17 May 2018

CARTAGENA PROTOCOL ON BIOSAFETY (Protocol)
Articles 15 and 16: Risk Assessment and Risk Management of Living Modified Organisms

The Global Industry Coalition (GIC) [1] continues to have significant concerns with the ongoing negotiations on risk assessment (RA) and risk management (RM) of living modified organisms (LMOs) under the Protocol, in particular, how gaps in existing guidance are identified and selected for further consideration in the absence of consensus by the Parties that such work is justified. The proposed decision for consideration by the Subsidiary Body on Scientific, Technical and Technological Affairs at their 22nd meeting (SBSTTA-22) continues the inefficient and unproductive work that has occurred on this issue since 2004, using the same mechanisms that have not led to beneficial outcomes for the Parties. The GIC is firmly of the view that the SBSTTA should discontinue this repetitious work. SBSTTA is instead requested to recommend work on developing objective and agreed-upon criteria to determine whether further work on RA is warranted. An appropriate mechanism for this activity is an online forum that would allow for the participation of a wide spectrum of experts to engage and support outcomes fully-informed by appropriate expertise.

A. Background

Articles 15 and 16[2] of the Protocol outline requirements that relate to RA and RM of LMOs. Article 15 requires Parties to make decisions on the import of LMOs for intentional introduction into the environment in accordance with scientifically-sound and evidence-based RAs. The general principles, methodological steps, and points to consider in the conduct of such RAs are set out in Annex III of the Protocol. Article 16[3] of the Protocol requires Parties to adopt measures and strategies for managing and controlling risks identified by the RA, and for preventing unintentional transboundary movements of LMOs with the objective to prevent adverse effects of the LMOs on the conservation and sustainable use of biological diversity.

At their eighth meeting in 2016, the Conference of the Parties serving as the meeting of the Parties to the Protocol invited Parties to submit[4] to the Executive Secretary: (a) information on their needs and priorities for further guidance on specific topics of RA of LMOs; (b) proposals on criteria, including the technical justification, that may facilitate the selection of topics for the development of further guidance; and (c) views on perceived gaps in existing guidance materials. At the same meeting, Parties extended the Online Forum on RA and RM to exchange experiences on RA, provide information and views on, and perceived gaps in existing guidance materials, and proposals to address any gaps identified. Lastly, Parties requested the SBSTTA review the information provided and to recommend a way forward to address the needs, priorities and gaps identified by Parties for consideration by the Conference of the Parties serving as the meeting of the Parties to the Protocol at its ninth meeting (COP/MOP-9), including the possible establishment of a new *ad hoc* technical expert group (AHTEG). Accordingly, Parties will consider at the 22nd meeting of the SBSTTA (SBSTTA-22) (2-7 July 2018, Montreal, Canada) draft recommendations for COP/MOP-9.

B. GIC Views on the Draft Recommendations on RA and RM of LMOs at SBSTTA-22

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

[2] http://bch.cbd.int/protocol/text/.

[3] http://bch.cbd.int/protocol/text

[4] Nineteen Parties and 3 other governments submitted information to the Secretariat's notification SCBD/SPS/DC/MPM/MW/86376. Seven out of 19 Parties stated that they do not need any new guidance and that there are no gaps in existing guidance on RA; 8 out of 19 Parties identified need for guidance on LM fish; 8 out of 19 indicated need for guidance on synthetic biology, with 3 Parties (3/19) specifically identifying gene drives; 1 out of 19 Parties identified genome editing as a particular need. Other topics were identified by some Parties in addition to the ones listed above; however, these do not form part of the recommendations proposed to SBSTTA-22 and are therefore not listed here. The three non-Party governments, all with significant practical experience in conducting RA of LMOs, indicated that they do not support the development of any new guidance on specific topics.

The GIC highlights paragraphs 1 and 2 of the suggested recommendations, which underline the lack of consensus amongst Parties on the existence of gaps and need for additional guidance. Some Parties assert that gaps exist while others state that there are no gaps in existing guidance and RA methodology. No agreement has been achieved by Parties as to whether additional guidance can address the gaps that some countries identified, nor has a process been identified to support the identification and prioritization of topics that actually warrant technical guidance. The GIC notes that the discussion on risk assessment has not materially changed since the Parties last meeting (COP/MOP-8) in 2016.

