SOCIO-ECONOMIC CONSIDERATIONS AND BIOSAFETY REGULATIONS

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Event
At the COP/MOP-7 meeting of the Cartagena Protocol on Biosafety (CPB) in October 2014 in Pyeongchang, South Korea, considerable discussions regarding the increased application of socio-economic considerations (SECs) in biosafety regulations were held. Numerous stakeholders including some environmental non-governmental organizations (eNGOs) are lobbying for the mandatory inclusion of SECs in biosafety regulations. A change from the existing voluntary inclusion of SECs to mandatory represents a change in the existing CPB text. Mandatory SEC inclusion will increase the cost of compliance, creating further barriers to the commercialization of innovative agricultural technologies in developing countries and potentially causing delays in food security improvements especially if such inclusion is not done properly.

Significance
In 2008, the Food and Agriculture Organization (FAO) issued a challenge to feed a 9 billion population by 2050, indicating that production would need to increase by 100% in some countries. Biotechnology and genetically modified (GM) crops are part of the solution. As identified by Klümper & Qaim (2014), GM crops have increased crop yields by 22%, decreased chemical use by 37% and increased farmer profits by 68%. Requiring an unfeasible inclusion of SECs as part of biosafety regulation will delay these benefits in developing countries facing food insecurity challenges.

Evidence
Ludlow et al. (2014) provide a focused assessment of SEC factors, potential methodologies, data requirements and feasibility of inclusion into biosafety regulatory frameworks. Article 26.1 of the CPB states:

> 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. (Secretariat to the CBD, 2000)

Many stakeholders are trying to implicitly change Article 26.1 by strongly advocating for “may take into account” to be reworded as “must take into account” especially in national laws and regulations. As Ludlow et al. portray, the costs of SEC application in time, money and loss of food security, will be significant. While numerous SECs are proposed for inclusion in biosafety regulations, this brief will highlight three of the most contentious SECs for developing countries.

Small landholder subsistence farms are labour intensive. Gouse (2014) identifies that in Sub-Saharan Africa (SSA), 65% of farm power is manual and hand weeding is a crucial part of successful crop production. Kibata et al. (2002) document that labour shortages that delay weeding reduce corn yields by 15-90%. Much of the hand weeding labour is done by females, but frequently additional labour is hired at peak times. Adoption of innovative agricultural technologies changes labour patterns. Gouse (2012) examined the labour impacts from GM corn adoption in South Africa, finding that hand weeding was reduced by 100 hours per season, amounting to a labour reduction of 50%. Hand weeding is frequently referred to as drudgery work, using unskilled labour. If female landholders are freed from this task, they would reallocate this time to other activities, which Gouse (2014) identifies as caring for children or tending vegetable plots. Ex ante assessment of potential labour impacts would, Gouse (2014) indicates, ideally use a computable general equilibrium model or a social accounting matrix. The challenge for developing countries is that there is frequently a lack of the large, thorough data sets necessary for such assessments. In short, innovations inevitably result in labour market adjustments but these can be challenging to accurately model, providing eNGOs leverage to pressure developing country governments not to commercialize an innovative technology if there is labour market displacement.

Appropriate incentives are needed to trigger investments, manage the discovery and development phases of new technologies and ensure the resulting technologies are optimally adopted by farmers (Lawson, 2014). The extension of intellectual property rights (IPRs) to plants created necessary (but not sufficient) incentives for private sector investment of larger amounts of capital into the development of new plant varieties (Phillips and Khachatourians, 2001). In developing countries where crop varieties have traditionally been developed by public institutions, the commercialization of a technology whereby either a public or private developer holds IPRs on the new varieties would, without a doubt, be viewed as a negative SEC by many eNGOs. To receive a return on their investment, developers need to charge a higher price for their technology than for varieties without IPRs (Horna et al., 2013). Critics of biotechnology advocate that the higher prices charged to farmers can only be viewed as a negative SEC, in spite of mounting evidence
to the contrary (Smyth et al., 2014). A number of eNGOs that lobby developing country governments to implement broad-based SECs, seem to portray IPRs as a policy choice leading only to negative outcomes and thus misinform these governments about the potential benefits of IP incentives for investment (see Friends of the Earth, 2014). It is quite unlikely that without such incentives, there will be no changes to existing public breeding programs, no public/private partnerships developed for new breeding programs and no new investment from private technology development firms, leaving subsistence farmers in the same dire situations (Perdikis et al., 2004).

Ethics aim to protect human beings from oppression by others. Innovation and the changes triggered are by their very nature, socially disruptive. A problematic aspect of value judgments is to over-estimate the potential harms and to under-estimate the perceived benefits. Ethical assessment is extremely difficult because assessors must balance utilitarian notions of winners and losers against the libertarian notion that no one should be disadvantaged (Thompson, 2014). For policy-makers assessing ethics, all effects or impacts that the action (including alternatives) has on individuals would need to be assessed. Whose utility is considered? The adopting farmers? The industrial supply chain stakeholders for the product and technology? Or the larger society? Each leads to vastly different outcomes. The challenge is that many stakeholder including a number of eNGOs suggest that GM crops must not have any negative externalities or losers, which contradicts the theory of utilitarianism. A further challenge is that the assessor must make a value judgment on whether an action has a beneficial or detrimental effect while recognizing that they, as an individual, will ultimately bring their own preconceived values to aid in the decision-making process, thereby influencing the process in favour or against the decision. Disclosure of these values will be necessary for transparent and justifiable regulation.

Conclusion
The three SECs considered above all have particular resonance for developing countries. They also illustrate a spectrum of difficulties if SECs are applied to biosafety regulation. Whilst these problems – lack of thorough data sets, incomplete information and the subjective nature of assessment – are considered here in the context of particular SECs, they will accompany assessment of many other SECs proposed for mandatory inclusion by different stakeholders including eNGOs. Failure to overcome these difficulties will delay adoption of an innovative technology with the potential to address one of the most significant challenges for the global community, that of food security.

References