**COMMENTS TO THE DOCUMENT: POST-RELEASE MONITORING AND LONG-TERM EFFECTS OF LMOS RELEASED INTO THE ENVIRONMENT**

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In the Draft guidelines on monitoring post-released proposed, takes as the basis of monitoring, risk assessment. However, there are a number of factors that must be monitored once a transgenic event has been released into the environment, and may not have been identified in the risk assessment, especially because of the uncertainty around this new technology .

Risk assessing works with causal factors risks and variable. These variables are fragmented, since each variable is treated as "separate entity". Mathematically, it attempts to find an association between variables, and from then to connect isolated phenomena in a cause - effect, fashion. But in fact what is doing is to break and disconnected the reality.

Usually in issues related with environment and health, it is impossible to establish a cause - effect relationship between a "risk factors" and certain effects. For example, it is impossible to state unequivocally that the presence of transgenic crops increases the incidence of cancer in a population. However it is already happening. It is necessary to maintain more complex and constant surveillance mechanisms in the areas of influence of these crops.

Once a crop is in the field, these risk factors interact with each other, synergistically and cumulatively, as a whole, so it is not appropriate to monitoring each of the "factors" alone, based on protection goals.



This methodology can be applied with some certainty, for example in construction and civil engineering, but not when it comes to the impacts of life forms in the environment (in this case, GM crops) within a specific technology package (in most cases the package includes the intensive use of pesticides) and the interaction between them and human communities.

Risk assessment set levels of acceptability, safety thresholds factor-by-factor, and establishing acceptable risk levels. Risk management focuses on modifying this risk factor in isolation (de Almeida - Filho, 2000). This approach does not include the social and power relations. That is, which sector of the society has more power to able to influence decisions, for example on which factor has a more acceptable risk than other. The economical groups that have interests in implementation of the technology (big farmers, seed companies, grain distributers) will put more emphasis on factors that could affect them financially. For example, in the case of herbicides resistance crops, an element of high risk will be the emergency of super weeds, since farmers will have to apply other herbicides, with the subsequent economical damage. In the other hand, for the local population the increased of herbicides and health impacts will be the priority[[1]](#footnote-1).

In the monitoring process, it should be taken into account the differences on lifestyles among sectors of the society. If we have different sectors of the society with the same level of exposure (eg. to pesticides associated with herbicide-resistant crops), the impact will differ among segments of the population living in residential areas (urban and peri-urban each one with different level of risk), rural workers rural are in continuous contact with crops, the pilots involved in aerial spraying or workers involved in processing. Each of these sectors of society has different levels of exposure to the GM crop and the technology package, but also will see differences in the ability that each of the groups has to react to "factor risk "(eg .the ability to have adequate medical care, a balanced diet, adequate rest, and the possibility to be without contact with the exposure material so the organisms has the capacity to recover).

In the same way, there will be a difference between countries which have environmental protection policies and who do not have. In the second case, the monitoring and enforcement mechanisms must be more rigorous, because the emergence of impact can be greater.

In deciding the methodology to be implemented in a monitoring program, it should be taken into account the quality of life of the population. For example can not be applied the same method of monitoring to a country that has a good public health system, with excellent studies on biodiversity and its dynamics, the wild relatives, their distribution and degree of vulnerability, the quality of soils, countries that do not have these systems or that they are privatized. In these cases, the surveillance should be permanent and the programs should be more rigorous. At the same time, society should participate in these program, in their design and with information about their own experiences in relation to the effect that GM has had cultivated in their life.

The focus of monitoring should be the technological package and not only the GM crop. Take, for example soy RR that covers almost 70% of the GM crops released worldwide. We can not just monitor the GM crop, as it was a separate entity from other elements, and as if in the design of the technology it was not implicitly included the technology package. All the herbicides resistance crops are designed to be used with herbicides, a this is an element that must be included in the monitoring programs.

