-polluted environment. In many countries, however, farmers indeed hold strong land rights that legally empower them to take such a decision. Payments for the amenity or eco-system service would then prevent them from doing so;

(c) Third, external effects are a well-defined concept in micro-economic theory and refer to unremunerated by-products of consumption or production decisions that provide utility to other individuals (or, in the case of negative externalities, to the provision of "bads" which provide "disutility"). Hence, not every side-effect qualifies as an external effect; specifically, effects stemming from changes in relative prices or changes in the income distribution would not qualify as economically relevant external effects.

83. Under a system of strong land rights, the ecosystem services provided by agricultural practices would indeed qualify as positive externalities; therefore, payments to farmers under agri-environmental programmes, in principle, have economic rationale to internalize such externalities. 77/ Trade patterns can be expected to change pursuant to such internalization. The problem for policy-makers is to find an *optimal level* of such payments, that is, a level that minimizes overall costs to society, including possible environment costs, but also the cost of trade distortions and subsequent specialization losses. Because of the negative trade impacts for the trade partners of the implementing country, this optimal level can be generally expected to be smaller in an open economy than in a closed economy reference scenario. Hence,

76/ See, e.g., OECD (2001a), 30-32, 37; Curry Report (2002), 69-70.

77/ Note that a long history of support measures and related income levels may lead farmers to perceive such subsidies as *de-facto* entitlements, whose removal allegedly merit compensation. It is important to distinguish such claims from payments to incite farmers to not use agricultural land in a specific way, even while they have the legal right to do so.

the asymmetry between domestic benefits in terms of environmental quality and international costs in the form of reduced production efficiency may lead national governments that primarily aim for domestic welfare maximization to "over pursue" agri-environmental policies. 78/

84. Conceptionally, this section distinguishes three different types of agri-environmental programmes, bearing in mind that they are often applied simultaneously: 79/

(a) Programmes that focus on the *retirement* of land from agricultural uses for conservation purposes (payments pertaining to conservation easements or long-term land set-aside schemes);

(b) Programmes that focus on *improving* the environmental performance and production practices on current agricultural land through incentive payments (e.g., payments for input reductions, land conversion from arable land to extensive grassland, reducing livestock density, conversion to organic farming);

(c) Programmes that focus on *maintaining* specific performances or agricultural practices (payments for specific performance or practices, e.g., payments use of conservation tillage or low rainfall erosion production systems, payments for the maintenance of traditional farming practices that are recognized to contribute to biodiversity and specific eco-system services, payments for the use of endangered local breeds).

85. Payments under agri-environment programmes are mainly used by developed countries. As explained in Section 3, there has been an important increase in agri-environmental expenditure during the 1990s for a large number of OECD countries. Notwithstanding this dominance of developed countries, it is noteworthy that some types of agri-environmental payments can also be used to address biodiversity-related problems of a number of developing countries. 80/ Examples include

(a) Payments for wildlife and wildlife habitat conservation (compensation of crop losses due to foraging wildlife, conservation concessions, conservation leases for wildlife migration corridors, performance payments for endangered species);

(b) Payments for the use of endangered local landraces. A number of developing countries host a large number of local varieties of domesticated crops and therefore hold a large part of the global pool of agricultural biodiversity at the genetic level. As farmers in these countries increasingly choose to rely on high-yield modern crop varieties, such local landraces are often endangered, thus giving rise to genetic erosion. 81/

86. Importantly, the global benefits of successful conservation policies would be substantial under these examples. Put otherwise, agri-environmental programmes implemented by developing countries often generate substantial positive external effects on the international level. 82/ They provide therefore important entry points for international cooperation and finance.

78/ See OECD (2000a), 12, and Latacz-Lohmann (2000).

79/ See Claasen et al. (2001), 10, 32-33, for a discussion.

80/ See Ferraro and Kiss (2002) for a more extensive discussion and examples.

81/ See Perrings (2001) for a discussion. Note that this problem is related to, but different from the issue of transgenic crops. With regard to this issue, see, e.g., the recent research project of the NAFTA Commission for Environmental Cooperation (CEC) on the effects of transgenic Maize in Mexico. See Carpentier and Herrmann (2002).

82/ Under the first example, benefits include the existence value attributed, by the population in developed countries, to many species in developing countries. Under the second example, benefits include the contribution of genetic information incorporated in traditional landraces to the breeding of modern crop varieties.

