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**The Battle for the Global Governance  
of Genetically Modified Organisms**  
The Roles of the European Union,  
Japan, Korea, and China in a Comparative Context

Yves Tiberghien

## **The Battle for the Global Governance of Genetically Modified Organisms** **The Roles of the European Union, Japan, Korea, and China in a Comparative Context**

### **Abstract**

Since the mid-1990s, a global political battle has developed around one of the most promising industries of the future: biotechnology. While transgenic technology showed great promise and became widely adopted in North America, it also became the target of a global resistance movement including non-governmental organizations (NGOs), key states, and international organizations. The emerging consensus among OECD countries embedded in the 1994 WTO agreement quickly collapsed after 1999, as the EU, Japan, Korea, and other countries led a counter-movement.

The battle entails several dimensions—modern technology and human progress, global trade, environmental protection, health, food security, development, democratic deficit, and cultural identity—making it one of the fault lines in globalization. State policy with respect to genetically modified organisms (GMOs) includes both national regulations and support for global standards in international negotiations such as the 2000 Cartagena Protocol on Biosafety.

This study analyzes the stakes in the battle for global governance, the key actors, and the principal battlefields. It then focuses on the roles of two key players, the EU and Japan, and how they led the move toward a more precautionary approach. The study reveals the political mechanisms behind this transformation, emphasizing the role of emerging civil society movements as the determining trigger for policy change.

## **Géopolitique des organismes génétiquement modifiés** **Le rôle de l'Union européenne, du Japon, de la Corée et de la Chine**

### **Résumé**

Depuis le milieu des années 1990, les grands pays du monde sont engagés dans une bataille pour le futur des OGM. Alors que l'industrie des biotechnologies agricoles s'est largement développée en Amérique du Nord, elle a aussi fait l'objet d'un fort contre-mouvement de résistance comprenant des organisations non gouvernementales, des États défenseurs du principe de précaution (Europe, Japon, Corée), et des organisations internationales. Le consensus émergent entre les pays de l'OCDE et ayant permis un accord au sein du traité de l'OMC de 1994 s'est évanoui.

Le débat autour des OGM touche simultanément à plusieurs dimensions : relation entre technologie et progrès humain, commerce mondial, protection de l'environnement, santé publique, sécurité alimentaire, développement, déficit démocratique, et identité culturelle. De ce fait, la controverse des OGM se trouve au cœur des débats sur la mondialisation. La bataille se joue tant au niveau global (traité de Carthagène, Codex, OMC) qu'au niveau national (compétition entre réglementations nationales).

Cette *Etude* fait le point sur les enjeux de la bataille globale, les acteurs clef, et les principaux champs de bataille. Dans un deuxième temps, elle analyse les causes politiques du nouveau rôle joué par deux unités importantes : l'Union européenne et le Japon. Les cas de la Corée, de la Chine et de l'Inde sont aussi évoqués. Au travers de cette analyse politique, l'auteur démontre que les positions prises par différents pays résultent moins d'un calcul économique que d'une réaction à une mobilisation inattendue de la société civile. Cette dernière a joué le rôle de catalyseur conditionnel dans un processus de changement de politique.

# **The Battle for the Global Governance of Genetically Modified Organisms**

**The Roles of the European Union, Japan, Korea, and China in a Comparative Context**

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## **INTRODUCTION: THE GLOBAL BATTLE AND ITS STAKES**

A remarkable mix of technological innovation, market integration, and trans-border flows has transformed the world over the past two decades. Many scholars and policy-makers consider this trend of globalization to be tied to global wealth creation and to global peace. At the same time, global markets require global order, global rules, and global legitimacy. The continuation and survival of global economic flows depend upon the capacity of large states to cooperate in guaranteeing global property rights and generating stable expectations.

This paper focuses on a single issue: the regulation of biotechnology and genetically modified organisms (GMOs). Biotechnology offers a fascinating prism for the study of global governance in a novel area. In this area, an initial regulatory consensus has fallen apart and the polarization of key states split between opposite positions has complicated the development of technology and trade.

Since 1996-1999, a global contest has pitted proponents of a liberal pro-science approach against proponents of a more prudent or regulatory approach. The liberal camp, led by the US, Canada, and Argentina (and, most recently, Brazil), defends the principle of « substantial equivalence », a concept according to which novel food products that have the exact same functions as traditional ones should not be regulated differently. This principle formed the basis of an international consensus reached within working groups of the Organization for Economic Cooperation and Development (OECD) and embedded in the 1994 WTO

Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement). On the opposite side, a number of countries have departed from this initial point of convergence and introduced « the precautionary principle », according to which protective regulations may be warranted when current knowledge is insufficient to assess all potential future risks. Proponents of this approach support both a more thorough approval mechanism for GMO products (including both food safety and environmental impact) and mandatory labeling and traceability of GMOs. The European Union has become a leader in this approach, developing the world's most stringent regulations at home and pushing for the adoption of the concept in global treaties. Japan has emerged as another key country in this camp, even though its bureaucracy managed to lessen the trade impact of GMO regulations through loopholes and high thresholds. Other countries converging toward a more precautionary approach have included South Korea, China, India, and Switzerland.

The contest takes place both at the national and international levels. At the national level, countries introduce regulations on the production, testing, and labeling of GMOs, competing between themselves to set a dominant global standard. At the international level, an inter-state tug-of-war gave birth to the UN Cartagena Biosafety Protocol (CPB) that was signed in Montreal in January 2000 and took effect in September 2003 after being ratified by 50 countries. A further battle has been raging within the WTO since May 2003, when the US, Canada, and Argentina launched a legal action against the EU's de facto moratorium on GMOs. The preliminary outcome of the WTO panel report was announced in February 2006 and resulted in European defeat. The panel confirmed that the de facto EU moratorium of 1999-2004 on new GMO approvals resulted in undue delay and thus in a violation of its WTO commitments (namely, the Agreement on the Application of Sanitary and Phytosanitary Measures, or SPS Agreement). The report of the panel was the longest in the WTO's history (1050 pages) and both camps braced for a tense period ahead, beginning with a likely EU appeal and continuing with likely law suits for economic damages.

The impact of this great international rift is far-reaching. At stake in this GMO battle is not just the future of agriculture biotechnology, but also the legitimacy of national and global regulatory institutions (including the WTO), the relation between science and society, and the political contract between society and government in a democratic setting. Politically, the GMO issue has raised larger questions about the legitimacy of governing authorities and about the inclusion of civil society actors in policy-making. Globally, new coalitions have emerged, particularly in the form of coordination between the EU, Japan, Korea, and, to some extent, China, and India. At stake is also the future control of the world's seed supply and food supply. Dominique Bodin-Rodier<sup>1</sup> calls this a global food war (« *guerre alimentaire* »). In addition, the GMO fight is likely to have a great influence over the regulations of future biotech applications, such as stem cells, modified and cloned animals, and even gene therapy.

Given the huge technological and economic potential of biotechnology for nearly all countries, the decisions taken by these latter countries to restrict their agricultural applications constitute the crux of the great GMO battle. This study therefore raises one key question: « What underlies the diversity of national responses (regulatory polarization) to a new technology with attractive potential for all? »

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<sup>1</sup> See Bodin-Rodier 2000.

In particular, in the light of the pre-existing consensus that lasted up to 1995 the question can be rephrased as follows: « Why have some countries shifted from a permissive to a tightly regulatory position despite the economic advantages involved and the investments they have made? »

Interestingly enough, even as late as 1995 nothing indicated that this shift was to be expected. In addition, national responses have often themselves been incoherent. Countries such as the EU, Japan, Sri Lanka, and Malaysia actually support and fund biotech R&D as a matter of priority and pursue elaborate Biotechnology plans, while blocking dissemination through product regulations. Countries such as Australia, New Zealand, and most recently Brazil, take regulatory positions at the national level; yet defend a liberal pro-science approach at the international level. Even within the EU, France flip-flopped four times on the GMO issues (moving from traditionally pro-GMO to anti- in February 1997, back to reasonably pro-GMO in November 1997, and anti-GMO in June 1999). Today, France is the only country not to have incorporated EU directive 2001/18 and GMOs remain politically explosive for any political party; yet, France is one of only three EU countries where GMO crops are actually grown and one of the few countries voting in favor of the approval of new GMO products in most votes taken since 2004.

This study presents a bottom-up interpretation for the shift of certain countries toward a precautionary approach. It argues that this regulatory departure is the result of an institutional crisis triggered by civil society actions. The entry of new actors and the use of new channels has led to the breakdown of a stable status quo. When a tipping point is reached, the civil society coalition succeeds in capturing public opinion and in forcing the process of change. This success depends partly on the strength of NGO networks and strategies, but also on the existence of a crisis of trust in governing institutions. However, if NGOs play a crucial role in triggering change, they do not control the outcome of this change. The actual form of GMO regulations depends on the balance of power between ministries and between bureaucratic institutions and politicians. In countries such as Japan and Korea, economic ministries managed to keep the process of change under control once initiated from the outside and to devise a mix of regulations that would prevent a trade conflict with the US.

The study is organized in seven sections. Section I presents the historical context of a selected shift away from an initial emerging consensus. Section II provides data on the emerging country clusters across the world. Section III gives an overview of the larger political processes at work. Section IV, V, and VI analyze the empirical events in selected key countries: the EU, Japan, and other Asian countries. Section VII concludes the study with a review of the most recent events and the issues that lie ahead.

## Biotech and GMOs: The Context

Biotechnology emerged in the late 1970s as a promising scientific field deemed to become one of the drivers of future economic growth. Within this field, GMOs represent only one concrete application, namely to agriculture. GMOs can be defined as living organisms that have been modified by the manipulation of genes (usually by the introduction into the organism of new gene coding for specific properties). The technology was first developed with bacteria in the 1980s; and bacteria such as *Bacillus subtilis* functioned like mini-factories capable of producing useful proteins (enzymes, insulin, etc.). Moving upward from breakthroughs in the use of recombinant bacteria, the biotech industry mastered the introduction of new beneficial genes into the genome of plants. The first generation of GM plants in the 1990s mostly incorporated new features that increased the efficacy and yield of production: herbicide resistance, insect resistance, sterility, virus resistance, and improved ripening (tomatoes).<sup>2</sup> The next generation of GM crops focused on improved features for consumers, such as higher nutrition (the case of golden rice) and even pharmaceutical features.

Following the 1992 approval of the US Food and Drug Administration (FDA)<sup>3</sup>, the development of genetically modified seeds and crops in the 1990s proved extremely successful and quickly transformed North American agriculture.<sup>4</sup> As of 2003, 81% of US-grown soybeans, 73% of US-grown cotton, and 40% of US-grown corn were genetically modified.<sup>5</sup> Between 1996 and 2004, the global area of transgenic crops increased nearly 60-fold, from 1.7 million hectares to 90.0 million hectares, underlining the extremely high rate of GMO technology adoption.<sup>6</sup> By 2005, GMOs were grown in 21 countries, although five countries represent 95% of the production: the US (55% of global area), Argentina (19%), Brazil (10.5%), Canada (6.5%), and China (4%).<sup>7</sup> Table 1<sup>8</sup> gives data on the status of biotech crops for both 2000 and 2005.

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<sup>2</sup> Cf presentation by Dr. Chris Sommerville, Director of the Carnegie Institute and Professor of Biology at Stanford University, on 15 February 2001, Stanford University.

<sup>3</sup> In 1992, the US FDA decided that GMO crops were not different from traditional plant breeding (substantial equivalence).

<sup>4</sup> Crop varieties developed by biotechnology were introduced for commercial production in the US in 1996 (source: Pew 2003) and in Canada in 1997.

<sup>5</sup> Source: Pew Initiative on Food and Biotechnology, August 2003, p. 4.

<sup>6</sup> Source: International Service for the Acquisition of Agri-biotech Applications (ISAAA), <http://www.isaaa.org/>, data from 16 January 2003.

<sup>7</sup> Source: ISAAA Brief 32-2004.

<sup>8</sup> Tables and Graphs are in the Appendices.

The table shows that the surface of GMO crops has more than doubled between 2000 and 2005. The number of countries growing GMOs has greatly increased as well, the most dramatic case being that of Brazil, which shifted from a no-GMO country to a country growing 10% of all worldwide GM crops. India also made an important move into GM crops in the same period. The share of US dropped from nearly 70% to 55%.

The bulk of current GMO production is concentrated on just four crops: soybeans, corn, canola, and cotton. The benefits of GMOs are clear and potentially enormous. In the short-term, they mainly represent gains in efficiency and productivity for farmers, resulting in potential cost reductions in the range of 20-30%. For pest-resistant crops (such as Bt-cotton and Bt-corn), they also allow farmers to cut down on the use of pesticides. In the longer-term, GMOs have the potential to allow affordable farming under harsh conditions (such as cold weather, desert soils, pest-infested environments) and to give birth to improved crops with added nutritional features. The same benefits may be available to an even larger extent when the gene technology moves into animals and fish.

However, while transgenic technology continued to dazzle many and to move beyond crops into fish and animals, it has also become the target of a global resistance movement due to several potential risks. Some of the risks highlighted by opponents include inadequate controls by regulatory authorities given the vast asymmetry in the information available (developing corporations have much greater knowledge about new products than governments) and the involvement of most scientists in the private sector. The risks involved in deficient regulation seemed apparent in September 2000, when Starlink corn (a corn ironically developed by French company Aventis CropScience and approved only for animal consumption by the US Food and Drug Administration was found in taco shells and other processed goods. In December 2000, the Japanese government also discovered that about 28,000 tons of Starlink corn had been imported into Japan in 2000 and that it had found its way into snack food, syrup, beer and animal feed. Other risks involve the potential transfer of allergens from one species to another without open disclosure, the unpredictability of GMOs over the long-term and the possibility of mutations, environmental hazards and detrimental impact on global biodiversity. On this last point, it is conceivable that the fact that farmers may massively adopt superior GM crops may lead to an unhealthy reliance on only a few crops, exposing mankind to a potentially catastrophic failure. It is also possible that GM genes get transferred into native plants and affect the native environment in an irreversible way. Finally, GMOs have a huge economic impact and lead to new power relations between farmers and seed companies, between seed companies and all the actors of the food chain, between consumers and the food chain, and between global actors. As often with new technologies, global economic battle lines are being redrawn.

