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Fourth meeting
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Item 16 of the provisional agenda*

SOCIO-ECONOMIC CONSIDERATIONS

Note by the Executive Secretary

*Compilation of views and case-studies concerning socio-economic impacts of living modified organisms***

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* UNEP/CBD/BS/COP-MOP/4/1

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SUBMISSIONS FROM PARTIES AND OTHER GOVERNMENTS

CHINA

[11 DECEMBER 2007]
[SUBMISSION: ENGLISH/CHINESE]

Socio-economic Considerations: At its second meeting, the COP-MOP requested Parties, other Governments and relevant international organizations to submit their views and case-studies, where available, concerning socio-economic impacts of living modified organisms (Decision BS-II/12, paragraph 5).

Main imports of LMOs to China as of now are GM-Soybeans, GM-cotton, GM-corn and GM-rape. Except for the transgenic cotton which may be used for commercial plantation, all other transgenic crops are used for processing. Foreign R & D companies are importing transgenic crop species for research purposes in small area of environmental release. Risk assessment on imported LMO is in compliance with the Regulations on Risk Assessments of Agricultural LMOs and is important part of risk assessment on ecological safety as well. In recent years China has undertaken researches on the socio-economic impacts by GM-cotton, GM-rice and GM-poplar trees.

For all that China has relatively inadequate research on the socio-economic impacts of LMOs and is facing many obstacles and impediments. On one hand China has complex ecological environment and its economy developed on an imbalanced basis. On the other hand China is short of research staff and inadequate financial support. And thirdly, the rapid development of LMOs is presenting big challenges to the monitoring and management.

COLOMBIA

[4 DECEMBER 2007]
[SUBMISSION: SPANISH]

Colombia no cuenta actualmente con estudios de caso sobre el impacto socioeconómico.

NORWAY

[13 DECEMBER 2007]
[SUBMISSION: ENGLISH]

Decision BS-II/12 – Socio-economic impacts

Paragraph 5 of Decision BS-II/12 of the second meeting of the Conference of the Parties serving as the Meeting of the Parties to the Cartagena Protocol requests Parties, other Governments and relevant international organizations to submit their views and case-studies, where available, concerning socio-economic impacts of living modified organisms.

The Annex of Decision 7 A of the sixth meeting of the Conference of the Parties to the CBD, environmental impact assessment is "*a process of evaluating the likely environmental impacts of a proposed project or development, taking into account inter-related socio-economic, cultural and human health impacts, both beneficial and adverse*".

Paragraph 1 of Article 26 of the Cartagena Protocol states that "[t]*he Parties, in reaching a decision on import under this Protocol, may take into account, consistent with their international obligations, socio-economic considerations arising from the impact of LMO on the conservation and sustainable use of biological diversity, especially with regard to the value of biological diversity to indigenous and local communities.*"

As Norway stated in our interventions at MOP2 and in our First Regular National Report, we are of the opinion that socio-economic aspects may be relevant to decisions concerning LMO.
This is reflected in the Norwegian legislation on the production and use of genetically modified organisms. For instance, socio-economic considerations may be relevant when considering co-existence between LMOs and conventional crops.

In 1993, Norway introduced the Gene Technology Act to ensure that the production and use of LMO takes place in an ethically and socially justifiable way, in accordance with the principle of sustainable development and without detrimental effects on health and the environment. These factors are described in the preparatory Proposition to the Storting, on the basis of which the Gene Technology Act was adopted in 1993 (Proposition No. 8 to the Odelsting (1992-93)). The purpose of taking these factors into account is to ensure the appropriate level of protection in balancing/weighing between the possible risks to health and the environment of the LMO under consideration, when judged against possible benefits of the release.

According to Section 17 and Appendix 4 of Regulations of 16 December 2005 No. 1495 relating to impact assessment pursuant to the Gene Technology Act, an impact assessment shall give an account of other consequences of LMO than those on the environment and human and animal health, including positive or negative effects in relation to sustainable development, ethical considerations that may arise in connection with the use of the LMO, and any favourable or unfavourable social consequences that may arise from the use of the LMO. The Regulations are accessible through the Biosafety Clearing House 1/.

The Norwegian Biotechnology Advisory Board (BAB) has developed a discussion paper on sustainability, benefit to the society and ethics in the assessment of genetically modified organisms. It is available at the website of the Advisory Board 2/. The paper has also been published on the Biosafety Information Resource Centre of the BCH.

The BAB is among the national bodies that consider and give their opinion on LMO applications in Norway, with special emphasis on ethical aspects, benefits to society and sustainable development. The BAB has so far pointed out that several of the LMO considered have do not provide any benefits to our society, either because they are not relevant for cultivation in our climate or because they are resistant to insects which do not exist in our fauna. The BAB has also considered the socio-economic consequences of LMO which are resistant to herbicides or insects, as most of the LMO commercialized so far are of this kind. The BAB has so far not been able to come to a clear and unambiguous conclusion neither on this point nor on whether the introduction of such LMO reduce the use of herbicides. Some studies show an increased use 3/, others show small, but significant reductions 4/. The overall conclusion of the BAB on socio-economic issues related to LMO is that there are very few published studies which address these issues, and that research is needed.