87. Agri-environmental programmes entail a wide range of environmental objectives and an equally wide range of possible designs. 83/ The performance of an agri-environmental policy instrument, that is, the extent of the gains for biodiversity, the cost to achieve those gains, and the distribution of such costs, largely depends of the programme design and implementation as well as on the peculiarities of the agricultural regions targeted by the programme and the general policy framework in place. It is often difficult to exactly assess the performance of agri-environmental programmes for the conservation and improvement of biological diversity. Such difficulties are mainly caused by methodological problems related to deficiencies of agri-environmental indicators. 84/

88. For instance, the promotion of organic farming by agri-environmental payments, undertaken by a number of countries, is still surrounded by controversy. While recent literature reviews generally indicate that organically managed fields and farms have greater biological diversity than conventionally managed sites, and that organic farming generally shows superior environment performance, 85/ critics argue that it may often be more cost-effective to provide relevant public goods by conventional agriculture plus agri-environmental measures, than by supporting organic farming. Furthermore, the reduced productivity of organic farming is also said to potentially contribute to further pressure for land conversion for agricultural purposes. 86/ In consequence, the need for robust, scientifically-based indicators is frequently underlined to enable the assessment of impacts and the evaluation of tradeoffs between different kinds of production systems. 87/

89. Some empirical studies note positive results for biodiversity of some environmental programmes, 88/ while others express more skepticism. 89/ In general, it is important to note that to improve the environmental performance of agriculture is the very purpose of agri-environment programmes. Notwithstanding existing design and measurement problems, payment programmes, in principle, can directly target the conservation and/or improvement of agricultural biological diversity. 90/ Compared with other types of domestic support measures, the ability for such targeting would give

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83/ Claasen et al. (2001), 1. In the case of agri-environmental programmes under the common agri-cultural policy of the European Union, the variety of agri-environment programmes is further increased by the fact that such programmes are administered on the national or even sub-national level. Hence, while it is known that approximately 20% of the EU's farmland is under some from of agri-environment agreement (contracts with farmers), the share of agreements on biodiversity has not been calculated (van Dijk 2000, 11). In France, biodiversity-related specifications figure prominently among the agri-environmental specifications in land management contracts with farmers. These include extensive grassland management by mowing (figuring in 63% of all contracts), hedgerow maintenance (30%), establishment of intermediate crops (20%), hedgerow planting (11%), extensive grassland management by compulsory grazing (11%), establishment of grassy areas through set-asides (10%) and ditch rehabilitation (10%). See Rougier (2002), 18. In the US, a number of agri-environmental programmes also relate to biodiversity (e.g., the wetland reserve programme, the wildlife habitat incentive programme); see Vasavada and Warmerdam (1998); Claasen et al (2001).

84/ Such methodological problems include: ill-defined biological goals, lack of scientific reference material on the relationship between biological processes and farming practices, the complexity of ecological workings and their resistance to change, the only partial influence of agriculture on these workings, and the difficulty of correlating agricultural and biological data on different scales. See Rougier (2002), 8, 15. In a recent overview, the NAFTA Commission for Environment Cooperation (CEC) concludes that "progress in honing non-pollution indicators capable of showing changes in biodiversity, forest cover, habitats and ecosystems remains less developed and certainly less quantitative than pollution-related indicators" (CEC 2002).

85/ See Dabbert (2003), Bartram and Perkins (2003); Curry Report (2002), 88-89.

86/ See Bruulsema (2003).

87/ Vetterli et al (2003).

88/ The European Commission's Evaluation of Agri-Environmental Programmes records highly positive results for reduced input measures, especially organic farming, nature protection measures and maintenance of landscapes, but some difficulties with extensification, set-aside for 20 years, and public access, resulting in low take up (EC 1998).

89/ For example, Kleijn et al. (2001) note that management agreements were often not effective in protecting biodiversity or, in some instances, even led to unexpected adverse effects.

90/ A Pan-European Conference on Agriculture and biodiversity, recently convened by the Council of Europe, UNEP, and the French government, recommends that agri-environmental programmes be applied for high nature value areas, and also to dispersed biodiversity and landscape values. See Council of Europe (2002).

payments under such agri-environmental programmes an immediate relative advantage for the conservation and sustainable use of biological diversity.

90. The biodiversity-related benefits of *land retirement programmes* clearly increase with the length of time land is removed from crop production. For example, many wetland services and other wildlife habitat functions arise only when the ecosystem is fully established, a process that may take years if not decades. Some of the previous biodiversity losses may even be irreversible. It is therefore under discussion whether the period envisaged for long-term land set-asides under the European Common Agricultural Policy (20 years) is sufficient to generate substantial environmental benefits.

91. Furthermore, it will often not be sufficient to just idle the land. Nature management strategies that take the context of the specific ecosystem fully into account will be needed in order to restore the areas in a targeted and effective way and to avoid, e.g., weed and pest problems. Moreover, a careful selection of eligible areas in target regions will often be necessary to avoid the designation of tiny, fragmented land set-asides scattered among highly intensified agricultural lands.

92. The remainder of this section mainly focuses on the possible *indirect* effects of agri-environmental programmes. Several issues are of special interest: the question to what extent the limitations of decouplement discussed above also apply to agri-environmental programmes, the role of production-related conditions attached to agri-environmental programmes and, more generally, the discussion on how to trade-proof agri-environment programmes, in order to minimize the expansive production effects of limited decouplement.

