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From risk assessment to in-context trajectory evaluation: GMOs and their social implications[1]

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Abstract

Over the past twenty years, biotechnologies have raised enormous expectations as well as passionate political controversies, paving the way to a strong polarization in European society and to an on-going debate on how should these technologies be assessed. Mainstream approaches have been focusing on risk-assessment procedures. According to this perspective, new technologies should be assessed in terms of their potential risk of negatively affecting human health and in terms of the environmental risks, such as cross-contamination and biodiversity preservation. Yet, the large majority of risk-assessment studies on GMOs mainly focus on animal trials, trying to detect biological or medical anomalies among the animals fed with GM products. Although many of these studies have repeatedly claimed that no significant health impact could be detected, their independence and reliability has been contested not only because they have been carried out by the same multinational corporations that produce the tested GMOs but also because the original data have not been released to the academic community for the studies to be replicated. Moreover, independent studies on GMOs have raised serious doubts about health safety in a number of different occasions (Le Curieux-Belfond et al. 2008; Seralini et al. 2009; Seralini, Cellier & Spiroux de Vendomois 2007; Gasnier et al. 2009; Heinemann & Traavik 2004; Traavik & Heinemann 2007).

Independently of whether GMOs constitute a direct threat to human health and the environment, risk-assessment approaches have reduced the evaluation of GMOs merely to a question of how much risk can a society bear for the introduction of these new products in the face of their claimed benefits but there is much more to GMOs than the risk/ benefit relationship suggests (Ferretti 2009). Many reasons lay behind the emergence and diffusion of risk-assessment approaches. On the one hand, these approaches support and strengthen the technological fix attitude that affects post-industrial societies. Problems that may have a number of different social, economic or political origins are

1 Extended abstract: A full paper is submitted to UWSF – Zeitschrift für Umweltchemie und Ökotoxikologie, Series: Implications of GMO-cultivation and monitoring. Springer-Verlag.

framed and addressed in terms of a technological solution that allow for a quick, effective fix that does not call into question these non-technical origins. A clear example maybe retrieved in the Syngenta website, where the issue of water scarcity and water supply all over the globe is reduced to a technical question, whose solution is offered through GM crops with reduced water absorption (www.singenta.com, "Bring plant potential to life" campaign). On the other hand, these approaches positively resonate with the tendency to delegate essentially political decisions to expert committees, which effectively divert responsibility from political actors to techno-scientific networks (Jasanoff 2003). In turn, this process de facto de-politicizes a number of controversial issues, which could otherwise threaten political consensus and stability. As a consequence, the growing momentum of risk-assessment approaches has encouraged a technocratic twist in science and technology policy, which has been criticized on a number of political and sociological grounds (Weingart 1999; Funtowicz & Liberatore 2003; Nowotny 2003; Felt at al. 2007; Levidow 2009; Ferretti & Pavone 2009).

First, it has been argued that risk-assessment approaches take the technology for granted, addressing public opposition to GMOs as a problem in itself. Instead of considering public arguments against GMOs as an opportunity to reconsider the technology from a different perspective, producing a wider and more robust assessment of GMOs' implications, the public has been addressed as the problem, calling for solutions that aimed at reducing this opposition rather than at learning from it (Felt et al. 2007; Levidow 2007).

Second, risk-assessment approaches address GMOs potential impact merely in terms of their human health-related and environmental risks. However, GMOs have also an important impact not only on the existing economic, political and social arrangements but also on the developmental trajectory of the areas selected for implantation. Technology shapes society and it is shaped continuously by it, in a mutually constitutive process that has been elsewhere described as co-production (Jasanoff 2005; Ferretti & Pavone 2009). In this co-production process, science and technology and social order emerge side by side.

Third, it has been pointed out that these technologies cannot be evaluated in abstract terms, independently of the juridical, social and economic context in which they will be implemented. Local institutional rules and practices shape technology innovation and implementation and cannot be considered equal in each and every corner of the world. Power relationships, economic interests, lack of transparency, weak rule enforcement may strongly affect not also the trajectory of implementation of a technology but also the actual repercussions that GMOs are likely to produce (Goven 2006b).

Last but not least, approaches focusing on risk do not call into question the actual trajectory that a technological innovation has followed to emerge, and the visions and imaginaries that came along with it (Mcnaghten et al. 2006; Felt et al. 2007). In other words, technological products are no neutral objects. They have been produced by specific actors, in specific contexts, in order to address a specific problem, which has been framed in such a way that a given technology makes sense as a solution. As a result of

the very process triggering their emergence, technologies are loaded with social and political values. Technologies materialise certain paradigms, in fact, they "re-construct" social paradigms (ideas and assumptions about functioning) into physical matter – this is what could make the utility of a technology. It has to "fit" to the social structures managing it, and resembles the material support a social setting organises to stabilise and proceed itself, which will remain completely undetected as long as the focus of technology assessment concentrates on their risk implications. Yet, a thorough analysis of the ethical, social and political load of values and principles that each technology carries in the visions and imaginaries it promotes is a fundamental step towards a social and political assessment of risk technologies in general, and GMOs in particular.

This paper will be developed in three steps. In the first step, the limits and implications of risk-assessment approaches will be outlined and discussed. In the second step, recent developments addressing these implications and trying to overcome the shortcomings of risk-assessment approaches, such as public engagement with GMOs and the ELSI (ethical, legal and social implications) on medical genetics and nanotechnology studies will be discussed. Finally, we will try to formulate some suggestions to help complementing existing risk-assessment studies with a more reflexive, socially-oriented approach. First, it is necessary to unpack the politics and ethics of a given technology, by addressing the emergence, the socio-technical networks, the power relationships and the economic interests that are tightly interrelated in the process of innovation and implementation. In this section – which tries to answer the question: what kind of future society is embedded in this technology? – the techno-social imaginaries and visions driving and underpinning technology innovation and implementation could be de-constructed and scrutinized, not only *per se* but also in relation to dominant socio-political imaginaries.

In the second section – which addresses the question: in what kind of society is this technology going to be implemented? – dominant practices, rules, formal and informal procedures and legislative gaps need to be explored. If risk-assessment procedures try to establish how safe is a technology, this approach rather tries to explore how "safe" is the context (Goven 2006b). In the third section, eco-social analysis should be integrated. GMOs affect agro-food production system, and have an impact not only on the environmental context in which they will be introduced but also in the way people feel and live and interact with this context. Social meanings, actions and relationships arise and are enacted around specific local environments and around the local understanding and framing of it. Changing these environments will inevitably change the socio-relational domains constructed around them. The potentiality of these changes, therefore, cannot be underestimated or neglected (Ferretti & Pavone 2009).

These three elements may help consolidating a more robust social assessment, which we define as an in-context trajectory evaluation. From this perspective, it emerges that there might be a number of socio-political reasons that support a moratorium on GMOs in Europe even if they come to be considered technically safe and ethically legitimate.

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