Socio-economic considerations have not been decisive in the decisions taken so far pursuant to the Norwegian legislation on LMO. Norway has encountered some difficulties in obtaining the information

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1/ http://bch.cbd.int/database/record.shtml?id=10278

2/ http://www.bion.no/publikasjoner/sustainability.pdf

3/ Benbrook C (2001) Do GM crops mean less pesticide use? Pesticide Outlook 204-207.
Benbrook C (2003) Impacts of genetically engineered crops on pesticide use in the United States: the first eight years. BioTech InfoNet.

4/ Brookes G, Barfoot P (2005) GM crops: the global economic and environmental impact - the first nine years 1996-2004. AgBioForum 8: 187-196.

necessary to consider socio-economic issues properly. One reason may be that the issues considered relevant were not specified in the Norwegian legislation until December 2005. Another reason may be that Norway, as a consequence of the Agreement on the European Economic Area, participates in the LMO authorisation procedures of the EC. So far all applications for deliberate release, including marketing of LMO, considered by Norway have been submitted through the EC, and the EC legislation does not place requirements on the notifiers to consider issues of socioeconomic impacts when submitting a LMO notification. The Norwegian competent authorities are currently co-ordinating a national project with the aim to look at how the concepts of sustainable development and benefit to society can be put further into operation for both the authorities and the notifiers. In addition the project will use two LMO-notifications as case studies to assess the possibilities of reaching a conclusion regarding socioeconomic impacts with the available knowledge for these two cases.

The EC Directive 2001/18/EC on the deliberate release into the environment of genetically modified organisms has been implemented in Norway through the Gene Technology Act and the Regulations mentioned above as a consequence of the Agreement on the European Economic Area. The preamble of the Directive states that a report to be issued every three years by the Commission, taking into account information provided by the Member States, should contain a separate chapter regarding the socioeconomic advantages and disadvantages of each category of LMOs authorised for placing on the market, which will take due account of the interest of farmers and consumers. Pursuant to Article 31 of the Directive, a specific report should be submitted in 2003 on the deliberate release of GMOs, including an assessment of inter alia the socioeconomic implications of deliberate releases and placing on the marked of GMOs. The report 5/ was submitted 31 August 2004 and is accessible at the following website: http://ec.europa.eu/environment/biotechnology/index_en.htm
The socioeconomic implications that are discussed are mainly the issue of co-existence of genetically modified crops with conventional and organic farming. They are discussed in Annex 4 to the report. The issue of co-existence is also commented upon in the European Commission First Regular National Report.

As a part of the ongoing Norwegian process of establishing measures for co-existence, the Norwegian Food Safety Authority has made a report about co-existence of genetically modified crops with conventional and organic crops in Norway. The report has been evaluated by the Norwegian Scientific Committee for Food Safety. The report is accessible in Norwegian at the website of the Food Safety Authority 6/ and the evaluation is accessible in Norwegian at the website of the Scientific Committee 7/. Based on these two documents and Recommendation 2003/556/EC of the European Commission, Guidelines for the development of national strategies and best practices to ensure the co-existence of genetically modified crops with conventional and organic farming, the Norwegian Food Safety Authority has prepared a draft regulation on growing etc. genetically modified plants. In addition the Norwegian Agricultural Authority has made a draft regulation on compensation for economic loss because of presence of LMO in the crop. The draft regulations are under consideration in the Ministry of Agriculture and Food.

SOUTH AFRICA

[13 DECEMBER 2007]
[SUBMISSION: ENGLISH]

Socio-economic considerations

5/ COM(2004) 575 final

6/ http://www.mattilsynet.no/mattilsynet/multimedia/archive/00026/Sameksistens_mellom__26470a.pdf

7/ Http://www.vkm.no/eway/default.aspx?pid=261&trg=MainLeft_4940&MainLeft_4940=4616:17037::0:4941:4:::0:0

Although socio-economic factors are considered during the decision-making process, we recognise the need for the development of some guidance framework. As the scope of LMOs is increasing and experiences improve, the socio-economic dimension will enjoy increased prominence in the regulatory system

UNITED STATES OF AMERICA (USA) [30 NOVEMBER 2007]
[SUBMISSION: ENGLISH]

At its second meeting, the COP-MOP requested Parties, other Governments and relevant international organizations to submit their views and case studies, where available, concerning socio-economic impacts of living modified organisms (Decision BS-II/12, paragraph 5).

Any socio-economic analysis carried out as part of a decision on import under the Protocol must be consistent with the requirements of Article 26, which clearly limits socio-economic considerations to those "arising from the impact of living modified organisms on the conservation and sustainable use of biological diversity." Parties must first analyze the impacts of LMO's on the conservation and sustainable use of biological diversity and only then may consider socio-economic issues arising from those impacts. Any broader interpretation of socio-economic considerations falls outside of, and is inconsistent with, the scope of the Protocol. When considering socio-economic issues as part of the decision-making process, Parties should take a balanced approach that considers socio-economic benefits that may accrue from the use of LMO's. Article 26 also requires that as Parties take account of socio-economic considerations, they do so in a manner consistent with their other international obligations such as those under the World Trade Organization and the Sanitary and Phytosanitary Agreement.