B. Limitations of decouplement under agri-environmental programmes

93. As agri-environmental programmes are part of the formally decoupled policies under the Green Box, they would appear to face the same criticism with regard to the limitations of decouplement. They may be not entirely decoupled and therefore have some positive effects on production once the real-world phenomena discussed in paragraph 76 are taken into consideration. These positive production effects, in turn, may have negative effects on agricultural biodiversity, which could again be analyzed analogously to those arising under Amber Box support measures (see section IV B above).

94. However, it has to be borne in mind that the URAA provides that payments under agri-environmental programmes *"shall be limited to the extra costs or loss of income involved in complying with the government programme."* Hence, such payments shall not give effect to a *net* increase of farmers' incomes. For instance, if a farmer is receiving payments for planting environmentally beneficial hedges on his land, such payments shall be limited to compensating the related income losses due to lower harvests, and the actual cost of planting the hedges. In consequence, indirect effects from increased income on production (and, hence, on biodiversity) along the lines given above would appear to also be restricted. 91/

95. It is noteworthy that such indirect effects will be less important if existing Amber Box support policies are simultaneously reduced, because keeping such policies unchanged will inflate the income losses that farmers incur pursuant to compliance with an agri-environmental programme, and will therefore require higher compensatory payments. 92/

96. To ensure policy coherence in this regard is identified by the OECD as an important emerging policy issue. A recent OECD report notes that, in a number of OECD countries, agri-environmental

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91/ Rude (2000), 18.

92/ This observation refers to the more general problem to define the appropriate benchmark against which to decide on the eligibility for payments, which is further discussed below.

policies and agricultural policies can be found to be pulling in opposite directions. 93/ Policies to redress environmental damage are sometimes implemented in the context of production and input-linked support measures that contribute to environmental damage. The report notes that "the coexistence of such policies can make the attainment of environmental objectives less certain and more costly that would otherwise be the case" and concludes that "the reform of agricultural policies would assist the achievement of environmental objectives by correcting the government failures that can complicate agri-environmental management". 94/

97. It is often argued that, in addition to compensating costs and income losses, it is necessary to give some additional, genuine incentive payment in order to encourage farmers to participate in a voluntary programme. 95/ To set these compensatory payments too low would impede the effectiveness of the agri-environmental programme. Farmers would then rather prefer to forego the agri-environmental payments by not participating in the programme. A number of aspects are noteworthy in this regard.

(a) First, insofar as such payments lead to a net increase of farmers' incomes, agri-environmental payments may not be entirely decoupled. Subsequent effects would have to be taken into consideration, along the lines of the discussion in paragraph 76;

(b) Second, in the light of the discussion above, incentives to participate in the programme can also be increased by lowering the reference income level through, for instance, the removal of other support measures. It therefore appears that the reference level of the "extra costs or loss of income involved in complying with the government programme" is of crucial importance;

(c) Third, it is sometimes pointed out that incentives to participate in voluntary agri-environmental programmes may also be generated by a feeling of social responsibility or by the increased, market-driven demand for food produced under high safety and environmental performance standards. Examples may include not only voluntary certification schemes for organic food, but also private standards applied by large retail chains.

98. Some agri-environmental programmes may influence relative input prices and may therefore give rise to subsequent input substitution. As discussed above, some agri-environmental policies aim to induce changes in the use of agricultural land in target areas or even focus on taking land out of agricultural production. 96/ For such a programme being successful, the opportunity costs of keeping land in "conventional" agricultural production would have to rise in order to incite farmers to change their production methods on (part of) their land according to the agri-environmental programme. In the case of conservation easements or land set-aside schemes, the opportunity cost of agricultural land in general would have to rise in order to incite farmers to re-allocate part of their land to conservation purposes. However, raising the opportunity costs of "conventional" agricultural land use also implies that the cost of other inputs would relatively decline. In consequence, the remaining agricultural land, not covered by the agri-environment programme, may be used more intensively. If such intensification were based on the increased use of agrochemicals and heavy machinery, negative impacts on agricultural biodiversity would have to be expected. If land supply is elastic, farmers may also choose to take additional land under production. 97/ If some agricultural land remains to be not covered by agri-environmental programmes,

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93/ Indeed, the OECD notes that *"the effectiveness of payments has been compromised when they have been implemented together with more production-linked support policies associated with environmental problems."* See OECD (2003c), 71.

94/ OECD (2003c), 76.

95/ Such is the practice in the European Union.

96/ It is noteworthy in this regard that such payments under agri-environmental programmes, even while they are considered to be have minimal trade distorting effects, may have a quite substantial (dampening) effect on production.

97/ Claasen et al (2001), 33.

additional regulatory requirements on agricultural practices and production methods would have to be introduced in order to minimize such indirect negative impacts on remaining lands.

99. It might, however, again be argued that such expansive production effects are more indirect and would therefore rather not offset the direct positive effects of such programmes, especially as they are able to address the conservation and sustainable use of agricultural biodiversity in a more targeted way than other measures.

