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REGIONAL ONLINE REAL-TIME CONFERENCES ON SOCIO-ECONOMIC CONSIDERATIONS IN DECISION-MAKING CONCERNING LIVING MODIFIED ORGANISMS
Africa, 16 June and 5 July 2011
Western European and Others Group and Central and Eastern Europe, 21 June 2011
Latin America and the Caribbean, 23 June 2011
Asia and the Pacific, 7 July 2011
Item 3 of the provisional agenda*

SOCIO-ECONOMIC CONSIDERATIONS: SUMMARY OF SUBMISSIONS RECEIVED FROM PARTIES, OTHER GOVERNMENTS AND RELEVANT ORGANISATIONS

Note by the Executive Secretary

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* UNEP/CBD/BS/REGCONF-SEC/1/1.

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INTRODUCTION

1. Article 26 of the Cartagena Protocol on Biosafety concerns socio-economic considerations. It provides that:

> "1. 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.
>
> "2. The Parties are encouraged to cooperate on research and information exchange on any socio-economic impacts of living modified organisms, especially on indigenous and local communities."

2. The issue of socio-economic considerations was first discussed by the Conference of the Parties serving as the meeting of the Parties (COP-MOP) at its second meeting in May-June 2005. The discussion focused on paragraph 2 of Article 26 and the decision adopted by the Parties (decision BS-II/12) requested the submission of views and case studies concerning socio-economic impacts of living modified organisms (LMOs) to be considered at the fourth meeting of the Parties.

3. The fourth coordination meeting for governments and organizations implementing or funding biosafety capacity-building activities was held in February 2008. Among other things, the meeting discussed and made recommendations regarding measures for improving capacity-building for addressing socio-economic considerations in decision-making regarding LMOs. The recommendations were noted by the Parties at their fourth meeting. In paragraph 3 of decision BS-IV/16, the Parties to the Protocol invited the coordination meeting to further consider possibilities for cooperation in identifying needs for capacity-building among Parties for research and information exchange on socio-economic impacts of LMOs and to submit any recommendations for consideration at COP-MOP 5. Accordingly, the sixth coordination meeting discussed the issue and made recommendations to COP-MOP 5.

4. At their fifth meeting, in decision BS-V/3, on the status of capacity-building activities, the Parties noted the recommendations of the sixth coordination meeting. They also:

(a) Invited Parties and other Governments to submit to the Biosafety Clearing-House (BCH) their capacity-building needs and priorities regarding socio-economic considerations (para. 22);

(b) Urged Parties, other Governments and relevant organizations to submit to the Executive Secretary relevant information on socio-economic considerations, including guidance material and case studies on, *inter alia*, institutional arrangements and best practices (para. 23);

(c) Requested the Executive Secretary to convene regional online conferences to (i) facilitate the exchange of views, information and experiences on socio-economic considerations on a regional basis; and (ii) identify possible issues for further consideration (para. 24);

(d) Requested the Executive Secretary to convene, prior to the sixth meeting of the Conference of the Parties serving as the meeting of the Parties to the Protocol, subject to the necessary financial resources being made available, a regionally-balanced workshop on capacity-building for research and information exchange on socio-economic impacts of living modified organisms, with the following main objectives:

(i) Analysis of the capacity-building activities, needs and priorities regarding socio-economic considerations submitted to the Biosafety Clearing-House by Parties and other Governments, and identification of options for cooperation in addressing those needs;

(ii) Exchange and analysis of information on the use of socio-economic considerations in the context of Article 26 of the Protocol (para. 25);

(e) Requested the Liaison Group on Capacity-Building for Biosafety to give advice to the Executive Secretary on the organisation of the workshop (para. 27); and

(f) Requested the Executive Secretary to synthesize the outcomes of the online conferences and workshop and submit a report to the sixth meeting of the Parties for consideration of further steps (para. 28).

5. Pursuant to the above decision, the Secretariat issued notification 2011-16 on 20 January 2011. The notification outlines the organization of activities on socio-economic considerations emanating from decision BS-V/3. Among other things, the notification called for the submission of information in accordance with paragraph 23 and the submission of capacity-building needs and priorities in accordance with paragraph 22. The notification also indicated that the information received would be compiled for the consideration of the Liaison Group to provide advice on the organization of the workshop on capacity-building for research and information exchange on socio-economic impacts of living modified organisms.

6. The Secretariat received a large volume of information in response to notification 2011-16 (ref. No. SCBD/BS/CG/KG/JH/74729). The present document thus contains a summary or abstract from the different documents that were submitted as of 9 May 2011. It should be noted that the submissions from organizations do not necessarily represent the views of the Governments of the countries discussed in the submissions.

7. The full text of the submissions will be available online through the Biosafety Clearing-House and specifically via the Resources section of the Portal on Socio-Economic Considerations: http://bch.cbd.int/protocol/cpb_art26/resources.shtml. Where possible, a link to the resource in the Biosafety Information Resource Centre has also been provided in the summary below.

SUBMISSIONS FROM PARTIES

BOLIVIA

[1 MARCH 2011]
[ORIGINAL: ENGLISH]

Bolivian Position on Socioeconomic Considerations In the Context of the Cartagena Protocol on Biosafety

I. Summary of socioeconomic concerns related to living modified organisms

The Plurinational State of Bolivia recognizes the multiple and intertwined ecological and socioeconomic interactions that occur along the life cycle of living modified organisms (LMOs).

Based on the current knowledge, including the published literature and narratives, the Plurinational State of Bolivia recognizes that changes in biodiversity and ecosystems caused by LMOs are linked to pressing socioeconomic (SE) concerns. These changes with SE implications can be summarized in the following:

- Increased weediness
- Unforeseen adverse effects on non-target organisms
- Potential population replacement
- Contamination of wild and agricultural biological diversity
- Introduction of novel foods in the food web and with potential adverse health effects in wild fauna, farm animals as well as to human beings.

To these changes in biodiversity and ecosystems should be added the changes related to the production systems on which LMOs rely on (particularly agricultural LMOs). These are:

- Decrease in agricultural biodiversity
- Bioaccumulation of toxic substances
- Habitat destruction.

From the Bolivian perspective, these changes in biodiversity and ecosystems are related to a series of potential adverse effects on rural livelihood, public health and food sovereignty, which can be summarized (but not restricted to) by the following:

- Impacts on access to, tenure and use of natural resources key to production and sustainable livelihoods.
- Emergence of new economic risks.
- Impacts on community welfare.

In addition to these reported SE implications related to LMOs, for the Plurinational State of Bolivia of special concern are the following issues:

- Potential eco-social impacts in mega-diverse countries and centers of origin and diversification
- Current gaps of knowledge and uncertainties on the safety of LMOs and potential impact on public health.
- SE impacts on non-adopters of LMOs
- Ethical concerns related to the promotion of LMOs as part of a strategy to eradicate hunger, decrease poverty and improve health.

Under this context, the ultimate concern of the Plurinational State of Bolivia in relation to SE considerations of LMOs is their high potential to negatively impact food and health sovereignty, particularly of peasant and indigenous communities.

II. Gaps of knowledge and capacity building needs

The Plurinational State of Bolivia urges the inclusion of socioeconomic considerations (SEC) in national and international biosafety decision-making by transparent, participatory and interdisciplinary approaches in light of:

i) The objective and scope of the CPB
ii) The close and complex interrelation of multiple socioeconomic and ecological processes
iii) The principles of sustainable development

From the Bolivian perspective, there is a wide gap of knowledge on SE impacts related to LMOs, particularly in relation to local and indigenous communities.

The drivers of this limited information on SE impacts are the lack of proper methodologies to assess them, lack of knowledge on level of presence of LMOs in the environment and food webs, and underestimation of the importance of SEC in light of international trade agreements and R&D. The Plurinational State of Bolivia is of the view that capacity building on SEC should contribute overcome to these drivers of lack of knowledge by:

- Definition of SEC under the CPB.
- SE research based on the premises of ecological economics and methodological pluralism
- Methodologies for transparent and active public participation on SE impact assessment.
- Analysis of cases of biosafety or environmental decision-making that include SEC.
- SE valuation of local alternatives to LMOs

Addressing these capacity building needs on SEC and other related topics to be identified in the process would require the establishment of a working group (e.g. AHTEG) with participation of actors from different sectors.

Finally, in the Bolivian view, the effective inclusion of SEC in biosafety decision-making should not be restricted to:

- Specific LMOs, but also their related technological packages (e.g. herbicides that are used with LM herbicide tolerant crops);
- Economic and cost-benefit appraisal, but SEC in terms of sustainability with special focus on sustainability of rural and indigenous livelihoods, making the necessary specifications for mega-diverse countries and centers of origin and diversity;
- Agricultural LMOs, but also other LMOs (e.g. LM mosquitoes, LM fish, LM trees, etc.);
- Direct ecological impacts on biodiversity, but also changes in conservation, access and use of biodiversity that might weaken food sovereignty;
- General socioeconomic groups, but also vulnerable and marginalized groups (e.g. peasant and indigenous communities, rural women and youth, communities with specific health or nutritional disorders, among others), placing special attention to the development of adequate methodologies to address the needs of these groups; and

- Scholars, but also the whole range of actor potentially affected by LMOs through participatory and more qualitative research.

EUROPEAN UNION [18 APRIL 2011]
[ORIGINAL: ENGLISH]

The European Union and its 27 Member States submitted ten documents:

- **Response to notification 2011-016: European Union and its Members States submission of information on socio economic considerations.**

- **Report from the Commission to the European Parliament and the Council on socio-economic implications of GMO cultivation on the basis of Member States contributions, as requested by the Conclusions of the Environment Council of December 2008.** Brussels, COM(2011) final, document SANCO/10715/2011 Rev. 5.

- **Commission Staff Working Paper: Accompanying document to the Report from the Commission to the European Parliament and the Council on socio-economic implications of GMO cultivation on the basis of Member States contributions, as requested by the Conclusions of the Environment Council of December 2008.** Brussels, SEC(2011) final, document SANCO/10715/2011.

- **"Assessing Socio-Economic Impacts of GMOs: Issues to Consider for Policy Development",** by Armin Spoek (2010). Federal Ministry of Health; Federal Ministry for Agriculture, Forestry, Environment, and Water Management, Austria.

- **Experience with Bt Maize Cultivation in the Czech Republic 2005-2009**, by Ministry of Agriculture of the Czech Republic (Prague: April 2010).

- **Principles of co-existence**, Czech Republic.

- **Obligations for commercial cultivation of genetically modified maize in the Czech Republic.**

- **Obligations for commercial cultivation of genetically modified potatoes**, Czech Republic.

- **Summary of the report of the Czech Republic on the socio-economic implications of the placing on the market of GMOs for cultivation.**

- **"Economical impact of the introduction of GMOs into the Hungarian Agriculture"**, by György Pataki and Réka Matolay (October 2008).

1) Response to notification 2011-016: European Union and its Members States submission of information on socio economic considerations.

The document contains information on socio-economic considerations from the following Member States of the European Union: Austria, Bulgaria, Czech Republic, Germany, Hungary, Italy, Poland and the Slovak Republic. The information complements the report from the European Commission on socio-

economic implications of the cultivation of genetically modified organisms (GMOs) (see numbers 2 and 3, below.)

2) Report from the Commission to the European Parliament and the Council on socio-economic implications of GMO cultivation on the basis of Member States contributions, as requested by the Conclusions of the Environment Council of December 2008.

In December 2008, the European Council invited the European Commission and the Member States to work on the question of the socio-economic implications of deliberate releases and placing on the market of GMOs. To the end, the Commission launched a consultation of the Member States via a questionnaire. The Member States were invited to: (i) report *ex post* on the socio-economic impact of GMOs cultivated in their territory; and (ii) assess *ex ante* the possible socio-economic implications of future cultivation of GMOs. The report examines the outcome of this consultation. It notes that:

- The understanding of the meaning and scope of the socio-economic dimension of GMO cultivation varies widely among the Member States and stakeholders;
- From the contributions received, it was difficult to pinpoint clear positions or trends at national or European levels;
- In general, the contributions seemed to reflect polarised opinions built upon a limited fact-based background on the specific European context and influenced by initial perceptions on the cultivation of Bt and herbicide tolerant crops in Europe and worldwide;
- Comments largely focused on the social and economic impacts of GMO cultivation at the initial stages of the seed-to-shelves chain;
- The scientific literature and studies referred to by contributors were mostly focused on economic impacts of GMO cultivation on the in-farm level;
- Contributions from some Member States included detailed suggestions on whether and how to analyse socio-economic factors and address them in the management of GMO cultivation in Europe; and
- Many contributions underlined that, if carried out in the future, evaluations of socio-economic factors should also consider ethics and take into account other European policies as well as legal opportunities and constraints at the international level.

The report also looks at socio-economic dimensions of GMO cultivation in third countries and summarizes EU-funded research projects to date that have addressed socio-economic perspectives of GMO cultivation. The report concludes by identifying next steps to be taken in this area. The next steps include work to define a robust set of factors to properly capture the actual *ex ante* and *ex post* socio-economic consequences of the cultivation of GMOs and exploring different approaches to possibly make use of the increased understanding of the multi-dimensional socio-economic factors in the management of GMO cultivation in the EU.

3) Commission Staff Working Paper: Accompanying document to the Report from the Commission to the European Parliament and the Council on socio-economic implications of GMO cultivation on the basis of Member States contributions, as requested by the Conclusions of the Environment Council of December 2008.

The Commission staff working paper accompanies the report outlined in number 2, above. It contains the questionnaire prepared by the Commission on the socio-economic implications of the placing on the market of GMOs for cultivation; non-exhaustive summaries of individual contributions of the 25 Member States that answered the questionnaire; and a bibliography of the available peer-reviewed literature on the socio-economic dimensions of the cultivation of GMOs.

4) "Assessing Socio-Economic Impacts of GMOs: Issues to Consider for Policy Development".