SUBMISSIONS FROM ORGANIZATIONS

AFRICABIO

[9 JANUARY 2008]
[SUBMISSION: ENGLISH]

The submission from AfricaBio consisted of 16 documents. Their titles and locations on the Biosafety Information Resource Centre of the Biosafety Clearing-House are as follows:

- "Three Seasons of Subsistence Insect-Resistant Maize in South Africa: Have Smallholders Benefited?", https://bch.cbd.int/database/record.shtml?id=44718;
- "Global Impact of Insect-Resistant (Bt) Cotton", https://bch.cbd.int/database/record.shtml?id=44715;
- "Aspects of Biotechnology and Genetically Modified Crops in South Africa", https://bch.cbd.int/database/record.shtml?id=44714;
- "Farm-Level Economic Performance of Genetically Modified Cotton in Maharashtra, India", https://bch.cbd.int/database/record.shtml?id=44713
- "Economic impact of transgenic crops in developing countries", https://bch.cbd.int/database/record.shtml?id=44710;
- "Impacts of GM cotton and maize on household livelihoods in South Africa", https://bch.cbd.int/database/record.shtml?id=44708;
- "Bt Maize for Small Scale Farmers: A Case Study", https://bch.cbd.int/database/record.shtml?id=44706;
- "Economy-wide Impacts of Bt Cotton", https://bch.cbd.int/database/record.shtml?id=44705;
- Overview of the Socio Economic Benefits of Agricultural Biotechnology in South Africa, http://bch.cbd.int/database/record.shtml?id=44686;
- The Use of Genetically Modified Crops in Developing Countries, http://bch.cbd.int/database/record.aspx?id=44688;
- Biotechnology In Africa: The Adoption and Economic Impacts of Bt Cotton in the Makhathini Flats, Republic Of South Africa, http://bch.cbd.int/database/record.aspx?id=44690;
- Benefits from Bt Cotton Use by Smallholder Farmers in South Africa, http://bch.cbd.int/database/record.aspx?id=44693;
- Parables: Applied Economics Literature About the Impact of Genetically Engineered Crop Varieties in Developing Economies, http://bch.cbd.int/database/record.aspx?id=44695;
- Bt Cotton In South Africa: Adoption and the Impact on Farm Incomes Amongst Small-Scale and Large Scale Farmers, http://bch.cbd.int/database/record.shtml?id=44696;
- Bt Cotton in KwaZulu Natal: Technological Triumph but Institutional Failure, http://bch.cbd.int/database/record.shtml?id=44702; and
- GM Crops: The First Ten Years - Global Socio-Economic and Environmental Impacts, http://bch.cbd.int/database/record.shtml?id=44668.

ALL INDIA CROP BIOTECHNOLOGY ASSOCIATION [29 NOVEMBER 2007] [SUBMISSION: ENGLISH]

The submission from the All India Crop Biotechnology Association consisted of two documents: one on the "Socio-Economic Impact of Biotechnology in India: Overview of Empirical Studies" and the other "A Case Study from India". They are available here https://bch.cbd.int/database/record.shtml?id=44672 and here http://bch.cbd.int/database/record.shtml?id=44840, respectively on the Biosafety Information Resource Centre of the Biosafety Clearing-House.

ARGENTINE COUNCIL FOR INFORMATION AND DEVELOPMENT OF BIOTECHNOLOGY [19 NOVEMBER 2007] [SUBMISSION: ENGLISH]

The submission from the Argentine Council for Information and Development of Biotechnology consisted of a study on "Ten Years of Genetically Modified Crops in Argentine Agriculture". It is available here http://bch.cbd.int/database/record.shtml?id=44646 on the Biosafety Information Resource Centre of the Biosafety Clearing-House.

BASE INVESTIGACIONES SOCIALES [5 DECEMBER 2007] [SUBMISSION: ENGLISH]

The submission from BASE Investigaciones Sociales consisted of two book chapters, "The Crop-Sprayed Villages of Argentina" and "The Refugees of the Agroexport Model". They are available here https://bch.cbd.int/database/record.shtml?id=44682 and here https://bch.cbd.int/database/record.shtml?id=44680, respectively on the Biosafety Information Resource Centre of the Biosafety Clearing-House.

BIOTECHNOLOGY COALITION OF THE PHILIPPINES [28 NOVEMBER 2007] [SUBMISSION: ENGLISH]

The submission from the Biotechnology Coalition of the Philippines consisted of a paper on "Economic, Environmental and Social Benefits of Adopting Agricultural Biotechnology in the Philippines". It is available here http://bch.cbd.int/database/record.shtml?id=44670 on the Biosafety Information Resource Centre of the Biosafety Clearing-House.

BRAZILIAN COUNCIL FOR BIOTECHNOLOGY INFORMATION [13 NOVEMBER 2007] [SUBMISSION: ENGLISH]

The submission from the Brazilian Council for Biotechnology Information consisted of a case study of the "Economic and Environmental Benefits of Biotechnology in Brazil". It is available here https://bch.cbd.int/database/record.shtml?id=44678 on the Biosafety Information Resource Centre of the Biosafety Clearing-House.