100. The requirement that payments under agri-environmental programmes "shall be limited to the extra costs or loss of income involved in complying with the government programme" is sometimes said to favor intensive farmers who are ready to give up some environmentally harmful practices in exchange for a compensatory payment. Under this provision, governments appear to have more limited leeway to reward farmers for agricultural practices which are already environmentally friendly prior to the introduction of any governmental programme. Clearly, such farmers may have the intention to intensify their production in the future in an environmentally harmful way. In such a case, the "extra costs or loss of income involved in complying" could also refer to the intensification benefits forgone if current environmentally friendly practices are maintained. The difficulty, however, is to identify the case in which farmers indeed plan to intensify, that is, to distinguish this case from the cases in which farmers merely threaten to do so in order to receive payments.

101. A number of model analyses claim to show that payments based on such existing practices produce substantially less environmental performance per monetary unit paid than payments for improved performance. The reason is that much of the money goes to "good actors" and very little of the programme funds actually leverage new conservation efforts. 98/ The underlying problem of these analyses, however, is again that it is very difficult if not impossible to assess what farmers would have done in the absence of the programme. If they would have increasingly given up these practices under such a scenario (due to market pressure etc.), these analyses systematically under-estimate the environment performance of payments based on existing practices.

102. These difficulties are part of the more general problem to define the appropriate benchmark against which to gauge the eligibility for payments. In the scenario discussed in paragraph 100, the problem is again to define a benchmark income level, based on which *"extra costs or loss of income"* could be calculated. Depending on the procedure on how to determine this benchmark income level, distorted production outcomes may result from strategic behavior of farmers. 99/ Assume for instance that current production levels would serve as a benchmark. If farmers suspect that a payment programme based on such a benchmark will be introduced in the future, they have an incentive to temporarily raise production levels beyond market needs in order to increase their eligibility for payments under the programme. In such a situation, an empirical assessment of the efficacy of the payment programme will overstate its environmental benefit unless being corrected for such distortions stemming from strategic behavior.

103. Agri-environmental performance or practice standards could serve as an alternative benchmark. 100/ Only agricultural practices that over-comply with these standards would be eligible for

98/ Claasen et al compare payments for reducing sediment damage to water quality and find that payments for improved performance generate substantially larger erosion reductions than payments based on good practices (conservation tillage production systems). See Claasen et al (2001), 40-41.

99/ Note that such strategic behavior may also result under Amber and Blue Box payments.

100/ See Claasen et al (2001), 34-35; Latacz-Lohmann (2000), 346.

agri-environmental payments. 101/ Compared with a benchmark based on current production levels, such a benchmark would have the advantage that the individual farmer cannot easily influence it. Furthermore, they would also increase the effectiveness (measured in terms of environment performance per monetary unit spent) of payments.

104. Moreover, similar standards could also be implemented as mandatory minimum standards, in order to contribute to minimize any negative impacts on biodiversity. Even on areas that are not put under agri-environmental programmes, farmers would have to comply at least with these minimum standards. However, in some countries, the national system of land and property rights may limit the use of such a mandatory approach without compensation. For instance, if farmers' property rights are strong and well protected, the regulatory leeway for the government may be restricted to major threats to human health and occupational safety of farm workers.

C. The role of production-related conditions

105. A related question is whether conditions pertaining to the use of specific production methods, or to agricultural production in general, should be part of the eligibility criteria under agri-environmental programmes. Note that the URAA allows that *"conditions related to production methods or inputs"* are part of the necessary conditions attached to the governmental programme (URAA annex 2, paragraph 12). This seems to be an important exception to the general requirements for direct payments to producers as given in paragraph 6 of annex 2, which state, *inter alia,* that "the amount of such payments in any given year shall not be related to, or based on, the factors of production employed in any year after the base period" and that "no production shall be required in order to receive such payments."

106. Under current practice, agri-environmental payments are indeed often based on indicators relating to specific inputs, production methods or, in the case of certain energy crop schemes, production volumes, an important reason being the methodological difficulties in using performance indicators that directly measure the status of agricultural ecosystems and related biodiversity. Furthermore, it is also said that, for reasons of practicability, criteria need to be meaningful to farmers and should therefore not dissociate environment aims from everyday farming concerns. 102/

107. As was explained before, traditional farming practices applied in extensive farming regions on marginal lands are often said to play a crucial role in creating and maintaining site-specific biodiversity. In such regions, agricultural biodiversity as well as land conservation and related ecosystem services may actually depend on the continued application of these traditional farming practices. It was also said that, if agricultural biodiversity is indeed closely tied to the prevalence of such traditional farming techniques on marginal land, the policy challenge would be to preserve these traditional farming practices. Agri-environmental payments may then appear to be useful to reward such practices in carefully selected regions; such practices, however, are often linked to specific production methods.

