



## CONFERENCE/WORKSHOP ORGANISER'S REPORT

### *“Environmental Release of Engineered Pests: Building an international governance framework”*

*The opinions expressed and arguments employed in this report are the sole responsibility of the authors and do not necessarily reflect those of the OECD or of the governments of its Member countries.*

#### **Brief Description of what the conference/workshop was about**

Rapid developments in molecular biology have led to the possibility of genetically modifying entire populations of sexually reproducing organisms through the release of a few genetically engineered individuals that spread desirable genes through a “mutagenic chain reaction.” So-called “gene drives” have been proposed for the suppression or mollification of a number of agricultural pests, invasive species and disease vectors. Because of the dramatic scale of change implicated by these technologies, a growing body of policy scholarship has addressed the governance challenges for effectively taking advantage of their expected benefits and mitigating their risks.

However, little attention has yet been paid to the international dimension of gene drive governance. This workshop was about international and transnational governance of gene drive applications for pest management. The workshop’s goals were threefold: (1) Exchange experiences on national governments’ regulation of existing agricultural biotechnologies and the prospects of regulating gene drive applications in pest control, (2) identify the range of social, ethical, regulatory levers and barriers to effectively govern emerging genetic vector and pest control technologies, and lastly (3) to develop recommendations for international coordination of gene drive governance.

#### **Participation – details of total number of participants, countries they came from, backgrounds (academia, industry, etc.)**

Invited speakers included natural scientists with expertise on gene drives, national government regulators, risk assessors and social scientists focusing on emerging biotechnologies.

- Total speakers – 17
- Total participants – 65
- Represented countries – Australia, Brazil, Canada, China, India, Japan, Mexico, Panama, Philippines, Spain, South Africa, UK, US

#### **Major highlights from the presentations and sessions**

The first set of presentations, on most of Day 1, included a number of descriptions of risk assessments and regulatory processes for existing genetic pest management (GPM) organisms (non-drive), including GM olive fruit fly in Spain, stakeholder engagement processes in EFSA, as well as Brazil regulators experiences with (non-drive) GM mosquito releases by Oxitec. This was noted by participants to be extremely useful for comparing and contrasting regulatory processes and governance experiences of biotechnology across countries.

Presentations at the end of Day 1 and on Day 2 commented on the ‘socioecological’ context. These presentations first sought to draw lessons from regulation – and public response – of existing biotechnology, in particular genetically modified (GM) crops. These presentations made the recurring point that greater emphasis on participatory processes in developing gene drive governance is necessary. A presentation by Andrew Stirling also argued and demonstrated that technological innovation is inherently political, and therefore that the regulatory actions about next-generation biotechnologies be based more explicitly on public choice (with a number of tools and methods for doing so proposed in the presentations). Presentations by Keith Hayes, Michael Burgess, John Mumford demonstrated how regulators around the OECD and globally have been experimenting with expanded participatory processes. A presentation by Camilla



Beech on the firm Oxitec's regulatory experience with its GPM biotechnologies provided industry's perspective on these issues.

The second half of Day 2 involved a collaborative stakeholder mapping exercise. The purpose of this exercise was to illuminate possible avenues for enhancing international participatory processes for coordinating – and eventually harmonizing – gene drive governance, recognizing the unique potential for these technologies to uncontrollably spread across sovereign boundaries. Workshop participants were divided into small groups to consider three prepared case studies on hypothetical international disputes that could arise from gene drive deployments for pest control. These case studies included: (i) a scenario in which a gene drive for suppressing invasive rodents on sensitive island ecosystems might contaminate international grain shipments and lead to a trade dispute, (ii) a scenario in which one country had decided to unilaterally release a gene drive mosquito for malaria prevention despite protests from a neighbouring country, and (iii) a scenario in which transgenic material from a gene drive fruit fly was detected on international shipments of agricultural produce leading to a trade dispute. For each of these studies, participants were tasked not with envisioning resolutions to these disputes, but rather with simply mapping out the parties who had an interest in the dispute, as well as those parties who had influence or power over how the dispute could be resolved.

### **Major outcomes/conclusions in terms of policy relevance**

Workshop speakers are drafting short, open-access policy papers for publication in a special issue of BioMed Central Proceedings in late 2017. The workshop organizers are also seeking to publish a short synthesis paper for a high-profile journal (e.g. as a Commentary in Nature Biotechnology).

Some key lessons that emerged from workshop include:

- The fact that gene drives are intended to spread raises the tangible prospect of direct, transboundary movement of Living Modified Organisms (LMOs). This is similar to biocontrol approaches to pest management, but very different from other genetic engineering applications in agriculture (such as genetically modified crops or non-drive forms of genetic pest management). Economic analysis of this possibility suggests that, without international regulatory coordination, gene drive deployers in one country are unlikely consider potentially substantive effects (positive or negative) on neighbouring countries into which the gene drive may spread. Thus, at an international level gene drives deployments exhibit possible features of public goods and externalities.
- In general, there is a choice to be made about the international conventions through which different elements of international gene drive governance should be directed. Direct transboundary spread of LMOs invokes protocols within the CBD and the International Plant Protection Convention (IPPC), with the latter being used by the WTO for harmonizing international phytosanitary standards.
- More generally, gene drives have the potential to significantly alter our global commons. Because of the institutional complexity involved in governing global commons, specialized analytical methods may be useful for identifying opportunities for coordination. One such method is “Institutional Analysis and Development,” formulated by Elinor Ostrom. Stakeholder mapping, analysis and participation is one component of this broader method.
- The different international conventions and treaties which may apply to gene drive governance have vastly different norms and institutions regarding stakeholder participation and engagement with civil society. The choice of international convention for governing gene drives should consider the effectiveness of existing stakeholder engagement processes.
- Most national government regulatory authorities are limited by existing statutes as to how interactive stakeholder participation can be. Many regulators expect major stakeholder input to be channelled through formal legislative political processes.
- In developing international governance of gene drives, participatory processes may need to be layered to manage local, regional and global constituencies for effective action. Different process layers may allow for more or less one-way or two-way engagement.



**Relevance to CRP theme(s)**

This workshop related most directly to the “Sustainability in Practice” theme of the CRP, as evidenced by the above points.

**Website for further details – please also indicate if the presentations are/will be available on the website**

Available at: <https://research.ncsu.edu/ges/oecd-crp-meeting/>

(Slides are available at this link for those speakers who agreed to have their presentations shared.)