TWN submission on socio-economic considerations (Article 26 of the Cartagena Protocol on Biosafety)

Examples of methodologies and applications of socio-economic considerations, in the light of the elements of the voluntary Guidance

1. This paper reviewed the literature on socio-economic impacts (SEI) from the introduction and use of genetically modified (GM) crops, identifying shortcomings in methodologies and proposing ways forward. We summarise the key findings briefly below:

Catacora-Vargas et al. (2018). Socio-economic Research on Genetically Modified Crops: A Study of the Literature. *Agriculture and Human Values* 35:489–51. https://doi.org/10.1007/s10460-017-9842-4

The review exposes limited empirical SEI research (particularly on social impacts) of GM crops for possible use in decision-making, and an imbalance in knowledge and framings used. This effectively defines the realities influenced by the introduction of GM crops according to few selective economic parameters.

The authors cite other serious shortcomings: the focus on short-term studies; lack of contextual analysis; the application of untested or unjustified assumptions and extrapolations; incomplete information on relevant research parameters; and, the use of conventional agriculture as the "universal" comparator, which masks other alternatives, both for research and policy. The most substantive, to them, is the economistic bias at the expense of more attention to social dimensions and effects.

The problems in the methodologies and in the corresponding reported results of the SEI literature on GM crops have biosafety political and policy implications. Among them is the dominant worldview that so-called "modern", industrial and highly "technified" agriculture deserves exclusive promotion because it is taken as more productive than other agricultural systems. The review also finds that the large sample of the reviewed literature has systematically reported policy conclusions without enough properly qualified empirical data such as short-term decreases in herbicide-uses presented as constant over the long run. The neglect of attention to social aspects of GM crops in SEI research, especially in the medium and long term, creates a crucial knowledge-gap for drawing reliable conclusions; understanding the systemic effects of GM crops on the food systems and related institutional dynamics; and, consequently, for the identification of alternatives.

Adequate SEI scientific practice related to GM crops will require acknowledging the limitations of single-discipline economic, econometric and related methods, and—even when social dimensions are investigated—the short term quality of most current research. Broader questions and improved methodologies, assisted by more rigorous peer-review, will be required to overcome current research shortcomings. To advance towards more realistic in-context trajectory evaluations, the authors recommend overcoming the inconsistency of appraising long-term global development goals (e.g. hunger- and poverty-reduction) by using only short-term studies. Addressing these questions will also require public and open deliberations with a broader range of informed policy actors and stakeholders than has hitherto prevailed.

2. A recent paper highlights an innovative methodology for assessing socio-economic considerations, which we summarise briefly below:

Wickson et al. (2017). Addressing Socio-Economic and Ethical Considerations in Biotechnology Governance: The Potential of a New Politics of Care. *Food Ethics* 1(2): 193-199. doi.org/10.1007/s41055-017-0014-4.
https://link.springer.com/article/10.1007/s41055-017-0014-4

This paper puts forward a framework of care-based ethics and politics, which can be used to guide the assessment of socio-economic and ethical considerations within formal biotechnology regulatory systems. It cites six key defining features:

(1*) Relational worldview:* This emphasises the interconnected nature of the world and prioritises the relationships between entities within social and ecological communities, as well as the relevance of analysing any shift or rupture in relationships brought about by new technologies.

(2) *Context:* Sensitivity to context requires that technologies are not only assessed on an individual basis; the way a technology represents and advances a certain trajectory over space and time must also be evaluated.

(3) *Dependence:* A focus on the (changing) nature of relations of dependence through the development and use of new technologies allows questions to be asked about whether these relationships are caring, nurturing and empowering or extractive, destructive and limiting.

(4) *Power and Vulnerability:* It is important to ask how the distribution of power (e.g. through money, status or more invisible means) can support, burden or disadvantage particular actors, especially the most vulnerable.

(5) *Affect:* The key role of affect and emotion must be recognised, acknowledged and granted legitimacy during decision-making processes.

(6) *Narrative:* Narrative is recognised as valuable for the way in which it can draw attention to particularity and context, as well as encourage the consideration and assessment of alternatives. It also helps to grant individuals the power to tell and control their own stories.