This report was an attachment from Austria to the EU submission. The report is motivated by the conclusions of EU Council of Environment Ministers of December 4, 2008, asking the European Commission to explore the possibility to consider other factors beyond health and environmental risks, i.e. "socio-economic benefits and risks and agronomic sustainability" (all covered by the term socioeconomic in this report) in GMO market authorisation. While socioeconomic issues have played a major role in the long standing EU debate on GMOs, there is, however, very little experience in explicitly and systematically assessing socioeconomic impacts of GMOs. Against this backdrop, this report aims to identify and explore the issues relevant to the topic and provide recommendations for policy development and further research. Research was structured along the following main questions: (i) what are socioeconomic effects of GMOs and what are the relevant issues and controversies? (ii) Whether and how can socioeconomic effects be differentiated or clustered e.g. according to the specific GMO, the intended application or the type of release? (iii) How could socioeconomic effects be assessed in the course of GMO market authorisations? Furthermore (iv), the study should explore the awareness and views of Austrian stakeholders on this topic. The study draws on a review of published literature and policy documents as well as phone interviews with stakeholders in Austria.

Note: the report was also included in the submission from Third World Network. See their submission in the section on "Submissions from Organizations" below.

5) Experience with Bt Maize Cultivation in the Czech Republic 2005-2009.

This study provides an overview of Bt maize cultivation in the Czech Republic between 2005 and 2009. It includes the results of a survey of Czech Bt maize growers and the advantages and disadvantages of Bt maize cultivation. It also includes findings from varietal testing of Bt maize in the Czech Republic between 2004 and 2008, results of monitoring the biological effectiveness of Bt maize in the country between 2006 and 2008 and the economics of Bt maize cultivation in the Czech Republic.

6) Principles of co-existence.

The document outlines the rules on co-existence in the Czech Republic that apply to conventional farming, organic farming and farming of GM crops.

7) Obligations for commercial cultivation of genetically modified maize in the Czech Republic.

8) Obligations for commercial cultivation of genetically modified potatoes.

These two documents outline the obligations on farmers who grow or intend to grow GM maize or potatoes in the Czech Republic. The obligations include requirements to inform other farmers and the Ministries of Agriculture and Environment, maintain isolation distances, label the final products and maintain cultivation records.

9) Summary of the report of the Czech Republic on the socio-economic implications of the placing on the market of GMOs for cultivation.

The Czech Republic consulted with stakeholders in order to respond to the questionnaire from the European Commission. Most of those consulted listed a number of positive socio-economic implications of GMO cultivation. A number of negative socio-economic implications were also identified by the stakeholders consulted. In the area of agronomic sustainability, most of those consulted stated that the cultivation of GM crops resulted in a decrease in the use of pesticides and the phenomenon of the development of pest resistance does not relate exclusively to GM crops.

10) "Economical impact of the introduction of GMOs into the Hungarian Agriculture".

This report summarizes the state of the international agricultural biotechnology industry and its regulatory environment. It includes an evaluation of agricultural biotechnology in the food supply chain by examining experiences at the level of the farmer, the food industry and the end consumer. It also examines the effects of agricultural biotechnology on the national economy and explores issues relating to co-existence. The report concludes with the following proposals for Hungarian agricultural policy:

- On the basis of the experiences gained thus far, there is no evidence to indicate that the production of first generation GM crops improves the productivity or decreases the costs of farmers to result in increased competitiveness.

- The majority of consumers in both Europe and Hungary is opposed to GM foods, does not wish to consume GM products and expects GM products to be unequivocally labelled in order to guarantee customers the right to freely make their choice. The characteristics of the market demand do not make it economically feasible to avert to the production of GM crops or to support their growing.

- The tendencies exhibited by the food market indicate that comfortable, safe and healthy foods are going to continue increasing market share. In the eyes of consumers, the GM products presently available do not meet these criteria and consumers do not feel that these benefits would be attained. In fact, they generally increase an uncomfortable feeling in consumers, decrease the trust that consumers have in foods and in the related institutional system, which can easily have a backward effect on the competitiveness of the agricultural sector in the form of food scandals.

- Consumers are not in need of more information concerning GM foods, but their trust should be increased regarding the safety of the food supply chain, the regulating authorities and the credibility and legitimacy of the other players on the market.

- The freedom of choice of farmers might be upheld through the continued application of coexistence regulations. At the same time however, thorough and detailed regional evaluations are necessary to be able to assess economic feasibility next to technological

sustainability. In the case of certain circumstances or characteristics, the production of GM crops in certain regions can lead to a decrease in the competitiveness of the agricultural sector by taking away the possibility of organic farming as well as the competitive strategy based on geographical labelling concerning source and protection.

- The application of biotechnology in agriculture transforms the agricultural ecosystem and can also manifest effects on numerous levels of biodiversity; these effects will not limit themselves to areas under agricultural cultivation, but will irreversibly influence even natural protection areas in a manner that cannot be anticipated beforehand. Agricultural ecosystems are important parts of European and Hungarian nature protection and serve as institutes for the protection of biological diversity. It is well known that the EU gained a significant environmental contribution with the accession of Hungary. A price can basically not be put on the economic value of this asset, although it also appears in several sectors besides agriculture (for example, tourism). The effects of agricultural biotechnology thus include these sectors and their values and result in consequences that cannot be scientifically foreseen – precaution is therefore very much substantiated.

- The application of biotechnology in agriculture can have an effect on agriculture that totally transforms its social characteristics and traditions. Its effects on ownership structures, market relationships, the use of certain regions and microregions, and biodiversity will all have effects on society by benefits and costs being distributed in different degrees between the various concerned groups. Agricultural policies therefore have to face issues of societal justice. This demands that all those involved in domestic agriculture participate in a democratic forum that includes a wide stratum of society and that concerns the future of sustainable agricultural practices.

MEXICO

[4 & 28 April MARCH 2011]
[ORIGINAL: SPANISH]

The Government of Mexico submitted four documents:

- **"Report of the visit of staff from the Executive Secretariat of the Inter-Secretarial Commission on Biosafety of Genetically Modified Organisms to the villages of the Yaqui tribe in the State of Sonora",** 18-20 de marzo 2009.

- **"Political Rights and Social Organization: the Case of the Yaquis and the Mayos",** Doctoral thesis by Alejandro Figueroa.

- **A list of publications regarding socio-economic considerations.**

- **Capacity-building needs regarding socio-economic considerations.**

1) "Report of the visit of staff from the Executive Secretariat of the Inter-Secretarial Commission on Biosafety of Genetically Modified Organisms to the villages of the Yaqui tribe in the State of Sonora".

The Biosafety Law on Genetically Modified Organisms (La Ley de Bioseguridad de los Organismos Genéticamente Modificados - LBOGM), specifically article 108, paragraph 3, determines

that the Inter-Secretarial Commission on Biosafety of Genetically Modified Organisms (CIBIOGEM), must carry out studies and take into account socio-economic considerations resulting from the effects of GMOs that are to be released into the environment in the national territory. In doing so, it must establish mechanisms for consultation and participation of indigenous peoples and communities that inhabit the areas where the GMOs will be released, taking into account the value of biological diversity.

To that effect, the Executive Secretariat of the CIBIOGEM (SEj), in coordination with the National Commission for the Development of Indigenous Peoples (CDI), took some actions to verify whether the provisions in paragraph 3 of article 108 were being followed.
In this regard, the present document aims to share the experience of the Government of Mexico in its task of complying with the legal mandate regarding mechanisms for consultation and participation of indigenous peoples and communities.

2) "Political Rights and Social Organization: the Case of the Yaquis and the Mayos".

Background paper to the report above.

3) List of publications regarding socio-economic considerations:

The list is available through the document exchange function of the online Portal on Socio-Economic Considerations. It may be found via: http://bch.cbd.int/protocol/cpb_art26/resources.shtml.

4) Capacity-building needs regarding socio-economic considerations.

An unofficial translation of the capacity-building needs regarding socio-economic considerations identified by the Government of Mexico is provided below. The original Spanish submission is available through the document exchange function of the online Portal on Socio-Economic Considerations. It may be found via: http://bch.cbd.int/protocol/cpb_art26/resources.shtml.

The Government of Mexico, in response to Notification ref: SCBD/BS/CG/KG/jh/74729 pertaining to Section IV of Decision BS-V/3 of the Fifth Conference of the Parties to the Convention on Biological Diversity serving as the meeting of the Parties to the Cartagena Protocol on Biosafety (COP-MOP 5) regarding paragraph 22 which invites Parties and other Governments to submit their capacity-building needs and priorities with respect to socio-economic considerations, identified the following needs:

- Carry out a complete assessment of the impact of genetically modified crops in Mexico, over a specific period (proposal 1996-2010). One would seek to collect information from different public and private institutions regarding developments in the adoption of the technology, taking into account the comparative examination of changes in agricultural practices and the economic, social and ecological dividends.

- Need to further develop infrastructure and human capacity for the integration and systematization of information generated in the country regarding the economic and social impacts of biotechnology use.

- Need to increase capacity to carry out assessments of the socioeconomic effects of the use of GM mosquitoes for the control of dengue in tropical zones in our country *versus* conventional methods of insecticide use, and also consider the possible expansion of the impact area of this disease due to climate change.

- Have realistic prospects with regard to the agro-biotechnological and commercial development of genetically modified varieties in crops of strategic importance to the country. The objective is to compile updated information on different agro-biotechnology development projects of strategic crops on a technical, economic-financial and social level. This would assist in creating precise and accessible indicators to encourage the affiliation of scientific-technological, productive and financial organizations so as to consolidate viable options for the development of these crops.

- To strengthen capacity to carry out comparative estimates of the agricultural, forest and fishing production systems, etc. using genetically modified organisms *vs* conventional systems insofar as they contribute to the mitigation of and adaptation to climate change and what potential effect this contribution has on the society as a whole.

- To strengthen capacity for the development of comparative studies of the economics of ecosystem services that incorporate real costs (or benefits) of different production systems, so as to have elements to encourage sustainability and reduce carbon emissions.

- Identification of potential production niches and regional value chains to improve the supply of national oilseed. Based on information compiled regarding the cultivation of genetically modified soybean and canola, one could establish a useful framework to facilitate the responsible adoption of this technology, keeping in mind marketing, agronomic and socio-economic aspects.

- To strengthen capacity regarding the creation and evaluation of public policy that achieves a balance between precaution and innovation and considers the protection of biological diversity in terms of the environment, employment, social development, importance for indigenous and local communities, as well as low carbon growth.

- Capacity for the creation of interdisciplinary studies to carry out *ex ante* analyses and methodological guides.

- Meetings where developers may exchange information on the impact of genetically modified organisms on the sustainable development of diversity.

- Exchange of information with the private sector regarding advances in the detection and supervision of genetically modified organisms.

NIGER

[27 JANUARY 2011]
[ORIGINAL: ENGLISH]

CAPACITY BUILDING NEEDS AND PRIORITIES REGARDING SOCIO-ECONOMIC CONSIDERATIONS

Socioeconomic characteristics

The population of Niger is composed of eight major socio-linguistic groups characterized especially with respect to their socio-cultural identity and are divided into several subgroups. They are more than 85% and are mostly rural farmers but may work in addition in other secondary activities such as crafts, fishing or trade. They therefore depend mainly on natural resources and are organized in communities whose relations with this environment are strongly influenced by cultural facts.

Niger's population of 15790 352 inhabitants in 2009 (FMR, 2009) with 50.14% of women. The population growth rate is one of the highest in the world

Rural activities (agro pastoral) remain the main work of nearly 90% of Nigerians. Croplands occupy about 12% of the total (3 605 000 ha in 1996).

Livestock is one of the biggest wealth activity of Niger. Much of the country unsuitable for rained agriculture has mainly pastoral vocation.

The economy of Niger republic is relatively diversified and remains at rudimentary stage. Mean income rate of population was estimated at U.S. $ 280 in 1992 against U.S. $ 302.9 in 1961-63, U.S. $ 462.7 in 1981-83. With a real growth rate estimated in 1998 to 4.5%, and can be estimated at U.S. $ 970.

In conclusion, after reviewing the general features of the country, it emerges that the biological resources and natural environment remain the sole medium of all systems of production and therefore for survival. In Niger, that idea is even more relevant as the country's economy is largely dominated by agriculture which is unfortunately subjected to various climatic constraints, leading to food insecurity and recurrent periods of famine in several localities of the country.

Indeed, each year there are 10 to 30% of the population cereal needs losses over of 50%, and nearly 100,000 hectares of farmland were unproductive. This situation is especially worrying because its effects come in addition with high population growth (3.2% according to estimation made recently (population info N ° 33, January 2010)), causing an imbalance between the needs that continue to growth and natural resources which only deteriorate.

In this situation, especially modern biotechnology may well be a solution for Niger to significantly improve the living conditions of the population especially in the field of agricultural production.

Following authorization for release, handling, use, etc. of LMO in the national territory, a system of control, monitoring and assessment will be established to monitor potential effects on human health, biological diversity and socio-economic environment. It is in this spirit that a structure responsible for inspection, monitoring and assessment has been taken into account in structuring the national biosafety framework. The monitoring will also prepare a report which will discuss all the difficulties of implementing the framework.

Capacity building needs

The development and implementation of a National Biosafety Framework in Niger, particularly socio-economic considerations must take into account the lack of qualified human resources, material and financial resources which require a significant support.

Scientific and technical needs

- Training scientists on qualitative and quantitative methods for research and monitoring;
- Provide technical and financial support for reference laboratory equipments;
- Establish expertise in the following specialties: Plant Genetics, Entomology, Taxonomy, Plant Pathology, Agronomy, Environmental Impact Assessment, and Epidemiology;

- Organize training, information and awareness sessions of actors (government, civil society, scientists, community bases, private sector etc..) on LMOs socio-economic impacts;
- Establish regional and international cooperation for sharing experience.

