

**THE AGRICULTURE SECTOR: ENVIRONMENTAL BENEFITS OF
TRADE LIBERALIZATION**

**THE SECOND REGIONAL WORKSHOP
OF THE UNCTAD PROJECT ON
STRENGTHENING RESEARCH AND POLICY-MAKING
CAPACITY ON TRADE AND ENVIRONMENT IN
DEVELOPING COUNTRIES**

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1. INTRODUCTION

1. This paper aims to contribute to the discussion on the environmental benefits of eliminating trade restrictions and distortions in the agriculture sector.
2. The role of WTO and other international organizations in promoting cooperation and coordination among countries is established in Chapter 14 of Agenda 21, i.e., “to encourage, in the context of achieving sustainable agricultural development and consistent with the relevant internationally agreed principles on trade and environment, a more open and non-discriminatory trading system and the avoidance of unjustifiable trade barriers which together with other policies will facilitate the further integration of agriculture and environmental policies so as to make them mutually supportive”.
3. The study of the effect of environmental measures on market access, especially in relation to developing countries, and environmental benefits of removing trade restrictions and distortions is very important, in order to find solutions that contribute to the achievement of sustainable development. The exchange of national experiences of sectors in which trade liberalization represents existing or potential “win-win” situations for both trade and environment is a good basis to identify situations where they are mutually supportive.

NON-TRADE CONCERNS IN THE AGRICULTURE SECTOR

4. According to document WT/CTE/W/67, produced by the Secretariat of WTO, “the political economy of trade protection is such that although trade restrictions and distortions may impose burdens on society as a whole, they are particularly difficult to remove due to the resistance from domestic coalitions and special interest groups. Welfare gains from trade liberalization, including improvements in the environment, exceed costs when viewed in an economy-wide perspective rather from the perspective of the adversely affected interested group. Institutional reform, permitting trade policy to be viewed in an economy-wide perspective along with the

net benefits to society at large-including environmental benefits- would facilitate the task of removing trade restrictions and distortions.

5. Despite the fact that the Agreement on Agriculture already includes provisions that take into consideration non-trade concerns (Annex II, paragraph 3 on public stockholding for food and security purposes; paragraph 12 on payments under environmental programmes; Article 12 on export restrictions), the concept of multifunctionality in agriculture has been mentioned in the WTO in order to emphasize the need to address environmental aspects of agricultural production. We in Brazil are worried that this concept has been used in an attempt to justify the maintenance or the increase of subsidies in the agriculture sector. It is true that the agricultural production has outcomes broader than the mere production of food and fibre, often related to features such as the rural landscape, the environment, biodiversity and socio-economic elements. Governments have the responsibility of deciding how to combine production needs with policies that address all these other aspects of the agricultural production. The problem is to distinguish between policies that address these concerns in a legitimate way and thus enhance sustainable development, and policies that merely make use of the concept of “multifunctionality” as a justification for the maintenance of agricultural protection and subsidies.
6. In Brazil, trade liberalization has proven to be an important tool to encourage the development of sustainable agricultural production and thus the addressing of negative externalities related to the agricultural sector. It must be clarified that the preoccupation with the environmental impact of the agricultural activity is not a prerogative of high support countries. The use of high levels of pesticide, the loss of biodiversity and soil erosion are problems that may occur both in low and high-support countries. The use of subsidies, on the contrary, especially those which are coupled to production, can result in an increase of agricultural output, affecting negatively the environment and distorting production and trade by encouraging overexploitation of the soil and excessive consumption of fertilizers and pesticides. Such trade-distorting policies have the effect of impeding trade, hampering exports from various countries, including developing countries.
7. According to OECD studies, subsidies and price support initiatives in the agricultural sector have provided farmers with a disincentive to rotate

crops. By concentrating their plantation in the subsidized crop, farmers end up practising monoculture, which is known to be one of the main causes of soil erosion and of overuses of fertilizers and pesticides. These comments are not theoretical but based on national experience. Until the early 1980s, the agricultural sector in Brazil was highly protected. When liberalization began, a series of inefficiencies in the use of Governamental support became evident. During this period of intervention, a moment of growth in domestic agricultural production did indeed occur, but important production factors were wasted. The protection of the environment and the introduction of sustainable production practices then ranked very low in among farmers' priorities. As a consequence, the agricultural sector became very dependant on Governamental support and this situation brought about a series of trade and environment related problems, many of which Brazil still has to cope with today. Yet, as described later in this paper, the Brazilian agricultural sector has benefitted from positive outcomes from the trade liberalization process.

