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Responding Public Demand for Assurance of Genetically Modified Crops: Case from Japan

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ABSTRACT Genetically modified (GM) crops provide a classic example of risk characterised with uncertainty and ambiguity. This article analyses the risk management of GM crops in Japan as a case and investigates how the Japanese government has responded to the growing public demand for safety assurance of new agricultural and food varieties. It argues that, while the government realised the need to respond to public reluctance in consuming GM food by adopting more resilient and discursive management, it has faced a dilemma to incorporate the new type of approach into conventional risk assessment. This tension was reflected in the process and policy outputs of the consensus conference on GM crops, which was ambiguously placed in the risk management process. This article shows the dynamics of opting for policies to manage scientifically uncertain risks in particular socio-political and institutional contexts. Such understanding can suggest ways towards enhanced policy debates.

KEY WORDS: Japan, GM crops, risk management, consensus conference

1. Introduction

The worldwide acreage of GM crops continues to grow sharply. In 2004, 81 million hectares produced transgenic crops such as soybean, cotton, tobacco, potato, rapeseed and maize. This global acreage has steadily grown

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annually in a number of countries led by the USA and followed by Canada, China, and Argentina.¹

Genetic modification in agriculture, if appropriately developed, could offer new and broad potential for contributing to enhanced nutritional quantity and quality, and thereby reduced malnutrition, improved human health and food security (FAO, 2001). However, there are still uncertainties about non-physical as well as physical aspects of GM crops—such as adverse impacts on society, humans and the natural environment. The scale of the accompanying global debate about GM crops is unprecedented. This debate, which is fairly intensive and emotionally charged, has polarised scientists, food producers, consumers and environmental and consumers' groups as well as policy-makers (Behrens *et al.*, 1997; Gaskell and Bauer, 2001). The debate therefore may provide an excellent example of how risk institutions deal with risk with high ambiguity.

This article describes the responses of the Japanese government to the potential risk of GM crops and shows the difficulty of choosing viable policy options to provide sceptical consumers safety assurance for scientifically uncertain risks. The GM food debate drawn from Japan is intriguing for three distinct reasons. For one, Japan was one of the first pacemakers of the biotechnology industry in the 1960s, calling biotechnology 'the motor of a third industrial age' (Bud, 1995, p. 298), and has maintained its position to harness the biotechnology sector as the prominent, future industry.² Consequently the biotechnology sector has a strong presence in Japan (Brock, 1989). For another, Japan's dependency on crop imports adds a particular aspect to its risk management. Given Japan's low self-sufficiency of food (40%) today, it has been suggested that Japan has become one of the world's largest importers of genetically modified crops—data from 2003 show that nearly 75% of the imported soybeans came from the USA, where 80% of the cultivated soybean was genetically modified; and 80% of imported rapeseed came from Canada, where 70% is genetically modified.³

Finally, Japan has typically exercised a consensual public policy approach, in which expert science dominates the policy arena and a closed group of stakeholders, typically government officials, industry representatives and scientists from established institutions agree on the future direction of public policymaking (Low *et al.*, 1999; Schwarz, 2002). Limited opportunities for public deliberation are seen and in a paternalistic political culture where diversity and challenges to state authority are not encouraged (Buruma, 2003; Pharr, 1990). In the case of the GM debate, however, long-standing public resistance to GM food triggered the government to initiate

¹ According to James, C. (2004). Preview: Global Status of Commercialized Biotech/GM Crops: 2004. ISAAA Briefs No.32. Ithaca, NY: ISAAA.

² The Government of Japan (1999) Biotechnology sangyo no sozonimuketa kihon senryaku, Press Release, 13 July 1999.

³ AFFEC, Idenshikumikaesakumotsu ni kansuru Q&A, Heisei 16nen12gatu6nichisakusei, www.s.affrc.go.jp/docs/anzenka/qanda.htm (accessed on 14 February 2005).

deliberative discourse activities. The consensus conference on GM crops hosted by the Ministry of Agriculture, Forestry and Fisheries (MAFF) of Japan (2000, Tokyo) was a novel project in Japanese political culture. However, the innovative but 'radical' nature of public deliberation potentially challenged the established understanding of how technological policymaking should be conducted. The policy reaction taken by the Japanese government may thus clearly illustrate how conventional public policy-making within the framework of promoting GM technology has been challenged in the face of public demands for safety assurance (or 'a feeling of security'/'ease of mind') in consuming GM food in this particular socio-political context.