Legislative needs

- Application decree on the circulation, marketing and use of LMOs;
- Application decree on the control and monitoring of LMOs produced or imported in Niger;
- Application decree establishing the conditions for introduction in Niger of animal, plant or other genetically modified products;
- Application decree on reparations for damages resulting from the use of LMOs on the property of others.

NORWAY

[28 FEBRUARY 2011]
[ORIGINAL: ENGLISH]

The Government of Norway submitted two publications:

- **"GMO Assessment in Norway as Compared to EU Procedures: Societal Utility and Sustainable Development"**. A report by the Directorate for Nature Management (DN) of Norway, May 2009.

- **"Sustainability, Benefit to the Community and Ethics in the Assessment of Genetically Modified Organism: Implementation of the Concepts set out in Sections 1 and 10 of the Norwegian Gene Technology Act".** Published by The Norwegian Biotechnology Advisory Board. 2nd revised edition May 2006, translated into English November 2009.
  Also available in the Biosafety Information Resource Centre: http://bch.cbd.int/database/record-v4.shtml?documentid=42106.

1) GMO Assessment in Norway as Compared to EU Procedures: Societal Utility and Sustainable Development

The overall mandate of the study was to assess how and to what extent marketing applications for GMOs fulfil the criteria of sustainable development and societal utility in the Norwegian Gene Technology Act. The authors identified four objectives: a) elaborate how the Norwegian authorities can use the procedures implemented in the EU system; b) discuss how the concepts of sustainable development and societal utility can be applied in a broader sense; c) evaluate the information provided in two given GMO marketing applications, with a focus on the adequacy of the supplemented information; and d) develop recommendations concerning the assessment of sustainable development and societal utility. The report is based on a desk study of available literature and documentation.

2) Sustainability, Benefit to the Community and Ethics in the Assessment of Genetically Modified Organisms

The purpose of the Norwegian Gene Technology Act is "to ensure that the production and use of genetically modified organisms 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" (Section 1 Purpose of the Act). In section 10 of the Act (Approval), it is stated that "...Deliberate release of genetically modified organisms may only be approved when there is no risk of

detrimental effects on health or the environment. In deciding whether or not to grant the application, significant emphasis shall also be placed on whether the deliberate release represents a benefit to the community and a contribution to sustainable development...". The Norwegian Biotechnology Advisory Board has an important role in assessing whether a proposed deliberate release ("deliberate release" includes all activities using LMOs that does not take place in facilities approved for contained use) takes place in an ethically and socially justifiable way, in accordance with the principle of sustainable development, and if the deliberate release represents a benefit to the community. "Sustainability, benefit to the community and ethics in the assessment of genetically modified organisms" is a discussion paper by the Board on how to implement the concepts of sections 1 and 10 of the Gene Technology Act in assessment of LMOs.

SUBMISSIONS FROM ORGANIZATIONS

AFRICAN CENTRE FOR BIOSAFETY [28 FEBRUARY 2011]
[ORIGINAL: ENGLISH]

The African Centre for Biosafety submitted seven documents:

- **"Threats to the Food Security and Food Sovereignty in the Eastern Cape: Impacts of the Massive Food Production Programme (MFPP), GMOs and cash crops in four villages in the Amathole District Municipality".** Study by the Masifunde Education and Development Project Trust. December 2010. Funded by: Rosa Luxemburg Foundation through the Institute of Social and Economic Research (ISER), Rhodes University and Community Technology Development Trust (Zimbabwe).

- **"Potential economic benefits of a genetically modified (GM) tubermoth-resistant potato variety in South Africa: an ex-ante socio-economic evaluation for commercial producers".** Report by the Agricultural Research Council and University of the Free State. Jordaan, AJ and Carstens, J.P. assisted by Jordaan, AD, Swanepoel, K and Sissons, D. April 2007.

- **"Smallholder potato production activities in South Africa: a socio-economic and technical assessment of five cases in three provinces".** Study by TGB Hart (HSRC) and HJ Vorster (ARC), 15 December 2006.

- **"Commercial release of GM wine yeast rejected and trial release of fungal resistant grape cultivars approved".**

- **"Bt cotton in South Africa: The case of the Makhathini farmers"**, by Elfrieda Pschorn-Strauss, Seedling, April 2005.

- **"Global Agriculture and Genetically Modified Cotton in Africa",** by Stephen Greenberg, African Centre for Biosafety, October 2004.

- **"Can the poor held GM Crops? Technology, representation & cotton in the Makhathini Flats, South Africa",** by Harald Witt, Rajeev Patel & Matthew Schnurr, Review of African Political Economy, 109: 497-513 (2006).

1) Threats to the Food Security and Food Sovereignty in the Eastern Cape: Impacts of the Massive Food Production Programme (MFPP), GMOs and cash crops in four villages in the Amathole District Municipality

Background

In 2002, the Massive Food Production Programme (MFPP) was introduced into one of South Africa's poorest provinces, the Eastern Cape under the Provincial Growth and Development Programme. This project takes a "Green Revolution" approach to "unlock the agricultural potential in underdeveloped areas" and to see a "critical mass of rural households [become] self-sufficient in carbohydrates and

proteins". This programme is a public-private partnership between government, agribusiness and local contractors.*

Genetically modified maize, soya and cotton, along with their chemical counterparts, form the core of this programme. In the first year these inputs are fully subsidised, in the second year a support subsidy of 75% is given and by the fifth year, farmers are expected to be on their own feet. This extremely top-down result has not brought prosperity to rural folk in the Eastern Cape and has been a poor substitution for urgent development needed in the area based on proper land reform, implementation of infrastructure, access to markets and appropriate technology and training.

Summary

The study "Threats to the Food Security and Food Sovereignty in the Eastern Cape: Impacts of the Massive Food Production Programme (MFPP), GMOs and cash crops in four villages in the Amathole District Municipality", looks at the failings of the Massive Food Production Programme in the Eastern Cape of South Africa, concluding that instead of support for industrial agriculture and genetically modified seed, the following would be more appropriate:

- Access to land outside the communal areas that will transform the dominant social and property relations;
- An agricultural policy with a vision and an approach to small-scale agriculture aimed at food security and food sovereignty;
- Water reform and provision of infrastructure;
- Marketing and financial support from the state for (and building on) people's own initiatives, incorporating new technologies that are being advanced in organic and agro-ecological farming elsewhere, rather than promote agri-business technologies.

2) Potential economic benefits of a genetically modified (GM) tubermoth-resistant potato variety in South Africa: an ex-ante socio-economic evaluation for commercial producers.

Background
Commercial Release of Tuber-moth resistant potato (SpuntaG2) Denied

South Africa produces over 1 million metric tons of seed and table potatoes each year. Potatoes are grown in all 9 provinces of South Africa, which encompasses many different climatic regions. This enables a continuous supply of fresh potatoes throughout the year. Around 57 000 ha are planted to potatoes in SA –fetching a gross income of 2.6 billion ZAR per annum and accounting for 3.7% of the total income from agricultural production.

In August 2008 the Agriculture Research Council (ARC) made application in terms of the South African Genetically Modified Organisms Act (Act 15 of 1997), for a general release permit in respect of potatoes that have been genetically modified to confer resistance to the tuber moth. The ARC had been involved in field trials in South Africa since 2004.

* GRAIN October 2008 Lessons from a Green Revolution in South Africa http://docs.google.com/viewer?a=v&q=cache:vDQ1VFmxAt4J:www.grain.org/seedling_files/seed-08-10-5.pdf+lessons+from+a+green+revolution+in+south+africa&hl=en&pid=bl&srcid=ADGEESiIq3EKWl1q2iXi43pQtMFUtVQt-_vhtkwLtUSpehJ8SF1rdNTgNbty1eIRkfG2-LjYK7va4zAzw-k53ehiZLzemyUU2QzfqiRjwNUGR61WFxRE0kruuTqnTP8I3IXw-8MLgwEZ&sig=AHIEtbQUQNdnqUDKpFA66FL4EcbR2zxj4w accessed 25 February 2011.

The African Centre for Biosafety engaged in the decision making process from 2006, carrying out research, gaining independent analysis of safety dossiers, consulting retailers and consumers and objecting to two field trials as well as the application for commercial release. These objections, as well as a publication entitled 'Hot Potato GM potatoes in South Africa-a critical analysis', can be found on the ACB website at http://www.biosafetyafrica.org.za/index.php/Potato/menu-id-100023.html

As a result of our investigations we came to the conclusion that the tuber-moth resistant potato was not developed in answer to pressing problems faced by South African farmers, industry or consumers. We voiced our concern that a public research institution was spending money on research that was of little use to South African farmers.

The socio-economic studies commissioned by the ARC clearly showed that neither commercial nor small-holder farmers would benefit from the technology (executive summaries of these studies are attached). In the case of commercial farmers, it was found that they were not experiencing major problems with the tubermoth and that the pest was controlled within a spraying regime designed to control more problematic pests, such as leafminer. In terms of small-scale farmers, the majority of these are located in a province where the tubermoth did not present a problem due to the climate.

In addition, the South African potato industry, represented by Potatoes South Africa, were not supportive of the project, stating that the tubermoth-resistant potato would not benefit farmers in any way but could negatively impact on market acceptance of their product.

Consumers that were consulted during our research were indeed not keen to consume GM potatoes and in the absence of any mandatory labelling laws in South Africa to afford them choice, voiced their opposition to the Spunta potato.

In October 2009 the Executive Council (EC) announced their rejection of the Agricultural Research Council's application for the general release of GM potatoes resistant to tubermoth. The EC sited both biosafety and socio-economic concerns in their final decision, listed below[†]:

- The Socio-economic impact study indicates that the commercial farmers do not anticipate this event to present a significant lowering of inputs as the same spraying regime is required to manage other pests which this event does not target
- Small scale farmers identified more pressing challenges relating to production such as lack of water, seed availability, fertilizers, etc
- No evidence is presented that other pest management strategies against PTM have been considered or compared with the release of GM-Spunta
- The applicant presents several arguments of the value of this event for small scale farmers; however, entry of these GM potatoes into the formal trade remains a particular concern. Segregation of GM from non-GM potatoes would require an Identity Preservation System which is currently not in place.
- The capacity of small scale farmers to implement risk management measures could potentially be onerous
- Considering the biology of potatoes, vegetative material (tubers) may be used for propagation, which may complicate risk management
- PTM is not a major pest for stored potatoes but rather rodents

† minutes of the meeting of the executive council under GMO Act, 1997 held on 21 July 2009 www.nda.agric.za accessed 25 February 2011

- The Western Blot of transformed potatoes was limited to protein extracts from leaves and there is an assumption that one band represents the Cry1 la1 protein. No data is presented of expression levels in tubers
- Concerns on the toxicity testing by use of an animal feeding study was conducted with cooked (boiled) potato although raw freeze dried potato would have been better suited
- No evidence is presented that known allergens of potato, namely Sol t1 (patatin) are not over expressed in the GM potato
- No actual toxicity data of the cry-protein on the target organism PTM is presented.

This decision is currently on appeal.

Summary of Report

The development of GM crops already resulted in a significant increase in output for crops such as maize, cotton, soybeans and others in South Africa. South African commercial farmers are willing to adopt biotechnology if it improves their output and profitability. Potatoes that are genetically modified through biotechnology could have a significant impact on the South African potato industry if the new cultivars improve output and quality and or reduce input costs.

This report is a follow up on the ABSP report dated July 2005 and has the objective to provide farm level data for use in the empirical model used in the 2005 report.

The survey revealed that the majority of farmers were already producing GM maize and that they would be willing to produce GM potatoes if it would have a positive impact on their profitability. The results of this study show, however, that the expected impact on the potato industry as a result of better tubermoth control by means of GM potato would not be as significant as expected. The ABSP report (2005) refers to an input cost reduction of 8% for commercial farmers, while this survey reveals that farmers could save between 1.3% and 1.7% in inputs if the price of GM seeds were to remain the same as that of current seed The average saving that can be expected by potato producers is R610 per farm on farms experiencing tubermoth problems. The reason why this amount is much lower than the normal chemical expenditure is because the farmer interviewed indicated that they had other more serious problems such as leaf miner and that they had to control other insects as well. The same chemicals designed for tubermoth also control leaf miner and other insects.

The results clearly show that tubermoth is a major problem only in the Ceres production area where farmers spend twice as much to control tubermoth than in the rest of South Africa. Kwa-Zulu Natal appears to be the production area with the most insignificant tubermoth problems, with only a few farmers stating that they were experiencing minor tubermoth infestations. The tubermoth as a problem was ranked low by the farmers from all other regions in South Africa except in the Ceres region and that is one of the main reasons why the farmers interviewed were of the opinion that the GM potato would not have any significant impact on their production.

Farmers also mentioned that they had other cultivars available with a higher yield potential than the new GM cultivar and they did not expect a rapid adoption rate with the new potato. Most farmers, however, agreed that they are willing to introduce GM potatoes if it would significantly improve productivity.

The survey revealed that the farmers interviewed were of the opinion that the number of sprays would not be influenced significantly, since most farmers were following a fixed spray programme designed to control all insects and pests. The same chemicals designed for tubermoth control also controls other insects, and the farmers expected that they might be able to save on one or a maximum of two sprays.

They also indicated that the GM potato would have no impact on labour utilisation, since they normally used permanent labour and not seasonal labour for spraying.

The farmers interviewed were less concerned about the marketability of GM potatoes in South Africa than expected. Most of the farmers were of the opinion that the South African consumer would purchase the product if it were accompanied by a proper marketing promotion effort. However, the producers interviewed were of the opinion that the export market for potatoes would be influenced negatively. More than half of the producers indicated that they are of the opinion that other African countries and Europe would not import GM potatoes.

It appears that farmers in general would agree to introduce GM potatoes into their production planning on condition that the new technology significantly increases their profits. The GM potato with tubermoth resistant genes might not have the expected rapid adoption rate amongst farmers, since most farmers have tubermoth infestation under control at a reasonable cost.