The draft recommendations on RA and RM of LMOs for consideration by the Parties at SBSTTA-22 propose two primary activities:

- A comprehensive study regarding the potential adverse effects to the conservation and sustainable use of biodiversity, taking into account human health, and including considerations that are relevant to the RA of (a) *organisms produced through genome editing and organisms containing engineered gene drives*, and (b) *living modified fish*, in order to inform further consideration of whether there is a need for the development of additional guidance materials on RA for these organisms (paragraph 18(5) of the draft recommendations); and
- a *process for the identification and prioritization of specific issues of RA of LMOs* that may warrant future consideration by the Parties, taking into account elements included in an annex to the draft decision (paragraph 18(6).

These activities are proposed to be carried out by:

- a newly-established AHTEG, composed of experts selected in accordance with the consolidated modus operandi of SBSTTA (paragraph 18(7)); and
- an online forum on RA and RM (paragraph 18(8).

The GIC's views on the proposed draft recommendation on these issues are outlined below.

(1) *A comprehensive study by a newly-established AHTEG on RA and RM regarding the potential adverse effects to the conservation and sustainable use of biodiversity of (a) organisms produced through genome editing and organisms containing engineered gene drives, and (b) living modified fish (paragraph 18(5))*

The GIC has been an active and engaged contributor to the work under the Protocol on RA and RM since the Protocol entered into force. Expert GIC members have shared their practical experience in the field of RA and RM of LMOs with the objective to contribute to the elaboration of a general RA guidance document. Our experience from this multi-year process has demonstrated that due to the strong polarization of opinion, divergence from scientific evidence and inability to reach consensus, the output of the former AHTEG - namely the voluntary guidance on RA of LMOs - had very mixed reception from Parties, with a number of Parties preferring to follow alternative guidance documents to conduct RA of LMOs. Importantly, Parties stressed the utility of national and other international materials in conducting risk assessment of LMOs.

We also note that a generic "comprehensive study" by a newly-established AHTEG is unlikely to provide any clarity on the topic of potential adverse effects, as risk assessment is a case-by-case approach that needs to be applied to real-life examples and for relevant receiving environments. It should be kept in mind that an AHTEG will have limited expertise on topics as broad as that proposed given the rules governing participation. Open-ended forum mechanisms allow for input from a broader group of qualified experts.

The GIC notes that the outcome of the AHTEG on Synthetic Biology that was held in February 2018 used as a basis for the draft recommendation is misrepresented. No

recommendation was reached on the issue of gene drives and the need for additional RA guidance. A representative of the GIC participated in this AHTEG and provided clarifying comments during the peer review of the report from the meeting. The SBSTTA should carefully review and consider the comments made during the peer review process to have more accurate view upon which to base their recommendation.

The draft SBSTTA-22 recommendation to work on genome editing, gene drives or LM fish is not justified by evidence and is clearly not a consensus position amongst Parties and other governments with practical experience in conducting RAs. The GIC stresses that the majority opinion and views based on comments during the on-line form (29 January – 12 February 2018) is that there are no gaps in existing risk assessment methodology, and that the existing RA guidance can be successfully applied to the types of products identified in the draft SBSTTA-22 recommendation.

The GIC is very concerned with the proposal that a newly-established AHTEG would be tasked with the generation of a comprehensive study about the organisms produced through genome editing, organisms containing engineered gene drives, and LM fish. It is our view that this would lead to the same process as that which occurred in the previous AHTEG. The GIC strongly recommends that SBSTTA does not support a new AHTEG, and does not support a recommendation to conduct a study on the potential adverse effects to the conservation and sustainable use of biodiversity of (a) organisms produced through genome editing and organisms containing engineered gene drives, and (b) LM fish.

Organisms produced through genome editing: It has already been established by a number of Parties, as well as other governments, that the application of genome editing tools may result in categories of products that do not meet the definition of a LMO under the Protocol because the resulting organism does not possess a novel combination of genetic material or because natural reproductive physiological barriers were not overcome (see Annex I). For the cases where the use of gene editing tools result in the generation of LMOs (e.g., transgenic organisms), the current RA and RM provisions of the Protocol would be fully applicable. The GIC questions the rationale of the proposal to conduct a "comprehensive study" on the adverse effects of organisms developed through genome editing. Genome editing is an umbrella term for a range of tools that can be used to achieve a range of outcomes. Thus, a generic assessment of the group per se is unlikely to inform decision making in any meaningful way. As indicated above, risk assessment should be performed on a case-by-case basis considering the characteristics of each specific LMO organism and relevant receiving environments. Therefore, we are of the view that there is no need to develop additional RA guidance for organisms produced through genome editing: if the resulting organism is a LMO, then the Protocol already applies to the product.