CENTRE FOR CHINESE AGRICULTURAL POLICY [30 NOVEMBER 2007]
[SUBMISSION: ENGLISH]

The submission from the Centre for Chinese Agricultural Policy of the Chinese Academy of Sciences consisted of a case study of the "Socio-economic Impacts of GM Crops in China". It is available here https://bch.cbd.int/database/record.shtml?id=44674 on the Biosafety Information Resource Centre of the Biosafety Clearing-House.

CROPLIFE AUSTRALIA LIMITED [26 NOVEMBER 2007]
[SUBMISSION: ENGLISH]

The submission from CropLife Australia Limited consisted of two papers, one on "Socio-Economic Benefits of Agricultural Biotechnology: Canola and Australian Farming Systems", the other on "Canola and Australian Farming Systems 2003-2007". They are available here http://bch.cbd.int/database/record.shtml?id=44648 and here http://bch.cbd.int/database/record.aspx?id=44652, respectively, on the Biosafety Information Resource Centre of the Biosafety Clearing-House.

FOOD AND AGRICULTURE ORGANIZATION [16 SEPTEMBER 2005]
[SUBMISSION: ENGLISH]

FAO published an "Annotated bibliography on the economic and socio-economic impact of agricultural biotechnology in developing countries". The document brings together a wide range of assessments of economic and socio-economic impact of agricultural biotechnology, including LMOs in developing countries. FAO also published a major review, the 2003-2004 State of Food and Agriculture report, which explores the potential of agricultural biotechnology – especially transgenic crops – to meet the needs of the poor. This includes the socio-economics impacts.

FAO is organizing an International Dialogue on Agricultural and Rural Development in the 21st Century: Lessons from the Past and Policies for the Future in Beijing, China in September 2005. It will cover the role and impact of biotechnology in agriculture and rural development under the theme Frontiers of Science for Agriculture in the 21st Century. The paper and relevant information are available at http://www.fao.org/es/ESA/beijing/topics_04.htm.

FRIENDS OF THE EARTH INTERNATIONAL [30 NOVEMBER 2007]
[SUBMISSION: ENGLISH]

Views on socio-economic considerations to be incorporated into decision-making related to Living Modified Organisms

1. Introduction

Living Modified Organisms (LMOs) may have adverse impacts on the social and economic aspects of people's livelihoods. Such social and economic adverse impacts derived from the use of LMOs need to be addressed by decision-makers.

2. Socio-economic considerations in the context of the Cartagena Protocol on Biosafety

Article 26 of the Cartagena Protocol on Biosafety (CPB) affirms that "the Parties, in reaching a decision on import under this Protocol or under its domestic measures implementing the Protocol, may take into account, consistent with their international obligations, socio-economic considerations arising from the impact of living modified organisms on the conservation and sustainable use of biological diversity, especially with regard to the value of biological diversity to indigenous and local communities".

First of all, the scope of the activities under consideration would refer to import and domestic procedures, so it includes a non-exhaustive list of activities like transit, handling and use of LMOs.

Secondly, adverse impacts on the livelihood of local and indigenous communities would be included within the socio-economic aspects to be considered in the framework of article 26 CPB. LMOs are living organisms that may be introduced in the "biodiversity" of a certain context, so once they are introduced, if they have negative impacts in the territories introduced and on the livelihood of the people occupying such territories, it certainly would be a situation to be considered within the context of article 26 CPB. Socio-economic considerations arising from the impact on human health need to be also included in the light of article 1 and 4 of the CPB which requests Parties to take into consideration human health.

Thirdly, the impact of LMOs into biodiversity, the livelihoods of local and indigenous communities and human health should include direct, indirect and long-term impacts:

- Impacts arising directly from the LMO itself into biodiversity, the livelihoods of local and indigenous communities and human health. For example contamination of organic crops from LMOs, and loss of economic value.
- Impacts arising indirectly from the LMO into biodiversity, the livelihoods of local and indigenous communities and human health. For example negative impacts derived from the use of agrochemicals directly associated with the release of LMOs, or impacts derived from the associated economic model attached to the LMO, like interdiction to replant the seeds, and royalty payments.
- Impacts arising on the long term derived from the LMO into biodiversity, the livelihoods of local and indigenous communities and human health. For example an element that may be taken into consideration by decision-makers is the long-term impacts on aquatic ecosystems derived from the introduction that large scale cultivation of genetically modified (GM) maize may have in the livelihood of local and indigenous communities.

Finally in what concerns the issue of how socio-economic considerations are taken into account, article 26 is not providing much information, however there are multiple measures that can be taken in this respect. Here you are some examples:

- Inclusion of socio-economic impacts into current risk management and assessment procedures
- Creation of a specific "socio-economic evaluation" into decision-making for LMO impacts. Associated to this could be the set up of a new body particularly created to evaluate socio-economic impacts, or mandating an existing body –that incorporates the relevant experts- to do so.
- Adequate public consultation on socio-economic aspects that ensures effective access to information and public participation prior to decisions related to LMOs, including referendums.

3. Examples of socio-economic impacts and its consideration

In recent years numerous examples of socio-economic impacts related to the release of LMOs have been identified in many places around the world. Below there are a few examples:

3.1 Socio-Economic impacts derived from the contamination of GM crops:

The extent of cultivation of GM crops and the problems to control the transfer of transgenes into conventional crops is causing social and economic impacts on farmer communities around the world. Manifold farmers who never bought and planted GM crops have been subject to socio-economic impacts.