3) "**Smallholder potato production activities in South Africa: a socio-economic and technical assessment of five cases in three provinces".**

Excerpt from summary

The current study focused on socio-economic conditions and agricultural practices of smallholder potato farmers in South Africa. The study attempted to identify smallholder potato farmer constraints and needs. This included the diversity of purposes for production along with practises pests, and disease prevalence. The studies were done in the form of a survey in five villages in three provinces. Mpumalanga and KwaZulu-Natal (resource poor, mainly subsistence farmers) were identified for their high production potential for smallholders due to rainfall, but the areas differed in climate, seed availability and extension exposure. The southern Cape was identified for farmers with slightly better access to resources (resource medium, smallholder commercial) in this area.

The variability of responses within and between villages highlighted the different types of farmers found in South Africa. This study only gives a snapshot view of what is happening with specifically selected farmers. The results of this study cannot be used to generalise at the village or even broader level, but it does give trends in terms of the constraints and needs of smallholder potato farmers. The reports can only comment on what was found in these five villages at the specific time the surveys were done, and the reader must keep this in mind when looking at results. More in-depth studies need to be done at the village level to help address area specific farmer needs. Many of these challenges can be related to practises throughout the production cycle and the means to implement these but others depend largely on agro-ecological and socio-economic circumstances and diversity. Focussing on adapted technology development and dissemination would help many of these farmers to achieve a better quality and yield of potatoes.

4) "Commercial release of GM wine yeast rejected and trial release of fungal resistant grape cultivars approved".

Summary

As of 2006 wine was South Africa's single most valuable agricultural export and the country was the world's 9th largest exporter of wine. The export value of the product is starting to exceed that of local wine sales, illustrating the increasingly important role that wine plays in maintaining the country's balance of payments. In addition, wine tourism market is valued at about three times the value of wine

exports, with about 28 000 people being employed in the industry. There have been two applications in South Africa for GM wines – one for malolactic yeast and another for fungal resistant grapes.

In December 2006 the Cape Wine Makers Guild prepared a media release unequivocally rejecting the "commercial use of GM organisms in any South African wine", citing potential damage to their hard-won environmentally sound image and fears of market rejection.[‡]

In September 2007 the South African government announced their rejection of Warren-Chem's application for the general release of GM malolactic yeast, used in the process of wine making. The major basis for this decision was both resistance from the local wine industry as well as the very high possibility of the rejection of GM wines by South Africa's major exporting partners in the European Union.[§]

Despite their decision to reject the release of malolactic yeast for wine in 2007 based on the possibility of consumer rejection, the Department of Agriculture announced their approval of field trials of GM fungal resistant grape cultivars in September 2009[**]

The application was submitted by the Department of Viticulture and Oenology in the Institute for Wine Biotechnology (IWB) at the University of Stellenbosch (US) to evaluate long-term stability and expression of introduced genes in the grapevine cultivars (*Vitis vinifera*) Sultana and Chardonnay, designated as TSGn (Transgenic Sultana) and TCGn (Transgenic Chardonnay). The focus of the grapevine biotechnology programme at the US was fungal disease resistance.

When this application was submitted in 2006, a random survey conducted by the NGO Biowatch South Africa found that almost 75% of wine estates were unaware of the application to grow GM grapes and of those who knew about the applications, half were opposed, primarily relating to economic considerations. The objections to these field trials by two NGO's, the African Centre for Biosafety and Biowatch South Africa can be found at:
http://www.biosafetyafrica.org.za/images/stories/dmdocuments/Objections_GM_Wine_TSGn_TCGn_10_10_06.pdf and http://www.biowatch.org.za/docs/grapevine_objection.pdf

5) "Bt cotton in South Africa: The case of the Makhathini farmers"

We have a few widely publicised studies proclaiming the benefits of Bt cotton for small farmers, including higher yields and reduced pesticide use. However, the growing evidence of farmers' experiences points to a darker reality, as shown by this article in South Africa. Bt cotton has not proved to be sustainable in terms of reducing pesticide use nor in terms of improving income for farmers. In many areas insect resistance management plans are not known by farmers and therefore not followed. Secondary pests are becoming a major problem and in some areas, such as in India, Bt cotton simply did not perform. Far from addressing the problems faced by small farmers, reports from the field show that Bt cotton exacerbates their poverty. Alternative methods for reducing pesticide use in cotton are not promoted even though it has proven to be very successful. Bt cotton is just a distraction that maintains the pesticide industry and lures countries of the South into accepting GM.

[‡] http://www.wosa.co.za/sa/news_article.php?id=1080

§ Minutes of the meeting of the executive council under GMO Act, 1997 held on 18 September 2007 www.nda.agric.za accessed 25 February 2011

[**] Minutes of the meeting of the Executive Council under GMO Act 1997 held on 12 2009 www.nda.agric.za accessed 25 February 2011

The article summarises the results of five years of research undertaken by Biowatch South Africa on the socio-economic impact of Bt cotton on small-scale farmers in South Africa. The key findings and conclusions from the research project are as follows:

- adoption rates were high in the first three years and then dropped dramatically;
- farmers have accumulated massive debts and the community and government is subsidising cotton production;
- farmers planting Bt cotton still use pesticides;
- Bt cotton does not address farmers' needs and constraints;
- Bt cotton has benefited better-off farmers and businessmen at the expense of the poor;
- there is little support for farmers and no implementation of biosafety practices.

6) "Global Agriculture and Genetically Modified Cotton in Africa"

Introduction

There is a strong push to spread the commercial planting of genetically modified (GM or transgenic) cotton into Africa's core cotton growing regions. Yet the language of poverty reduction and humanitarianism that is used to justify this is a thinly veiled disguise for the global expansion of transnational corporate interests. There are many reasons to be wary of the introduction of genetically modified organisms into agriculture. These include environmental and health concerns, lack of certainty about economic benefits, ethical and even spiritual concerns, and issues related to the use of technology for sectional interests. This paper will focus on the socio-economic and political implications of the introduction of this technology. Historical precedent, and an understanding of existing social structures and the uneven power relations underpinning them cannot be ignored in this discussion.

Under capitalism, investment only has value if profits are realised at some point. This means that there is a drive to realise profits on past investments in technological research and development (R&D), regardless of long-term or hidden social, political, economic, environmental or other costs that might be incurred by some sections of society. Smallholder African cotton producers, generally resource poor and lacking in adequate support, are now the targets for profit making. Building on the social devastation left by colonialism and still all too apparent across Africa, the introduction of GM crops seeks to restructure political, social and economic systems yet further to the primary benefit of corporate activity. Nation states play an important role in facilitating these processes of technology-driven development and economic concentration by maintaining and restructuring regulatory frameworks as required. The challenge for Africa is not only how to resist this imposition, but also how the African populace can reassert control over political and economic processes that unfold in its name but seldom to its benefit.

7) "Can the poor held GM Crops? Technology, representation & cotton in the Makhathini Flats, South Africa"

The adoption of Genetically Modified (GM) cotton in South Africa's Makhathini Flats in 1998 was heralded as a case in which agricultural biotechnology could benefit smallholder farmers, and a model for the rest of the continent to follow. Using historical, political economic and ethnographic data, we find the initial enthusiasm around GM technology to be misguided. We argue that Makhathini's structured institutional framework privileges adopters of GM technologies through access to credit and markets. The adoption of GM cotton is symptomatic not of farmers' endorsement of GM technology, but a sign of the profound lack of choice facing them in the region.

EUROPEAN NETWORK OF SCIENTISTS FOR SOCIAL AND ENVIRONMENTAL RESPONSIBILITY [28 FEBRUARY 2011] [ORIGINAL: ENGLISH]

ENSSER submitted twelve documents:

- **ENSSER submission for the SEC online discussions.**

- **ENSSER second submission for the SEC online discussions.**

- **"Coexistence of plants and coexistence of farmers: is an individual choice possible**?", by Rosa Binimelis. Journal of Agricultural and Environmental Ethics (2008)

- **"Catalan agriculture and genetically modified organisms (GMOs) — An application of DPSIR model",** by Binimelis, R., et al., Ecological Economics (2009), doi:10.1016/j.ecolecon.2009.02.003.

- **"A Precautionary Approach to Genetically Modified Organisms: Challenges and Implications for Policy and Science"** by Anne Ingeborg Myhr. Journal of Agricultural and Environmental Ethics (2010).

- **"GMO assessment in Norway: societal utility and sustainable development"** by Myhr, A. I. and Rosendal, G.K. Published in European Molecular Biology Organization Reports, Volume 10, No. 9, 2009.

- **"GM crops on trial: Technological development as a real-world experiment"**, by Les Levidow and Susan Carr. Published in Futures 39 (2007) 408–431, 2006.

- **"A Joint Memorial recognizing the significance of indigenous agricultural practice and native seeds to New Mexico's cultural heritage and food security."** Senate Joint Memorial 38 48th legislature - State of New Mexico - first session, 2007, introduced by Carlos R. Cisneros.

- **Bill 361 (Draft) of the State of Hawai'i, U.S.A**.

- **Regional Council of the Regional Government of Cusco. Regional By-law N° 010-2007-CR/GRC Cusco**

- "**Transgenic potatoes will not be released by CIP in the Andean countries".** Press Release by the International Potato Center - Centro Internacional de la Papa – CIP. 2007.

- **State of Minnesota - A Bill for an act relating to environment; modifying provisions for regulating genetically engineered organisms; requiring a study**; amending Minnesota Statutes 2006, sections 116C.92; 116C.94, subdivision 1; 116C.97, subdivision 2.

1) ENSSER submission for the SEC online discussions

This submission focuses on recent research in Spain on coexistence issues around Bt maize and organic maize production.

The introduction of genetically modified (GM) crops into agriculture and the food chain has caused public controversy over socio-economic impacts and changes in the model of agrarian production. This conflict has been pointed as an example of a modern reflexivity, with an increasing concern on how modern biotechnology affects the social interests and values, and on what risks are imposed to society (Devos et al. 2008; Lewidow and Carr 2007). Even though this huge public controversy, GM crop introduction has been mainly discussed in the scientific literature from a technical perspective. In spite of the aspiration to an integrated approach, socio-economics aspects of biosafety have been much less studied than the technical ones (Rosendal & Myhr 2009; Myhr 2010). Following it, decisions on GM crops are characterised by giving a central role to biotechnology expertise, in contrast to other areas such as ecology or sociology (Funtowicz and Strand 2007).

In the European context, most of studies dealing with socio-economic considerations of GMOs were conducted ex-ante, based on modeling and experimental cases, or were done at the theoretical level due to the lack of commercial fields. For this reason we consider important the contribution made by Binimelis (2008) analyzing the conceptualization and implementation of ‘‘coexistence’’ in Catalonia and Aragon (NE of Spain) where 23,000 and 35,900 ha of GM maize were sown respectively, during 2007. The analysis revealed a social confrontation between proponents and opponents of GM technology. In that sense, without an agreement of the objectives to be achieved, the technocratic coexistence policy framework leaded to a legitimacy crisis. There were thus confronting ideas on the feasibility to establish isolation distances or segregate the product and regulate liability in case of admixture, responding to contrasting world-views.

The study analysed also the difficulties that “organic” farmers face in practice in order to claim compensation if “contamination” takes place, due to technical uncertainties (e.g. for measuring the level of “contamination” or its origin) and because of social constraints. Individually affected “organic” farmers suing for compensation due to economic losses would be obliged to identify the farmer responsible for the contamination, leading to local confrontation in small villages. Moreover, beyond economic compensation, the technical coexistence framework in Europe between transgenic and “organic” agriculture is constrained within the quantifiable economic aspects derived from the admixture of GM and non-GM crops. Other socio-economic extra-market goods or “bads” (e.g. loss of trust among consumers, admixture of GMOs with local varieties, increase of farmer’s dependency on external inputs), are excluded as they cannot be objectively quantified or are incommensurable. As a result, the area devoted to organic maize has been reduced significantly (by 75% in Aragon and 95% in Catalonia,) since the first analysis for the detection of GM traces were conducted. Framing the problem as a technical issue, without considering the social conditions in which the technology and the management measures are implemented, and to what degree they will be observed, resulted not in coexistence but in the promotion of GM agriculture over organic agriculture.

Besides it, other lessons that can be learnt from this case study are:

- The need to engage non-scientific experts with relevant local knowledge in the risk assessment procedures.
- Effective public participation requires unrestricted access to public information.
- There is an urgent need to collect and analyse existing case studies on socio-economic impacts, and to undertake new ones in emerging socio-economic aspects.
- Socio-economic impacts of GMOs should be assessed before but also during their introduction.
- Careful attention should be paid to the contamination cases involving local maize varieties. The mentioned studies in Spain have demonstrated that some of these local varieties can no longer be used for futute plantings.

The Spanish experience shows that the GE and non-GE coexistence is a fallacy under the present social conditions in Spain.

2) ENSSER second submission for the SEC online discussions

This submission focuses on examples of legislation and policy recommendations that take into account socioeconomic considerations in biosafety with regard to indigenous issues.

1) Chili

Research institutions in New Mexico (USA) are working on genetic engineering of chili. After protests from indigenous and other groups, the State Senate in 2007 adopted a "joint memorial recognizing the significance if indigenous agricultural practice and native seeds to New Mexico's cultural heritage and food security". The memorial amongst others recommends measures to prevent the contamination of native seeds with transgenes in urging "that the legislature support the efforts of the New Mexico food and seed sovereignty alliance to prevent genetic contamination of native seeds, strengthen small-scale agriculture and increase the cultivation of native crops in their communities".

2) Coffee and Taro

Researcher on Hawai'i (USA) had been working on genetically engineering of taro and coffee. After protests from indigenous and other organisations, the County of Hawai'i in 2008 adopted an ordinance that bans the testing and use of GE taro and coffee in order "to protect the taro kalo and coffee industry from genetic engineering and preserve agriculturally-based practices and cultural traditions". In 2009, The County of Maui adopted a similar ban on GE taro.

