

Pros and Cons of the Precautionary Principle (PP): European Experience with the regulation of GM Crops

Joyce Tait and Joanna Chataway

This policy brief reviews the development of the precautionary principle (PP) in Europe, mainly in the context of GM crops – the only area where it has been applied consistently to the development of an entire industry sector. We raise the question: Has the uncritical adoption of two key policy strands, the precautionary principle and ‘upstream engagement’ diminished the innovativeness and competitiveness of a major European industry sector and is it also challenging future innovation in life sciences?

INCREASING EMBEDDEDNESS OF THE PRECAUTIONARY PRINCIPLE IN EU LEGISLATION

During the 1980s, several trends came together in Europe to smooth the path to the adoption of the precautionary principle. An underlying issue was the environmental damage caused by the use of organochlorine insecticides. The regulatory systems in place in the 1970s and 80s required a convincing level of proof of damage before action could be taken and, in the case of the organochlorine insecticides, very significant environmental harm had been caused by the time regulatory measures were implemented¹.

In the political sphere there was a move away from a top-down government approach to a governance approach

At the same time, in the political sphere there was a move away from a top-down government approach to a governance approach² with a focus on bottom-up public engagement as a contribution to policy making, epitomised by the precautionary principle. This European approach empowered non-governmental organisations (NGOs) and other advocacy groups who were seen as representing this public voice and who campaigned for the



adoption of the PP as a way of avoiding the mistakes of the past, with agriculture and the chemical industry being major foci of attention. At the time the PP, allied to this governance agenda, was seen as a landmark in environmental protection.

REGULATING GM CROPS

Discussions on regulation of GM crops began in the 1980s against this background, with disagreement over whether regulation should be product based (the US position) or process based (the EU position, equivalent to

a precautionary approach)³. US/EU differences over this question, conducted through the Organisation for Economic Cooperation and Development (OECD) and more recently the World Trade Organisation, are still unresolved.

The PP enabled advocacy groups to circumvent the previous requirement for risk regulation to be linked to evidence of harm

The precautionary approach was initially adopted as a temporary measure in Europe, with the support of agro-

biotechnology companies, with the intention of moving to a more product-based approach as evidence became available for the safety of GM crops. However, citing the PP, a broad NGO advocacy coalition raised concerns about an array of potential risks and influenced the EU regulatory system to become more, rather than less precautionary over time.

The historic approach of balancing risks and benefits was replaced by a focus entirely on risk

The PP enabled advocacy groups to circumvent the previous requirement for risk regulation to be linked to evidence of harm so that conjecture of future harm, based on weak analysis and evidence could be used to justify the PP. Likewise the historic approach of balancing risks and benefits was replaced by a focus entirely on risk.

Agro-biotechnology companies were ill-prepared to respond to these challenges, partly because of the disruptive nature of GM technology in relation to their existing chemicals-based development pathways⁴. Since that time for a variety of reasons they have been unwilling to engage in European debates and dialogues.

The current European regulatory system for GM crops is more complex and demanding than that for any similar technology and yet there is little sound evidence of direct environmental damage or health risks from the approved GM crops in use in other regions and considerable evidence of their benefits. Nevertheless public opinion still seems to be against this new technology and several regional governments in Europe refuse to permit GM crop trials in their region, quoting as reasons the risks to people and the environment. There is an imbalance of political power that has no basis in balanced evidentiary standards.

This raises questions about the roots of European opposition to GM technology, the role of pressure groups and the ideological nature of their opposition⁵. These questions are important because opposition to GM crop technology is not diminishing significantly as evidence for the safety and benefits of the technology accumulates⁶.

It is possible that the influence of advocacy groups in dominating the framing of this

technology for the European public would have been less in the absence of the PP which enabled critics of GM agriculture to invoke 'risk' as an issue to attain leverage in political debates despite insubstantial evidence of harm. The PP may have added to public alarm rather than providing reassurance, in that members of the public are questioning, 'If this technology is as safe as you claim, why do we need to be precautionary?'

Government pressure from the EU, along with lobbying from NGOs, has also influenced the development of international legislation, particularly the UN Biodiversity Convention and the linked Cartagena Protocol, both of which take a precautionary approach to GM crop development.