In the wide-ranging social and political discussions over GMOs in many countries, debate has crystallized around seven separate issues:

1. A debate over scientific progress
2. A debate over food safety
3. A debate over environmental impact, threat to biodiversity, and coexistence
4. A debate over transparency and necessary information for consumers
5. A debate over the control of large corporations over food and over society

6. A debate over the relationship between farmers and large corporations, both in the context of developing and established economic systems
7. And a debate over cultural diversity and legitimate resistance to globalization.

### **The US and Canada as First Movers and Initial Path-Setters**

As host to the most advanced universities and private companies in the field of biotechnology, the US was confronted first with the issue of regulating GMOs. Much has been written about the initial moratorium on genetic engineering self-imposed by US scientists in the mid-1970s (Asilomar conference) and the ensuing decision to remove it, after it was judged to be both impractical and unjustified. By 1992, the decision was made by the Food and Drug Administration with support of the Bush administration (including Vice President Dan Quayle's direct involvement) to adopt the principle of «substantial equivalence» and not to require extra regulations for GM crops when they did not involve any significant differences from conventional crops in terms of nutrition, composition, or intended use. The idea was that crops engineered through DNA-technology were no more likely than conventional crops to have a negative health or environmental impact. As a matter of principle, therefore, they should not require special approval or special segregation in the food chain. The decision was adopted both as part of a general pro-science attitude and because of close links between large corporations and the administration. There was no noticeable opposition to the move at the time.

Gradually, the US regulatory system of GMOs developed a split jurisdiction between three agencies: the Food and Drug Administration (FDA) is in charge of food safety and drug approval; the US Department of Agriculture (USDA) approves new plant varieties, and the Environment Protection Agency (EPA) overviews micro-organisms and pesticides. It is generally said that the FDA has a more flexible and more pro-science attitude than the USDA.

It is important to note that, since 1992, the US regulatory system requires only notification to the FDA when conditions of substantial equivalence apply. The FDA has the authority to require a pre-market safety assessment, but only effectively required one in 1992 in the case of the Flavr tomato. In general the FDA prefers to rely on the responsibility of developers to produce safe products. The USDA adopted a broadly similar procedure in 1993. Labeling of GMOs remains purely voluntary. Only when the new food or crop is not equivalent in terms of nutrition, composition, or intended use (or when it contains allergens) is labeling required.

The Canadian system is broadly similar to that of the US, given the reliance on substantial equivalence and the absence of mandatory labeling. However, Canada developed a slightly stricter procedure with mandatory notification of authorities (Health Canada) for any new GM crop and a preliminary pre-market safety study by Health Canada before a decision is made on substantial equivalence. When novelty is found, further studies can be required. In practice, however, most products approved in the US are also approved in Canada.

GMO crops began to be used in large-scale commercial farming in 1996 in both the US and Canada.



## Global Pathway: From an Emerging Consensus to a Bitter Multi-Level Conflict

The principle of substantial equivalence became a point of convergence between OECD countries during meetings of the biotechnology group in 1986-1994. A classic definition of the principle can be found in a 1993 OECD document:

« For foods and food components from organisms developed by the application of modern biotechnology, the most practical approach to the determination is to consider whether they are substantially equivalent to analogous food product(s) if such exist....The concept of substantial equivalence embodies the idea that existing organisms used as foods, or as a source of food, can be used as the basis for comparison when assessing the safety of human consumption of a food or food component that has been modified or is new. »<sup>9</sup>

In other words, the principle affirms that when GM crops or GM foods are equivalent in usage, nutritional content, and allergenic properties, they should not be subject to assessment methods that are different from methods used to assess conventional crops and foods.

In 1995, the biotechnology working group was formally constituted with the following goals:

« The Working Group was established in 1995<sup>10</sup> at a time when the first commercial transgenic crops were being considered for regulatory approval in a number of OECD member countries. From the beginning, one of its primary goals was to promote international regulatory harmonization in biotechnology among member countries. Regulatory harmonization is the attempt to ensure that the information used in risk/safety assessments, as well as the methods used to collect such information, are as similar as possible. It could lead to countries recognizing or even accepting information from one another's assessments. The benefits of harmonization are clear. It increases mutual understanding among member countries, which avoids duplication, saves on scarce resources and increases the efficiency of the risk/safety assessment process. This in turn improves safety, while reducing unnecessary barriers to trade ». <sup>11</sup>

The emerging consensus concepts in the period 1986-1994 included relying on existing scientific data in the health and environmental fields to make safety assessments and to review cases on a case-by-case basis (i.e., not to impose broad concepts such as the

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<sup>9</sup> OECD 1993.

<sup>10</sup> The original title of the Working Group was the Expert Group for the Harmonization of Regulatory Oversight in Biotechnology. It became an OECD Working Group in 1998.

<sup>11</sup> OECD 2005.

precautionary principle). All founding WTO members in 1994 also signed on to a commitment to proceed to strictly scientific assessments of all new products (as part of the SPS Agreement). The most relevant sections of the SPS Agreement (and those found to have been violated by the EU in the 2006 report of the WTO panel) are given below.

#### **Key Components of the SPS Agreements (relevant to GMOS)**

##### **Article 5. Assessment of Risk and Determination of the Appropriate Level of Sanitary or Phytosanitary Protection**

1. Members shall ensure that their sanitary or phytosanitary measures are based on an assessment, appropriate to the circumstances, of the risks to human, animal or plant life or health, taking into account risk assessment techniques developed by the relevant international organizations.

2. In the assessment of risks, Members shall take into account available scientific evidence; relevant processes and production methods; relevant inspection, sampling and testing methods; prevalence of specific diseases or pests; existence of pest — or disease — free areas; relevant ecological and environmental conditions; and quarantine or other treatment.

##### **Article 8. Control, Inspection and Approval Procedures**

Members shall observe the provisions of Annex C in the operation of control, inspection and approval procedures, including national systems for approving the use of additives or for establishing tolerances for contaminants in foods, beverages or feedstuffs, and otherwise ensure that their procedures are not inconsistent with the provisions of this Agreement.

##### **Annex C. Control, Inspection and Approval Procedures**

1. Members shall ensure, with respect to any procedure to check and ensure the fulfilment of sanitary or phytosanitary measures, that:

(a) such procedures are undertaken and completed without undue delay and in no less favourable manner for imported products than for like domestic products.

In sum, the 1994 Agreement committed parties to a science-based assessment of food safety and excluded the precautionary principle. It also committed parties to act without undue delay, such delay being seen as hidden protectionism. It is true that the SPS Agreement (reached in Marrakech in 1994) did not focus specifically on GMOs and was really only one component of a larger scale deal between big players intended to stabilize and further develop the world trade system. The delegates who negotiated the agreement were far from anticipating that GMOs would become such a controversial issue in the late 1990s, although there were significant debates and differences about the reliability of a purely scientific assessment.<sup>12</sup> The SPS agreement thus emerged as a compromise and did contain sentences that gave some margin of action to countries willing to have tighter safety evaluations (for example, Annex C. 3: « Nothing in this Agreement shall prevent Members from carrying out reasonable inspection within their own territories »).

It is this emerging consensus that broke down when the EU started to move toward the precautionary principle in 1997 and imposed its moratorium in 1999. The following chronology summarizes the main steps of the global battle over GMOs.

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<sup>12</sup> Source: personal interview with top WTO official in charge of SPS negotiations, January 2006.

### **Chronology of Global Battle over GMOs**

- 1988-1992: US adoption of concept of substantial equivalence; decision to submit GMOs to regulations similar to other products
- 1993-1995: international regulatory consensus around OECD guidelines (substantial equivalence), SPS agreement (WTO) and empowerment of CODEX (UN), TRIPS (WTO) including large protection of plants (in loose terms)
- 1996: first commercial crops grown in the US and Canada
- 1997-1999: EU turns against GMOs, from political crisis to moratorium
- 1999-2000: Global negotiations leading to the Cartagena Protocol on Biosafety (CPB)
- 2000: US-EU Consultative Report with Proposed Consensus Position – not adhered to by either party
- 2001 and 2003: EU passes 2 core legislations, putting in place the strictest regime in world (mandatory labeling, 0.9% threshold, traceability required, thorough approval process). EU moratorium lifted in 2004
- 2003: Launching of WTO law suit, US-Canada-Argentina vs. EU
- 2002-2005: Disputed international governance – tensions in Codex over labeling (no consensus reached), tensions in CPB- MOP2 conference (Montreal, May 2005) over international control regulations over transboundary movements of LMOs
- 2004: Retrieval by Monsanto of GM wheat from regulatory process in US and Canada (NGO & consumer pressures from Japan and Korea; veto of Canadian wheat board)
- 2006: GM rice approval expected in China; cloned meat approval expected in US

In sum, the attempt to keep a common regulatory approach to GMOs turned into a gradual battle over global governance. Countries clustered in polarized camps and the battle gradually moved to the UN (Cartagena negotiations in 1999-2000), to the Codex Alimentarius, and to the WTO with the 2003 case against the EU.

### **What GMO Politics Is probably NOT about: Limits of Classical Explanations**

Many arguments have been presented in the literature about GMO regulations in general. This paper contends that most of these arguments are insufficient to explain the European or Japanese puzzle.

First, it is often argued that responses to GMOs are tied to culture. According to such an argument, European attachment to quality food explains the gut-level rejection of GMOs. Gottweis and Andree<sup>13</sup> have argued that the relative degree of trust in science in different

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<sup>13</sup> See Gottweis 1995 and Andree 2002.

countries determines the political response to GMOs. Cultural arguments are often used in public forums and in the press. However, how can the major and sudden change of direction in GMO policy be explained in terms of culture?

Next, scholars and policy-makers alike have suggested that the EU and Japanese actions were driven by trade considerations and represented a return to some degree of protectionism against US imports.<sup>14</sup> In 1999 Pascal Lamy, the new EU trade commissioner, met with US President Clinton and was later grilled by the US Congress. Both meetings focused partly on the GMO regulations, regulations clearly framed as an intentional trade obstacle for domestic purposes.<sup>15</sup> However, studying the European or Japanese GMO regulatory response through a trade lens is clearly flawed. Japan and the EU depend on trade to a much larger extent than the US and have fully supported and led the attempt to further the trade agenda in various WTO meetings. There is no competitive advantage to be gained by the EU or Japan by restricting imports of GM crops. In the case of Japan, the impact of safety and labeling regulations has been practically neutral. There has been no redirection of trade and the US has continued to represent 70-75% of Japanese imports of soybeans (about 3.7 million tons per year) before and after 2001. Rather, the primary impact has been to prevent the production of GMO crops in Japan and to decrease the quantity of field tests, thus reducing the dynamism of Japan's biotech industry. In the case of Europe, trade flows have been affected, as corn imports from the US collapsed (from \$400 million in 1996 to \$15 million in 1999 and \$10 million in 2004)<sup>16</sup> and soybean imports decreased significantly (\$2.3 billion in 1996 or 1997; \$1.0 billion in 1999 and \$0.9 billion in 2004). Conversely, import flows were redirected toward Brazil and other GM-free producers, although Brazil's shift to GMOs after 2003 raises question about the sustainability of this change. The EU may yet return to imports from the US in the near future. It is hard to believe, however, that the EU has gained from such redirection of trade flows. With an increase in the price of feed, the impact on the meat industry may have been negative. Far more importantly, European regulations have had a long-lasting negative impact on its biotech industry, undermining its potential technological leadership for decades ahead. Clearly, business and trade interests are a weak explanation. Business interest groups and networks connected with ministries were stacked against GMOs in both the European and the Japanese cases.

Other arguments have emphasized the impact of one single event: the mad cow (BSE) crisis in the UK and later in the EU.<sup>17</sup> According to such views, the mad cow crisis dealt a terrible blow to the safety of food regulations in Europe and turned Europeans and Japanese against GMOs. However, the argument is faulty, both in the Japanese case and for most European countries. The large wave of popular actions against GMOs and consumer actions dates back to 1997-1998, while the BSE crisis only started in 2000-2001 in non-UK Europe

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<sup>14</sup> Cf presentation by Dr. Chris Sommerville, Director of the Carnegie Institute and Professor of Biology at Stanford University, 15 February 2001, Stanford University. See also international trade lens used in Falkner 2000 and Newell and Mackenzie 2000.

<sup>15</sup> See Lamy 2002: 123.

<sup>16</sup> Source: United States Department of Agriculture, Foreign Agriculture Service.

<sup>17</sup> See Vogel 2001; Vogel and Cadot 2001.

and in Japan. In addition, Japanese NGO networks have built upon arguments that were independent from the BSE crisis in their fight against GMOs: issues such as the patenting of life, the threat to biodiversity, and the risks of mutations.

One could advance a constructivist argument based on international norms to explain the European and Japanese anti-GMO attitude. Much has been written about the rise of international norms and of global regimes on human rights, gender, and environmental protection.<sup>18</sup> Likewise, a global social movement has clearly come about in the field of GMOs with ties between anti-GMO and NGO activists in nearly every country. Indeed, one global NGO, Greenpeace, had a major impact in 1996 in shaping public opinion in Northern Europe on the issue of GMOs. However, such an explanation has one major flaw: why are there such variations in the GMO policies between countries? Why are the US and Canada so impervious to the international norms advocated by NGOs while the EU is so penetrable? Why is Japan, a notoriously state-dominated society, more responsive to such international norms and movements than Canada?