3) Potato

Researchers in Peru had been working on genetic engineering of potatoes. After protests from indigenous and other organisations, the CIP in a 2007 press release declared that in 2006 it has "decided that genetically modified (GM) potatoes would not be disseminated by CIP in the Andean zone, which includes the countries of Peru, Bolivia, Ecuador, Colombia, Venezuela, Argentina and Chile. Potatoes were first domesticated in what is modern-day Peru. [...] CIP is deeply committed to responsible development and dissemination of new technologies. We feel that there is not yet an adequate understanding of potential environmental risks and cultural consequences associated with the introduction of transgenic potatoes in the center of diversity." Also in 2007, the government of the region of Cusco declared the region to be a zone free of transgenic organisms in oredr to protect traditional crops in their center of origin from contamination by transgenes.

4) Wild Rice

Indigenous organisations in Minnesota (USA) raised concern about the ongoing research on genetic engineering of rice that might impact small and indigenous farmers in several parts of the world. Wild rice - not related to rice - is a traditional food plant for the indigenous peoples in Minnesota which also is sold to the markets to bring additional income. In order to protect wild rice against future impacts of genetic engineering, the State Senate in 2007 adopted a bill that obliges the Environmental Quality Board to inform all stakeholders about releases of GE wild rice in the USA and calls for a wild rice study. Furthermore the Environmental Quality Board is enabled to regulate activities with GE wild rice in Minnesota.

3) “Coexistence of plants and coexistence of farmers: is an individual choice possible?”

The introduction of genetically modified organisms (GMOs) in Europe has been characterized by controversy. In 2002, the European Union introduced the concept of “coexistence” as a compromise

solution that, through the establishment of science-based technical measures, should allow the market to operate freely while reducing policy conflicts on GMOs. However, the concept remains highly contested and the technical measures difficult to apply. This paper presents qualitative research on the conceptualization and implementation of the coexistence framework in two regions of Spain (Catalonia and Aragon), where 42% and 55% of maize was GM in 2006, respectively. In this context, the concept of coexistence and its proposed implementation both fail to resolve previous conflicts and actually work to generate new ones through the individualization of choice and impacts. Considerations of the social conditions in which the technology and the management measures are implemented were not taken into account. This resulted in the promotion of biotechnological agriculture over other alternatives.

4) "Catalan agriculture and genetically modified organisms (GMOs) — An application of DPSIR model"

Although there is a strong controversy regarding the introduction and commercialisation of genetically modified organisms (GMOs) in Europe, GM maize has been sown in Spain since 1998. Stakeholders' positions on the role that GMOs play in trends of the state of agriculture and environment in Catalonia are analysed. The application of the Driving forces –Pressures – State – Impact – Responses (DPSIR) framework in this case study highlights its potential for organising and structuring information. However, the model can be ambiguous when used as an analytical tool in value-laden complex situations. Thus, GM agriculture is sometimes seen as a pressure on the agro-environment and sometimes as a modernising response to an economic and environmental crisis. A redefinition of the DPSIR categories is proposed, aiming to reflect on these situations by better acknowledging different legitimate perspectives and narratives. This is done, on the one hand, by allowing alternative descriptions of causal chains and, on the other hand, by taking into consideration social and political aspects besides the relationship between economics and environmental spheres.

5) "A Precautionary Approach to Genetically Modified Organisms: Challenges and implications for Policy and Science"

The commercial introduction of genetically modified organisms (GMOs) has revealed a broad range of views among scientists and other stakeholders on perspectives of genetic engineering (GE) and if and how GMOs should be regulated. Within this controversy, the precautionary principle has become a contentious issue with high support from skeptical groups but resisted by GMO advocates. How to handle lack of scientific understanding and scientific disagreement are core issues within these debates. This article examines some of the key issues affecting precaution as a legal standard and as an approach to the use of science in decision-making processes. It is pointed out that there is a need for reflection over the level of scientific evidence required for applying the precautionary principle as well as who should have the burden of proof when there are uncertainties. Further, an awareness of the broader scientific uncertainties found in GMO risk assessment implies that a precautionary approach must be elaborated: both for acknowledging uncertainties and for identification of scientific responses. Since precaution is an important issue within the sustainable development framework, it is suggested that sustainability can provide a normative standard that can help to reveal the influence and negotiate the importance of the various forms of uncertainty. Wise management of uncertainties and inclusion of normative aspects in risk assessment and management may help to ensure sustainable and socially robust GMO innovations at present and in the future.

6) "GMO assessment in Norway: societal utility and sustainable development"

The controversy surrounding genetically modified organisms (GMOs) has been a highly politicized issue in Europe. While opponents of GM crops maintain that scientific risk assessments are

not sufficient to address potential long-term hazards for health or the environment, proponents have criticized the current regulatory framework for being influenced by political and other non-scientific interests. In this regard, it is interesting to compare the situation in Norway, which is linked to, but not bound by European Union (EU) law and which places a comparatively strict regulatory burden on GMOs. Here, we briefly present our assessment of applications to market GMOs in Norway, and how they fulfil the criteria of sustainable development and societal utility that are required by the Norwegian Gene Technology Act. The Norwegian Directorate for Nature Management in Trondheim requested the study (Myhr & Rosendal, 2009), but the results have implications beyond Norway as other countries are also exploring ways to integrate socio-economic considerations into the national regulation of GMOs.

7) "GM crops on trial: Technological development as a real-world experiment"

Through the European controversy over agricultural biotechnology, genetically modified (GM) crops have been evaluated for an increasingly wide range of potential effects. As the experimental phase has been extended into commercial practices, the terms for product approval have become more negotiable and contentious. To analyse the regulatory conflicts, this paper links three theoretical perspectives: issue-framing, agri-environmental discourses, and technological development as a real-world experiment. Agri-biotechnological risks have been framed by contending discourses, which attribute moral meanings to the agricultural environment. Agri-biotech proponents have emphasised eco-efficiency benefits, which can remedy past environmental damage, while critics have framed 'uncontrollable risks' in successively broader ways through ominous metaphors of environmental catastrophe. Regulatory authorities have translated those metaphors into measurable biophysical effects. They anticipate and design commercial use as a 'real-world experiment', by assigning greater moral-legal responsibility to agro-industrial operators who handle GM products. Expert-regulatory debate reflexively considers the social discipline necessary to prevent harm, now more broadly defined than before. Official procedures undergo tensions between predicting, testing and prescribing operator behaviour. In effect, GM crops have been kept continuously 'on trial'.

8) "A Joint Memorial recognizing the significance of indigenous agricultural practice and native seeds to New Mexico's cultural heritage and food security"

Excerpt:

NOW, THEREFORE, BE IT RESOLVED BY THE LEGISLATURE OF THE STATE OF NEW MEXICO that the legislature recognize the significance of native seeds to the cultural heritage and food security of New Mexico; and

BE IT FURTHER RESOLVED that the legislature support the efforts of the New Mexico food and seed sovereignty alliance to prevent genetic contamination of native seeds, strengthen small-scale agriculture and increase the cultivation of native crops in their communities; and

BE IT FURTHER RESOLVED that the New Mexico department of agriculture be requested to collaborate with the New Mexico food and seed sovereignty alliance in supporting traditional farmers in their communities, protecting native seeds and increasing the cultivation of native seeds by developing specific policy recommendations; and

BE IT FURTHER RESOLVED that copies of this memorial be transmitted to the governor, the director of the New Mexico department of agriculture and the secretary of Indian affairs.

9) Bill 361 (Draft) of the State of Hawai'i, U.S.A.

An Ordinance amending Chapter 14 General Welfare Hawaii County code 1983. (2005 Edition, as amended), relating to the restriction of genetically engineered Taro (Kalo) and Coffee.

Purpose.

The purpose of this article is to protect the taro (kalo) and coffee industry from genetic engineering and preserve agriculturally-based practices and cultural traditions associated with taro (kalo) and coffee within the County of Hawai'i.

Genetically engineered (transgenic) taro (kalo) unlawful.

It shall be unlawful for any person to test propagate cultivate raise plant grow, introduce or release genetically engineered (transgenic) or recombinant DNA taro (kalo).

Genetically engineered (transgenic) coffee unlawful.

It shall be unlawful to test, propagate, cultivate, raise, plant, grow, introduce or release genetically engineered transgenic or recombinant DNA coffee.

Penalty.

Any person violating any provision of this article shall be guilty of a violation and upon conviction thereof, shall be sentenced by a fine not exceeding $1,000.

10) Regional Council of the Regional Government of Cusco. Regional By-law N° 010-2007-CR/GRC Cusco.

Regulation declaring Cusco as a Centre of Origin of potato and other native crops and as free of transgenic crops. It further prohibits activities of introduction, cultivation, manipulation, storage, investigation, conservation, exchange, confined use and commercialization of GMOs in the region. Also calls for scientific studies to be carried out on the environmental, cultural and socioeconomic risks of GMOs. It also includes articles on registering traditional knowledge and working with the local and indigenous communities, universities, research centres and civil society and on the promotion and development of native organic and natural products and native crops.

11) "Transgenic potatoes will not be released by CIP in the Andean countries"

26 July 2007 – Lima, Peru. Recent internal communications from the International Potato Center (CIP), related to an educational workshop offered to Peruvian journalists on the state of potato biotechnology, have led to some confusing reports in the international press about CIP's development of a transgenic potato variety. CIP does have a transgenic potato, but this is not a new development. The potato was produced prior to 2002, as part of a research project designed to develop scientific capacity to work with these new biotechnologies. This transgenic potato is not being grown in the field in Peru or anywhere else in the world. In April 2006, the CIP Board of Trustees, including its Director General, decided that genetically modified (GM) potatoes would not be disseminated by CIP in the Andean zone, which includes the countries of Peru, Bolivia, Ecuador, Colombia, Venezuela, Argentina and Chile.

12) State of Minnesota - A Bill for an act relating to environment; modifying provisions for regulating genetically engineered organisms; requiring a study.

The Bill amends Minnesota Statutes 2006, section 116C.92 to read that the Environmental Quality Board shall notify interested parties (which includes anyone, including individuals who request

to be notified) if a permit to release genetically engineered wild rice is issued anywhere in the United States. The board shall adopt rules that require an environmental impact statement and otherwise comply with chapter 116D and rules adopted under it for a proposed release and a permit for a release of genetically engineered wild rice. The board may place conditions on the permit and may deny, modify, suspend, or revoke the permit. By February 15, 2008, the commissioner of natural resources must prepare a study for natural wild rice that includes: (1) the current location and estimated acreage and area of natural stands; (2) potential threats to natural stands, including, but not limited to, development pressure, water levels, pollution, invasive species, and genetically engineered strains; and (3) recommendations to the house and senate committees with jurisdiction over natural resources on protecting and increasing natural wild rice stands in the state. In developing the study, the commissioner must contact and ask for comments from the state's wild rice industry, the commissioner of agriculture, local officials with significant areas of wild rice within their jurisdictions, tribal leaders within affected federally recognized tribes, and interested citizens.

GLOBAL INDUSTRY COALITION [01 MARCH 2011]
[ORIGINAL: ENGLISH]

Any guidance from the Liaison Group on Capacity Building in Biosafety (Liaison Group) addressing socio-economic considerations in decision-making on living modified organisms (LMOs) should appropriately remain within the scope of the language of Article 26 of the Cartagena Protocol on Biosafety (Protocol), which requires that these considerations: must be taken into account in a manner consistent with Parties' international obligations; and must be limited to those arising from the potential impact of LMOs on the conservation and sustainable use of biological diversity. Additionally, work on this issue should respect the mandate assigned by the Parties and focus on continued research and information-exchange within this context, with the goal of informing the discussion at MOP-6 on capacity building needs in this area.

The GIC respectfully submits that the two main objectives in the MOP-5 decision requesting the Executive Secretary to organization a regionally-balanced workshop on capacity-building for research and information exchange on socio-economic impacts of LMOs provide clear guidance to the Liaison Group on the scope of their discussions at their meeting in April 2011 as follows:

(a) Analysis of Capacity-building Activities, Needs and Priorities regarding Socio-economic Considerations and Options for Addressing Those Needs

- 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.

- It is the mandate of the Liaison Group to provide input on such capacity building needs for research and information exchange on socio-economic impacts of LMOs, and focus on identifying options for meeting those needs.

- The GIC therefore strongly recommends that the Liaison Group focus its discussions on this very mandate, and not extend it beyond to efforts such as developing criteria or guidance documents that outline ways in which socio-economic issues could be considered in the decision-making process on LMOs. The GIC believes that such activities should only be undertaken on a country-by-country basis and after a thorough and informed discussion of Article 26 by the Parties that will occur at MOP-6.

- Exchange and Analysis of Information on the Use of Socio-economic Considerations *in the Context of Article 26 of the Protocol*

- Article 26 of the 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.

- 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.

- In addition, 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.

Therefore, it is important that outcomes from the Liaison Group be limited to the mandate and context of Article 26.1 of the Protocol, as requested by the Parties at MOP-5, which requires that socio-economic considerations: must be taken into account in a manner consistent with Parties' international obligations; and must be limited to those arising from the impact of LMOs on the conservation and sustainable use of biological diversity.

GRUPO SEMILLAS [25 FEBRUARY 2011]
[ORIGINAL: SPANISH]

"The failure of GM cotton in Colombia" by Germán Vélez, Grupo Semillas (2011)

Seven years following the commercial release of transgenic cotton seeds, their failure is evident. They have not fulfilled the promises of being more productive. They have neither reduced the use of pesticides and herbicides, nor diminished production costs or generated a major yield for farmers. Those who have learned lessons from this crisis are the small agriculturists, farmers and indigenous groups; they have understood that these transgenic seeds are not suited to their production systems and that, in addition, it annihilates them; for that reason they are developing multiple strategies to face them. Now the challenge for farmers is how to face the threats to biodiversity and alimentary sovereignty, that are being generated by transgenic maize seeds, that the ICA has authorized for cultivation in the country since 2007. Today, there are more and more farmers wanting to defend our native seeds and that do not want transgenic seeds entering their territory, their production systems and their food.