When the risk assessment of herbicides resistance crops was done, it focused on molecular aspects, (which by the way were incompletes, as it was announced in the 1990's by several scientific studies). But they did not take into consideration the impact that this production model that was unleashing.

A crop that has been designed to not be affected by herbicide, being it a herb. With these kind of crops, it will not be possible to have other crops. So it will viable only for large-scale production. It is an aspect that is not addressed in risk assessment, but it should be included in a post-release monitoring program. The intensive use of herbicides has an impact on the environment (soil, vegetation, soil microorganisms, biodiversity) and human health, and these are factors that should be monitored, and that are not included in the risk assessment, since they were not identified as “protection goals”.

Since human health is already the most pressing issues in relation with the impacts of RR soybeans, for example in the Southern Cone, a robust monitoring program must work with information from health centres, where there is already a important bulk of information about diseases related to the model RR soybean + glyphosate spraying, that need to be systematized. This would allow epidemiological comparisons between sites impacted and not impacted by the soybean crop productive model (based on the premise that other social and environmental conditions are equal). This would obviate the need to show cause – effect sort of data, and can be used as a basis to implement the Nagoya – Kuaka Lumpur Protocol.

In relation with the proposal to have *Case-Specific Monitoring*,  it will not be acceptable for monitoring specific cases in countries that already have more than 20 million hectares with a genetically modified crop, and were these crop are already generating impacts. It will be necessary to make a continuous monitoring of all the affected territory. This is an activity that can be carried out by the same decentralized local governments that should have a warning system to respond correctly to contingencies.

If a country does not have financial or technical capacity to carry out this monitoring activity, then it is not able to accept the introduction of GM crops in their territory, since this country will face significant environmental liabilities, and health without the presence of the transgenic crop has a positive effect on the good living of the population. The draft proposes

If the capacity issues are identified early enough to find party might find some additional resources-through cooperation with other Parties.

Given the limited funds that there are available for international cooperation, these should be aimed at solving pressing problems of society.

Monitoring should be done from the perspective of social metabolism; the impacts of GE crops should be monitored throughout the production process that begins with the occupation of the territory. It is important to monitor which were the changes in land use, crops or natural ecosystems that were displaced for the establishment of the transgenic crop. This is a very important aspect, because the technology that accompanies transgenic crops with herbicide resistance is land grabbing, because as noted above, does not allow the coexistence of other crops or other forms of production, and to facilitate spraying, and in order to justify such aerial spraying scale is needed. In this phase, it should be included the effect of spraying with pesticides in the population, soil, water quality in the micro-flora and fauna and biodiversity in general.

Then it will be necessary to evaluate the process of transformation: the (unexpected) impact of how the processing of RR soy affects the plant workers and surrounding populations. The dust stirred up in that process (containing transgenic proteins and high concentrations of glyphosate) may be an occupational hazard that must be monitored, and contrasted with other workers in the same branch but does not work with transgenic material, and the territorial occupation of the processing plants and how they compete with food production in terms of space.

The next step is the transport. A post-release monitoring should consider the impact of the transgenic grain transport communication routes used for transport. There are already scientific reports that account for genetic contamination associated with this phase. Additionally, it should monitor the impacts of highways and railway construction, the transformation of rivers into waterways and the intensity in the used of this communication network in the local population.

The next phase of social metabolism is the consumption, which would be out of this monitoring system, because as stated in the Draft Guidance, this may require a separate monitoring process.

The final step is excretion or waste generation as the last phase of social metabolism. It should be monitored waste generation along the described chain, ie. in the agricultural phase, transport and processing of raw materials. Here we have to monitor what happens to agricultural waste (in the case of large-scale plantings can grow into large-scale pollutants). Saxena et al (1999) showed for example that the Bt toxin is released Into the rhizosphere soil in the root exudate from Bt corn, binds to surface-active rapidly soil particles soil, it retains larvicidal activity and it is protected biodegradation.

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1. See for example Barri (2010) [↑](#footnote-ref-1)