Finally, this paper emphasizes that GMO politics is not about ideology. Partisan politics explanations (e.g. Garrett)<sup>19</sup> produce little understanding of the positions taken in the GMO debate. Indeed, the UK GMO battlefront features a staunchly anti-GMO Prince Charles vs. a pro-GMO Labor Prime Minister, Tony Blair. In France, the conservative coalition under Prime Minister Juppé turned against GMOs in February 1997, while the socialist-community-green coalition under Prime Minister Jospin turned back to a pro-GMO position in late 1997 and in 1998. The same absence of salience in party competition characterizes GMOs in Japan. Only the Japan Communist Party (JCP) seems to have taken GMOs as a political cause. GMOs transcend the usual political spectrums.

## COUNTRY CLUSTERS TODAY ON TWO DIMENSIONS

Since 1999, the global contest has been fought both at the national and international levels. On the national level, countries introduce regulations on the production, testing, and labeling of GMOs, competing between themselves to set a dominant global standard. On the international level, an inter-state tug-of-war gave birth to the UN Cartagena Biosafety Protocol (CPB) that was signed in Montreal in January 2000 and took effect in September 2003 after being ratified by 50 countries. A further battle has been taking place within the WTO since May 2003, when the US, Canada, and Argentina launched a legal action against the EU's de facto moratorium on GMOs. Table 2 summarizes the lineup of major states through a two-dimensional matrix of regulatory positions with respect to GMOs. The vertical axis classes countries according to their national regulations (liberal or precautionary). The

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<sup>18</sup> See for example Boli and Thomas 1999.

<sup>19</sup> Garrett 1998.

horizontal axis groups them according to their ratification of the CPB and positions taken in international forums such as the Codex Alimentarius. Details on the domestic and international positions of each country are given in Table 3.

Within OECD countries, the default box is box 1 (consistent liberalizers). Given that biotechnology is one of the most promising technologies, going against it implies huge economic and technological costs. The next fallback position is box 3 (Australia *et. al.*), a position allowing states to keep flexibility and full control over their regulatory regime. Such countries respond to consumer demands for transparency and control through a degree of regulation of varying intensity but do not seek actively to enshrine these controls in a set of global rules. Conversely, the EU position occupies the other end of the spectrum. The EU chose not only to pass the strictest GMO regulations in the world (so strict that the industry argues that they are unenforceable) but also to pursue tight international regulations through a new UN treaty and through stonewalling at the WTO. These latter steps partly contradict the EU's prior commitments to the WTO.

It is worth noting that a third dimension recently opened with the independent rules or decisions taken by provinces or regions at variance with the national position. Some regions have taken unilateral moves toward becoming GMO-free regions, even in unified states where this implies a change in the allocation of power. Central governments find themselves either unable to respond or in difficulty as to how to respond. Some key examples include the following:

- US: California county votes, Vermont
- Canada: Prince Edward Island Province considering becoming GM-free
- Japan: vote by Hokkaido to increase barriers to the approval of GM crops
- EU: 164 regions and provinces organized under Florence Declaration, 4500 self-declared GMO-free local governments.

## **EXPLANATORY FRAMEWORK FOR POST-1995 POLARIZATION**

This study considers GMOs to be symbols or proxies for a much larger set of problems. In this sense, GMOs have now gone beyond their purely scientific and technical barriers and have become embedded in much broader conflicts.

In countries that have departed from the OECD consensus, the GMO regulatory process has roughly followed a three-part sequence. First, civil society coalitions have played a crucial initial role as determining catalysts. Second, they have tended to be successful where trust in governing authorities has already been eroded by broader issues related to the handling of globalization and the quality of democratic governance (Europe) or to a general crisis of central bureaucratic control (Japan). When these conditions were fulfilled, civil society actors tipped the scales and captured the public agenda. Third, governments have tried to head off negative reactions by preventively developing new regulatory institutions. But the actual form and contours of these new GMO regulations have been shaped by the

balance of power between ministries and by relations between politicians and the bureaucracy.

In all countries, the initial status quo was a closed system with only a few actors (business, state, political supporters) and within a limited frame and agenda (competitiveness, biotechnology research). In step 1 of the process of change, new civil actors organize and try to make the agenda public. Initially, these outside actors have neither resources nor access to information, nor a voice in the political system. Thus, these civil society actors use alternative means: petitions, protests, court cases<sup>20</sup>, etc. The movement is more likely to gain a critical mass if it can build upon pre-existing movements (e.g. consumer movement in Japan, anti-globalization movement in France, environmental movement in the UK). Three main strategies are used to take possession of the agenda. The high road consists in targeting strategic cases, scandals, or symbolic images to reach public opinion directly. A second road consists in bypassing the central government and gaining critical mass through persuading sympathetic local governments. A third road consists in targeting operators of the economic chain by raising their costs and threatening boycotts. In this first phase, civil society takes hold of an issue and succeeds in placing it on top of the public agenda and in shaping the public framing of the issue. This process of publicizing and issue-framing triggers a sequence of institutional change. It is a necessary (albeit insufficient) condition for change. There is a crucial strategic advantage in being the first mover in the battle over the public framing of the issue. What matters is to make a dramatic opening move, since this initiative will set the context and determine the symbolic images involved which (although often crude and approximate) will play a vital role in the coming debate. Finally, the backlash triggered by civil society is enhanced when it can be combined with parallel movements that also have a shock effect.

In step 2, the initial reaction triggered by civil society turns into a full-scale institutional legitimacy crisis and revealing a massive gap between government policy and public aspiration (a democratic deficit, a crisis of trust in administration or politicians, a protest against the global economic system etc.). This larger-scale transformation depends then on the existence of this gap which it comes to crystallize in the mind of the public. In other words the GMO issue then becomes a proxy for this latent, broader crisis of trust in institutions. The public's refusal is expressed through opinion polls, but also in national elections. The public backlash triggers further bandwagoning of key political actors intent on keeping in step with their electorate. This is when the tipping point is reached.<sup>21</sup>

If the backlash and bandwagoning reach a high enough threshold, it may set off in turn a top-down decision to recuperate the public agenda by proposing stringent legislative solutions, thus completing the cycle of institutional change. For the political leadership, the situation is indeed asymmetric: the cost of acceding to public pressure and giving way in one specific (and novel) area, namely GMOs, is relatively limited in comparison to the

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<sup>20</sup> See Upham 1987 for an excellent analysis of the use of court cases to bring attention to new issues.

<sup>21</sup> See Gladwell 2000 for a popular rendition of the concept. Gladwell writes: « the tipping point is that magic moment when an idea, trend, or social behavior crosses a threshold, tips, and spreads like wildfire » (back cover). He argues that social trends work like epidemics. The operating mechanism is contagion; small changes can have a major effect; and a major change can happen suddenly.

benefits that accrue from the regaining of institutional legitimacy that it will bring. International institutions or states are thus tempted to diffuse discontent by acting aggressively on one narrow issue area only, so as to avoid the spread of the crisis. Sacrificing the narrowly framed issue (GMOs) allows the political leadership to safeguard a larger agenda. In addition, answering the demands for institutional change that are concerned with one particular area may well serve the interests of political actors in other domains.

### **Conditions and Enabling Factors**

Three institutional factors may facilitate this process of reaching the tipping point and eventual recuperation. In the first place, the existence of a pre-existing institutional crisis facilitates the task of capturing the public agenda. In the case of the EU, the growing democratic deficit and the decreasing trust in the EU Commission in the 1990s fueled the GMO crisis. In Japan, the succession of bureaucratic scandals since the early 1990s, particularly the scandals affecting the Ministry of Finance, the AIDS scandal of 1994-1995, and the subsequent mad cow scandal dramatically affected the trust of Japanese people in the bureaucracy. This weakening opened a window for new actors to offer alternative sources of information and expertise.

Second, the existence of other seemingly more legitimate global blueprints and models can play a major role in supporting the NGOs' attempts to take over the public agenda. In the case of GMOs in Japan, the model of the European Union (EU) played a major role. In 1998 the anti-GMO movement assigned a member (Akiko Frid) the job of keeping up with EU developments. The major protests in Europe from 1996 to 1998, the first labeling directives of 1998, and the EU moratorium of 1999 represented major steps forward and served as legitimate models to be imitated. In the 1999 Cartagena negotiations, the EU advocated a global platform to spread the precautionary principle and its regulatory approach worldwide. After 1999, Japanese NGOs could point to the EU as a legitimate model and point to legitimate international law in the form of the Cartagena protocol in arguing for change in Japan's GMO approach.

Finally, the existence of alternative routes to decision-making in political systems meant that strategies that were effective in one country could not always be imitated in other national settings that required different tactics. If Japanese NGOs found it hard to penetrate decision-making in the ministries in charge or even to gain major political allies in major parties (LDP or DPJ), they could bypass the center and rely upon the tools available to local governments, namely declarations passed by local councils or even direct ordinances at the prefectural or local levels. This is partly due to the high degree of legitimacy of democratically elected local governments and councils. A similar process is now at work in the EU, as coalitions of regions with the support of a few key states (Austria and Italy) are trying to extend the EU regulatory frontier further through bottom-up pressure.



## THE EU AS INITIATOR OF PRECAUTIONARY POLICIES : THE POLITICS BEHIND THE BUMPY TRAJECTORY

The European Union (EU) has emerged as the key regulatory leader in the field of GMOs and the chief counter-voice to the initial OECD consensus approach. In quick succession, the EU developed the world's strictest assessment procedures and the toughest labeling requirements in place anywhere. The EU also operated on the basis of a de facto moratorium on any new approvals between June 1999 and January 2004. This de facto moratorium had a major impact on trade flows from the US and is now being challenged at the WTO. Finally, the EU buttressed its emerging regulatory regime with the development of the principle of precaution, a principle that it managed to enshrine in the CPB in 2000.

The remarkable position shift of the EU (and of major EU countries, such as France) in 1996-1999 is linked to an effective campaign by NGO networks, the relay afforded by a few small individual states (Austria, Denmark, and Greece), and to a shift in public opinion. Also crucial in the process were the growing voice of the European Parliament and the overall democratic crisis of the EU. To a lesser degree, the power shift within the Commission and the growing role of DG Environment (reinforced after 1986 and 1992) and DG Sanco (health and consumption, created in 1992) played a role too. The leadership position of the EU on GMOs emerged as a potential rallying point to regain the trust of citizens in their institutions and to project a common identity abroad.

How did GMOs come to be the major battlefield for EU institutional legitimacy? Why did civil society, the EP, EU states, and the EU commission pick GMOs as the proxy for a much larger battle? Other key issues have revealed a gap between government decisions and public opinion (a democratic deficit) but have not elicited the same degree of hostile response. For example, financial regulations, takeover regulation, or even the pact of growth and stability might have set off such reactions. NGOs have actively campaigned against water privatization or in favor of a Tobin tax but are no way near a political success on these issues. As this paper shows, part of the high profile that GMOs took in Europe is the unforeseen result of a combination of factors. There was no warning of the virulent campaigns that the GMO concerns would lead to in Europe. Key states such as France, the UK, and Germany have continued to hesitate throughout the entire conflict. GMOs became a high profile subject and attracted a high degree of public attention in an interactive and dynamic process between civil society, states, large firms, and EU institutions. However, the increased visibility and high stakes of the GMO battle also stem from its unique mix of politics, human health, blatant corporate lobbying, environmental concerns, food production, and the social role of science and technology.

In the case of the EU response to GMOs, the civil society triggered public malaise regarding EU institutional capacity and regarding the EU's response to globalization. Bandwagoning around the NGO agenda proved particularly effective in a world of multi-level and fragmented governance. The EP intervened at key junctures, particularly after 1996. In November 1996, at the height of the Greenpeace campaign against the delivery of GM soy from US ships, the EP passed a resolution calling for compulsory labeling, thus

lending political support to the Greenpeace campaign.<sup>22</sup> In 1997, the EP condemned the Commission's certification of Novartis corn. It later called for a EU moratorium. On the other hand, the EP parted paths with civil society in approving the directive on bio patenting in May 1998. Other key actors included individual states, such as Austria and Denmark (although Denmark shifted after 2000), and national courts such as the French Conseil d'Etat (Council of State).

Once the pressure reached a sufficiently high point, top-down recuperation took place. Interestingly, the key institution that played the role of political entrepreneur and vector for institutional change was the Council of Ministers. The major shift in the EU's response to GMOs came with the moratorium of June 1999, a moratorium decided by the Council. The Commission was the second mover, appearing still hesitant in 1999 (including at the December Seattle summit), but acting more decisively at the Montreal conference (on biosafety) and in the drafting of two stringent directives in 2000-2003. Clearly, the Commission joined the Council in regaining leadership over GMO regulations after 1999, because it saw some advantages in advancing European integration and building European identity, as well as regaining public legitimacy in the eyes of the public. On the other hand, the conversion of the Commission to this common major institutional change has remained superficial and disputed, as shown by the 2002 Biotechnology paper and by its ambiguous attitude in the WTO dispute with the US.

### **Larger Context: The Meaning of the EU's Decisions on GMOs**

On a broader level, the recent emergence of the European Union (EU) as a global political actor in selected areas, such as trade, currency management, financial regulations, environment, and technology raises fundamental questions. On the global scene, does the EU count for more or less than the sum of its parts? Is the EU primarily a weak actor that simply accepts dominant global rules and passes them on down to national polities in a coordinated fashion? Or does the EU have a will and power of its own? Who controls the EU's unified voice in global settings, such as the World Trade Organization (WTO) or other global negotiation forums? Does the EU contribute to further inter-state cooperation concerning global standards? Or does it weaken the global political regime that sustains economic globalization?