RAP-AL URUGUAY
RED DE ACCIÓN EN PLAGUICIDAS Y SUS ALTERNATIVAS PARA AMÉRICA LATINA

[28 FEBRUARY 2011]
[ORIGINAL: SPANISH]

RAP-AL Uruguay submitted two documents:

- "**Uruguay: socioeconomic impacts of transgenic crops"** by Maria Isabel Cárcamo (February 2011).

- **A list of web links to articles published by their organization between 2006 and 2011.**

1) Uruguay: socioeconomic impacts of transgenic crops

Abstract

The introduction of GM crops in our country (maize and soybean) has led to a number of impacts: concentration of land and production, low level of employment generation and expulsion of rural producers. It has also generated environmental impacts due to the massive use of pesticides, causing contamination of the populations that live close to these crops or rural schools which are surrounded by them, as well as destruction of flora and fauna and natural resources, which ultimately all result in socioeconomic impacts.

2) List of articles by RAP-AL Uruguay regarding socio-economic impacts of GMOs:

The list is available through the document exchange function of the online Portal on Socio-Economic Considerations. It may be found via: http://bch.cbd.int/protocol/cpb_art26/resources.shtml.

REGIONAL AGRICULTURAL AND ENVIRONMENTAL INITIATIVES NETWORK – AFRICA

[6 MAY 2011]
[ORIGINAL: ENGLISH]

The Regional Agricultural & Environmental Initiatives Network-Africa (RAEIN-Africa), a Southern Africa-based, not for profit organization is currently implementing a programme aimed at creating an enabling environment for innovative interventions that enhance poverty reduction and sustainable development in the region. The programme is funded by Netherlands Ministry of Foreign Affairs (DGIS). Through this programme, RAEIN-Africa has been supporting a number of initiatives aimed at enhancing the capacity for assessing socio-economic impacts of GMOs. This was in response to a desire by partner countries to include socio-economic considerations in biosafety decision-making as elaborated in National Biosafety Frameworks against the general lack of guidelines of how this can be done. These initiatives include:

A. In-country studies aimed at enhancing the understanding of socio-economic issues that would need to be considered in adoption of GM technologies. These studies were carried out **in Botswana, Malawi, Namibia, Swaziland, Tanzania, Zambia and Zimbabwe.** The main outcome of these studies was list of socio-economic factors considered important for subsistence farmers in the region

B. A Training workshop on Biosafety Socio-economic Considerations held in February 2010. The Workshop was organized in partnership with the University of Pretoria. Presenters included Jose Falck-Zepeda (Program for Biosafety Systems, IFPRI) and Worku Damena Yifru, CPB secretariat. The workshop was attended by 31 participants representing regulators, decision-makers and academics from 13 SADC countries i.e. (Angola, Botswana, Malawi, Namibia, South Africa, Swaziland. The three day workshop shed light on the scope, approaches, methods and experiences on conducting a socio-economic impact assessment studies and how it relates to genetically modified crops and regulation their regulation.

C. In partnership with the University of Pretoria and with technical backstopping from Jose Falck-Zepeda, RAEIN-Africa, through a multi-disciplinary team established following the training workshop composed of members from South Africa, Zimbabwe, Malawi and Namibia, been carrying out a project aimed at developing a guideline for the assessment of socio-economic impacts of GMOs. This project had a number of components as follows:
   - An *ex ante Bt* cotton study carried out in Balaka and Chikwawa districts, Malawi in April 2010 aimed at identifying potential socio-economic impacts on the farming community and cotton sector.
   - *Ex post* study on *Bt* cotton and *Bt* and HT maize studies in Makhathini, Hlabisa and Simdlangenthsa areas of KwaZulu Natal, South Africa with the aim of identifying the actual socio-economic impacts of GM crops on smallholder farmer communities.
   - Preliminary findings from the two case studies and a framework of the guideline was presented at a stakeholder's workshop in September 2010
   - The guideline was further developed by drawing information from the country studies and feedback from the regional consultative workshop.
   - The guideline development process and lessons learned were shared at a RAEIN-Africa side event at COP/MOP5 in Nagoya and feedback further enhanced the substance and development of the document. The side event was supported by the Ministry of Housing, Environment and Spatial Planning (VROM) of the Netherlands.

A synthesis report and a preliminary guideline have been compiled and will be shared upon further interrogation by partners in the region.

RED POR UNA AMÉRICA LATINA LIBRE DE TRANSGÉNICOS [28 FEBRUARY 2011]
[ORIGINAL: SPANISH]

Red por una América Latina Libre de Transgénicos (GM Free Latin America Network) submitted two documents:

- **"Con la soja al cuello. La transgénesis de un modelo",** by Diego Domínguez and Pablo Sabatino, researchers for the Gino Germani Social Studies Institute of the University of Buenos Aires.

- **"Política de ayuda alimentaria y organismos transgénicos : impactos en los países receptores. Los casos de Ecuador y Guatemala",** by Ana Lucia Bravo Robles.

1) Con la soja al cuello. La transgénesis de un modelo

A case study for socio-economic impacts of RR soy in Argentina. The case study analyzes the 2002 National Agricultural Census which confirms Argentina's transformation from the "world's granary" to a "soy 'banana' republic". Soy production and neoliberal politics first appeared in the country in the 1970s and were consolidated in the 1990s. While the country became increasingly more unequal in terms of wealth distribution and unemployment grew abruptly, the argentine countryside was on its way to farming without farmers, which was concentrated as well as exclusive.

2) Política de ayuda alimentaria y organismos transgénicos : impactos en los países receptores. Los casos de Ecuador y Guatemala ["Food Aid Policy and Transgenic Organisms: Impacts on Receptor Countries. The Case of Ecuador and Guatemala"]

The investigative article studies the impact of foreign food aid that contains transgenic organisms, on receptor countries, specifically in the cases of Ecuador and Guatemala. The impacts can be evidenced, in part, by the national production of the crops studied (maize and/or soybean) and in the additional consumption of the imported product, which assaults the alimentary sovereignty of these countries.

TERRA DE DIREITOS [28 FEBRUARY 2011]
[ORIGINAL: ENGLISH]

Terra de Direitos submitted five documents:

- **"Brazil loses control over GM corn and endangers the country's biodiversity",** published by Terra de Direitos.

- **"Genetic Engineering and Food Sovereignty - Sustainable Agriculture is the *Only* Option to Feed the World: Reader on Studies and Experiences -Threats by GM-Agriculture, Ways towards Sustainable Agriculture and Lobbying Work in Developing Countries",** by Church Development Service (EED) and Partners, Bonn/Germany, 2009.

- **2009 legal action by numerous Brazilian non-governmental organizations.**

- **2010 legal action by numerous Brazilian non-governmental organizations.**

- **Letter from Brazilian NGOs to the President of the National Council for Biosafety.**

1) Brazil loses control over GM corn and endangers the country's biodiversity

Excerpts from publication:

Similar to the case of transgenic soybeans, genetic contamination of conventional maize fields by GM corn is a reality in Brazil, even if the country's current minimum segregation requirements are observed.

Present data reveal that the country does not label properly food made of genetically modified maize and has been exporting GM grains as if they were conventional ones, contrary to decisions of the Parties to the Cartagena Protocol which indicate the necessity of identifying exported loads.

Contamination raises the question about the numerous releases of GMOs undertaken by CTNBio without due administrative process of health and environmental risk assessment.

With the seed market in the hands of a few companies, the trend indicates that in short time, all corn producers who do not have their own seeds shall be obliged to plant transgenic varieties.

In addition to offending the right of consumers to know whether they are consuming GM products, genetic contamination in the field endangers the existence of certain varieties of corn developed over hundred years by Brazilian small-scale or traditional farmers.

The dispute involving GMOs gained a new chapter in its history. By judicial decision, Bayer is now forbidden to sell its Liberty Link corn – resistant to the herbicide glufosinate ammonium – throughout Brazil, as consequence of the absence of a monitoring post-commercial release plan.

2) Genetic Engineering and Food Sovereignty - Sustainable Agriculture is the *Only* Option to Feed the World.

Preface by Directors (Claudia Warning and Wilfried Steen)

In connection with the work of the EED in the global south, we have collected the experiences of partners and EED professionals seconded by EED overseas, and looked into the question of whether or not genetic engineering is necessary in agriculture and nutrition, in order to fight rural poverty and hunger.

During the past year, the global crisis of increased food prices has played a big role in world politics. Most of the schemes to overcome the crisis were about removing 'supplyside constraints' (restrictions on the supply side) to encourage agriculture worldwide and increase production. The majority of political declarations, as for example the decisions of the G8 in the summer of 2008, proclaim a 'New Green Revolution for Africa.' This is essentially a revival of a modernisation approach that was so successful in the 1970s and 1980s, but failed miserably, even in those days, in Africa.

Today in Asia and Latin America we are faced with the ecological consequences of intensive farming that paid little respect to the environment or society. The Green Revolution is concerned with introducing small farmers to modern industrial inputs, for example, the use of inorganic fertilisers, pesticides and high-yield seeds. Yet, there is nothing to indicate that this approach in Africa functions

any better now, than it did 30 years ago. How can we take account of the negative experiences in Asia? Even the new farming technologies – and the G8 are referring here to new types of biotechnology – are not making a major difference in this respect. The approach is false, because factors related to the local environment are ignored: humans and their culture and society, of risks and is also very expensive. Therefore, varieties have to be developed, which can find wide distribution in order to recoup the high development costs. This runs counter to the knowledge that there can be no quick fixes in agriculture, that the way forward must be location-specific.

The case studies of our practical development work, presented in this Reader, document some of the problems with rural development if it relies too much on genetic engineering. The experiences also show that this genetic engineering has not only been pretty ineffective thus far, but actually puts other forms of agriculture, especially agro-ecological approaches, at risk.

Genetic engineering is no alternative to an agro-ecological approach, which is shaped by principles of diversity and improved with the involvement of local farmers. The agro-ecological, participatory approach not only promises better yields together with improved environmental conditions, but also its distribution effect is more advantageous – it is of direct benefit to poor, peasant farmers.

Most of the articles in this volume arise from a four-year, joint work project coordinated by the EED, in which 18 partners from all continents and from all departments in the EED were involved. This programme formed a mutual exchange among all participants, not just a new relationship with our partners, but also a new South-South dialogue among our partners. Its theme focused not only on the use of agro-ecological related to genetic engineering. The programme also involved joint lobbying at the international level on questions of bio-safety and sustainable agriculture. We look back on this complex, but ultimately, rich learning process, with gratitude. Our special thanks go to our overseas partners, who proved to us that development policy is no longer a one-way street. This process of mutual learning must continue!

3) 2009 legal action by numerous Brazilian non-governmental organizations.

4) 2010 legal action by numerous Brazilian non-governmental organizations.

5) Letter from Brazilian NGOs to the President of the National Council for Biosafety.

These three documents have not been summarized as they were not submitted in an official language of the United Nations. They have, however, been made available in the Resources section of the Portal on Socio-Economic Considerations in their original Portuguese. They may be found via: http://bch.cbd.int/protocol/cpb_art26/resources.shtml.

THIRD WORLD NETWORK [28 FEBRUARY 2011]
[ORIGINAL: ENGLISH]

Third World Network submitted three documents:

- **"Assessing Socio-Economic Impacts of GMOs: Issues to Consider for Policy Development",** by Armin Spoek (2010). Federal Ministry of Health; Federal Ministry for Agriculture, Forestry, Environment, and Water Management, Austria.

- **"Systemic risks of genetically modified crops: the need for new approaches to risk assessment",** by Hartmut Meyer (2011). *Environmental Sciences Europe* 2011, 23:7. doi:10.1186/2190-4715-23-7. Also available in the Biosafety Information Resource Centre: http://bch.cbd.int/database/record-v4.shtml?documentid=101542.

- **"Socio-Economic Impact of Transgenic Corn on Peasants and Lumad Indigenous Peoples in Mindanao (Philippines)".** Prepared by Sibol ng Agham at Teknolohiya (SIBAT) Inc in cooperation with Center for Lumad Advancement (CLAN) (2008).

1) Assessing Socio-Economic Impacts of GMOs: Issues to Consider for Policy Development. Final Report.

- Also submitted by the European Union and its 27 Member States. See the section above on the European Union for the summary of the document.

2) Systemic risks of genetically modified crops: the need for new approaches to risk assessment

Abstract

Purpose
Since more than 25 years, public dialogues, expert consultations and scientific publications have concluded that a comprehensive assessment of the implications of genetic engineering in agriculture and food production needs to include health, environmental, social and economical aspects, but only very few legal frameworks allow to assess the two latter aspects. This article aims to explain the divergence between societal debate and biosafety legislation and presents approaches to bring both together.

Main features
The article reviews the development of biosafety regulations in the USA and the EU, focussing on diverging concepts applied for assessing the risks of genetically modified organisms (GMOs).

Results
The dominant environmental risk assessment methodology has been developed to answer basic questions to enable expedient decision making. As a first step, methodologies that take into account complex environmental and landscape aspects should be applied. Expanding the scope of risk assessment, more holistic concepts have been developed, for example the Organisation for Econonomic Co-operation and Development (OECD) concept of systemic risks which includes socio-economic aspects. International bodies as the OECD, the Convention on Biological Diversity (CBD) and the European Union (EU) have developed the Strategic Environmental Assessment (SEA) as an instrument that includes the additional aspects of risk assessment as demanded by many stakeholders. Interestingly, there had been no attempts yet to link the existing frameworks of GMO risk assessment and SEA.

Conclusions
It is recommended to adapt current models of SEA to assess the systemic risks of GMOs. It is also suggested to revise the EU GMO legislation to promote the inclusion of SEA elements.

3) Socio-Economic Impact of Transgenic Corn on Peasants and Lumad Indigenous Peoples in Mindanao (Philippines

Lumad, meaning "born of the earth", is the collective name for the indigenous peoples and the original inhabitants of Mindanao.