Organisms containing engineered gene drives: Gene editing tools may be applied in a multitude of biotechnological applications, including in the development of organisms containing engineered gene drives. However, gene editing cannot be equated to engineered gene drives. The promising concept of engineered gene drives for supplementary population control solutions of significant disease vectors and crop pests has captured the interest of the scientific community and funders and supporters of gene drive research. Guiding principles have been developed for the sponsors and supporters of gene drive research[5] who subscribe to the recommendations of the 2016 NASEM report[6] on gene drives that research should be conducted with respect and humility for the broader ecosystem in which humans live, taking

[5] Emerson C, James S, Littler K, Randazzo F (2017) Principles for gene drive research. Science: 1135-1136

[6] NASEM (2016) Gene Drives on the Horizon: Advancing Science, Navigating Uncertainty, and Aligning Research with Public Values;

into account the potential immediate and longer-term effects through appropriate ecological risk assessment, which is a hallmark of both good stewardship and good governance. A number of national and regulatory evaluations[7] have already been conducted on the feasibility, ways of working and precautionary measures that need to be in place in order to address biosafety concerns and to realize the potential of engineered gene drives. This substantial body of work precedes the initiative proposed in the draft SBSTTA-22 recommendation. A study conducted under the Convention is unlikely to improve upon or enhance the quality and credibility of the technical information already provided from these other fora which involved recognized experts actively engaged in scientific research and development.

LM fish: LM fish has been raised on occasion for over a decade as a topic that needs specific guidance, with no agreement by Parties to develop additional guidance in this area. There is already a number of governments with existing RA guidance for fish and animals (e.g., Japan, Canada, United States), as well as several international organizations (e.g., OECD Consensus Document on the Biology of Atlantic salmon) working on guidance directly applicable to environmental RA of LM fish and animals. Considering this body of information, the GIC is of the view that the proposed 'comprehensive study" regarding the potential adverse effects to the conservation and sustainable use of biodiversity of living modified fish would not add value to the discussion and considerations for RA. Furthermore, Annex III of the Protocol also applies to all LMOs (plants, animals, trees, insects, fish, and micro-organisms). As such, the existing environmental RA guidance may also be applied to RA of transgenic fish in conjunction with guidance at the country level, making any additional guidance developed under the Protocol duplicative and unnecessary.

(2) *A process for the identification and prioritization of specific issues of risk assessment of living modified organisms that may warrant future consideration (paragraph 18(6))*

The GIC supports the elaboration of a workable process for the identification and prioritization of specific issues of RA for consideration by the Parties to the Protocol. The GIC appreciates the recognition for the development of specific resources by national, regional and international bodies and is of the view that this work can be built upon and adapted to the objectives of the Protocol, as appropriate. The criteria proposed in the annex to the draft SBSTTA-22 decision constitute a comprehensive list which could be helpful for further discussions with some modification as outlined below. In addition, once specific topics are prioritized for future consideration based on the agreed-upon criteria, the appropriate way that these topics are addressed further should also be established.

(3) *Criteria to determine whether specific issues warrant further consideration (Annex to draft recommendations)*

Before providing input on each criterion individually, the GIC states the importance that these criteria are agreed upon by Parties and there is broad consensus on their applicability before they are used in practice. They must be considered *collectively* in making a determination of whether a specific issue warrants further consideration. In other words, the issue should be required to meet all criteria collectively before moving forward as an issue that warrants further attention. In addition, the GIC is of the view that the focus of the debate should fall primarily on the *characteristics* of the resulting organisms and not on particular *methods* that may have been used in the development of such organisms.

[7] Australian Academy of Science (2017) Synthetic gene drives in Australia: implications of emerging technologies; RIVM Letter report 2016-0023 Gene drives Policy report; HCB Scientific Committee (2017). Scientific Opinion of the High Council for Biotechnology concerning use of genetically modified mosquitoes for vector control in response to the referral of 12 October 2015 (Ref. HCB-2017.06.07). (Paris, HCB), 142 pp. Available online: http://www.hautconseildesbiotechnologies.fr. Lorenz Centre 2017 Challenges for the Regulation of Gene Drive Technology http://www.lorentzcenter.nl/lc/web/2017/872/report.pdf

(a) *Fall within the scope and objective of the Cartagena Protocol*;
The GIC strongly supports this criterion.