3.1.1 Socio-economic impacts on farmers derived from contamination with unauthorized GM crop varieties: The StarLink case

The StarLink contamination scandal provides an example of socio-economic impacts derived from the contamination of the seed and food supply with a GM crop not authorized. StarLink is a variety of GM maize not authorized for human consumption, which entered the food supply and contaminated more than 80 different maize seed varieties in the United States. Many farmers who never bought or grow StarLink corn seed were contaminated by that variety and incurred in significant economic costs.

Several of those farmers launched a court case against the company responsible, and a settlement was agreed at $110,000,000. Such financial resources were made available for farmers that suffer contamination from StarLink who never bought StarLink seed. The members of the Class Action got paid for lost market value, transportation, and storage costs resulting from contamination of their crops, fields, equipment and property, with a cap of $10 million per claimant.

In 2006 another unauthorized variety, this time of GM rice called LL601 contaminated the rice supply in the United States. Rice farmers claimed to have suffered socio-economic impacts derived from that contamination and several lawsuits were launched.

3.1.2 Socio-Economic impacts on conventional farmers from contamination with authorized GM varieties

Conventional farmers who never bought and planted GM crops have suffered significant economic and social impacts due to the contamination of their seed by LMO varieties. One of the most well-known cases is the Canadian farmer Percy Schmeiser, a west Canadian canola grower, who has been saving his seeds for decades. Forty years of research in his canola has been lost due to the fact that Monsanto's GM canola contaminated his field. Not only his field was contaminated but Monsanto launched a lawsuit against him for alleged "illegal use of their technology", getting him involved in additional economic costs. In 2004 though, the Supreme Court of Canada ruled that Mr. Schmeiser did not have to pay Monsanto anything, as he did not profit from the presence of Roundup Ready canola in his fields.

3.1.3 Socio-Economic impacts on organic farmers from GM crop and pesticide contamination

Contamination of organic products has been occurring in many places around the world since GM crops were released into the environment. Organic farmers in Canada for example launched a petition against the developers of GM crops due to the economic costs they incurred because GM canola crashed their market for the oilseed. In Brazil in 2007, according to well-documented Brazilian civil society reports, many cases of contamination of organic soy have been identified in the country. In Paraguay, according to Paraguayan newspapers, in November this year members of the indigenous community of kuetuwyve succeeded in stopping a soy landowner, which was planting soy in the nearby area of their land, precisely where they were cultivating organic sugarcane. The planting of GM soy nearby put at economic risk the organic certification, particularly due to the risk of pesticide drift to their organic sugarcane. Fortunately in that particular case it was reported that the competent authorities of the National Service of Seed and crop health and quality (SENAVE) proceeded with the destruction of all the soy invading the illegal area nearby the indigenous community.

3.2 Socio-Economic impacts on farmer communities derived from agronomic failure of GM crops

Many small farmers in Andhra Pradesh had been affected by the adverse impacts derived from well-documented agronomic failures of Bt cotton in several districts. In May 2005, the GEAC refused to renew the licenses for the sale in Andhra Pradesh of the three first-ever GM cottonseed varieties authorized for commercialization in India: Monsanto's Mech-12 Bt, Mech-162 Bt and Mech-184 Bt. The reason given was that the varieties had been found ineffective in controlling pests in Andhra Pradesh. The decision was taken after adverse reports were received from about 20 farmers' organizations in the region; the organizations further demanded that the unauthorized Bt cotton be seized before the sowing season. The Andhra Pradesh government also called in the High Court regarding compensation to farmers. As State Agriculture Minister N. Raghuveera Reddy said: "if they do not pay the compensation amount before this cotton season, we will not hesitate to cancel their license".

3.3 General socio-Economic considerations arising from the impacts on biodiversity and human health.

In Argentina and Paraguay the soybean expansion has advanced associated with huge socio-economic impacts on biodiversity and human health. Deforestation and damage to the human health of local and indigenous communities has been a constant paradigm of the soy expansion in South America. In Argentina for example in the neighbourhood of Ituzaingó, which is surrounded by fields of GM soy, the health of the population has been put under siege due to pesticide drift associated with the GM soy. In 2005 testing detected agrochemicals in the blood of children between 4 and 14 years, and increasing health problems were detected in a large part of the population.

The impacts on biodiversity and human health are directly affecting the livelihoods of the rural communities. For instance it is interesting to note that in Paraguay the soy expansion in the rural areas is increasing rural poverty instead of decreasing it. Population living below the poverty line has worsened in Paraguay from 33,9% affected in 2000 to 39,2% in 2005 -with levels even higher to 40,1% in rural areas-.

3.4 Socio-Economic considerations as the basis for measures that restrict or ban GM crops

A Party may take into account socio-economic considerations arising from the impact of LMOs on biodiversity, on the livelihoods of local and indigenous communities and human health. Parties may decide to take restrictive measures in order to assess socio-economic aspects. For example the South African government in 2005 communicated that it had placed a moratorium on import approvals, pending the outcome of a socio-economic study by the Department of Trade and Industry.