The agricultural landscape of Mindanao today had been converted to predominantly export plantation agriculture of bananas, pineapple, asparagus, papaya and other export crops, while other parts are converted to aquafarms, real estate, and industrial complexes. Mindanao had thus been divided up into agri-business districts aimed at assigning sectors and projects ostensibly aimed at increasing productivity. This conversion transpires today at a rapid rate, using contract growing schemes (rental, contract farmer-grower) that ultimately result to Lumad farmers losing their land.

The introduction of the first transgenic seed (Bt corn) in the country had been within the government.'s agricultural liberalization framework supported by its modern biotechnology flagship program. Public consultations with the various stakeholders, particularly with farmers stipulated by regulation, were made with deceit by seed companies to expedite field trials. Many NGOs and farmer groups fought the government.'s pro-GMO policy and denounced multinational corporations.' control on seed resources and violation of farmers.' rights.

The implications of GMOs in agriculture, health and ecology are not yet conclusive prior to their propagation and commercialization since 2002 in the country. GMOs were never subjected to an EIA which should have been undertaken by the government to protect Philippine farmers including IP farming communities from ecologically-harmful and culturally-disruptive technologies. But researches point out to the rapid encroachment of hybrid and GMO seeds to IPs ancestral lands. Worse, many IP farmers are not aware of the negative implications of these seeds in their customary farming practices. There remain some genetic diversity in corn and other food crops that are confirmed to be still among the Lumad farmers. They need to be conserved and protected from genetic contamination. While socio-economic effects are the main focus of this research, the concern on the protection of genetic resources is equally important. Thus, it is the overall objective of this research to investigate the implications, particularly on the socio-economic lives of the affected Lumads, of the incursion of Bt corn in their agriculture.

The investigative research only validates the claim of sustainable agriculture advocates and practitioners that Genetic Engineering in agriculture such as the Bt technology is not a viable developmental option. It is an expression of research and technology not within the control and aspirations of the poor majority of farmers who have not yet recovered from the ill-effects of chemical-based modern agriculture. That such a technology only perpetuates dependency of farmers to farm inputs which is not within their control and consequently, their further marginalization. Concomitantly, the unpredictable and untested risks in the environment and people.'s health are too much to behold as documented health problems are already being manifested. GMOs and hybrids, which are products of transnational seed companies run against the tenets of sustainable agriculture and development.

UNIÓN DE CIENTÍFICOS COMPROMETIDOS CON LA SOCIEDAD

[27 FEBRUARY 2011]
[ORIGINAL: ENGLISH]

The Unión de Científicos Comprometidos con la Sociedad submitted two documents:

- **"Native Races of Maize and Food Security for All in Mexico"**, by Antonio Turrent Fernández of the Unión de Científicos Comprometidos con la Sociedad.

- **A letter submitted on behalf of the organization to the President of Mexico** presenting its arguments for rejecting commercial liberation of transgenic maíze in Mexico.

1) Native Races of Maize and Food Security for All in Mexico

Mexico is the center of origin of maize and of teosinte, its direct ancestor. Sixty-two ethnic groups share credit for the domestication of maize, having been stewards and further developers of 59 native races of maize. They accomplished this technological breakthrough as they were developing a consensual "autochthonous maize breeding system" that emphasized seed interchange among neighbors, introduction of allopatric (evolutionarily distinct) parental materials, and a high seed selection pressure. At present, maize is the basic staple of Mexico. It provides 65 percent of caloric input and 40 percent of protein input to the national diet. The maize agroecosystem of Mexico extends over nine million hectares, 1.5 million of which are irrigated and the remainder rain fed.

There are two practical reasons why Mexico must protect and further develop its native races of maize: 1) food security for all, and 2) specialty maize needs for the pluricultural Mexican cuisine.

Food security for all. Only three million hectares of the maize agroecosystem have optimal or nearly optimal field conditions. A significant fraction of this farmland is managed under a modern, competitive system that has Industrial Agriculture as its model. Maize yield of this farmland is approaching its potential, but it will not be sufficient to reach food security for all. The remaining six million hectares have suboptimal edaphoclimatic conditions and include highly variable agroniches. These are characterized by drought, frost, Sierra conditions (fog, high humidity, hyperacidic soils, above and below ground endemic diseases of maize), hyperalcaline soils, elevation over sea level, and others. There are always one or more native races of maize that could be adapted to any of the agroniches. Notwithstanding 60 or more years of public and private research efforts to substitute hybrids and open pollinated varieties for native races of maize these continue to go unmatched in most of those agroniches.

Specialty maize needs for a pluricultural Mexican cuisine. Only the 59 native races of maize can provide the highly specialized maize grain required for more than 600 food preparations (including 300 types of tamales) and beverages from nixtamalized maize. Any standard maize hybrid or open pollinated variety would fail most tests of kernel quality for the pluricultural Mexican cuisine.

Neglect of the small farming sector and overemphasis on the modern farming sector are widely recognized as causal factors for the growing maize deficit which has reached 30 percent of national apparent consumption and which is getting worse. Yet, the government strategy continues to further privilege modernization of the already modern sector, by considering the adoption of transgenic maize. Permission was granted for twenty-five field experiments on transgenic maize in northern Mexico in the 2009/2010 growing cycle. Furthermore, multinationals are lobbying intensely for a faster process to commercial liberation of their technology.

This is a double threat to native races of maize by 1) decreasing farmland planted which in turn will decrease the genetic diversity *in vivo* and 2) risking the progressive and irreversible accumulation of transgenic DNA. Transgenic maize and native races cannot coexist in Mexico without the progressive and nonreversible accumulation of transgenic DNA. There is no way that DNA flow through seed-pollen will take place in the presence of the "Autochthonous Maize Breeding" practiced in several million farming units. It is well known that seed banks do not cover the genetic diversity of Native Races of Mexican Maize.

It has been shown that Mexico has the public and private knowledge and the resources to reach maize self-sufficiency without transgenic technology. Abundant water and land resources have been identified which could increase national potential production from 33 to 57 million tons per year.

Conclusions

1. Transgenic maize technology is not necessary for reaching food security for the Mexican population.
2. Native Races of Maize are necessary for reaching food security for all and for providing the specialty grains required by the pluricultural Mexican Cuisine.
3. Mexico has the necessary resources to reach maize self-sufficiency in the near future.

2) Letter to Mr. Felipe de Jesús Calderón Hinojosa, President of Mexico, dated September 29, 2009.

Excerpt:

This year you stand in a historical position to prevent irreversible damage to one of the World's most precious resources: Mexico's maize diversity. We observe that your Administration may be rushing to introduce genetically modified (GM) maize into the Mexican environment and we are convinced, from our understanding of the scientific evidence, that this move represents a disproportionate risk which should be avoided for the benefit of Mexico and the World. Joined together in our well-informed concern, we urge you to move aggressively to ensure that no GM maize is planted in Mexico, the Center of Origin and Diversification of this important crop.

SUBMISSIONS FROM INDIVIDUALS

PROF. IAN MAURO
MOUNT ALLISON UNIVERSITY

[28 FEBRUARY 2011]
[ORIGINAL: ENGLISH]

Dr. Ian Mauro submitted four publications:

- **"Farmer Knowledge and Risk Analysis: Postrelease Evaluation of Herbicide-Tolerant Canola in Western Canada",** by Ian J. Mauro and Stéphane M. McLachlan of the Environmental Conservation Lab, Department of Environment and Geography, University of Manitoba. Published in Risk Analysis, Vol. 28, No. 2, 2008.

- **"Biotechnology and Ecological Risk"** by Ian J. Mauro. Published in the *Encyclopedia of Geography*. 2010. SAGE Publications. 1 Oct. 2010.

- **"Sustainable Agriculture"** by Ian J. Mauro. Published in *Encyclopedia of Geography*. 2010, SAGE Publications. 1 Oct. 2010.

- **"Farmer knowledge and a priori risk analysis: pre-release evaluation of genetically modified Roundup Ready wheat across the Canadian prairies",** by: Ian J. Mauro & Stéphane M. McLachlan, Environmental Conservation Lab, Clayton H. Riddell Faculty of Environment, Earth, and Resources, University of Manitoba, & Rene C. Van Acker, Department of Plant Agriculture, University of Guelph. Published in Environmental Science and Pollution Research (2009). Also available in the Biosafety Information Resource Centre: http://bch.cbd.int/database/attachment/?id=11118.

1) Farmer knowledge and risk analysis: post-release evaluation of herbicide-tolerant canola in Western Canada

The global controversy regarding the use of genetically modified (GM) crops has proved to be a challenge for "science-based" risk assessments. Although risk analysis incorporates societal perspectives in decision making over these crops, it is largely predicated on contrasts between "expert" and "lay" perspectives. The overall objective of this study is to explore the role for farmers' knowledge, and their decade-long experience with herbicide-tolerant (HT) canola, in the risk analysis of GM crops. From 2002 to 2003, data were collected using interviews (n = 15) and mail surveys (n = 370) with farmers from Manitoba and across Canada. The main benefits associated with HT canola were management oriented and included easier weed control, herbicide rotation, and better weed control, whereas the main risks were more diverse and included market harm, technology use agreements (TUAs), and increased seed costs. Benefits and risks were inversely related, and the salient factor influencing risk was farmer experiences with HT canola volunteers, followed by small farm size and duration using HT canola. These HT volunteers were reported by 38% of farmers, from both internal (e.g., seedbank, farm machinery, etc.) and external (e.g., wind, seed contamination, etc.) sources, and were found to persist over time. Farmer knowledge is a reliable and rich source of information regarding the efficacy of HT crops, demonstrating that individual experiences are important to risk perception. The socioeconomic nature of most risks combined with the continuing "farm income crisis" in North America demonstrates the need for a more holistic and inclusive approach to risk assessment associated with HT crops and, indeed, with all new agricultural technology.

2) Biotechnology and ecological risk

Since the late 1970s, advances in biotechnology have allowed for the unprecedented crossing of genes between species, and over the past decade many of these genetically modified organisms (GMOs) have been released into ecological systems. The environmental release of GMOs has taken place at landscape and test plot scales, predominately involving crop and tree varieties, although livestock and fish species have also been modified and are on the verge of commercialization in some countries. While GMOs mainly offer production benefits, it is largely accepted that biotechnology is still in its infancy and may cause unanticipated ecological risks, which requires further study that may be aided by the holistic discipline of geography.

3) Sustainable Agriculture

Agriculture has had a profound impact on the natural world, especially over the course of the 20th century. In many places, agriculture is now increasingly industrialized, leading to monocultures that are reliant on external mechanical, biological, and chemical inputs (e.g., tractors, hybrid seeds, and pesticides). Many geographers and others are beginning to question the sustainability of these conventional systems. Indeed, industrial agriculture has hit a crisis point—especially when considered in combination with the issues of environmental erosion, climate change, and depleting fossil fuels—and politicians, agribusiness leaders, environmentalists, and farmers alike now advocate for "sustainable agriculture." However, sustainable agriculture is a poorly defined and highly politicized term, and it clearly means different things to different stakeholders. This is because sustainable agriculture is a philosophical approach, rather than a specific production system, that promotes social, ecological, and economic health in food- and fiber-producing lands and communities. A diversity of locally based low-input and knowledge-intensive farm systems exist that follow the principles of sustainable agriculture. As these holistic approaches to cultivation and animal husbandry are further refined and communicated, their legitimacy and widespread adoption is inevitable.

4) Farmer knowledge and a priori risk analysis: pre-release evaluation of genetically modified Roundup Ready wheat across the Canadian prairies

Abstract

Background, aim, and scope

The controversy over the world's first genetically modified (GM) wheat, Roundup Ready wheat (RRW), challenged the efficacy of 'sciencebased' risk assessment, largely because it excluded the public, particularly farmers, from meaningful input. Risk analysis, in contrast, is broader in orientation as it incorporates scientific data as well as socioeconomic, ethical, and legal concerns, and considers expert and lay input in decision-making. Local knowledge (LK) of farmers is experience-based and represents a rich and reliable source of information regarding the impacts associated with agricultural technology, thereby complementing the scientific data normally used in risk assessment. The overall goal of this study was to explore the role of farmer LK in the a priori risk analysis of RRW.

Materials and methods

In 2004, data were collected from farmers using mail surveys sent across the three prairie provinces (i.e., Manitoba, Saskatchewan, and Alberta) in western Canada. A stratified random sampling approach was used whereby four separate sampling districts were identified in regions where wheat was grown for each province. Rural post offices were randomly selected in each sampling district using Canada Post databases such that no one post office exceeded 80 farms and that each sampling

district comprised 225–235 test farms (n=11,040). In total, 1,814 people responded, representing an adjusted response rate for farmers of 33%. A subsequent telephone survey showed there was no non-response bias.

Results

The primary benefits associated with RRW were associated with weed control, whereas risks emphasized the importance of market harm, corporate control, agronomic problems, and the likelihood of contamination. Overall, risks were ranked much higher than benefits, and the great majority of farmers were highly critical of RRW commercialization. In total, 83.2% of respondents disagreed that RRW should have unconfined release into the environment. Risk was associated with distrust in government and corporations, previous experience with GM canola, and a strong belief in the importance of community and environment. Farmers were critical of expert-based risk assessment, particularly RRW field trials, and believed that their LK was valuable for assessing agbiotechnology as a whole.

Discussion

Over 90% of canola production across the Canadian prairies makes use of herbicide-tolerant (HT) varieties. Yet, respondents were generally uniform in their criticism of RRW, regardless whether they were HT users, non-HT-users, conservation tillage or organic in approach. They had a sophisticated understanding of how GM trait confinement was intrinsically tied to grain system segregation and, ultimately, market accessibility, and were concerned that gene flow in RRW would not be contained.
Organic farmers were particularly critical of RRW, in large part because certification standards prohibit the presence of GMtraits. Farmers practicing conservation tillage were also at relatively great risk, in part because their dependence on glyphosate to control weeds increases the likelihood that RRW volunteer would become more difficult and costly to control.