(b) *Pose challenges to existing risk assessment frameworks and methodologies*;
This criterion is extremely broad and open to subjective interpretation. The GIC cautions against the word "challenges" as it is subjective and open to interpretation based on personal experience and opinion. The GIC suggests this could be made more specific to ensure it is appropriately applied, for example, "*There is no precedence within existing risk assessment frameworks and methodologies for the LMO in question."*

(c) *Involve technical knowledge and expertise that are available in the scientific community at large*;
To be clear about the intention of this criterion, the GIC suggests an edit to reflect that, in order for an issue to be considered further, "*Technical knowledge and expertise must be available in the scientific community at large to advise further consideration of the issue.*"

(d) *Concern techniques with a high pace of scientific and technological advancement*;
This criterion is problematic in our view, because the pace of scientific and technological advancement is subjective and is not a predictor of risk for the resulting organisms. More importantly, this criterion does not provide information related to potential hazards and risk.

(e) *Concern living modified organisms that*:
The GIC agrees that the following criteria are very important from the perspective of biosafety and the Protocol. However, we point out that each criterion necessarily requires that information from a case-by-case risk assessment be available in order to draw conclusions. Having adequate information on the following would actually mitigate against the need for new guidance.

(i) *Have the potential to cause serious or irreversible adverse effects on biodiversity, taking into account the urgent need to protect specific aspects of biodiversity such as an endemic/rare species, or a unique habitat or ecosystem*;
This is a necessary element. The purpose of this exercise is to identify possible LMOs where *actual risk is likely*. If this is used as a criterion, credible evidence must be presented. "Potential to cause harm" must be evidence-based and not simply hypothetical.

(ii) *May be introduced into the environment either deliberately or accidentally*;
The GIC suggests this focus on LMOs for intentional release into the environment is necessary for the purposes of prioritization; however, a more precise and appropriate formulation would be: "*Will be introduced into the environment.*"

(iii) *Have the potential to disseminate across territorial borders*;
This is a mandatory criterion as it relates back to the scope of the Protocol (transboundary movements).

(iv) *Are already, or are likely to be, commercialized or in use somewhere in the world.*
This is also a mandatory element to prioritize products with "real world" applications.

(4) <u>Establishment of a new AHTEG (paragraph 18(7))</u>

The GIC is extremely concerned with the proposal to establish yet another AHTEG to carry out new work on RA and RM and strongly encourages SBSTTA not to support this recommendation. It risks continuing the controversial and unproductive work undertaken in RA and RM under the Protocol to date.

(5) Extension of the online forum on risk assessment and risk management (paragraph 18(8))
The online fora provide an inclusive and efficient way to share and collect expert opinion and have proven to be a useful mechanism for monitoring developments in the area RA of all types of LMOs. They allow for a broad range of participants from governments, academia, industry and the NGO community to actively engage in conversations about ongoing developments and do not limit discussions to a select few with less expertise. The GIC therefore supports the proposal for the extension of the online forum on RA and RM and will actively engage in its discussions. Given the broader and more inclusive nature of the forum, we believe that it represents a very important first step in the exchange of views on specific RA and RM issues.

For more information on this and other Protocol implementation issues, please visit http://croplife.org/plant-biotechnology/cartagena-protocol-on-biosafety/.

Annex I
Categorization of LMOs Within Scope/Outside Scope of Protocol

Based on the definition for LMO and the conditions of Article 3 of Protocol, several outcomes are possible:

- an organism (LMO) that falls under the scope of the Protocol must meet all the conditions of the definition (see table below).
- Consequently, if an organism does not meet one of the definition conditions, it would be either not a living organism, not a modified organism or is outside the scope of the Protocol.

Capable of transferring or replicating genetic material Art 3(h)	**Possesses a novel combination of genetic material obtained through the use of modern biotechnology Art 3(g)**	**Modern biotechnology Art 3 (i)**		
		In vitro nucleic acid techniques	Overcome natural physiological reproductive or recombination barriers and are not techniques used in traditional breeding and selection	**LMO in scope of Protocol?**
no				NO Not a living organism
yes	no			NO No novel combination of genetic material
yes	yes	no		NO No use of *in vitro* nucleic acid techniques. e.g. mutagenesis, cross breeding, natural transgenesis, etc.
yes	yes	yes	no	NO Does not overcome natural phys. reproductive barriers e.g. gene editing, cisgenesis
yes	yes	yes	yes	YES Meets all conditions for an LMO in the scope of the Protocol e.g. transgenesis