Such considerations may include the potential adverse socio-economic impacts derived from Living Modified Organisms, but as well may take into consideration the potential socio-economic benefits of LMOs. Taking into account the potential socio-economic benefits of LMOs means assessing whether a certain LMO provides benefits at the social and economic level. For example socio-economic aspects have been considered, amongst others by the French Government in the context of their decision to suspend the commercialisation of pesticide-resistant LMOs in France in October 2007. The Government recognized that they have doubts about the current benefits of pesticide-resistant LMOs, and. that decisions on LMOs need to be made for the "public interest not just on commercial interest".

4. Conclusions and Recommendations

This paper shows that LMOs have caused and continue to cause socio-economic impacts at different levels in several countries around the world. The adverse socio-economic impacts on biodiversity, the

livelihoods of local and indigenous communities, and on human health need to be adequately assessed and taken into account by decision-makers who will make decisions in the context of their biosafety obligations under the Protocol or under their domestic legislation. Additionally, those decision-makers may take into account considerations arising from the assessment of the socio-economic benefits of the LMOs.

The views and experiences of farmers, Indigenous Communities and any group that is impacted by LMOs need to be taken into account and incorporated adequately into decision-making. The Meeting of the Parties of the Biosafey Protocol should explore how such views and experiences may be properly taken into account in decision-making on biosafety related activities, as well as should consider providing more specific guidance on the issue.

GLOBAL INDUSTRY COALITION

[30 NOVEMBER 2007]
[SUBMISSION: ENGLISH]

**Article 26 of the Cartagena Protocol on Biosafety (Protocol):
Experiences of the Global Industry Coalition**

Further to Decision BS-II/12 requesting Parties, other Governments and relevant international organizations to provide to the Executive Secretary their views and case-studies, where available, concerning socio-economic impacts of LMOs, please find below the views of the Global Industry Coalition (GIC) 8/ *in response to this request.*

Any consideration of socio-economic impacts in decision-making must remain within the scope of the language of Article 26 of the Protocol, which requires that these considerations: (a) must be taken into account in a manner consistent with Parties' international obligations; and (b) must be limited to those arising from the impact of living modified organisms (LMOs) on the conservation and sustainable use of biological diversity. Work on this issue should focus on continued research and information-exchange.

1. **Parties should limit any consideration of socio-economic impacts of LMOs under the Protocol in accordance with the provisions in Article 26.1.**

Article 26 of the Biosafety Protocol establishes the right of Parties to take into account socio-economic considerations arising from the impact of LMOs with regard to the conservation and sustainable use of biodiversity in reaching a decision on whether to import these organisms or under domestic measures implementing the Protocol. However, when Parties are taking these impacts into account, Article 26.1 places several constraints on this consideration. Firstly, Parties must limit any consideration of socio-economic impacts of LMOs to those impacts *on the conservation and sustainable use of biological diversity*. Broadening the scope and type of socio-economic considerations to those beyond this limitation would be inconsistent with the provisions of the Protocol, reduce the transparency of the regulatory process, and increase the overall cost and length of time required in regulatory decision-making.

8/ The Global Industry Coalition (GIC) for the Cartagena Protocol on Biosafety receives input and direction from trade associations representing thousands of companies from all over the world. Participants include associations representing and companies engaged in a variety of industrial sectors such as plant science, seeds, agricultural biotechnology, food production, animal agriculture, human and animal health care, and the environment.

Secondly, such considerations may only be taken into account consistent with Parties' existing international obligations. While the parameters of this limitation have not yet been explored in the Protocol context, consideration of existing obligations under the World Trade Organization (WTO) Agreements and those found under other international standard-setting bodies provide guidance to the Parties on this issue. Decisions and guidance provided under the Protocol must take this limitation into account and avoid outputs that would jeopardize Parties' abilities to comply with their other legal obligations.

For example, the WTO Agreement on Sanitary and Phytosanitary Measures (SPS Agreement), which applies to all sanitary and phytosanitary measures that affect trade, allows WTO Members to take into account economic factors when assessing the risk to animal or plant life or health and determining the appropriate measures to be applied. These economic factors include: the potential damage in terms of loss of production or sales in the event of entry, establishment or spread of a pest or disease; the costs of control or eradication in the territory of the importing Member; and the relative cost-effectiveness of alternative approaches to limiting risks. 9/ WTO Members must then apply the least trade restrictive measure in meeting their appropriate level of protection. Therefore, to be consistent with the existing international obligations found in the SPS Agreement, relevant socio-economic considerations under the Protocol would have to be limited to a clearly defined *economic* analysis that addresses the potential impact, either positive or negative, when applying sanitary and phytosanitary measures that affect trade of LMOs.

2. Work on socio-economic considerations should focus on cooperation on research and information exchange, as provided by Article 26.2 of the Protocol.

As recognized by the Parties, 10/ information sharing about the potential positive and negative impacts of LMOs on the conservation and sustainable use of biodiversity is an important part of the public education and awareness activities necessary for informed choice and public acceptance of biotechnology. In addition, cooperation with regard to research and information exchange about the potential positive and negative socio-economic impacts of LMOs, including impacts on indigenous and local communities, can be useful for government regulators, public research institutes, private sector, academia, and other stakeholders as well as the public at large. As such, the GIC supports efforts to identify ways and means for useful cooperation.