2. Potential physical and non-physical impacts of GM crops

Science is not conclusive in the argument about GM crops. Uncertainties persist about several aspects such as pathogenicity or toxicity to non-target organisms (plants, animals, humans) and exchange of genetic material with other organisms in humans and the environment. However, there seems to be agreement among most scientists that significant risks to human health are either non-existent or extremely unlikely (MRC, 2000; NAS *et al.*, 2000; Royal Society, 1999). Scientists still disagree about the ecological side effects and long-term impacts of GM crops on the environment. Many potential impacts are theoretically known and empirically proven, but neither the extent of potential damage nor the likelihood of this damage to become manifest are yet to be clearly known to science. Even those impacts that are known or highly probable are interpreted and evaluated quite differently. A classical example is Bt corn. Bt corn has a gene inserted into its DNA that allows it to produce a protein from the *Bacillus thuringiensis* (Bt) that is toxic to certain insects. The resulting plant is thus genetically modified to produce its own pesticide. Losey *et al.* (1999) in *Nature* reported that in their laboratory studies the adverse effects of Bt-corn pollen on monarch butterfly larvae and this study brought to light a new type of impact on non-target organisms by GM crops. Field studies were conducted to clarify the influence of Bt pollen on the specie. Stanley-Horn *et al.* (2001) and Sears *et al.* (2001) reported that the impact of Bt pollen on the larvae was negligible, but the study of Stanley-Horn *et al.* (2001) in which the leading author of the 1999 *Nature* study also participated suggested further studies to examine the lifetime and reproductive impact on monarchs after long-term exposure to naturally deposited Bt pollen.

Besides these potential physical impacts, non-physical impacts of GM crops have raised concerns. While many argue for economic benefits expected from the adoption of GM plants in the forms of lower prices for consumers and reduction of production costs for producers (e.g. EPA, 2001), environmentalists as well as more cautious analysts of GM sorts have expressed social and economic concerns: GM foods may speed up the process of homogenising the world food supply and increase the vulnerability of food security once the world relies on a limited number of GM

crops (Royal Society of Canada, 2001). Concerns about loss of ownership and sovereignty have been raised if GM seed is associated with intellectual property rights by a handful of multinational companies (Mantegazzini, 1986; Nuffield Council on Bioethics, 2003). Possibilities for neo-colonial domination of developing countries have received particular attention. Critics argue that GM crops will be more expensive than conventional ones and the increased input costs will force out small farmers (Porritt, 2000; Shiva, 2000).

If a risk is characterised by large uncertainties, many analysts recommend a precautionary approach as the primary risk management style (NRPB, 2004; O’Riordan and Cameron, 1994; Renn *et al.*, 2002). The precautionary approach requires, alongside traditional risk assessment, measures to improve the knowledge base and these may typically include research efforts in laboratories and fields; long-term monitoring of potential effects of GM crops on humans and the environment; and publicly funded international collaborative research. Parallel to the precautionary management option, the high degree of ambiguity in interpreting and evaluating risk necessitates improved transparency of risk decision process and, to varying degrees, discursive management (Klinke and Renn, 2001). This is concerned with the interactive exchange of information and opinions throughout the risk management process and designed to rectify needless misunderstanding about controversial risks and facilitate tension between different stakeholders about those risks. In other words, those who have to pay for either being too cautious or not being cautious enough should be partners in deliberating the right balance between these two extremes. Instruments for conducting such public discourses include consensus conferences (Joss and Durant, 1995; Nishizawa 2002, 2003) and citizen panels (Renn *et al.*, 1995).

Currently, 18 sorts of GM plants such as insect-resistant potato and corn have been certified for commercialisation in Japan.⁴ MAFF and the Ministry of Health, Labour and Welfare (MHLW) have been pivotal players in safety assessment of GM crops and foods.⁵ The ministries have set up various guidelines for assessing risks of GM plants at differing levels of technology development and application in agriculture.⁶ The principles translated in these guidelines are based fundamentally on the concepts of familiarity and substantial equivalence agreed upon the safety assessment of transgenic plants by the OECD member states in 1993 (OECD, 1993).

⁴As of February 2005. AFFREC, Idenshikumikaeshokubutsu (GMO) no anzenseikakunin jyokyo, 23 May 2003, <http://www.s.affrc.go.jp/docs/sentan/guide/develop.htm> (accessed on 14 February 2005).

⁵Since July 2003, the Food Safety Commission is in charge of risk assessment as regards GM crops and foods.

⁶For example, the “Guidelines for Application of Recombinant DNA Organisms in Agriculture, Forestry, Fisheries, The Food Industry and Other Related Industry” by MAFF issued in 1989; “Guidelines for Safety Assessment of Genetically Modified Feed”, 6 May 2004 and “Guidelines for Safety Assessment of Genetically Modified Foods” both issued by the Food Safety Commission, 29 January 2004.