Clearly, the answers to these questions vary according to issues concerned. On issues such as financial and investment regulations, the EU seems to join with the US in pushing a pro-liberalization agenda at the global level. On issues such as a cultural diversity and agricultural subsidies, the EU seems to be at the forefront of a movement to resist US interests and to shape the agenda of international institutions toward its own interests. On yet other issues, such as takeover regulations and corporate governance, the EU seems internally divided and unable to speak with a strong unified voice on the international scene.

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<sup>22</sup> See Kempf 2003: 137.

Biotechnology offers a particularly useful prism for the study of the EU's role in global governance for a number of reasons. Its timeline corresponds with the timeline of accelerated EU integration (from the mid-1980s to the current period). EU decisions with respect to GMO regulations at the European level and at the international level involve huge stakes, not only with respect to the future of biotechnology, but also with respect to the relevance of institutions such as the WTO, and international cooperation concerning globalization as a whole. The competition between the EU and the US over GMOs has recently dominated the debate over food aid to Africa as well as the debate over combating worldwide hunger, as countries such as Zimbabwe chose to emulate (comply with?) the EU and turn down GM grains from the US.

The EU position on GMOs came noticeably late, in a fragmented manner, and tended to go against the EU's own economic interests. Indeed, the EU took time both to find a common voice on the issue of biotechnology and to move from a concern for technological competitiveness to a primary concern about health and environment. For example, in 1983, the Commission framed the issue in terms of the need to improve biotechnological competitiveness relative to Japan and the US.<sup>23</sup> Even though the Directorate-General (DG) XI (Environment) gained control within the Commission over GMOs by the late 1980s and led the way to the drafting of two restrictive regulations in 1990, these two regulations still were not enough for the EU to block the approval of GM products. As a result, 18 GM products were approved for market consumption between October 1991 and October 1998. Only in June 1999 did the EU council reach a broad agreement in favor of a full moratorium on new approvals of GMOs. At the level of the states, only 3 states acted consistently against GMOs throughout the 1990s: Denmark, Greece, and Austria. Denmark initiated the EU regulatory process through its own 1986 Environment and Gene *Technology Act*<sup>24</sup>, while Greece and Austria consistently acted as first movers and initiators of EU-level anti-GMO regulations during the 1990s. Is the GMO story one of 3 small tails wagging the EU dog? On the other hand, the big states, particularly France, Germany, and the UK, wavered back and forth. Steeped in its role as agricultural powerhouse of Europe and its strong presence in the biotech industry, France took a position as the sole pro-GMO state in 1997 and 1998, allowing the EU to approve the notorious Novartis corn Bt-11. By 1999, France had turned resolutely anti-GMO, leading the battle against the US in words and at the WTO.

### **The EU's Shift from a Competitiveness Focus to a Stringent Regulatory Stance**

Interestingly enough, by the standards of Table 2, the EU started out in box 1 in the 1980s (as a liberal supporter of biotechnology) and only moved to box 3 in 1997-1999, and to box 4 in 1999.

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<sup>23</sup> Patterson 2000: 320.

<sup>24</sup> Patterson 2000: 321.

The key regulatory steps are summarized below.

### Chronology of EU Regulations

- 1990-1991: First EU regulations on contained use and deliberate release to introduce an approval procedure (requires unanimity to block)
- 1997: 258/97 – Novel Foods: Mandatory labeling, only product-based (final product), substantial equivalence accepted (no labeling when no GM protein in final product), 1% threshold
- 1997: Amsterdam treaty, first adoption of precautionary principle, allowing countries to take safeguard measures and impede free trade
- June 24, 1999: Moratorium decided by EU Council by group of core countries
- Directive 49-50/2000: Extension to flavorings and additives, with 1% threshold (under what Austria was pushing for). Only product-based (no labeling when GM protein not present in the final product). But one big innovation: regulation introduces a 1% de minimis threshold for adventitious contamination: i.e. conventional food where GM material accidentally introduced reaches 1% must be labeled as GM
- 2001: Adoption of Directive 2001/18 on Environmental Release (field tests, crop approvals): complex dual-level approval (states and EU). Must be enacted by all member states, problems in France. Introduces 0.9% threshold for labeling (DG Environment in lead)
- 2003: Regulation 1829-1830/2003: core regulations on labeling and approval of GMOs, create one-stop policy (DG Sanco in lead)

This chronology underlines the very gradual and ad-hoc way through which the EU regulatory system came about. In addition, two distinct processes took place in parallel: a gradual construction of a legal system and the ad-hoc intervention of a de facto moratorium pushed by member states. Table 4 gives the fuller measure of the disputed nature of the EU regulatory process and of its multi-level nature.

Table 4 summarizes the facts behind this change within the EU and outlines the dependent variable at three interactive levels: national, EU, and international levels. It makes three points clear. First, the EU policy toward GMOs is a disputed process and the outcome is a mixed one. The EU started out with a focus on technology promotion and competitiveness, a focus that is still present among key directorates of the Commission, as evidenced by the 2002 Life Science paper. The regulatory turn toward tight regulations of GMOs is based on upon institutional changes included in the Single European Act of 1987, the Maastricht Treaty of 1992 and the 1997 Amsterdam Treaty, but only comes to full force in 1999 (moratorium). A similar mixed record is evident at the international level, with acceptance of pro-GMO WTO regulations in 1994 and an anti-GMO stance beginning in the Cartagena negotiations in 1999-2000. The record shows that the EU position in fact stiffened considerably between 1999 (Cartagena) and 2000 (Montreal final negotiations). Second, Table 4 emphasizes the fact that all three levels of regulations – state, EU regulations, and international treaties – are interlocked and interactive. State-level actions and regulations have a clear impact on EU-level regulations, while EU regulations lead to responses at the level of states. EU regulations and state-level positions determine the EU's international actions, while in turn international actions lead to feedback responses at the

two lower levels. GMO regulation is clearly a sphere of interactive multi-level governance and the three levels cannot be separated. Third, the table emphasizes the fact that GMO regulation in the EU is a highly political process, closely connected to domestic elections and referenda, to inter-directorate competition within the commission, to inter-institutional rivalries at the EU level, and to state-EU tensions over control and power. EU regulatory output in the field of GMOs is not the rational or efficient outcome according to normative or bureaucratic scripts. It is not even the outcome of a tug-of-war between EU-level interest groups competing for the attention of the Commission, the EP, or the Council of Ministers. Rather, the checkered and broken path of GMO regulation suggests that it is embedded in larger unrelated political battles and that the ultimate outcome depends upon the unintended consequences of multi-level interactions.

### **The Prism: GMOs as a Proxy for Larger Political Battles**

This paper argues that GMOs act as a proxy for a larger battle over the EU's institutional response to globalization. However, the study of public opinion data shows that the very negative European polls on biotechnology are both a recent phenomenon (post 1996) and a proxy for a larger malaise about globalization and the EU's response to it.

What was the initial opinion of Europeans regarding GMOs before the trigger activities of civil society in 1996-1999? The Commission's Eurobarometer on Biotechnology published in 1997 based on October-November 1996 data reveals a much more peaceful picture than in 2000 or 2002. In its overall introduction, the Commission wrote:

« All in all, Europeans take an "optimistic" view of the developments they expect from modern biotechnology (vi).

Support for modern biotechnology increases with knowledge of the subject, as do "optimistic" and "pessimistic" attitudes toward it (vii).

A majority of Europeans think the various applications of modern biotechnology submitted for their opinion will benefit society (vii) (...) Generally speaking, more Europeans think the six applications put to them will be beneficial to society than worry about the associated risks (viii). »

Precisely, the 1996 data showed that, in the EU 15, optimism about biotechnology outweighed pessimism 50% to 26% (higher than for space technology at 49% to 14%) and optimism about genetic engineering specifically outweighed pessimism 43% to 22% (p. 6). The key exception in the survey was Austria where optimism about biotechnology was only at 37% and optimism about genetic engineering at a mere 18%.<sup>25</sup> Austria was already ahead of the curve in an « activated » stage. Finland also showed some low figures (optimism about genetic engineering at 26% only), but all the other EU countries were clustered and showed similar results. The survey also showed that as many as 47% of the people had no familiarity with biotechnology and another 40% expressed familiarity only through television or

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<sup>25</sup> Eurobarometer 55.2 : 7.

admitted forgetting about it. The numbers were relatively stable across EU countries, except for Austria (no familiarity at only 26%) and Finland (no familiarity at only 28%). Further, the 1996 Eurobarometer found a clear link between knowledge about biotechnology and optimism regarding it (p. 28), revealing the fact that anti-GMO civil society had not yet dominated the public agenda framing.

With respect to research in GM food, a minor issue in this overall survey, 44% of the respondents expressed support for it, a rather strong number (p. 46).

In sum, the European public in 1996 appeared relatively uninformed about GMOs and relatively supportive of GMOs and biotechnology, with the exceptions of Austria and Finland.

#### • A Public Opinion Turning Against GMOs by 2000

The (largely expanded and more complex) 2000 Eurobarometer on Biotechnology shows a starkly different picture. Based on data collected between November 1 and December 15, 1999, the survey reveals that Europeans had become increasingly opposed to GM foods. Summary results for public views on GM food among the decided public are presented in Table 5. Using a EU average (weighted by the population), the data shows that support for GMOs among the decided public dropped by 13% between 1996 and 1999. It is worth mentioning that the concentration on the decided public only by the Eurobarometer leads to a higher support level in absolute terms. For example the EU average opposition of 51% (average support of 49%) in 1999 compares to an average 71% for the response to the question: « I do not want this type of food » among the general population.<sup>26</sup> In relative terms, the survey shows that opposition to GM food increased in all 15 EU Countries. Although the support rate merely decreased by 3% in the Netherlands (78% to 75%) or 7% in Germany (from 56% to 49%), it decreased by as much as 19% in France (54% to 35%) and 20% in the UK (67% to 47%). In 1999, only five countries show opposition to GMOs below 50%: Ireland, Netherlands, Finland, Portugal, and Spain.

A Commission-financed analysis of the 2000 data by the objective International Research Group on Biotechnology and the Public (George Gaskell *et al*) commented: « [in six key states: Belgium, Greece, Italy, France, Luxembourg, and the UK] patterns of widespread public ambivalence about GM foods in 1996 appear to have given way to widespread public hostility in 1999 » (p. 938). The survey further revealed that even among supporters of GM foods and animal cloning an outright majority believed that the two applications « threaten the natural order » and are « fundamentally unnatural » (Gaskell *et al*, 937).

In turn, the 2003 Eurobarometer survey (based on 2002 data) concluded that positions about GM food and GM crops stabilized after 1999. The steep declines recorded in 1996-1999 are not reproduced (p. 2) In fact, support for GMOs rebounds in a few countries (UK, Sweden, Denmark) probably in response to the new EU regulations. Table 5 presents data for the EU 15 countries in 1996, 1999, and 2002.

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<sup>26</sup> Eurobarometer 55.2 conducted in 2000, p. 40.

- **European Attitude Toward Science: No Luddites Outside GMOs**

Interestingly, the study of other Eurobarometer surveys about European attitudes toward science and biotechnology in general reveals that Europeans tend to view scientific progress positively outside the domain of GM food and GM crops. In 2000, 80.5% of Europeans (EU 15) agreed with the statement that « scientific and technological progress will help to cure diseases such as Aids, and cancer » and 72.4% thought that science would « open greater opportunities for future generations ». <sup>27</sup> 70.7% also support the idea that science and technology will make life not just easier and comfortable, but also healthier. 85% further say that science and technology play an important role in industrial development and 75.0% think that the government ought to support scientific research. In this context, European attitudes toward GMOs stand out among a cluster of related scientific domains, as presented in Table 6.

In sum, GMOs occupy a special place within European opinion from 1999 onward. The general 2001 Eurobarometer on Science and Technology concluded that GMO was an important and special issue. « When it comes to GMOs (...), 94.6% of Europeans want to have the right to choose (...). 59.4% of Europeans believe that GMOs may have negative effects on the environment » (p. 7). Furthermore, unlike most other scientific domains, opposition to GMOs increases with knowledge about them: « the higher the level of knowledge (...), the more people believe there may be negative effects on the environment » (p. 42).

- **GMO as a Proxy Issue: EU vs. Globalization**

The 2003 Eurobarometer on biotechnology revealed the role of GMOs as a proxy for larger issues:

« Biotechnology does not attract the interest of a narrow group of Europeans who are particularly exercised by this issue alone. Rather, those who are most engaged with biotechnology are "generalists"—with interests in a wider range of public affairs. In this way, public opinion on biotechnology is likely to derive in part from views about the credibility of wider political and scientific institutions, as well as those solely related to biotechnology (p. 3) ».

An essay by one of the researchers from the French National Institute of Agricultural Research (INRA), the institute entrusted with the Eurobarometer on Biotechnology by the EU Commission, pushed the analysis further. Bonny argues that GMOs have become « the symbol of negatively perceived trends ». <sup>28</sup> Bonny writes the following key lines, which are worth quoting at length:

« For some people, especially many activists, biotechnology also symbolizes the negative aspects of globalization and economic liberalism: destruction of local cultures and economies, growing trend of commodifying everything including genetic resources, and aggravated competition often perceived as disloyal due to the rivalry created between economies with different levels of development (...) So,

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<sup>27</sup> Eurobarometer 55.2: 29.

<sup>28</sup> Bonny 2003: 57.

certain surveys reveal that economic motives have become an important cause of opposition to GMOs (...) Arguments put forward by active opponents show that they often perceive this struggle as a form of opposition to extreme liberalism »<sup>29</sup>

Graph 1 presents further evidence for the linkage between opposition to GMOs and broader concerns about government's response to globalization in the EU. Removing Finland from the data set (an atypical case with high support for GMOs yet high concerns about globalization), one finds a relatively good fit between concerns about GMOs and concerns about globalization.