108. More generally, the idea that agriculture often generates a number of substantial benefits beyond the production of food and fibre is captured by the concept of multifonctionality. According to this concept, agriculture, beyond hosting biodiversity, also provides countryside amenities to rural and urban populations, contributes to the economic viability of many rural areas and to food security. Furthermore, century-old traditional farming landscapes are said to represent an important element of national cultural heritage. Importantly, such non-commodity output of agriculture is sometimes produced jointly with

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101/ For instance, Buckwell et al (1997) proposed to move the European Unions Common Agricultural Policy towards environmental and cultural landscape payments (ECLP). Eligibility for such payments would be determined according to three tiers of environmental standards. Tier zero would cover all standards farmers must respect without payments. Tiers 1 and 2 refer to higher-level services provided on the basis of contracts with regional authorities and would be directed to high nature value farming systems (tier 1) and specific management practices in selected areas (tier 2).

102/ Rougier (2002), 13.

agricultural commodities, that is, there are technical interdependencies or shared production factors. 103/ Whether and how to take such non-commodity outputs into account in agricultural and trade policies are important and contentious issues in the ongoing WTO agricultural negotiations.

109. Under the analytical framework developed by the OECD, 104/ three questions should be answered for any non-commodity output in order to assess the need for policy interventions:

(a) Is there a strong degree of jointness between agricultural commodity output and the non-commodity output? If so, is the jointness *inherent* or can it be altered through farming practices, technologies or non-agricultural provision of the non-commodity output?

(b) Assuming that there is a strong degree of jointness, is there a market failure associated with the production of the non-commodity output, or do markets exist and function well?

(c) If there is a market failure, is government action required or are there non-governmental options?

110. From the viewpoint of environmental policy, specific agricultural production methods are, in principle, not more than *proxy criteria* for environmental performance and the related level and quality of ecosystem services. The question is then whether these proxy criteria are *good* ones. Unless there is a proven *inherent* jointness, basing policy instruments on such proxy criteria may have two shortcomings for the conservation and sustainable use of biodiversity:

(a) First, it may be difficult to design a set of criteria, defining a specific agricultural production method, which covers all important biodiversity-related aspects. If, however, the set of criteria is incomplete, it may give rise to unexpected reactions by farmers. While farmers do formally comply with the programme, such unexpected reactions may have adverse consequences for biodiversity ("you get what you pay for"); 105/

(b) Second, other measures that are not covered by the agri-environmental programme may have similar or even more positive impacts for biodiversity conservation.

111. Payments that would be directly based on a comprehensive set of environmental performance indicators could contribute to avoid such problems. Note, however, that designing and monitoring such a comprehensive set may be very costly. Furthermore, current agri-environmental indicators are often characterized to be deficient with regard to agricultural biodiversity. There are, however, recent efforts at the international level 106/ to develop indicators that could not only serve as a basis or better assess agricultural impacts on biodiversity while taking regional differences into account, but may also eventually serve as a basis for more targeted payments under agri-environment programmes.

D. Minimizing indirect production effects

112. A key concern in policy analysis is to distinguish between agri-environmental measures that are shown to address market failures by internalizing environmental externalities or ensuring the provision of public goods associated with agriculture, from policies that appear to be merely labelled to serve environmental purposes, while being used as means to support domestic farmers and protect them from

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103/ OECD (2000a), 11.

104/ OECD (2000c).

105/ Claasen et al (2001), at 27, summarize that "*targeting a specific environment problem will not necessarily address other environment problems and may make some worse*."

106/ See OECD (2001d) for recent developments of the OECD work on agri-biodiversity indicators. Recent OECD meetings focused on soil erosion and soil biodiversity, on land conservation and on agricultural water use and water quality. For FAO's work on indicators of agricultural genetic resources, see Collette (2001).

international competition. In the international discussion, a number of proposals were submitted on how to design agri-environmental programmes in a way to avoid such suspicions. Furthermore, the application of these proposals may contribute to minimize the negative effects on agricultural biodiversity stemming from the indirect production effects analyzed above. Such proposals include: 107/

(a) Specifying clear environmental objectives for the programmes, 108/ based, to the extent possible, on quantitative environmental performance indicators and reliable information;

(b) Clarifying property rights in environmental resources, including baseline standards as reference levels, to establish the applicability of payments, charges, and subsidies;

(c) Ensure transparency in designing and implementing agri-environmental programmes to bridge the cultures of environmental and trade interests, to build trust, and to facilitate open trade-environmental negotiations and decisions;

(d) Matching the geographical scope of the programme with the spatial dimension of agri-environmental problems;

(e) Establishing scientific linkage between the environmental objective and the policy instrument, thus ensuring technical efficiency of the instrument in achieving the objective;

(f) Using mechanisms of competitive bidding of agri-environmental contracts to increase cost-efficiency and reduce overcompensation;

(g) Monitoring and evaluating programmes, based on well-established research methodologies and their further development, to document policy/programme efficacy and to further ensure the transparency of agri-environmental measures;

(h) Probing for less trade-distorting alternatives, based on an assessment of size and distribution of costs and benefits of agri-environmental programmes, as an integral part of the process to design and implement agri-environmental measures, bearing in mind that locally higher costs may possibly be offset by cost savings because of reduced trade distortions.