It is important that discussions concerning this item are limited to the mandate in the Protocol and, in particular, to the current work plan that focuses exclusively on cooperation on research and information exchange. Given that extensive peer-reviewed material is already available about the socioeconomic impacts of biotechnology products, including to smallholder farmers and local communities, the GIC does not believe it would be useful or appropriate for Parties to expend resources to create new programs of work or other additional activities in this area.

Accordingly, the GIC supports the decision of the Parties at their second meeting calling on Parties, other Governments and organizations to continue to cooperate on research and information exchange regarding potential socio-economic impacts of LMOs on the conservation and sustainable use of biodiversity within relevant processes under other organizations and arrangements, and to share such information on the Biosafety Clearing-House.

An example of information-sharing of peer-reviewed material about the socio-economic benefits of biotechnology can be found on the CropLife International Database of the Benefits and Safety of

9/ SPS Agreement, Article 5, para 5.

10/ See paragraph 3 of Decision BS-II/12.

Biotechnology. This tool provides access to research studies that meet agreed-upon criteria for high quality that highlight important impacts of agricultural biotech products and technologies. These studies can be easily searched in terms of crops, traits, countries, regions, and/or beneficial impact area (agronomic, environmental, safety and health, socioeconomic, developing countries or co-existence).

The information available in this database clearly demonstrates that currently grown agricultural biotechnology products provide significant socio-economic benefits to both large and smallholder farmers. These biotechnology-derived crops offer growers a superior tool to protect their crop yields from pests. This results in improved peace of mind for the farmer and can free their time and that of their families so they can choose to spend it on activities other than crop production. In addition, these studies demonstrate how biotech crops contribute to reduced pesticide sprays, which reduces the environmental impact on non-target organisms, a key component of biodiversity. The database contains 54 papers that have been identified as having information on socio-economic benefits. Please visit www.croplife.org/biotechdatabase to view the information on this searchable database.

INTERNATIONAL SERVICE FOR THE ACQUISITION OF AGRI-BIOTECH APPLICATIONS [23 NOVEMBER 2007] [SUBMISSION: ENGLISH]

The submission from the International Service for the Acquisition of Agri-Biotech Applications consisted of two briefs, one on "GM Crops: The First Ten Years – Global Socio-Economic and Environmental Impacts", the other on "Global Status of Commercialized Biotech/GM Crops: 2006". The former is available here http://bch.cbd.int/database/record.shtml?id=44668 on the Biosafety Information Resource Centre of the Biosafety Clearing-House. The latter was not included in the synthesis document and is only available for a fee so it has not been included in the Biosafety Information Resource Centre of the Biosafety Clearing-House.

PUBLIC RESEARCH AND REGULATION INITIATIVE [3 DECEMBER 2007] [SUBMISSION: ENGLISH]

Article 26 of the Cartagena Protocol states that Parties, in reaching a decision on import under the Protocol or under its domestic measures implementing the Protocol, may take into account, consistent with their international obligations, socio-economic considerations arising from the impact of living modified organisms on the conservation and sustainable use of biological diversity.

PRRI believes that this article is crucial for the functioning of the Protocol, because it makes clear that informed decision making on LMOs not only means taking into account potential impacts on the conservation and sustainable use of biological diversity, but also socio-economic impacts, including socio-economic benefits. I expand on this below.

Article 15, in conjunction with Annex III, makes clear that the process of risk assessment starts with an identification of potential adverse effects on the conservation and sustainable use of biological diversity, and ends with an assessment of whether any identified risks are acceptable or manageable. The use of the term 'acceptable' means that identified risks are 'weighed' against any beneficial impacts on the conservation and sustainable use of biological diversity. For example, the potential effects on non-target insects of an insect resistant crop plant may be outweighed by the benefits for those same non-target organisms due to the reduction in application of synthetic pesticides.

Looking at this in the broader context of environmental protection, we bring to the attention of the MOP that the two major genes presently commercialised in GMOs come from bacteria; resistance to a relatively inexpensive, environmentally friendly, and toxicologically safe herbicide, and a gene encoding a single protein conferring resistance to insects from a bacterium called *Bacillus thuringiensis* (Bt). The same bacterium with its myriad of proteins is sprayed at great expense to control insects in organic agriculture. In genetically modified Bt crops, a single Bt gene is put into the crop plants and the farmer just plants it out. The herbicide resistance allows the farmer to refrain from soil eroding and soil compacting tillage. In the use of these two genes alone between 1996-2004 there has been a saving of a million tons of petroleum, a reduction of pesticide use by 172,000 tons, resulting in a positive ecological footprint improvement of 14% globally (Brookes and Barfoot 2006).

As the use of GMOs can have many different benefits for the conservation and sustainable use of biological diversity, PRRI intends to hold a side event at MOP4 in which we will present and discuss examples of such benefits.

Turning to the topic at hand, PRRI further believes that for informed and balanced decision making, it is equally important to be able to take into account potential socio-economic benefits arising from the use of LMOs.