## The Role of NGOs and Institutional Legitimacy

Reviews of opinion surveys about GMOs, particularly in the case of France, lead to further implications. On the basis of the INRA/Eurobarometer data, Bonny states that opposition to GMOs started to spread in 1996, when the first GM seeds arrived in Europe and in the midst of the EU debate over the approval of the Novartis Bt corn. She identifies as crucial, the « strong influence of associations that focus on risks ». These associations cluster in four groups: ecologist organizations (Greenpeace, Friends of the Earth), groups working for citizens' rights (Ecoropa, the Natural Law Party), farmers' unions (particularly the Confédération Paysanne led by Jose Bové), and anti-globalization organizations (such as ATTAC). At the EU level, the 1999 Eurobarometer data showed that the actors judged most often by respondents as « doing a good job for society » with respect to GMOs were consumers' unions, doctors, the media, and environmental groups. Industry, on the other hand garnered a negative score in most EU countries (51% negative opinion vs. 25% positive opinions in the case of France).<sup>30</sup> Finally, Bonny links negative opinions about GMOs to a low « confidence in institutions » at the time of the crisis.

A similarly insightful view into the making of a public backlash against GMOs in Europe after 1996 comes from an issue of *The Monsanto Monitor* published in January 1999, in which the biotech leader, Monsanto, evaluated why its public relations campaign in Europe had turned out to be so counter-productive. The review pointed to a larger institutional crisis:

« Public Surveys indicate that many citizens in Europe do not believe that biotechnology is regulated very well. Moreover, public institutions are not well trusted. This situation may affect the acceptance of the use of biotechnology for food production (p. 3) »

Monsanto further acknowledged that the problem was not with the elites, since politicians were sensitive to the argument of « competitiveness of Europe in the global markets ».

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<sup>29</sup> Bonny 2003: 58.

<sup>30</sup> Bonny 2003: 53.



In sum, the data presented in this section reveals the importance of a turnaround of public opinion with respect to GMOs around 1996 and the transformation of GMOs into a larger symbol for a reaction to globalization and to the response of European governments to globalization.

How were NGOs successful in constructing GMOs as a proxy for unbridled economic globalization? Interestingly, it did not start that way. Arnaud Apoteker, the French Greenpeace leader on GMOs, had to fight a long battle with the Greenpeace leadership in 1993-1996 before being allowed to launch a campaign on GMOs. Greenpeace initially saw GMOs as the wrong battle. They surmised that GMOs were a narrow and technical matter that would not interest the public and foresaw some positive environmental impact through the use of biotechnology. The success of the November 1996 campaign in France and related campaigns in Northern Europe came as a big surprise for the leadership. The framing of GMOs as a key vector of globalization came in a piecemeal fashion and only gradually. In Europe, it occurred through the enlargement of the NGO coalition beyond Greenpeace toward farmers' unions (eg Confédération Paysanne) and anti-globalization NGOs (such as ATTAC), a process that did not take place in Japan for example. This second wave of NGOs focused on two main aspects of the GMO controversy: property rights and the ownership of life by large (foreign) corporations; and the industrialization of agriculture (moving toward a productivist model). These two dimensions carried the GMO issue beyond a mere food safety issue or an environmental issue and made it a symbol of globalization.

## **JAPAN: UNPRECEDENTED POLITICS BEHIND AN UNEXPECTED SHIFT**

The Japanese turn toward a regulatory approach to biotechnology was not predictable, given the deeply entrenched propensity of the Japanese state to promote science in general since the Meiji era<sup>31</sup> and biotechnology in particular since the 1970s.<sup>32</sup> The 1980 long-term economic plan proposed by the Ministry of International Trade and Industry (MITI) identified biotechnology as one of three industries that formed the basis for future economic growth.<sup>33</sup> The strategy was supported by a broad consensus. Changing course in such a strategic sector is costly indeed. In this light, the regulatory course taken by Japan after 1999 is particularly puzzling and hard to explain in conventional terms.

The strength of this initial status quo remains visible to this day, with the particular influence of LDP Diet member Omi Koji (Mori faction). Omi was first elected in 1990 after a long career as a senior bureaucrat at MITI. He has been the leader of the biotechnology

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<sup>31</sup> Callon 1995; Johnson 1982; Samuels 1994.

<sup>32</sup> Brock 1989.

<sup>33</sup> Brock 1989: 1.

lobby and the Chairman of the Diet members' Promotion Alliance for Life Sciences. Under Prime Minister Mori Yoshiro (2000-2001), he was assigned the task of finding ways to promote biotechnology and arrange international meetings for Mori.<sup>34</sup> Under Prime Minister Koizumi, he became Minister of Science of Technology (April 2001 to September 2003). In 2002, he created a strategic council on biotechnology, with Keidanren's support, with the stated aim of catching up with the US and Europe in biotechnology.<sup>35</sup> Omi was also influential in the creation (with great pomp) of the Science and Technology in Society (STS) Forum in November 2004. The first meeting took place in Kyoto in the presence and with full support of Prime Minister Koizumi. Both in this first meeting and in the follow-up in September 2005, Omi gave some of the key speeches. In line with this official state support, Japan is a major actor in biotechnology research and industrial development. The annual BioJapan event is a huge affair. The last session in September 2004 attracted both members of the Imperial Family and Prime Minister Koizumi, as well as over 20,000 professional participants.<sup>36</sup> The Japan Bioindustry Association (JBA)'s membership numbers 300 companies, 100 public organization, and 1300 individual academic researchers.<sup>37</sup>

Two additional elements further entrenched this supportive approach to biotechnology and biotech agriculture. One is Japan's extremely high level of food dependency, particularly with respect to the US. As of 2001, Japan's self-sufficiency in corn, canola, and cottonseed is 0%; self-sufficiency in soybeans, a major food staple, is 5.3%. In turn, Japan imports 88% of its corn and 76% of its soybeans from the US.<sup>38</sup> As for canola, 81% comes from Canada. This situation makes it very difficult for Japan to take a position that goes against a technology that is widely adopted in American agriculture. Alternative sources are simply not there. At the same time, biotechnology offers hopes to reduce Japan's high food dependency ratio.

Finally, the position taken by Japan on GMOs and biotechnology has high global stakes. Given the high-level contest for global GMO governance between the US and the EU, Japan is partly seen as pivotal player. If Japan openly sides with the EU's preference for the precautionary principle and a regulatory approach, it can accelerate global momentum against the technology. As a result, Japan has been under strong US pressure to support the new technology.

In this highly charged context, in 1999-2004, Japan ended up tilting toward the regulatory camp. It passed mandatory labeling regulations in 1999, thus joining the handful of countries that have imposed such stringent requirements on the industry (together with the EU, Australia, New Zealand, and Russia). Japan further raised the bar for the approval of

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<sup>34</sup> Personal Interview with President of parliamentary commission on biotechnology and GMOs in French parliament, August 23, 2005.

<sup>35</sup> Source: Monsanto's Biotenz online magazine, June 12, 2002. « Japan to Form Council to Promote Biotechnology in July ».

<sup>36</sup> Source: BioJapan, 2004, Vol 21, n° 2-1.

<sup>37</sup> Source: JBA, [http://www.jba.or.jp/eng/jba\\_e/index.html](http://www.jba.or.jp/eng/jba_e/index.html)

<sup>38</sup> Source: Amagasa 2005.

field tests and several prefectures took further steps to prevent these tests. In addition, Japan signed and ratified the Cartagena protocol on Biosafety and passed one of the most far-reaching sets of domestic regulations in 2004 to implement the protocol. This highly surprising outcome represents a major, and risky, new departure for Japan. This posture not only risks limiting Japan's long-term competitiveness in biotechnology, it also intensifies the global contest over biotech governance. Why did Japan take the risk of such significant change with global impact?

This puzzle is not easily explained by classic theories of Japanese policy-making. An interest group model is insufficient, given the weight of pro-biotech interests and their excellent access to METI and to the political sphere. A bureaucratic model is ineffective, given that the major ministries involved (MITI/METI, The Ministry of Agriculture and Fisheries, and the Ministry of Health and Welfare) had long been aligned in their support for biotechnology, producer groups and food processors. An explanation based on party politics in the post-electoral reform environment also seems insufficient given that only the Japan Communist Party (JCP) has been vocal on GMOs and that the issue has barely surfaced in national elections.

This study advances an explanation centered on a new actor on the Japanese political scene: civil society groups. Japan's shift in its regulation of GMOs was a result of an institutional crisis triggered by civil society actions. The entry of new actors and the use of new channels led to the breakdown of a stable status quo. A coalition of consumer associations with large local followings succeeded in organizing major petitions (with millions of signatures) and capturing public opinion. Initially unable to influence the central government, they relied on local governments to amplify the protest. By late 1998, 1600 local governments (nearly half of the 3300 existing councils) had passed written opinions on the matter.<sup>39</sup> Local governments in Aichi prefecture, Iwate prefecture, and in Hokkaido later took major steps to thwart open research fields or prevent the planting of GM crops. In turn, the action of these consumer groups succeeded in upsetting the status quo at the national level. They forced the ministries in charge and political leaders to take regulatory measures that could appease the growing protest and defuse the crisis. The process of triggering the tipping point was facilitated by an existing crisis of trust in Japan's administration and by the existence of blueprints from Europe that could be adopted by the Japanese consumer movement. However, civil society only had the ability to exert pressure, not to shape the actual regulations. The emerging regulations, precautionary, yet rather loose (with a 5% threshold on labeling and several key exceptions) were shaped by the the economic ministry and the agriculture ministry that dominated the regulatory process.

### **The Japanese Road: From GMO Liberalizer to Regulator**

Since the 1980 MITI report identifying biotechnology as one priority area for economic growth, the Japanese government has supported the research and development of GMOs. In April 1984, for example, the Ministry of Agriculture, Fishery, and Forestry (MAFF)

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<sup>39</sup> Personal email interview with leading NGO activist, August 26, 2005.

announced a plan to promote the development of biotechnology. A key step in this process was the 1986 revision of the Major Food Product Seeds Law, which annulled the long-time monopoly of local governments in seed development for key food crops (rice, soybeans, wheat) and allowed private companies to develop seeds. This change, together with permissive guidelines published by MAFF (agriculture), MITI (genetic engineering in industry), and the Ministry of Health and Welfare (MHW) gave a boost to private research. As early as the late 1980s, research started on GM rice and GM tomatoes in Japan. MAFF itself joined the development of GM products by direct research in the field. In 1989, MAFF conducted the first field test of a GM crop (a tomato), in a containment greenhouse. Other GM crops developed by MAFF or private companies were given the green light for full open field-testing in 1991 (including tomatoes, melon, petunia, etc.). MAFF also launched the rice genome project in 1991, leading to open tests of GM rice crops in the mid-1990s. In 1992, MAFF authorized the planting of GM tomatoes for food consumption.<sup>40</sup> Finally, in 1996, MAFF fully liberalized the sale of major crop seeds by private companies, on condition of a safety approval. Meanwhile, the first GM crops imported from the US and Canada arrived in Japan in late 1996 (corn, soy, canola). In January 1997, Prime Minister Hashimoto Ryutaro publicly supported GM crops in Diet questions and answers. By 2001, it was estimated by Japanese NGOs that 40% of all corn consumed in Japan and 62% of all soybeans were genetically modified. The introduction of GM crops was done without labeling and without informing the general public, based on the principle of « substantial equivalence ».<sup>41</sup>

On the international scene, the Japanese government participated in and approved the OECD process of food safety evaluation (begun in 1993), a process that gave international support to the principle of « substantial equivalence ».<sup>42</sup> Likewise, Japan accepted without difficulties the Marrakech treaty (the foundation of the WTO) in 1994 and its accompanying Sanitary and Phytosanitary Agreement (SPS). The SPS agreement further established the principle of substantial equivalence and a relatively liberal approach to trade in GMOs.

The tide in Japan suddenly turned in July 1999, when MAFF agreed to the introduction of GMO labeling, despite open US pressure and opposition by industry (Nihon Keizai Shimbun, 31 July, 1999). This led to a MAFF-drafted law, the revised Law Concerning Standardization and Proper Labeling of Agricultural and Forestry Products (JAS law), passed in March 2000, and was effective on April 1, 2001. This law required the labeling of GMOs in Japan, albeit with major loopholes. Only 28 kinds of foods were covered (including tofu, natto, miso). To be labeled as GMOs, the usage of GM crops had to reach at least a 5% threshold and the GMO had to be among the top 3 components of a given food product. Finally, processed food such as corn flakes or soy sauce was excluded.<sup>43</sup> This compromise angered major food exporters (US, Canada, Australia), domestic agriculture industry, as well as consumer groups who found the loopholes too numerous. This MAFF law was followed by a revised Food Sanitation Law, drafted by the Ministry of Health and Welfare and also effective in April 2001.

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<sup>40</sup> See chronology in appendix for further details.

<sup>41</sup> Amagasa 2005.

<sup>42</sup> Hayashi 2004.

<sup>43</sup> Source: *Japan Times*, August 4, 1999.

The second major regulatory step taken by Japan was the ratification of the Cartagena protocol on biosafety in June 2003, together with a far-reaching domestic law, the Law concerning the Conservation and Sustainable Use of Biological Diversity through Regulations on the Use of Living Modified Organisms (so-called Cartagena Law in Japan). Six ministries, The Ministry of Education, Culture, Sports, Science, and Technology, the Ministry of Health, Labor, and Welfare, the MAFF, the METI, the Ministry of Finance, and the Ministry of Environment jointly sponsored this law. For the first time, the Ministry of Environment had the lead role. The new law, effective April 2004, tightened rules for GMO tests and planting, forcing a more thorough impact study. It clarified responsibilities for GM contamination and set tough penalties for violators (including jail).