For a politics of care to truly permeate biotechnology governance, it will first be necessary for scientific risk assessment to reimagine its place within a more multifaceted form of assessment so that the considerations of care can carry the same weight in regulatory decision-making.

An extended scope and reorientation of interest is required at the level of both policy-making and regulatory assessment. This includes:

(a) moving beyond assessing a technology's risks to human health and the environment to also ask other types of relevant questions;

(b) expanding beyond case-by-case assessments to also consider the overarching trajectories being pursued, the potential cumulative impacts involved, and the available alternatives; and

(c) opening up the terms and modes of governance to be more inclusive, deliberative and reflexive.

3. This review of the literature on the social impacts of GM crops looked at current knowledge and identified research gaps, which we summarise briefly below:

Fischer et al. (2015). Social Impacts of GM Crops in Agriculture: A Systematic Literature Review. *Sustainability* 7(7), 8598-8620. https://doi.org/10.3390/su7078598

This review found that very few studies took a comprehensive view of the social impacts of GM crops in agriculture. The literature was dominated by studies on economic impacts which presented a more positive picture of the role of GM crops in socially sustainable agriculture than was warranted. The review showed that economic impacts for different groups of farmers were in fact very mixed and that the political and regulatory context had significant impact on the ability of different groups of farmers in different locations to benefit. In addition, while wellbeing was frequently discussed, it was rarely studied and cultural heritage and farm level risk from GM crops were rarely covered.

Moreover, the review found that two-thirds of publications are based on previously published empirical evidence, indicating a need for new empirical investigations into the social impacts of GM crops in agriculture.

4. This paper provides a case study of the socioeconomic impacts of GMOs on beekeeping in Spain and Uruguay. We summarise the key findings below:

Binimelis and Wickson (2018). The Troubled Relationship Between GMOs and Beekeeping: An Exploration of Socioeconomic Impacts in Spain and Uruguay. Agroecology and Sustainable Food Systems 43(5). https://doi.org/10.1080/21683565.2018.1514678

Although there are demands to incorporate socioeconomic impact (SEI) assessment into regulatory deliberations, these often neglect to look beyond the technology in isolation to also include the networks of relations agricultural biotechnologies require and create. This paper argues that understanding the impacts of genetically modified organisms (GMOs) cultivation requires attentiveness to the operational context of the technology as well as a wide range of actors and potential pathways of harm.

In examining the relationship between GM crops and beekeepers in Spain and Uruguay, the study found that there have been socioeconomic impacts from the contamination of honey from GMOs themselves (in the form of GM pollen), and also from the co-technologies used in collaboration with GM crops (in the form of herbicides like glyphosate), from their role in perpetuating and extending industrial models of agriculture (in the form of large-scale chemically intensive monocultures), and from the attempts to implement regimes (in the forms of restrictions on freedom of movement and operations).

The researchers stress that socioeconomic impact assessment must complement risk assessment practices for GMOs and should not only adopt a systems-based perspective

towards the technologies, but extend beyond a narrow range of affected actors to include all relevant stakeholders in agri/food systems.

4. This paper is a case study of the sustainability of GM soybean cultivation in Argentina and its key findings are summarised briefly below:

Phélinas and Choumert (2017). Is GM Soybean Cultivation in Argentina Sustainable? World Development 99: 452-462. https://doi.org/10.1016/j.worlddev.2017.05.033

This paper uses a holistic approach to explore the long-term sustainability of the "soybeanization" of Argentinian agriculture, through an evidence-based assessment of the most relevant economic, social, and environmental factors. The research was based on a unique data set drawn from a field survey carried out in 2011 in two provinces of the Argentinian Pampas.

The key findings are as follows:

- Although GM soybean package adoption has increased farm productivity and profits, it has made the country's economy too heavily dependent on soybean production and exports.
- GM soybean production in Argentina has had significant harmful impacts on the environment, putting its long-term sustainability into question. Promoting sustainable agricultural growth is imperative.
- There are concerns over the increase in land under tenancy and in the number of short-term rental agreements which provide strong incentives for the intensification of land use and rapid conversion of rotational cropping patterns into permanent soybean production.
- The expansion of GM soybean cultivation has caused the loss of many jobs at the farm level, and a significant shift in demand away from unskilled to skilled labor. There is a high risk that former farm laborers will remain unemployed and fall into poverty.