As experience shows, the use of GMOs can also have direct socio-economic benefits for individual farmers. For example, the reduction of pesticide use as a result of the cultivation of Bt cotton by small farmers in developing countries also has clear health benefits for those farmers who in the past were exposed to the pesticides which they sprayed manually with little pumps mounted on their backs without protective gloves and clothing, often resulting in acute illnesses, not to mention the chronic effects of long term exposure. As experience also shows, the use of Bt crops can lead to the reduction of mycotoxins in maize. Mycotoxins are cancer-causing toxins produced by fungi, which can grow on the wounds of maize plants caused by pest insects. As has recently been demonstrated in South Africa with herbicide resistant maize, it can replace hand weeding, eliminating drudgery and allowed farmers to cultivate more of their arable lands, while spending more time on other, more productive aspects of their lives. This has had the greatest impact with women farmers, allowing them to have greater time with family affairs, and has allowed HIV-AIDS infected farmers, with reduced physical capacity, to continue farming.

Looking at this in the broader context of global food security, it is important to remain aware that farmers are up against a large number of constraints in trying to provide a sustainable, sufficient, and safe supply of foods, and have a constant battle with a continuously evolving nature in trying to do so. The crops have a myriad of insect pests, diseases and weeds to cope with. There are also problems of soil erosion, drought, and flooding. Farmers have to invest heavily in tillage, fertilizer and pesticides to deal with these problems. Any solution that can be put into the crop seed; higher productivity, disease and insect resistance, resistances to inexpensive herbicides, drought tolerance, increased fertilizer use, efficiency, etc., lessens costs of inputs as well as decreases environmental impact. Breeding has helped with many crops to a point, until a genetic 'glass ceiling' was reached. Breeding can only recombine genes that a crop has on its chromosomes, e.g. if genes for a particular insect resistance do not exist in the crop's genome, no amount of breeding will ever achieve resistance. Breeding has helped less with some crops because they have a lower genetic glass ceiling, i.e. fewer genes for the breeder to work with, and several of these crops are not cultivated as much as they used to be, leaving us dependent on 4 crops for 80% of the calories in our and our livestock's diet. This is a dangerous precedent considering the possibilities for global disease and insect pandemics. Thus, for all our crops there is a need to broaden the genetic base so that the genetic glass ceiling can be breached, and that a greater diversity of crops can be cultivated. The only way to increase the genetic base is to bring in genes that cannot be brought in by breeding.

PRRI intends to present and discuss examples of these and other socio-economic benefits in the proposed side event at MOP4 mentioned above.

RED POR UNA AMÉRICA LATINA LIBRE DE TRANSGÉNICOS [28 NOVEMBER 2007] [SUBMISSION: SPANISH]

The submission from *Red por una América Latina Libre de Transgénicos* consisted of two case studies, "*Impactos de los Cultivos Transgénicos en América Latina El Caso de la Soja RR en Argentina*" and "*Impactos de los Cultivos Transgénicos en América Latina El Caso de la Ayuda Alimentaria con Soja Transgénica*". They can be found here http://bch.cbd.int/database/record.shtml?id=44721 and here http://bch.cbd.int/database/record.shtml?id=44723 on the Biosafety Information Resource Centre of the Biosafety Clearing-House.

THIRD WORLD NETWORK [27 NOVEMBER 2007] [SUBMISSION: ENGLISH]

The submission from Third World Network consisted of four documents. Their titles and locations on the Biosafety Information Resource Centre of the Biosafety Clearing-House are as follows:

- "Potential Socio-Economic, Cultural and Ethical Impacts of GMOs: Prospects for Socio-Economic Impact Assessment", http://bch.cbd.int/database/record.aspx?id=44666;
- "Socio-Cultural Aspects of Native Maize Diversity", http://bch.cbd.int/database/record.aspx?id=44664;
- "Transgenic Crops in Argentina: The Ecological and Social Debt", http://bch.cbd.int/database/record.aspx?id=44659;
- "False Hopes Festering Failures", http://bch.cbd.int/database/record.aspx?id=44657.

WORLD HEALTH ORGANIZATION [14 SEPTEMBER 2005] [SUBMISSION: ENGLISH]

The WHO in June 2005 finalized a study of the implications of modern food biotechnology on human health and development. The report was developed with input from other key organizations, notably the Food and Agriculture Organization of the United Nations and the United Nations Environment Programme. The premise for the report was that GM food production could have significant influence on human health and development in the future, and the aim was to create a broader knowledge base to achieve transparent and inclusive consensus on the broader evaluation and application of biotechnology. The report entitled "Modern food biotechnology, human health and development: an evidence based study" (http://www.who.int/foodsafety/biotech/who_study/en/index.html) reviews evidence in several broad areas related to genetically modified foods, including currently available products, the assessment of risks and benefits, the broader socioeconomic impact, ethical considerations, intellectual property rights as well as the existing regulatory capacity in countries. The study concludes that continuous case-by-case assessment of genetically modified organisms is necessary. Although no scientific proof of such effects has yet been presented, some monitoring efforts related to potential long-term effects of these products will also most likely be necessary.

At the international level 15 legally-binding instruments and nonbinding codes of practice address some aspect of GMOs. Such sector-based regulations increase the already overstretched capacity of developing countries, and present challenges to develop a fully coherent policy and regulatory framework for modern

biotechnology. In general, more holistic evaluations of GM production is needed. Because of the complexity of such evaluations further progress on international harmonization in the broader fields of assessing and promoting sustainable agriculture, biodiversity, and socioeconomic development as they relate to the further development of agricultural biotechnology and health is needed.