On the international side, however, Japan has taken a more moderate stance. Initially, in 1999, Japan backed a US attempt to move back the biosafety process under the WTO (Seattle meeting), before eventually signing the Cartagena treaty in January 2000. In Codex negotiations, Japan has generally avoided taking a position in the open competition between the EU and the US over future food regulations and GMO governance.<sup>44</sup>

On the ground, however, the combined impact of tighter domestic regulations and direct consumer actions stalled research and cultivation of GMOs in Japan. In early 2005, the No! GMO Campaign could write:

« We have been successful in appealing to farmers not to plant GM crops in Japan. Thus far, no GM crops have been planted and harvested in Japan. We have also been successful in stopping cultivation trials of GM rice carried out by Monsanto, and have also prevented further development of GM crop varieties in Japan. As a result, all private Japanese companies and all local governments have withdrawn from GM food crop development. »<sup>45</sup>

In sum, the Japanese pathway to GMO regulation poses an important question: given the high levels of food dependency and the presence of large investments in biotechnology and the strength of a large biotechnology lobby, why did the Japanese government choose to pass costly regulations and to thwart this new technology? The change of direction in Japan's GMO regulation cannot be explained without a focus on a new actor: domestic civil society groups.

### **Major Transformation: The Rise of a Strong Civil Society Network**

Unlike in European countries where environmental groups (Greenpeace) or farmers' groups (such as Jose Bove's Confédération Paysanne) have led anti-GMO actions, the anti-GMO civil society movement in Japan emerged out of consumer groups. The consumer federation started focusing on GMOs in the early 1990s. In November 1996, the No! GMO

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<sup>44</sup> See in particular the *Japan Times*, April 17, 2001 (« Japan Stays Glued to Fence on GMO Traceability Issue »).

<sup>45</sup> Amagasa 2005: 1.

Campaign was launched, organized by the Consumers Union of Japan, in coalition with other organizations.<sup>46</sup> The leader of the campaign, Amagasa Keisuke, was a former science journalist who attended symposia and meetings of the European anti-GMO citizens movements in the early 1990s.<sup>47</sup> From the start, Amagasa and his colleagues focused on three targets: food safety, environmental impact, and control by Multinational Corporations (MNCs). By 2005, the campaign counted only 200 individual members, 200 organizational members (mainly local branches of Japan's consumer union and women's movements) and 6 staff members. But its strength has proved greater than its numbers thanks to a coalition of related NGOs, particularly the Consumers Union of Japan, Stop GM Seeds Network Japan, GMR Watch Center Information, and above all, the Seikatsu Club Consumers' Cooperative Union (which provided the large membership necessary for petition actions). What started as a Consumers' movement grew to a larger coalition with some environmental groups and farmers group, as well as citizen watch centers. The other ally for the campaign has proved to be the large interest in food issues in the media, probably on the heels of previous scandals such as the AIDS scandal.

The initial strategy of the campaign has been to focus on information and education, while launching major petitions (starting from local bases). Some of the main petitions include the following:

- 1997 April 23, the Welfare Ministry (current Ministry of Health, Labour and Welfare-MHLW) received 448,028 signatures from NO! GMO Campaign opposing GE food and demanding proper labeling on such food to give consumers the right to choose;
- According to the Welfare Ministry on April 13 1998, it received more than 2,000,000 signatures concerning GE food;
- 2000 December 5, the Minister of Agriculture received 121,630 signatures to oppose GE rice – development, cultivation, import and sales – from NO! GMO Campaign;
- 2001 April 5, the Minister of Agriculture received additional 51,222 (total: 172,852 signatures) from NO! GMO Campaign;
- 2001 October 5, signatures from Japanese NGOs to oppose GE rice were handed in to: Monsanto (1282 NGOs), Aventis (1281 NGOs), the Ministry of Agriculture, Forestry and Fisheries (1292 NGOs), the MHLW (1272 NGOs);
- 2002 January 30, Prime Minister Junichi Koizumi received 216,859 signatures to oppose GE rice.<sup>48</sup>

The actions of the campaign represented a wake-up call or trigger for a larger opinion movement.

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<sup>46</sup> Amagasa 2000, Amagasa 2005.

<sup>47</sup> Personal Interview with Mr. Amagasa, November 2005.

<sup>48</sup> Source: Citizen's Biotechnology Information Center Japan, personal submission to query, August 25, 2005. List prepared for Greenpeace International.

## The Impact on Public Opinion

The shift in Japanese public opinion seems quite dramatic. For example, Macer and Chen Ng<sup>49</sup> have reported a high level of support among Japanese for scientific innovation and biotechnology in particular. Among the Japanese public, 30% had a high opinion of scientific innovation in 1991, a level that reached 47% in 2000. In 2000, 59% thought that genetic engineering could be a means of improving the quality of life. With respect to one particular application, tomatoes with better taste, 69% expressed approval in 1991, a number that dropped to 59% in 2000. By 2004, however, an official survey of the Japanese Cabinet revealed that 60.3% of the Japanese public questioned the safety of GMOs.<sup>50</sup> Another poll in 2002 showed that 80% of Japanese demanded labeling of GM products.<sup>51</sup> Although further studies are required, public opinion seemed to have shifted in response to the exploitation of particular events (Monarch butterfly, Starlink corn contamination in 2000) that were played up by the GMO Campaign and relayed by the media, including television channels. One video on butterfly caterpillars that seemed affected by GM crops released in 1997 by the Japan Offspring Fund (JOF) caught the media's interest. Several TV channels used parts of the video in public programs, leading to a major impact on the public.<sup>52</sup>

## By-passing the Center: The Use of Local Council Declarations

From a political point of view, a key initial strategy of the anti-GMO movement consisted in bypassing the center and lobbying local governments to convince them to pass council declarations and send them to the central ministries. Amagasaka Keisuke and other members of the campaign toured local governments for this purpose. As a measure of their success, by April 1998, the Ministry of Health and Welfare had received 1050 written opinions over GE foods from local councils. By 1999, the number grew to 1600, half of Japan's 3300 local governments.<sup>53</sup> The process started with the Tokyo Council and spread through a gradual bandwagoning effect. The movement was successful because of single common goal (labeling) and the cooperation of a variety of other groups, such as consumer organizations, environment groups, cooperatives, and even church groups.<sup>54</sup>

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<sup>49</sup> See Macer and Chen Ng 2000.

<sup>50</sup> Cabinet Office (Naikakufu Chosa), « Kagaku Gijutsu to shakai ni kan suru yoron chosa » (April 2004), <http://www8.cao.go.jp/survey/h15/h15-kagaku/2-2.html>

<sup>51</sup> <http://www.gene.ch/gentech/2002/Jul/msg00075.html>

<sup>52</sup> Phone interview with two members of the Japan Offspring Fund, August 26, 2005.

<sup>53</sup> Source: Citizen's Biotechnology Information Center Japan, personal submission to query, August 25, 2005. List prepared for Greenpeace International. Phone interview with Akiko Frid on August 26, 2005.

<sup>54</sup> Email interview with Vision 21 activist, August 26, 2005.

Some local governments took further steps that amplified the movement. In particular, the city of Kawagoe shi made headlines in 1999 by banning all GM food from school meals. Seven other cities followed suit.

Through the dual pinch of local government declarations and national campaigns that had a major impact on public opinion, GMO regulation reached the agenda of the central government.

- **Political Victories for the Anti-GMO Campaign at the Local Level**

Building on its local roots, the anti-GMO campaign launched two major campaigns to stop research and development in GM rice in Japan. The first major campaign targeted the government of the Aichi prefecture, because of the cooperation since 1996 of Aichi's Agriculture Research Center with Monsanto for the development of Roundup-resistant rice. The movement led by the No! GMO Campaign and involving consumers' movements and organic farmers culminated in two large meetings in Nagoya on July 7 and November 17, 2002. In November, the coalition handed a petition of 580,000 citizens against the development and commercialization of GM rice to the Governor of Aichi ken. The campaign also enlisted some members of the Aichi Assembly, particularly Nakamura Tomomi. Ms. Nakamura questioned the Aichi governor in the assembly over GM rice. Victory for the movement was reached on December 5, 2002, when, in response to Assembly member Nakamura, the head of the Department of Agriculture and Forestry in Aichi announced that cooperation with Monsanto would be terminated and that commercialization of GM rice was abandoned.<sup>55</sup>

A similar campaign took place in Iwate prefecture in 2003 also over GM rice. The target, this time, was the Iwate Biotechnology Research Center established in 1992 and engaged in the development of a cold-resistant strain of GM rice. Open field-testing was approved by MAFF early in 2003. By November 28, 2003, the No! GMO Campaign had succeeded in gathering 407,000 signatures against Iwate's GM rice development and in enlisting 20 Iwate Assembly members in its campaign. In a grand meeting involving a march by over 450 people to the Iwate Prefectural government in Morioka city, the campaign transmitted the petition to the authorities. In response, the Director of the Agriculture, Forestry and Fisheries Department stated that Iwate would not conduct field tests and would abandon the research of GM rice.<sup>56</sup> The campaign declared victory and announced that no more field-testing on GM rice was taking place in Japan.

A third major local victory took place in Hokkaido in March 2005, when, in response to a major campaign symposium organized in February 2005, the local government passed an ordinance that raised the bar for the approval of any field testing or commercial plants in Hokkaido. The ordinance required specific approval by the Governor and further environmental impact studies, above and beyond the requirements of the central government. This was denounced by the Japan Bioindustry Association as a major defeat for Japan's competitiveness in the industry. Tsukuba followed with a similar bylaw.

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<sup>55</sup> Kawata 2002.

<sup>56</sup> Amagasa 2003.



Finally, the anti-GMO campaign has begun importing the GMO-free zone concept from Europe and North America. As of 2005, the Citizen's Biotechnology Information Center could report the following:

« The GMO Free Zone movement is happening in Japan. NO! GMO Campaign made a logo in October 2004, and established a "GMO Free Zone Movement". It formed a "GMO Free Zone Kick-off Gathering" in Shin-Asahi town, Shiga prefecture, in January 2005. Since then 3 towns in Yamagata Prefecture have been declared as GMO Free Zones, and on August 5 the "Minori-Anshin network" in Tokyo joined the movement. On September 3 the Tohoku Network will be declared as a GMO Free Zone. So far, 53 groups and individuals are involved with the movement, and 120 locations (4012 ha) have been declared as GMO Free Zones. »<sup>57</sup>

### **Impact at the Center: New GMO Regulations and Position in International Negotiations**

The pressure from the periphery reached the center in 1999-2001. As early as 1997, the House of Representatives created a sub-committee on GMO labeling within the special committee on consumer issues. Conclusions were not definitive, but the risk of politicization gradually appeared to MAFF and MHW, the two ministries in charge. MAFF created its own committee on GM labeling in 1998 and started discussions. But it really took until some of the more dramatic petitions and actions by the campaign for MAFF to take the plunge and move toward mandatory labeling (August 1999). In the words of Akasaka Kiyo, the chief negotiator for Japan's position in the Cartagena negotiations over Biosafety, the ministries simply found themselves under the gun of rising pressure:

« Public interest in biosafety issues began to increase dramatically in the middle of 1999, however, as the Japanese people became aware of the increasingly heated protest movements in Europe against LMO products (...). Both the Ministry of Agriculture, Forestry, and Fisheries and the Ministry of Health and Welfare were suddenly compelled to take measures to address the rising concern of the general public, and particularly their demand that the existence of LMOs in their food be identified. »<sup>58</sup>

Meanwhile, Japan's position in international forums also gradually moved from a liberal to a slightly regulatory position. In the first round of negotiations in February 1999, the chief negotiator, Akasaka Kiyo, enjoyed a large degree of freedom from Tokyo and low interest on the part of the average public. GMOs still appeared technical in nature. MITI influenced the preparation of the brief of the Japanese team in making sure that Japan's interests were protected not only as a major importer but also as a potential future exporter of biotechnology products. Japan thus adopted the position of a mediator in the so-called Compromise Group led by Switzerland. At the Seattle WTO negotiations in late 1999, Japan

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<sup>57</sup> Source: Citizen's Biotechnology Information Center Japan, personal submission to query, August 25, 2005. Part of a report prepared for Greenpeace International.

<sup>58</sup> Akasaka 2002: 200-201.

even supported a US proposal to make the Cartagena biosafety negotiations dependent on the WTO. By January 2000, however, in the last round of negotiations, Japan played a major role in ensuring the success of the treaty and expressed strong support for the treaty.<sup>59</sup>

In Codex negotiations (including the task force on foods derived from biotechnology), Japan has kept a median position, refusing to side with Europe on tight standards, but insisting on certain regulatory aspects.

• **Global Reach of Japanese Civil Society: The Battle over GM wheat, 2004**

The Japanese No-GMO movement claims one important global success, underscoring the potential impact of this new dynamic. Moving beyond the local and national levels, the No! GMO campaign decided to directly affect the global level by targeting the development of GM wheat by Monsanto. The campaign aimed at convincing Monsanto to give up the development of GM wheat by creating a credible threat of boycott of all North American wheat in Japan. The campaign focused both on Monsanto and on regulatory authorities in Canada and the US, which were reviewing the Monsanto GM wheat. Using their networks and many contacts in Japan, the No! GMO campaign put together a petition signed by 413 NGOs, companies, and local consumer unions in Japan (representing 1.2 million people), addressed to the heads of regulatory authorities in Canada and Japan, in which they urged them to dismiss the Monsanto application or face a serious deterioration of trade relationships with Japan. In turn, five key members of the Japanese campaign joined forces with the well-known Canadian NGO, the Council of Canadians, and organized several events in Canada and the USA. During this tour, they handed over their petition to Canadian and US authorities and met with important importers. They organized several public events. The Japanese members on the tour were:

- Keisuke Amagasa, No! GMO campaign
- Masako Koga, Consumers Union of Japan
- Takafumi Maekawa, Daichi-Wo-Mamoru-Kai
- Etsuko Kondo, Seikatsu Club Consumers Co-operative Union
- Ryoko Shimizu, Seikatsu Club Consumer Co-operative Union.<sup>60</sup>

Interestingly, the 413 organizations include a whole coalition of local consumer groups, food processing companies, women's groups, environmental groups, farmer groups, and anti-globalization NGOs (ATTAC). Between 1997 and 2004, the community of related NGOs in Japan has massively expanded.