E. Impacts of agri-environmental programmes on biodiversity

113. In conclusion, payments under carefully designed, targeted and implemented agri-environmental programmes that are based, to the extent possible, on scientifically sound environmental performance indicators, seem to have the potential to effectively improve incentives for the conservation and sustainable use of agricultural biodiversity. Possible indirect negative effects of such agri-environmental programmes, resulting from an expansion in agricultural production because of deficiencies in decouplement, could be reduced if existing Amber Box support is reduced simultaneously. The application of a number of proposals for trade-proofing agri-environmental programmes, summarized above, may further contribute to minimize the negative effects on agricultural biodiversity stemming from such indirect production effects. Payments under carefully designed, targeted and implemented agri-environment programmes could therefore qualify as generating positive incentives for the conservation and sustainable use of biodiversity.

107/ See Runge (1999); Ervin (1999), Rude (2000); OECD (2000a); Latacz-Lohmann (2000).

108/ It is pointed out by Claasen et al (2001, 27) that targeting payments to producers in need of income support is unlikely to fully address any specific agri-environment problem. Conversely, targeting multiple environment problems also means that significant funding would be directed toward farms that are not targeted for income support. Farmers' incomes and environmental problems are distinct policy problems, which may therefore merit the use of separate policy tools.

VIII. BLUE BOX PAYMENTS

114. Under Article 6.5 of the URAA, direct payments under production-limiting programmes are not subject to the reduction commitments if such payments are based on fixed area and yields, or such payments are made on 85% or less of the base level of production, or livestock payments are made on a fixed number of head. Domestic support measures meeting these requirements fall under the so-called Blue Box of the URAA. As such direct payments refer to land use or stock, they are not truly decoupled from agricultural production; however, even while they are linked to factors of production, they are not linked to price and volume of output.

115. For instance, such payments are largely used by the European Union (see the table presented in paragraph 31). 109/ They were introduced under the so-called McSharry reforms of the European Community Common Agricultural Policy (CAP) in 1992 to compensate farmers for significantly reduced market intervention prices, and were further strengthened under the Agenda 2000 reform of the CAP. For most of the main arable crops, farmers receive direct income support in the form of area payments under the Arable Area Payments Scheme (AAPS). To qualify for area payments, producers must set aside a certain proportion of their arable land (small producers are exempt up to a certain production limit). Although the set aside rate was initially at 15 per cent, it has been varied from year to year following decisions by the Council of Ministers. Farmers can, under certain conditions, opt to put additional land into voluntary set aside. In some countries, farmers can, subject to specific conditions, also grow crops for industrial purposes on set aside land and still receive the annual set aside payment (industrial oilseeds and energy crops).

116. Because of the specific design of Blue Box payments, and because of the additional requirement to take measures that limit agricultural production, no *direct* expansive effects on production are to be expected. 110/ However, as agricultural production is required in order to receive payments, it might also be suspected that production would decline in the absence of such support. This presupposes that the next best alternative land use is non-agricultural or fallow. If the next best alternative is agriculture based and the land changes ownership to a more efficient producer, output could actually increase. 111/

117. If such payments increase the net income of farmers, indirect effects on agricultural production, along the now-familiar lines of the analysis given above, and on agricultural biodiversity may result. However, compared with Amber Box policies that *directly* focus on market prices and/or quantities, the effects analyzed here are again more indirect, and the subsequent negative impacts on biodiversity would therefore also be more restricted. Indeed, quantitative assessments undertaken with the OECD policy evaluation matrix (PEM) confirm that area payments, even when assumed to be implemented with a requirement to plant, are less trade distorting than market price support, payments based on output, or payments based on input use. 112/

118. With regard to the scope of such indirect effects on agricultural production, it is instructive to compare a hypothetical Blue Box payment on 85% of the base level of production, coupled with a set aside of 15%, with a hypothetical payment under an Green Box, agri-environmental set-aside programme of an equal amount of arable land. The permitted *amount* of the Blue Box area payment is not restricted beyond the 85% rule. For instance, the area payments of the EU apply to all remaining arable land. In contrast, payments under the agri-environment set-aside scheme would be "limited to the extra costs or loss of income involved in complying with the government programme." Hence, governments are more

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109/ Other countries using or having used the Blue Box are: Iceland, Norway, Japan, the Slovakia, Slovenia, and the US. Since 1996, the US has not made use of the Blue Box. However, some support under the 2002 US farm bill is sometimes suspected to possibly fall under the Blue Box.

110/ Rude (2000b), 15.

111/ Rude (2000b), 18.