IMPACT OF PRECAUTION ON THE EUROPEAN SCIENCE BASE

Adoption of the current form of the PP in Europe, along with negative campaigning by pressure groups and concerned public opinion, have been important factors in reducing European investment in research on agricultural biotechnology and hence in decisions to close or reduce the size of scientific research institutes. The PP may also have had a negative impact on a previously flourishing and profitable European agro-biotechnology industry sector which is now greatly reduced in size and number of companies. This may have knock on effects on European industry's



ability to develop products tailored to the needs of European farming systems.

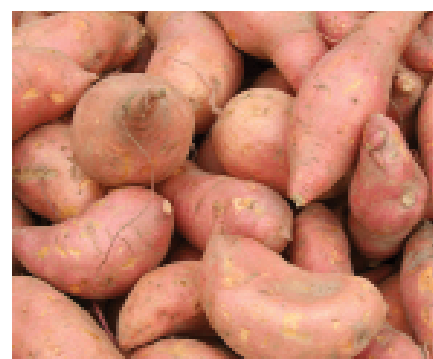
PP's greatest achievement to date seems to have been to slow down development of technologies that could usefully contribute to the environmental sustainability of agricultural systems

Numerous textbooks and many more journal articles have been written justifying the PP in its various forms and discoursing on its implementation. However, very few point out that it is fundamentally un-implementable⁷. Precaution will undoubtedly prevent some risk outcomes, but there will be no evidence to enable us to judge whether and when it has succeeded. Equally unknowable, it will also prevent research and development that could have led to public benefits.

Rather than the hoped-for improvement in environmental and health protection, the PP's greatest achievement to date seems to have been to slow down development of technologies that could usefully contribute to the environmental sustainability of agricultural systems.

REFLECTION ON THE EUROPEAN APPROACH TO GM REGULATION

A great deal of attention has been devoted to the question, 'What did we do wrong?'⁸, in developing GM crops in





Europe, given the relative success of the technology in many other parts of the world. In the UK the initiative in answering this question was taken up by a think tank through a campaign for 'upstream engagement'⁹. The argument was that we had failed to engage early enough and intensively enough with the public in the development of GM crops and that citizens should have a say in the basic funding of science, not just its application. This argument was widely accepted among scientists who saw it as a way of convincing the public of the value of what they do¹⁰.

If well conducted, according to appropriate rules of engagement, such a process can help to improve the quality of the dialogue among a wide range of stakeholders on issues related to the development of new technologies. However, upstream engagement allied to the precautionary principle can also create opportunities to reinforce the negative framing of new technologies such as nanotechnology and synthetic biology, following the pattern of previous framings of GM crops¹¹.

A SYSTEMIC IMPASSE

Simplistic answers (like upstream engagement) to complex systemic problems are unlikely to provide satisfactory solutions. GM crop regulation in Europe is now widely regarded as dysfunctional and yet it is proving very hard to move away from this systemic impasse.

Simplistic answers (like upstream engagement) to complex systemic problems are unlikely to provide satisfactory solutions

The ESRC Innogen Centre's approach to such questions is to focus in detail on three main constituencies – science and innovation communities, regulatory and governance communities and public stakeholder groups – and to use the knowledge acquired to understand how the constituencies are interacting with one another to determine which products and technologies are able to reach a market place and which industry sectors and companies, and also which countries, are able to develop them.

This policy brief has focused on how the precautionary principle (in the governance arena) interacting with issues related to

public engagement (in the public and stakeholder arena), allied to industry challenges in dealing with disruptive technology (in the science and innovation arena), has contrived dramatically to slow down GM crop related innovation in Europe and to pass the initiative to other countries, mainly the US, Latin America and China. As a result it may be that Europe has also lost the initiative in developing potential solutions to some of the key problems facing us in the 21st Century, particularly in the areas of food and fuel security.

We can see and calculate the impact of this systemic failure on products where development has started but fallen foul of the current EU precautionary approach, reinforced by negative public opinion; we cannot know the extent of lost opportunities where novel ideas are stifled before basic research has begun, although there is anecdotal evidence that this is happening¹².

A SYSTEMIC RESPONSE

More research is needed on the impact of the PP on GM and related technologies in Europe, and more dialogue on a broader

basis would be needed to develop systemic solutions to this problem that would command the support of all key players. From our research to date, we propose as a starting point an approach that involves balanced precaution (giving appropriate weight to the interests and values of all relevant stakeholders) and equitable scepticism, backed up by clear rules for engagement¹³.