What is most remarkable about this event is that the Japanese NGO campaign met with success. In May 2004, Monsanto announced that it was withdrawing its application in Canada and the US for the approval of GM-wheat and that it was abandoning research and development of this crop. Amagasa Keisuke declared victory and wrote this amazing statement, a first in Japanese NGO or consumer history:

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<sup>59</sup> Akasaka 2002.

<sup>60</sup> Source:

[www.canadians.org/display\\_document.htm?COC\\_token=:COC\\_token&id=1072&isdoc=1&catid=372](http://www.canadians.org/display_document.htm?COC_token=:COC_token&id=1072&isdoc=1&catid=372)

« Monsanto applied for approval of the GM wheat variety simultaneously in the USA and Canada in 2002, and was working for a start to cultivation in 2005. However, strong resistance from both producers and consumers all over the world has made commercialization all but impossible. Especially the strong opposition from the largest markets, Japanese and Korean consumers, to GE wheat has caused panic to spread among the producers of North America.

From 21 to 28 March 2004, a group of six Japanese consumer representatives, including representatives from the No! GMO Campaign, visited Canada and the USA to present a petition opposing the GM wheat to the Canadian federal government and a state government of the USA (North Dakota). The petition was signed by 414 organizations representing over 1.2 million Japanese people. It is thought that this visit and the submission of the petition had a very strong effect on public and official thinking in the two countries.

Effectively this means that Japanese consumer pressure has been successful in forcing Monsanto to suspend development of both GM rice and GM wheat. The company has tried to sell its GM crops to the world using its financial and political power, but it has now been shown that if Japanese consumers form strong links with and fight alongside people all over the world they will not be beaten. »<sup>61</sup>

This event summarizes the coming to age of Japanese civil society groups in the fields of GMOs and globalization. In May 2005, Japanese NGOs had another kind of global impact, when Akiko Frid, representing Greenpeace Japan and the No GMO Campaign brought to the Montreal Biosafety conference specimens of wild GM canola that had grown out of control near Japanese roads. Imported GM canola from Canada had fallen off trucks in various cities and ports and grown out of control. This live example of GM contamination captured international headlines. This event, however, was organized with Greenpeace International, rather than led by the homegrown Japanese NGOs.

### **A Changing Japan: From a Mercantilism to Neo-Liberalism to Global Civil Activism?**

Surprisingly, Japan finds itself in the position of playing an increasingly pivotal role in the elaboration of international and national regulations in support of global civic concerns. This is particularly surprising because of Japan's long-standing mercantilism and more recent conversion to global trade and neo-liberal reforms. In fields such as global environment, GMOs, but also human security, human rights, and gender, Japan finds itself supporting positions adopted by countries such as EU nations against focusing solely on competitiveness and economic productivity.

This shift toward civic values is the result of successful mobilization by emerging coalitions of domestic NGOs and citizens' movements. These NGO coalitions have been successful in importing European or global blueprints, raising public consciousness and enlisting local governments around precise campaign targets (such as GM labeling).

Interestingly, NGOs in the anti-globalization arena (free trade, water rights, Tobin tax and financial transactions) have not been so successful in their campaigns. It may be that these

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<sup>61</sup> Amagasa 2004.

purely global and technical issues have prevented NGOs from using the relays of local governments or that the coalition of opponents was too well organized.

Nevertheless, the achievements of NGOs in the fields of biotechnology and climate change indicate the transformation of the closed nature of Japanese politics and the growing interactions between local politics, national politics, and global politics.

## **TRAJECTORIES OF OTHER KEY PLAYERS**

The experiences of the EU and Japan can be compared with those of several other key countries. This section briefly reviews the cases of Korea, China, India, and Brazil. Korea has emerged as another OECD country moving toward a precautionary approach under civil society pressure. Australia presents a mixed picture with a liberal approach abroad, strict labeling and approval regulations at the national level but also the actual authorization of three GM crops (cotton, canola, carnation), and moratoriums on the level of states within the federation (9 out of 10). Taiwan and Hong Kong, on the other hand have kept liberal and non-restrictive import postures with respect to GMOs. Taiwan did move toward a degree of mandatory labeling after 2003, but only gradually, without trade impact, and without much pressure from organized civil society groups. The future of the battle for GMO governance, however, may well be determined by the actions of China and India, two major Asian states that have charted a middle course: while both adopted safety procedures and mandatory labeling, they also both view biotechnology as central to their development and both grow GM-cotton on a large scale. Both could tip toward either more regulations or more GMOs in the coming years.

Korea presents a contrasted response to agriculture biotechnology. On the one hand, the government and industry have identified biotechnology as a key industry for future competitiveness and future growth. Korea is a leader in stem cell research (under permissive regulations), and it has one of the highest budgets in biotechnology research: \$708 million in 2005 alone, \$79.2 million of which is in agriculture biotech.<sup>62</sup> On the other hand, Korea has not approved a single GM crop for commercial production and is not growing any. Furthermore, in response to strong pressures by domestic civic organizations, it introduced mandatory labeling regulations in 2001 with a relatively strict threshold (3%), leading to major trade frictions with the US in 2002. The Korean NGO coalition was formed relatively early (September 11, 1998) and in a coordinated and organized fashion. What emerged as the Solidarity for Biosafety and Bioethics included 17 founding members, including consumer organizations, green organizations, development organizations, civil organizations, several church organizations (Christian and Buddhist), women associations, and student associations (but no farmers' unions or anti-globalization associations). This coalition managed to stage several major demonstrations and surveys, for example tracking

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<sup>62</sup> Source: USDA, Global Agriculture Information Network Report number KS5035, 15 July 2005.

GMO in the food chain and affecting purchases of soybeans and tofu in a major way in 2000-2001.

But, unlike the EU (and Japan), Korea has accepted to slightly modify its approval regulations during trade negotiations with the US in 2002 to make them less trade distorting and has thus avoided a WTO dispute. In addition, Korea has not joined the EU in pushing for regulations at the global level. In fact, to this day, Korea has not ratified the CPB, partly because of the lead position taken by the Ministry of Commerce, Industry, and Energy (MOCIE) and because of trade concerns. Korean NGOs and private interests, however, have apparently been actively lobbying against the approval of GM wheat in North America and may have played a role in Monsanto's withdrawal in 2004.

China, on the other hand, presents a slightly puzzling mix of promotion of biotechnology and regulation. On the one hand, China is placing a great priority on GMOs and spending large government expenditures on the technology. It has the second highest budget in the world, estimated at \$112 million in 1999, slated to increase 400% from 2001 to the period 2002-2006 and has already tested over 100 edible plants (potatoes, tomatoes, papayas, etc.). This approach seems buttressed by relatively positive consumer attitudes in public surveys. The key GM crop so far is cotton, introduced in 1997 and representing 66% of the area sown with cotton in 2004. GM cotton has spread rapidly, due to lower costs and positive health impact on farmers. In addition, up to 70% of China's imported soybeans is GM. Most of these come from US and are used in food processing.

On the other hand, China decided in 2001-2002 to label all imported GMOs and to require certificates from the Ministry of Agriculture for any imported GMO. A new biosafety office was created within the ministry. Theoretically, China adopted process labeling (not just end product) with a strict level of 0%. In February 2002, China nearly introduced tighter import regulations on GMOs (and tight labeling thresholds) but backed down in the face of a US threat to lodge a WTO complaint. A compromise was found with China delaying the implementation of its most stringent rules. Still, China confirmed its regulatory line with the May 2005 ratification of the CPB. China is also currently considering making the large province of Heilongjiang (where 80% of soy is grown) GMO-free.

What is driving the Chinese move toward precaution? Three causes seem to have an impact. One is an economic calculation that China stands to gain by remaining GM-free for soybeans (cornering the Japan market). China also seems to target potential trade relations with the EU for some products. Second, the CPB ratification seems related to China's desire to be in line with international law, at least formally. Finally, the Environmental Protection Administration and the Ministry of Agriculture may have seen GMO regulations as one way to increase their leverage in power struggles among ministries. Most recently, the role of Greenpeace in China seems to have made a difference and to have an impact on the press and on public opinion.

One recent event, however, seems to cast a shadow on China's move toward a regulatory approach. Indeed, in 2005, unapproved GM rice leaked from large test fields and was sold in various areas of China (Hubei, Guangdong, etc.). The leak traced back to the chief scientist in charge of GMO research, Dr. Zhang Qifa of the Chinese Academy of Sciences; this was found out by Greenpeace and raised doubts about China's implementation of regulations. In a peculiar twist, the leaked GM rice was found to be sold at a premium in some cases!

India is also emerging as a key player in the field. Since 2000, the government has targeted biotechnology as a key national priority in the name of fighting poverty and malnutrition. In 2004, it announced an action plan with large subsidies for research in agricultural biotechnology and support for GM crops. As in China, the development of GMOs is based upon a strong national technological base, although Monsanto is also actively present. As of 2005, only GM cotton has been introduced as a commercial crop, and cultivated areas remain relatively modest (1.3 million hectares). The year 2005, nonetheless, recorded a large jump (from 0.5 to 1.3 million hectares). At the same time, India is home to some of the most active and informed anti-GMO NGOs, such as Navdanya, a movement for biodiversity conservation and farmers' rights led by the world famous scientist Vandana Shiva. India is also home to active farmers' unions. Unlike China, its democratic regime gives multiple entry points to opponents of GMOs and an intense battle is likely to be played out in the coming years. India could either join the GMO bandwagon or end up holding back. As of early 2006, the disappointments of some of the GM cotton crops seems to have led to the ruin and suicide of dozens of farmers in Northern India, in turn leading to law suits and further anti-GMO mobilization.

In contrast, Brazil is the biggest recent success story for the biotech industry. Brazil shifted from one of the most outspoken anti-GMO countries until 2003 to the third largest GMO producer in 2005. The initial moratorium was lifted in September 2003 with a temporary authorization. A complete law regulating biotechnology, supporting research, and the legalization of cultivation was passed in 2005. In the case of Brazil, a key factor was the growing pressure of illegal GM seeds crossing the border from Argentina, which rendered the moratorium nearly unenforceable. Other factors seem to have included intense lobbying of members of parliament by biotech companies and a belief by President Lula that GMOs would bring progress and development to Brazil. As of 2006, Brazil is trying to play on two fronts, developing a hyper-productive GM soy industry in the Southern part and a non-GM agriculture in the North, allowing it to cash in the additional premium fetched by such non-GM crops in Europe. How long this segregation can hold remains an open question.

Other key countries joining the biotech bandwagon include the Philippines (corn, maybe rice in the near future) and South Africa (cotton, soybeans). Outside South Africa, most African countries remain opposed to GMOs, in part due to trade and aid links with Europe, as well as linkages with European NGOs.

## CONCLUSION

GMOs have emerged as a surprising focal point for a battle over the governance of globalization. Since 1999, the battle pits proponents of a liberal and pro-science approach against proponents of a precautionary approach in relation to the environment, ethics, and culture. At the time of writing, the two camps remain in a relative stalemate. Liberal proponents, led by the US, have succeeded in establishing the scientific and liberal approach within the WTO and the OECD. Yet, precautionary proponents, led by the EU, have successfully instituted the precautionary principle in a separate treaty, the Cartagena Protocol on Biosafety (CPB) and have pushed ahead with the debate in another UN institution, the Codex Alimentarius. At the level of national regulations, the precautionary camp has spread its regulatory approach across a larger number of countries, including Japan, Korea, China, and India (although it lost the battle in Brazil).

These battle lines remain unstable and several major developments are likely to have an impact on the struggle in the coming years. First, the outcome of the WTO panel on GMOs came out in February against the EU. Although EU regulations were not seen as illegal, the de facto moratorium on new approvals enforced by the EU in 1998-2004 was seen as illegal according to WTO (SPS) rules. This outcome delivered an important victory to the pro-GMO camp, one that is likely to reverberate in other countries and could lead to a new case against the EU, this time challenging the core of EU regulations. However, this victory is also likely to be a pyrrhic victory, as it is wind in the sails of anti-GMO activists and weakens the legitimacy of the WTO in the eyes of European public opinion. Second, the Swiss referendum of November 27, 2005 (with a 55% support in favor a 5-year constitutional moratorium on GMOs) has renewed the pressure on the EU to move further and to pass strict regulations on coexistence. The holder of the EU presidency, Austria, called a summit for April 4-5, 2006 in Vienna. On the other hand, the recent lull over GMOs has emboldened industry and some agricultural lobbies to call for a reduction in regulations. Several countries have seen improvements in public opinion toward GMOs and are increasingly supporting approvals of new products. Third, the decisions taken by India and China in the coming two years to approve or not new GM crops (such as rice in China) could have a major snowballing effect. Finally, the technology itself is fast evolving and new products could recast the debate in a brand new light.