112/ OECD (2000d).

restricted in granting payments under agri-environmental programmes of the Green Box. Therefore, the *potential* for the expansion of agricultural production, arising from the now-familiar indirect effects analyzed above, and the subsequent negative effect on agricultural biodiversity would seem to be higher under Blue Box payments than under agri-environment programmes of the Green Box. 113/

119. Several aspects deserve to be addressed with regard to possible *direct* effects on biodiversity of such Blue Box, production-limiting programmes. As explained above, land-set asides can have positive repercussions for biodiversity, the extent of which depends on: (i) the choice of the area for the set-aside, (ii) the timeframe, (iii) the ease of reversibility of the set-aside, and (iv) the extent of additional conservation management measures. With regard to their impacts on biodiversity, set-aside schemes under Blue Box payments appear therefore to be assessed more critically than set-asides under agri-environmental programmes. Under agri-environmental programmes, set-asides have to be implemented at least for a minimum period of time, 114/ moreover, eligibility of land for set-aside can be granted in accordance to the environmental value of the land. In contrast, set-asides that focus on production limitations under the Blue box provisions usually grant more flexibility to farmers. They can be freely chosen be farmers and can be reverted to crop production within a short timeframe. Both features limit their value for biodiversity conservation.

120. The eligibility for payments under production-limiting Blue-box programmes can additionally be conditioned on compliance with agri-environment environmental standards, as is for instance the case under the "cross-compliance" approach of the European Union. Under such additional requirements, payments under the Blue Box are sometimes said to move closer to exempt Green Box payments. However, it is under considerable debate whether, and if so, under what particular provisions with regard, *inter alia*, to the additional requirements, they could be accepted as Green Box payments. 115/

IX. SUMMARY AND CONCLUSIONS

121. Reducing trade-distorting domestic support is an important element in liberalizing agricultural trade. Corresponding disciplines are sometimes characterized to be the single most innovative element of the Uruguay Round Agreement on Agriculture. The further substantial reduction of trade-distorting domestic support remains an important item in the ongoing WTO agricultural negotiations that were initiated in 2000 and further mandated in the Doha Ministerial Declaration.

122. Even while the overall level of domestic support decreased only moderately, important changes in the composition of related measures could be observed pursuant to the implementation of the URAA: a *reduction* in trade-distorting Amber Box support (e.g., direct price support or input subsidies), an *increase* in "decoupled" Green Box support considered to have no, or at most, minimally trade distorting effects or effects on production (direct payments to farmers), in particular an important *increase* in payments under environmental programmes (although remaining at a relatively low overall level), and an *increase* in partially decoupled Blue Box measures (payments under production-limiting programmes).

123. The note cautioned that the effects of trade restrictions and distortions are likely to be indirect and not readily identifiable in general terms. Both beneficial and detrimental effects can usually be identified. Data gaps and methodological problems make it very difficult to give robust *empirical* assessments of the direction of the overall outcome. Furthermore, it is difficult to empirically disentangle the genuine effects of specific trade liberalization policies and the impacts of other independent variables such as autonomous technological development, social change, or other policy interventions. For these reasons, the note

113/ Note that the production effect that is actually observed will depend on the level of payment government chose.

114/ For instance, under EU regulation, land has to be set aside for a minimum of 20 years in order to be eligible for payments.

115/ See e.g. Swinnen (2001), 29; Beard and Swinbank (2001).

focused on a conceptual analysis of the impact on agricultural biodiversity, while referring to existing empirical information when appropriate.

124. With regard to a *reduction of trade-distorting Amber Box support measures*, a number of repercussions on agricultural biodiversity were identified pursuant to subsequent changes in land use and the level of intensification.

(a) In countries implementing reductions in Amber Box support, the subsequent decrease of agricultural production on given acreage is expected to have positive effects on biological diversity, although some adverse impact can be expected because of output substitution effects (see paragraphs 48 to 49). The subsequent contraction of agricultural land in implementing countries is expected to have positive impacts on biological diversity if previous agricultural production was highly technified and specialized (see paragraph 53). In those cases, it appears that the overall effects of removing *Amber Box support policies* for agricultural biodiversity would be positive in implementing countries. It can therefore be concluded that, in such cases, Amber Box support measures would fall under the category of *perverse incentives* for biodiversity conservation and sustainable use. As per established terminology, perverse incentives induce unsustainable behaviour that reduces biodiversity, often as unanticipated side effects of policies designed to attain other objectives. 116/ The abandonment of perverse incentives or the mitigation of their negative impacts through appropriate means is needed to ensure the conservation of biodiversity and the sustainable use of its components;

(b) The contraction of agricultural land in implementing countries is often expected to have rather negative impacts if previous production relied on traditional, extensive farming practices on marginal land, that are important for creating and maintaining semi-natural areas with high levels of biodiversity (see paragraphs 54 to 58). While this observation does not lead to a strong point in favour of Amber Box support in general, well-targeted additional policy measures may be warranted, in addition to the removal of Amber Box support, to preserve such traditional farming practices if agricultural biodiversity is indeed closely tied to their prevalence;

(c) The effects of the subsequent expansion of agriculture in other countries is expected by many to have rather negative impacts on agricultural biodiversity. The scope of the overall effect depends (a) on the level and type of induced intensification and land use change; (b) on the role and extent of income effects and other socio-economic factors; and (c) on the design and implementation of additional policy measures, especially with regard to poverty alleviation (see paragraphs 58 to 67). It is also said that, starting from low productivity levels, moderate, agro-ecological forms of intensification may be expected to have no or only minor negative effects while reducing incentives for habitat conversion. Again, additional policy measures may be warranted to encourage such forms of intensification in these countries.