AGRICULTURE INCOME AND INVESTMENTS IN SUSTAINABLE TECHNOLOGY METHODS.

8. Today in Brazil research and development in agriculture is focused on the sustainability of the sector. New production methods take into account agronomic, social, economic and ecological aspects. Because of the rich biological, climate and soil diversity in Brazil, farm exploitation may have different impacts on the environment, which requires different models of sustainable production that meet federal and local environmental regulations.
9. One important aspect of the introduction of sustainable production methods in Brazil has been that private producers are increasingly the main investors in research and development in the agricultural sector. The availability of revenues (which come no longer from Governamental subsidies) is the key factor for the development of appropriate environmental technologies. The issue of the increase in agricultural income is directly linked to the introduction of environmental management systems in agriculture, and increased rural income will obviously depend on better market access conditions for commodities.

THE CASE OF CONSERVATION TILLAGE OR NON-TILLAGE SYSTEMS

10. The success of the use of Non-Tillage method in soya, corn, millet and sorghum in Brazil demonstrates how trade liberalization and, consequently, the increase in rural incomes enables the introduction of more sustainable production practices.
11. Brazil is the second largest world producer of soya. While 1/3 of national production goes to the internal market, the other 2/3 are exported - which represented US\$ 3.8 billion in 1995. As a result, the revenue yielded by soya depends on Brazil's access to foreign markets. These revenues were decisive in determining the conditions for the introduction of **Conservation Tillage** or the **Non-Tillage Planting System** in the cultivation of soya.
12. Conventional tillage provides a smooth, unridged soil surface that can encourage serious runoff and erosion problems on sloping crop land. In contrast, the Non-Tillage Planting System leaves at least 30 per cent of the field surface covered with crop residue after planting has been completed and involves reduced or minimum tillage. This planting system prepares a seedbed 2 inches wide or less, leaving most of the surface undisturbed and still covered with crops residues. The result is a wetter, colder environment that protects the seed and soil with its insulating effect on the surface residue. Non-Tillage requires investments in specific seeding machinery and in appropriate technology and techniques, as well as rotation of crops and diversification of species.
13. Thanks to the protective layer of crop residues (the mulch), the Non-Tillage System results in several environmental benefits for soil management, including:
 - reduction by more than 90 per cent of soil erosion;
 - reduction of floods and silting of riverbeds;
 - stabilization of soil temperature and moisture levels, thus favouring biological processes in the soil; and
 - increase of the organic components in the soil.

14. Concerning the use of herbicides in the Non-Tillage System, the practice of crop rotation and the use of green manure, together with the appropriate use of chemical products has resulted in a reduction of approximately 80 per cent of the amount used in Conventional Tillage. Recent experiments with corn have reduced the use of herbicides to zero in the post-plantation process.
15. Concerning greenhouse gas emissions, particularly CO₂ emissions, studies in the United States have demonstrated that the tilling process in the Conventional System results in a loss of organic matter and emission of carbon dioxide, thus contributing to the greenhouse effect. A wider diffusion of the Non-Tillage System could absorb up to 16 per cent of CO₂ emissions by fossil fuels. As it is a highly mechanized process, the Conventional System is also responsible for high levels of CO₂ emissions. Non-Tillage has been responsible for a reduction of 64 per cent to 74 per cent of CO₂ emissions.
16. Another significant positive environmental effect of the use of the Non-Tillage System is related to the conservation of biodiversity, since it encourages the development of biomass and biological activity in the soil. At the same time, the enrichment of soil nutrients has a highly positive effect on agricultural productivity and consequently there is no need to expand the arable area into native forests.
17. Since 1990, the use of the Non-Till System as a sustainable production practice in Brazil was used for almost 6 million hectares during the 1996/1997 harvest, and represented an increase of approximately 1 million hectares of soya per year. Around 1.5 million hectares of Non-Till is being used in the Cerrado region - the largest tropical area where this planting technique is applied. In the state of Paraná (one of the largest soya and corn producers in Brazil), for instance, while in 1995 Non-Till was used in nearly 40 per cent of the soya plantation area, today it has reached 60 per cent. In that state, the productivity levels with conventional planting have been negative (5.4 per cent), as opposed to a productivity of 44 per cent with the Non-Till System for soya (and 38 per cent for corn).