Conclusions

This research is the first of its kind to include farmer knowledge in the a priori risk analysis of GM crops and, arguably, given its prairie-wide scope, is the largest scale, independent-farmer-focused study on GM crops ever conducted. The surprising uniformity in attitudes between users and non-users of GM technology and among organic, conventional, conservation tillage and GM using farmers speaks to the ability of farmers to discriminate among HT varieties. Our results clearly show that prairie farmers recognize that the risks associated with RRW commercialization outweigh any benefits.

Recommendations and perspectives

Farmer knowledge systems are holistic in nature, incorporating socioeconomic, cultural, political, and agroecological factors that all can contribute meaningfully to the pre-release evaluation of GM crops. The inclusion of farmers and other stakeholders in risk assessment will also help enhance and even restore public confidence in science-focused approaches to risk assessment. Although farmers are highly knowledgeable regarding RRW and arguably any agricultural technology, their expertise continues to be overlooked by decisionmakers and regulators across North America.

DR. JUSTUS WESSELER
TECHNISCHE UNIVERSITÄT MÜNCHEN

[28 FEBRUARY 2011]
[ORIGINAL: ENGLISH]

Dr. Justus Wesseler submitted three documents:

- **"Biodiversity versus transgenic sugar beet: the one euro question"** by Matty Demont, Justus Wesseler and Eric Tollens, published in the European Review of Agricultural Economics Vol 31 (1) (2004).

- **"The Maximum Incremental Social Tolerable Irreversible Costs (MISTICs) and other benefits and costs of introducing transgenic maize in the EU-15"**, by Justus Wesselera, Sara Scatastab and Eleonora Nillesen, published in Pedobiologia, International Journal of Soil Biology, Volume 51 (2007).

- **"On the introduction of genetically modified bananas in Uganda, Social benefits, costs, and consumer preferences",** thesis submitted by Enoch Mutebi Kikulwe, in fulfilment of the requirements for the degree of doctor at Wageningen University (2010).

1) Biodiversity versus transgenic sugar beet: the one euro question

The decision on whether to release transgenic crops in the EU is subject to irreversibility, uncertainty and flexibility. We analyse the case of herbicide-tolerant sugar beet and assess whether the EU's 1998 de facto moratorium on transgenic crops for sugar beet was correct from a cost–benefit perspective, using a real option approach. We show that the decision was correct, providing households on average value the possible annual irreversible costs of herbicide-tolerant sugar beet at 1 Euro or more. On the other hand, the total net private reversible benefits forgone if the de facto moratorium is not lifted are around 169 million Euros per year.

2) The Maximum Incremental Social Tolerable Irreversible Costs (MISTICs) and other benefits and costs of introducing transgenic maize in the EU-15

The decision to release a new transgenic crop variety for planting in the European Union (EU) is a decision under irreversibility and uncertainty. We use a real option model to assess the ex-ante incremental benefits and costs of the decision to release Bt maize and HT maize in the EU-15 member states. The analysis uses Eurostat data for modelling the benefits and costs of non-transgenic maize using partial equilibrium models. The farm-level benefits and costs of Bt maize and HT maize are derived from field trials conducted within the EU-funded ECOGEN project in combination with secondary data sources. Adoption curves, hurdle rates and Maximum Incremental Social Tolerable Irreversible Costs (MISTICs) are calculated at country level for selected EU-15 member states. In general, the results show that the MISTICs on a per capita level are very small confirming previous results calculated in values for the year 1995. The MISTICs per farm are much larger. This indicates a problem for decision makers.

3) On the introduction of genetically modified bananas in Uganda, Social benefits, costs, and consumer preferences

Agriculture is the mainstay for the great majority of rural people in most African countries and is essential for poverty reduction and food security. The role of agriculture towards poverty reduction, however, has not been realized in Africa, despite advances in development of technologies such as improved varieties suitable to local conditions and resistant to pests, diseases and droughts stresses. Plant breeding using modern biotechnology and genetic modification in particular has the potential of speeding-up crop improvement. However, the central issue in agricultural biotechnology particularly in Africa is to achieve a functional biosafety system to ensure that a country has the capacity to assess risks that may be associated with modern biotechnology. Several countries have designed and implemented policies to address the safety concerns of consumers and producers, including environment and food safety. One of the requirements, as proposed in Article 2 of the Cartagena Protocol, is the inclusion of socioeconomic considerations in the biosafety assessment process. Many developing countries, including Uganda, have not determined whether and how to include socioeconomic considerations. Specifically, at what stage of the regulatory process should they be included, the involved scope, as well as the nature of the decision-making process within the Biosafety regulations. The aim of my thesis is to examine

potential social welfare impacts of introducing a GM banana in order to illustrate the relevance of socioeconomic analyses for supporting biotechnology decision-making and in particular the importance of consumer perceptions but also for contributing to the development and implementation of biosafety regulations. I present a general approach using GM banana as an example, while assuming the GM banana has passed standard food and biosafety safety assessments, i.e. can be considered to be safe. I explore the benefit-cost trade-offs of its introduction and the farmers' and consumers' willingness to pay for the technology and the end product. In the study I present a framework for considering concerns about genetically modified crops within a socioeconomic analysis of GM crops, using real options and choice experiment approaches. The approaches relate the economic benefits to consumers' concerns. The results show that the introduction of GM bananas would be desirable for the Ugandan society as a whole, mainly benefit poor rural households and would merit policy support. Nevertheless, if such a GM banana is introduced its introduction may result in strong opposition from the opponent segment of the population, which is composed of mainly urban consumers with an on average higher education and income. Interestingly and in contradiction to common wisdom only providing additional information about the technology and its safety will not result in higher acceptance. Based on this case study biosafety regulators would need to consider these socioeconomic effects before a decision to introduce a GM banana is made. However, the decision to consider socioeconomic impacts for other GM crops elsewhere depends on the crop and the country. The research methodology in this thesis provides the basis for assessing other GM crops as well.

PROF. KRISTEN C. NELSON
UNIVERSITY OF MINNESOTA

[25 FEBRUARY 2011]
[ORIGINAL: ENGLISH]

"Problem Formulation and Options Assessment Handbook", by Kristen C. Nelson and Michael J. Banker, St. Paul, Minnesota: International Project on GMO Environmental Risk Assessment Methodologies, 2007.

Also available in the Biosafety Information Resource Centre: http://bch.cbd.int/database/record-v4.shtml?documentid=48404.

The Problem Formulation and Options Assessment (PFOA) provides a framework for identifying the crucial societal needs that could be satisfied by introducing a GM crop into an agricultural system, and comparing the GM crop to other possible alternatives for meeting that critical societal need. To this end, a PFOA relies upon being transparent**,** inclusive of all appropriate stakeholders, and rationally informed by the best available science. To make this process tool accessible to interested users, we have developed the PFOA Handbook.

The purpose of the handbook is to:

- Introduce and explain the substance, theory, and practice of the PFOA methodology
- Provide guidance about the integration of a PFOA into a country's environmental risk assessment (ERA) procedures for genetically modified organisms (GMO)
- Examine considerations, techniques, and resources that can assist in designing, implementing, and conducting a country-specific PFOA

The handbook was designed to accommodate and account for users around the world, recognizing that each country has particular contexts (e.g. ecosystems, laws and regulations, political infrastructures, culture) and faces distinct challenges when trying to customize a PFOA process. The primary audiences are the government agencies and personnel responsible for conducting ERAs of GMOs within a particular country. This includes those already committed to using the PFOA

methodology in their ERAs and those who are considering doing so. The secondary audience is anyone who would participate in a PFOA process or seek to include it in the governance of GMOs.

STUART SMYTH
UNIVERSITY OF SASKATCHEWAN

[28 FEBRUARY 2011]
[ORIGINAL: ENGLISH]

Mr. Stuart Smyth submitted three documents:

- "**Global Governance Quandaries Regarding Transformative Technologies for Bioproducts, Crops, and Foods",** by Stuart Smyth, Peter W.B. Phillips and William A. Kerr, published in the Journal of World Trade 43, no. 6 (2009).

- "**Recent Trends in the Scientific Basis of Sanitary and Phytosanitary Trade Rules and Their Potential Impact on Investment",** by Stuart Smyth, Peter W.B. Phillips and William A. Kerr, published in Journal of World Investment and Trade, vol. 12, no. 1, Feb. 2011. Also available in the Biosafety Information Resource Centre: http://bch.cbd.int/database/attachment/?id=11117.

- "**Economic Benefits of Genetically Modified Herbicide Tolerant Canola for Producers",** by Michael Gusta, Stuart J. Smyth, Kenneth Belcher, Peter W. B. Phillips, and David Castle, accepted for publication in the online journal AgBioForum.

1) Global Governance Quandaries Regarding Transformative Technologies for Bioproducts, Crops, and Foods

Abstract

The evolution of multilateral regulatory regimes is a slow process that is based on consensus-building among a large number of participants. International organizations function best in relatively stable international environments where the inherently slow pace of decision-making does not create disconnects. They are least effective during periods of rapid change. By definition, a transformative technological change such as biotechnology precipitates disequilibrium. Technological change leads to the need for institutional adaptation and/or the establishment of new institutions. This article provides a review of international regulatory initiatives implemented or under negotiation to develop the architecture for regulating the production, trade, and marketing of biologically derived crops, bioproducts, and foods. The results of these global governance efforts are compared and contrasted to assess how transformative technology barriers have been identified and addressed within these institutions. Options for further effort are examined.

2) Recent Trends in the Scientific Basis of Sanitary and Phytosanitary Trade Rules and Their Potential Impact on Investment

Abstract

International trade rules based on science are not functioning efficiently. Twentieth century efforts enabled politics to be removed from the frameworks that govern international trade. Some degree of success was witnessed as numerous institutions (i.e. SPS/WTO, IPPC, OECD, Codex) were founded or their roles expanded. These institutions were established on the premise that science-based frameworks were essential to the efficient functioning of international commerce. The first decade of the

21st century would seem to suggest that these institutions are floundering and that the role of science as the basis of international trade rules is on the decline. The success of international institutions in dealing with transformative technologies such as biotechnology has thus far been rather dismal. This article focuses on the fundamental causes for the disruption of international trade and provides insights into how to move forward.

3) Economic Benefits of Genetically Modified Herbicide Tolerant Canola for Producers

Abstract

Genetically modified herbicide tolerant canola (GMHT) was introduced in Western Canada in 1995. In 2007, a producer survey elicited answers to 80 questions regarding their experiences, including: production practices; tillage and herbicide use; control of volunteer canola; and weed control practices. The survey revealed that the new technology generated between $1.063 billion and $1.192 billion annual net direct and indirect benefits for producers over 2005-7, partly attributed to lower input costs and partly attributed to better weed control. One major concern in the early years following introduction was the potential for HT traits to outcross with weedy relatives or for GMHT canola to become a pervasive and uncontrollable volunteer in non-canola crops, either of which would offset some producer gains. The survey largely discounts that concern. More than 94% of respondents reported that weed control was the same or had improved, less than one quarter expressed any concern about herbicide resistance in weed populations, 62% reported no difference in controlling for volunteer GM canola than for regular canola and only 8% indicated that they viewed volunteer GM canola to be one of the top five weeds they need to control.

PROF. PHILIP BEREANO
UNIVERSITY OF WASHINGTON

[28 FEBRUARY 2011]
[ORIGINAL: ENGLISH]

Prof. Philip Bereano submitted two documents:

- **"A step forward on cumulative impacts".** An editorial note by Nancy Myers, published in The Networker - The Newsletter of the Science & Environmental Health Network, Volume 16 (2) March 2011. The note is followed by excerpts from Cumulative Impacts: Building a Scientific Foundation, California, Environmental Protection Agency, Office of Environmental Health Hazard Assessment, December 2010.

- **A list of publications regarding socio-cultural considerations.**

1) A Step Forward on Cumulative Impacts

Editor's note: After 11 years

Environmental justice advocates have long pointed out the obvious: polluting industries tend to concentrate in poor communities, adding to social, economic, and other hardships already suffered by residents of these communities. All the stresses compound and contribute to significant health disparities between poorer and wealthier communities. The importance of "cumulative impacts," as Sierra Crane-Murdoch writes in a fine introduction to the concept in the March 10 High Country News, has become conventional wisdom in public health circles and suffering communities.

A California law enacted in 2000 gave the state's environmental protection agency (CalEPA) responsibility for remediating environmental injustice. It defines environmental justice as "the fair

treatment of people of all races, cultures, and incomes with respect to the development, adoption, implementation, and enforcement of environmental laws and policies."

Environmental justice advocates were quick to see the need for the precautionary principle--which shines a light of prevention through the smog of harm resulting from multiple factors--to address the problem of cumulative impacts. So when CalEPA was writing an action plan to carry out the environmental justice mandate, advocates saw to it that the plan included a promise to develop guidance not only on cumulative impacts analysis but also on precautionary approaches that would reduce cumulative impacts. The action plan was published in 2004.

Now, 11 years after the environmental justice law was enacted, one part of one of the most challenging steps of its implementation has been laid out in a report, Cumulative Impacts, Building a Scientific Foundation. The wheels of legislation turn slowly indeed. And yet California is still, as Carolyn Raffensperger wrote in 2005, leading the way on cumulative impacts policy. Building new policy from the ground up is a monumental task.

We present **two excerpts** of the CalEPA report, which introduces a scientific method to compare cumulative impacts in communities. The first excerpt explains the need to address cumulative impacts and introduces the comparison method. The second presents an overview of health disparities in vulnerable populations, focusing on diseases in which environmental factors are likely to play a role.

2) List of publications regarding socio-cultural considerations:

The list is available through the document exchange function of the online Portal on Socio-Economic Considerations. They may be found via: http://bch.cbd.int/protocol/cpb_art26/resources.shtml.