125. In the case of agriculture, the environmental effects of specific choices of agricultural inputs and production technologies are often external to the economic calculus of the individual farmer. The discussion of possible negative effects not only in extensive farming areas of implementing countries, but in particular in other countries made clear that unfettered market forces cannot be expected to automatically give rise to biodiversity-friendly agricultural production systems. Under the circumstances explained above, additional policy measures may be warranted.

126. Green Box measures are supposed to be decoupled from agricultural production and inputs and, hence, to be not or only minimally trade-distorting. It was shown that decouplement could never be complete if market imperfection, risk-averseness and political dynamics are taken into consideration.

116/ In the case of agricultural support, such another objective is, for instance, to provide income support in the farming sector to poor farmers. Recall, however, that Amber Box support seems to be rather inefficient in meeting this goal. See OECD (2003) and paragraph 57 for further discussion.

Some expansive effect on agricultural production is therefore to be expected both from Green Box measures as well as from an from (partially decoupled) Blue Box measures, whose impact on biodiversity in implementing and other countries can be addressed along the lines of the analysis of Amber Box support measures summarized above.

127. However, such effects are more indirect than under Amber Box measures. It can therefore be expected that a trade-distorting expansion of agricultural production and subsequent negative impacts on agro-biodiversity are less important under such measures. As discussed in paragraph 117, quantitative assessments undertaken with the OECD policy evaluation matrix (PEM) with regard to Blue Box measures confirm this expectation. Moreover, as such effects would be smaller the more decoupled the measures under consideration, a given amount paid under the Green Box could be expected to lead to even smaller indirect repercussions than a similar amount paid under (partially decoupled) Blue Box measures. Furthermore, in the case of payments under agri-environmental programmes, it was argued that such indirect effects will be less important if existing other support policies are simultaneously reduced, because such policies will inflate the compensation claims for the losses that farmers incur pursuant to compliance with an agri-environmental programme.

128. Despite a number of methodological problems in designing *agri-environmental programmes* for the conservation and sustainable use of agricultural biodiversity, mainly related to the lack of reliable and practicable agri-biodiversity indicators and to the problem of choosing appropriate benchmarks, it seems that well-targeted, designed and implemented programmes that are based, to the extent possible, on scientifically sound environmental performance indicators, are able to contribute to internalize positive external effects of agricultural production on biodiversity. Such ability gives agri-environmental programmes an immediate relative advantage when being compared with other types of domestic support measures. They have therefore the potential to qualify as *positive incentives* for the conservation and sustainable use of agricultural biodiversity.

129. In the discussion on agri-environmental programmes, a number of proposals were submitted on how to design them in a way to avoid suspicions that they are merely labelled to serve environmental purposes, while being used as means to support domestic farmers and protect them from international competition. Such proposals include, *inter alia*, specifying clear environmental objectives for the programmes; clarifying underlying property rights; ensuring transparency in designing and implementing agri-environmental programmes; ensuring technical efficiency of the instrument in achieving the objective; monitoring and evaluating programmes based on valid scientific research, and probing for less trade-distorting alternatives as an integral part of the process to design and implement agri-environmental measures. The implementation of such proposals may also contribute to restrain indirect expansive production effects and subsequent negative impacts on agricultural biodiversity.

130. Both Blue Box measures and payments under agri-environmental programmes preview the option of idling agricultural land. Such land-set aside schemes can have positive repercussions for biodiversity, the extent of which depends on (a) the choice of the area for the set-aside, (b) the timeframe, (c) the ease of reversibility of the set-aside, and (d) the extent of additional conservation management measures. With regard to these preconditions, set-asides that focus on production limitations under the Blue Box provisions usually grant more flexibility to farmers. Notwithstanding cross-compliance efforts, their positive impact for biodiversity appears therefore to be more limited than the impact of set-asides under agri-environmental programmes.

131. It can be concluded that the process of reducing trade-distorting domestic support policies has the potential to generate synergies with the objectives of the Convention on Biological Diversity to conserve and sustainably use biological diversity. Specifically, a reduction of Amber Box support policies can contribute to easing the pressure on agricultural biodiversity stemming from agricultural expansion and intensification, especially if complemented with well-designed “flanking” policies both in implementing and in other countries. Synergies may also exist when re-instrumenting domestic support towards

carefully crafted and targeted agri-environmental programmes under the Green Box. However, more analytical and conceptual work is necessary on the appropriate design and implementation of such agri-environmental policies and programmes and their interplay with the reduction of trade-distorting domestic support measures.

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