None of this implies that there should not be room for serious and intractable disagreements over the introduction of new technology. Such debates are an important part of political processes. However, when they become integrated within supposedly impartial processes of risk regulation, as has resulted from the introduction of the PP in Europe, it becomes increasingly difficult to make evidence-based decisions.

The following pointers summarise this approach:

Balanced precaution

- Consider carefully whose precaution should be relevant to a decision and what we should be precautionary about (for example, why be highly precautionary about environmental impacts and not at all precautionary about food security).
- Develop guidelines on the relevance of different areas of expertise to GM crop related issues, and weight the credence to be given to precautionary predictions from a variety of sources accordingly.
- Have a clear plan for moving away from a precautionary approach to an evidence-based approach as experience with a new technology accumulates.

Equitable scepticism

- In engagement processes, be equitably sceptical about the impartiality and value of evidence related to implementing the precautionary principle from different sources, based on an understanding of the underlying values and interests of different players.

Rules for engagement

- Promote dialogue across a wider range of issues to include the processes by which new scientific discoveries are translated to products in a market place and how these processes are regulated.
- Consider under what circumstances it is appropriate for market forces to determine what products should be available, rather than allowing the values and interests of one group to restrict the freedom of choice of others.
- Set standards for the quality and breadth of evidence that is brought to discussions about novel technologies and their regulation.

References and further reading:

- 1 Tait, J. and Levidow, L. (1992) Proactive and Reactive Approaches to Risk Regulation: the Case of Biotechnology, *Futures*, April, 1992, pp 219-231.
- 2 Lyall, C. and Tait, J. (2005) *New Modes of Governance: Developing an Integrated Policy Approach to Science, Technology, Risk and the Environment*. Aldershot, Hampshire: Ashgate Publishing Ltd.
- 3 See note (1)
- 4 Chataway, J., Tait, J. and Wield, D. (2004) Understanding company R&D strategies in agro-biotechnology: Trajectories and Blindspots. *Research Policy*, 33/6-7, 1041-1057; Tait, J. and Chataway, C. (2007) The Governance of Corporations, technological change and risk: Examining industrial perspectives on the development of genetically modified crops.

- Environment and Planning – C: Government and Policy, 25, 21-37.
- 5 Tait, J. (2001) More Faust than Frankenstein: the European Debate about Risk Regulation for Genetically Modified Crops. *Journal of Risk Research*, 4(2), 175-189.
- 6 Tait, J. (2008). Risk Governance of Genetically Modified Crops: European and American Perspectives. In eds. O. Renn and K. Walker, *Global Risk Governance: Concept and Practice Using the IRGC Framework*. Dordrecht, NL: Springer Science and Business Media; pp 133-153..
- 7 An exception is "Laws of Fear: beyond the precautionary principle" by Cass Sunstein (2005) Cambridge University Press.

- 8 See note (7)
- 9 Willis R, Wilsdon J (2004) *See-through science – why public engagement needs to move upstream*. London, UK: Demos
- 10 Anon (2004) Editorial – Going public. *Nature* 431: 883
- 11 Resignation letter, Helen Wallace. <http://www.genewatch.org/uploads/f03c6d66a9b354535738483c1c3d49e4/resignation.doc>
- 12 Tait, J. (2009) Upstream Engagement and the Governance of Science: the shadow of the GM crops experience in Europe. *EMBO Reports*. Vol 10, Special Issue, pp 18-22
- 13 See note (5)

Contact authors:

Professor Joyce Tait, ESRC Innogen Centre, University of Edinburgh, Old Surgeons Hall, High School Yards, Edinburgh, EH1 1LZ, UK, Tel: +44 1908 655119, email: joyce.tait@ed.ac.uk; Professor Joanna Chataway, RAND Europe and ESRC Innogen Centre, Open University, Walton Hall, Milton Keynes, MK7 6AA, email: chataway@rand.org

Contact centre:

Innogen: ESRC Centre for Social and Economic Research on Innovation in Genomics www.genomicsnetwork.ac.uk/innogen
 Innogen at the University of Edinburgh t - 0131 650 9113 e - Innogen@genomicsnetwork.ac.uk
 Innogen at the Open University t - +44 (0)1908 654 782 e - Innogen@open.ac.uk