What is certain, however, is that GMOs will continue to dominate several concurrent major societal debates and to lead to political innovations and new civil movements. The battle has only begun!<sup>63</sup>

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# Appendices

## List of Abbreviations

CODEX	Codex Alimentarius. International food code developed by the FAO and WHO through various committees
CPB	Cartagena Protocol on Biosafety
FAO	Food and Agriculture Organization (of the United Nations)
FDA(US)	Food and Drug Administration
GMO	Genetically Modified Organisms
ISAAA	International Service for the Acquisition of Agri-Biotech Applications
MOP	Meeting of the Parties (of the CPB)
OECD	Organization for Economic Cooperation and Development
SPSWTO	Agreement on the Application of Sanitary and Phytosanitary Measures
TRIPS	Agreement on Trade-Related Aspects of Intellectual Property Rights (WTO)
USDA	United States Department of Agriculture
WHO	World Health Organization (United Nations)
WTO	World Trade Organization

**Table 1**  
Status of Biotech Crops (ISAAA - Clive James)

	2005		2000	
	(area in Hectares)			
USA	49.8	55.3%	30.3	68%
Argentina	17.1	19.0%	10.0	23%
Brazil	9.4	10.4%	-	0
Canada	5.8	6.4%	3.0	7%
China	3.3	3.7%	0.5	1%
Paraguay	1.8	2.0%	-	0
India	1.3	1.4%	-	0
South Africa	0.5	0.6%	0.2	0.5%
Uruguay	0.3	0.3%	0.2	0.5%
Australia	0.3	0.3%	traces	
Mexico	0.1	0.1%	traces	
Romania	0.1	0.1%	traces	
Philippines	0.1	0.1%	-	
Spain	0.1	0.1%	traces	
Columbia	traces		-	
Iran	traces		-	
Honduras	traces		-	
Portugal	traces		-	
Germany	traces		traces	
France	traces		traces	
Czech Rep	traces		-	
<b>TOTAL</b>	<b>90.0</b>	<b>100.0%</b>	<b>44.2</b>	<b>99.9%</b>

**Table 2**  
Typology of States on the Liberal-Regulatory Spectrum on GMOs

International Level	Liberal (Pro GMO)	Regulatory (Anti-GMO)
Domestic Level		
Liberal (Pro-GMO)	<b>1. Consistent Liberalizers</b> [USA, Canada, Argentina, Philippines]	<b>2. Internationalist Regulators</b> [South Africa, Kenya, Turkey]
Regulatory (Anti-GMO)	<b>3. Unilateralist Regulators</b> [Japan until 2003, Australia, New-Zealand, Thailand, Russia, Brazil, Korea, Mexico]	<b>4. Consistent Regulators</b> [EU, Norway, China, Japan since 2003, Mexico, Venezuela, India, Malaysia, Indonesia, Kenya]

**Table 3**

Classification of Country Positions in 2004 on both the Domestic and International Dimensions

Country	Econ Indic.		Domestic DV			Int'l DV		
	GMO acreage ISAA 2004 M ha	GMO types	GM scient. Experi FAO	Mandatory Labeling	Threshold	Traceability (process) + Feed covered	CPB Ratific (09/05)	Codex Position Labeling May 05
<b>CONSISTENT LIBERALIZERS</b>								
USA	47.8 (59%)	Corn, Soy, Cotton, Canola		NO	-	-	NO	ANTI
Canada	5.4 (6%)	Canola, Corn, Soy		NO	-	-	NO	Neutral (chair)
Argentina	16.2 (20%)	Soy, Corn, Cotton	48	NO	-	-	NO	ANTI
Paraguay	1.2 (2%)	Soy	0	NO	-	-	2004	ANTI
Philippines	0.1	Corn	13	NO	-	-	NO	ANTI
Romania**	0.1 (or more)	Soy	0	NO	-	-	2003	
Pakistan	0		14	NO	-	-	NO	n/a
Nepal	0		0	NO	-	-	NO	n/a
<b>UNILATERALIST REGULATORS</b>								
Australia	0.2 (0.5%)	Cotton, Carnat. Canola		YES	1%	NO	NO	ANTI
New Zealand	0			YES	1%	NO	2005 (anti MOP2)	PRO
Brazil	5.0 (6%)	Soy, Corn, Cotton	43	YES	1%	NO (YES feed)	2003 (anti MOP2)	PRO
Korea	0		14	YES	3% (0% org)	NO	NO	n/a
Russia	0		0	YES	0.9% (not binding)	NO	NO	n/a
Mexico	0.1	Cotton, Soy	35	YES, not implem		NO	2002	ANTI
Thailand	0		22	YES	5%	-	NO	ANTI
<b>CONSISTENT REGULATORS</b>								
EU	0.1 (Spain)	Corn		YES	0.9%	YES	2002	PRO
Norway	0		0	YES	2%	YES	2001	PRO
Switzerland	0		0	YES	0.9%	YES	2002	PRO
Japan	0		0	YES	5%	NO	2004	PRO
China	3.7 (5%)	Cotton Rice?	69	YES	None yet	NO	2005	
India	0.5 (1%)	Cotton	88	YES	None yet	NO	2003	PRO
Malaysia	0		22	YES	5%		2003	PRO
Indonesia	0	Cotton	28	YES	5%		2004	PRO
Kenya	0		5				2002	PRO
<b>INTERNATIONALIST REGULATORS</b>								
South Africa	0.1 (1%)	Soy, Corn, Cotton	26	NO	-	-	2003	n/a
Swaziland			0	NO	-	-	NO	PRO
Ghana			1	NO	-	-	2003	PRO
Tunisia			1	NO	-	-	2003	PRO
Senegal			0	NO	-	-	2003	PRO
Panama			0	NO	-	-	2002	
Turkey			0	NO	-	-	2003	

**Table 4**

EU Actions with Respect to the Regulation of GMOs: Three-level Interactions

Key State-Level Regulations	Key EU-level Regulations and Political Moves	International Role (Cartagena, WTO)
<ul style="list-style-type: none"> <li>• 1986: France creates Commission of biomolecular genetics (CGB) to encourage biotechnology. Subsidies given for GM crop testing. French company Rhone Poulenc (just privatized) plays key role</li> </ul>	<ul style="list-style-type: none"> <li>• 1982: EP and Council adopt non-binding recommendation from Commission (1980) requiring only notification of DNA work</li> <li>• 1983: Commission paper focusing on competitiveness of EC biotech industry</li> </ul>	
<ul style="list-style-type: none"> <li>• 1984 Germany: Bundestag inquiry on Gene Technology (pushed by Greens) → FRG gene law in 1990</li> <li>• 1986 Denmark passes Environment and Gene Technology Act</li> </ul>	<ul style="list-style-type: none"> <li>• 1986: Commission proposal of framework to regulate biotechnology: no known risk but some regulation needed</li> <li>• 1986-1987: Single European Act gives EC new role in environment and R&amp;D. DG XI (Environment) gains key role on GMO file</li> </ul>	
<ul style="list-style-type: none"> <li>• 1992: France reluctantly transposes EC Directives and decides not to open a public inquiry on biotech. Strong support for biotech science and industry</li> </ul>	<ul style="list-style-type: none"> <li>• 1990: Directives 90/219 (Contained Use) and 90/220 (Deliberate Release) drafted by DG XI. Tight approval procedure for GM products but requires state unanimity to refuse approval in the face of Commission's OK</li> <li>• April 1991: Commission report on promoting EU Biotech competitiveness</li> </ul>	
<ul style="list-style-type: none"> <li>• 1993: Norway law on genetic technology, bans GMO imports that are not "socially justifiable"</li> <li>• 1994: UK Conference of Citizens (state sponsored) proposes labeling</li> <li>• 1994: Denmark and Sweden pass GMO labeling law. 1996: stricter Danish law</li> </ul>	<ul style="list-style-type: none"> <li>• 1992: Maastricht Treaty creates new EU responsibility: consumer protection and public health policy</li> <li>• 1996 battle over Monsanto soy. Commission forces opposition of Denmark, Sweden, Austria</li> <li>• Oct 1996: Commission forces approval of Novartis corn despite opposition of majority of states in June 1996 Council meeting (France as lone backer)</li> <li>• 1997 Novel Foods Regulation: tightening of notification and authorization procedure and introducing of some labeling requirements</li> </ul>	<ul style="list-style-type: none"> <li>• April 1994: EU Commission and EU states sign Marrakech Treaty (WTO founding treaty). Includes 2 key pro-GMO features: the "science-based" health and phytosanitary standards and intellectual property rights on GMO seeds (part of TRIPS)</li> <li>• 1994: global coalition of NGOs against GMOs forms in response to TRIPS (Third World Network, Ecoropa)</li> </ul>
<ul style="list-style-type: none"> <li>• Feb 1997: Austria bans Novartis Corn Bt (although approved by EU)</li> <li>• Mar 1997: Italy votes ban on growing GMO corn</li> <li>• Apr 1997: Austrian public petition against GMOs garners signatures from 20% of voters</li> <li>• 1998: Swiss Referendum on GMOs: 66% AGAINST GMO BAN</li> <li>• 1997-1998: French triple flip flop on Novartis corn Bt-11. Must counter-sign Commission decision as sole defender. Refuses in Feb 97, then OK's in Nov 97. Yet, France's highest court (Conseil d'Etat) freezes the authorization</li> <li>• Oct 1998-Feb 1999: Netherlands (first), Italy, and Norway sue at the ECJ for annulment of EU patent directive</li> <li>• Jan 1999: Greek ban on GM canola</li> </ul>	<ul style="list-style-type: none"> <li>• Apr 1997: EP almost unanimously votes motion to condemn Commission for approving Novartis corn</li> <li>• Dec 1997: Treaty of Amsterdam enshrines precautionary principle and specifically allows states to adopt measures to protect environment and health, even if it impedes free trade (Art 95)</li> <li>• May 1998: European Directive on the Legal Protection of Biotechnology Inventions (98/44/EC), harmonizing national legislation, allowing patenting of plants and animals.</li> <li>• June 1998: European Patent Office (EPO)'s Administrative Council adopts similar resolution (applying to all 20 signatories, including non-EU states).</li> <li>• <b>June 24, 1999: de facto moratorium on new GMO approvals decided by council of ministers</b></li> </ul>	<ul style="list-style-type: none"> <li>• Feb 1999: Cartagena negotiations over biosafety: clash between EU/Developing Countries and US-led Miami group, stalemate</li> <li>• Dec 1999, Seattle WTO: Pascal Lamy (Trade Commissioner) accepts deal with the US to bring GMO regulations under WTO. Facing uproar from EP and EU states, Lamy is forced to backtrack</li> <li>• Jan 2000: Montreal – Cartagena Biosafety Protocol, EU as pro-regulation leader</li> </ul>
<ul style="list-style-type: none"> <li>• Jan-April 2002: GMOs appear as one key issue in French Presidential elections. Parties divided. Anti-GMO parties prosper in election.</li> <li>• July 2003: France. Anti-GMO activist Jose Bové jailed in high-profile commando-type arrest. Strengthens anti-GMO feelings.</li> </ul>	<ul style="list-style-type: none"> <li>• Feb 2001 (implemented Oct 2002): Very tight directive passed by Council and EP on the release and tracking of all GMOs (2001/18 replacing 90/220)</li> <li>• March 2001: Stockholm EU Council identifies biotech as key sector for eco development and employment</li> <li>• Oct 2001: ECJ dismisses action by Netherlands, Italy, Norway against patent directive</li> <li>• Jan 2002: Life Science and Biotechnology Report by the Commission: aims at scientific leadership and end of moratorium</li> <li>• July 2003: EP vote marks adoption of tight new regulations on labeling (with low threshold of 0.9%)</li> <li>• July 2003: Commission sues Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, and Spain at the ECJ for not implementing Directive 2001/18</li> <li>• Sept 2003: EU Commission sues 8 states at the ECJ for their refusal to transpose EU patent directive: Austria, Belgium, France, Germany, Italy, Lux, Netherlands, Sweden</li> <li>• Dec 2003-Jan 2004: Battles over approval of Syngenta sweet corn Bt-11 and Monsanto NK corn. EU punts and does not lift moratorium. States are divided equally</li> <li>• 2004-2005: Approval of several new GMO events, all of them by default by the Commission (in the face of negative votes by the EU council without qualified majority).</li> </ul>	<ul style="list-style-type: none"> <li>• Sept 2000: Starlink Corn scandal in the US, Japan. Developed by French company Aventis</li> <li>• Dec 2000: Final Report of EU-US Biotechnology Consultative Forum: admits need for labeling and some limits on IPR.</li> <li>• Aug 2002: EU ratifies Cartagena Protocol</li> <li>• Aug 2002: EU-US controversy over food-aid to Africa. US aid refused by Zimbabwe, Zambia, and Mozambique because it contains GMOs.</li> <li>• May-Aug 2003: WTO legal complaint against EU (launched by US, Canada, Argentina). EU commission pushing for rule-based regime and end of ban</li> </ul>

Sources: Patterson 2000, Pew 2002

**Table 5**

National Changes in Support for Applications of Biotechnology 1996-2002 – Focus on GM Food  
(only % of decided public, adding supporters and risk tolerant supporters)

	1996	1999	2002	Change	
				1996-1999	1999-2002
Belgium	72	47	56	-25	9
Denmark	43	35	45	-8	10
Germany	56	49	48	-7	-1
Greece	49	19	24	-30	5
Italy	61	49	40	-12	-9
Spain	80	70	74	-10	4
France	54	35	30	-19	-5
Ireland	73	56	70	-17	14
Luxembourg	56	30	35	-26	5
Netherlands	78	75	65	-3	-10
Portugal	72	55	68	-17	13
UK	67	47	63	-20	16
Finland	77	69	70	-8	1
Sweden	42	41	58	-1	17
Austria	31	30	47	-1	17
EU 15 Average (Weighted with population)	62	49	51	-13	2

**Sources:** EU Commission, 2003, Eurobarometer 58.0: Europeans and Biotechnology in 2002 (Table 5, p. 18), Authors' calculations

**Table 6**

Levels of Support among Decided Public  
(both supporters and risk tolerant supporters) for Several Applications of Biotechnology in 2002 (EU-15)

Genetic Testing	91%
Cloning Human Cells	82%
Xenotransplants	73%
Enzymes	78%
GM crops	70%
<b>GM food</b>	<b>50%</b>

**Source:** Eurobarometer 58.0: 16



**Graph 1. GMOs as Proxy: Correlation Between Opposition to GMO (1999) and Feelings that Globalization cannot be Kept under Control by Governments (2000) (Source = Eurobarometers)**

