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## GMO assessment in Norway: societal utility and sustainable development

The controversy surrounding genetically modified organisms (GMOs) has been a highly politicized issue in Europe. While opponents of GM crops maintain that scientific risk assessments are not sufficient to address potential long-term hazards for health or the environment, proponents have criticized the current regulatory framework for being influenced by political and other non-scientific interests. In this regard, it is interesting to compare the situation in Norway, which is linked to, but not bound by European Union (EU) law and which places a comparatively strict regulatory burden on GMOs.

Here, we briefly present our assessment of applications to market GMOs in Norway, and how they fulfil the criteria of sustainable development and societal utility that are required by the Norwegian Gene Technology Act. The Norwegian Directorate for Nature Management in Trondheim requested the study (Myhr & Rosendal, 2009), but the results have implications beyond Norway as other countries are also exploring ways to integrate socio-economic considerations into the national regulation of GMOs.

After an initially liberal approach to GMO technology, Norwegian civil society, including farmers' organizations, has become

largely opposed to such organisms and the regulatory approach in Norway now places more emphasis on environmental, health and societal concerns. In fact, the legislation covering GMOs in Norway is similar to that of the EU as Norway is part of the European Economic Area (EEA). The Norwegian Gene Technology Act predates the EEA agreement and Norway therefore has an additional legal body regulating GMOs: the Act states that in deciding whether or not to grant the application, “significant emphasis shall also be placed on whether the deliberate release represents a benefit to the community and a contribution to sustainable development”.

In Norway, the requirement for GMOs to contribute to both societal utility and sustainable development means that assessments must take into consideration any health and environmental consequences in the countries in which the crops are grown—notably developing countries—as well as in the countries in which they are consumed. In contrast, the GMO panel of the European Food Safety Authority (EFSA) has argued that in the EU, a hazard should only be considered a problem if it is likely to have negative effects on health and the environment in the EU. The more stringent requirements in Norway cause a dilemma for Norwegian regulators: to what extent does the Norwegian Gene Technology Act require the Norwegian authorities to provide information about sustainable development and societal utility if the applicant fails to do so?

In our analysis of information about sustainability in applications to market GMOs in Norway, we found that the information supplied by the applicants was of high relevance when assessing global impact and ecological limits—two of the required criteria in the Norwegian Impact assessment regulation. However, when assessing the adequacy of the supplemented information we had problems due to confidentiality, and a substantial number of the supplied references pointed back to the applicants’ own research departments and therefore lacked

peer-reviewing. Another aspect is that there are many different interpretations of the significance and implications of the scientific findings. We also found that global impact and ecological limits entail much wider concerns—such as any potential effects on socio-ecological relationships—and for these, the assessed applications provided little or no relevant information. Further, we found no information that would address the requirements of four other criteria: basic human needs, distribution between generations, distribution between rich and poor countries, and economic growth.

We also assessed whether the applications to market GMOs fulfilled the criteria of societal utility. Societal utility is closely linked to basic human needs, distribution between generations, distribution between rich and poor countries, and economic growth, but is a complicated concept that may require many points to be considered. These would include, for example, an assessment of whether the technology is beneficial to small or large farms, whether the technology is likely to have any effect on employment, food security, landscape aesthetics, or human and animal health and welfare, and an assessment of who will benefit from the technology. In our analysis, we found that the applicants had carried out little research to identify how GM crops might contribute to sustainability and societal utility around in the world.

Our results give rise to a number of unresolved issues. First, there is a need to identify how ethical issues and public perspectives and values affect the framing and conduct of risk assessments and the management of GMOs. Second, there is a need to take a more integrated approach to GMO applications and risk issues to account for the present lack of scientific understanding. Third, the assessment of utility versus risks is an important element for implementing the criteria of the Norwegian Gene Technology Act and warrants broader analysis. A fourth element is the relationship between short-term concerns for human health and

long-term concerns for environmental consequences. The concern for human health and consumer choice has already led to evolving regulations for labelling GMO products. There is, however, no similar legislation with regard to environmental concerns, as Mother Nature is unlikely to read labels. Finally, there is a need for a legal analysis of the scope and types of requirements that the Norwegian Gene Technology Act places on the Norwegian authorities in regard to investigating societal utility and sustainable development in GMO applications.

The situation in Norway is also attracting international attention: at present, 156 countries that are party to the UN Cartagena Protocol on Biosafety—which calls for an assessment of “socio-economic considerations”—are struggling to implement this obligation. Furthermore, the Norwegian public tend to view the GMO issue in a broader context, as part of the globalization trend that is giving them fewer choices about which foods to eat and what medicines to take. Thus, there is a need for a better understanding of how GMOs affect sustainability and societal utility in countries where they are grown, as well as in countries that import GM food and feed.

#### CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

#### REFERENCES

Myhr AI, Rosendal GK (2009) *GMO assessment in Norway as compared to EU procedures: societal utility and sustainable development*. Trondheim, Norway: The Directorate for Nature Management. <http://www.dirnat.no/attachment.ap?id=10784>

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