Beside regulatory measures, the government has made a wide use of expert advice for the safety assessment of GM food. Within this framework, the government also attempted to call for ‘public acceptance’ of GM foods. Given that sufficient evidence for health hazards and threats to the natural environment has not been clearly established, the government, particularly MAFF, has invited the general public to lectures about GM foods.⁷

However socio-psychological repercussions in the form of consumers’ ambivalent attitude towards GM foods have been high in Japan like as in Europe (INRA/ECOSA, 2000)—consumer surveys (e.g. Metropolitan Government of Tokyo, 1997, 1999; JMAR/CBI, 2003; STAFF, 2004) have shown that 70–80% of Japanese consumers typically express an unwillingness to eat GM foods, and people show decreasing support for the development of GM crops (Macer and Chen Ng, 2000). According to a consumer survey, for instance, more than four in 10 say that they buy ‘non-GM’ tofu products regardless of price.⁸

Tensions between opponents and proponents of GM crops are yet to be reconciled. Farmers in Hokkaido were planning to plant GM soybean in the spring of 2005 for first time commercialisation in Japan, but they were obliged to withdraw their plans due to strong opposition by citizen groups.⁹ Moreover, several local governments like Hokkaido consider or have adopted ordinance to ban field-testing of GM crops to respond to consumers’ concerns. To this move, researchers and the industry warn that it may hinder technological advancement.¹⁰ The food industry like tofu manufacturers has responded to such consumers’ attitude by switching to non-GM ingredients to avoid the stigmatised image of GM products.¹¹

The subsequent sections describe chronologically the development and intensification of the Japanese GM debate since the first arrival of GM crops in 1996.

3. Initial reaction to GM crops in Japan (1996–1998)

The first sort of GM crops were GM corn and soybean imported from North America to Japan in late 1996.

⁷ AFFRC, Promotion of Activities to Build Public Acceptance (PA) of Biotechnology in Japan, 10 February 2000, <http://www.s.affrc.go.jp/doc/sentan/eintro/epa.htm> (accessed on 14 February 2005).

⁸ *Asahi Shimbun*, Shokuhintenkabutunifuan 64%, shohisha shohin erabide jie Tokyo to chosa, 5 January 2001.

⁹ *Yomiuri Shimbun*, GMdaizu, tokachi demo nohka saibaikeikaku kisei okashi, 5 December 2004.

¹⁰ *Nihon Keizai Shimbun*, Idenshikumikaesakumotu okugaisaibai, jichitai kiseihe ugo, 6 March 2004, p. 3.

¹¹ *Asahi Shimbun*, Hontounikieta? Idenshikumikaeshokuhin, 25 March 2001.

GM foods did not draw much attention from the general public of Japan at first - little response was heard from them.¹²

As this quote by a public relations officer of a biotechnology company notes, the first GM tomato marketed in Japan did not generate much repercussion.

Things have changed, however, as the public showed increasing reservations about the growing number of other GM crops imported to Japan from early 1997. Consumer advocacy groups launched a range of anti-GM food campaigns and called for more cautious handling of the agricultural products derived from the new technology. Still at this initial stage of the GM food dispute, the Japanese government relied heavily on the conventional scientific approach and utilised scientific arguments to combat consumer scepticism. When consumer movements began to demand for tighter safety control of GMOs and the debate became contentious in Japan, the immediate response was still dismissal:

...as far as the crops bear substantial equivalence to analogous food products, they were regarded as safe and thus, no labelling was necessary (comment by a MAFF official quoted in the *Mainichi*, 25 March 1997).¹³

During the course of the dramatic increase of imported GM cereals in 1998, moderate but influential consumer advocacy groups led by the Japanese Consumers' Co-operative Union started to launch a range of extensive campaigns to demand that central administration require mandatory certification system and labelling of GM foods. Despite these calls, however, the central government was not yet ready to acknowledge the need for regulatory control and rejected an immediate policy response to the consumers' demand.

4. Fuelled consumer campaigns (1999–2000)

In 1999 a deciding episode led to the governmental announcement of the introduction of the mandatory labelling and certification of GM crops in 2000. An active consumer group, The GMO No! Campaign, announced in August 1999 that they had traced a non-accredited sort of GMO in the corn snacks manufactured by big Japanese food processing companies sold in stores. Although MAFF and MHLW jointly investigated the case and denied the claim of the group, the incident hit the media headlines. The entire absence of a mandatory accreditation procedure as well as labelling became a favourite media story.

¹² Interview with a public relations officer of a multinational biotechnology firm, Tokyo, 29 August 2000.

¹³ Tomita, M. (1997) Idenshikumikaesakumotsu no yunyu kouseisho kyoka: shohisha dantaiga campaign, *Mainichi Shimbun*, 25 March 1997, 15.

This publicity accelerated an increasing public awareness of GM food and Japanese consumers no longer tolerated the absence of a labelling scheme. As a consequence many schools across Japan abandoned the use of GM ingredients such as tofu products, rapeseed oil and soy sauce in school lunch menus and use alternative non-GM ones, although this move meant high costs.¹⁴ A large number of municipalities sent petitions to the central government for the urgent creation of a labelling scheme. Newspapers criticised the lack of the labelling for consumers' choice. In 2000, MAFF and MHLW eventually announced mandatory labelling and certification of GM foods to be enacted in 2001.¹⁵

Unfortunately for the ministries, their decisions were undermined by the so-called Starlink incident. In October 2000, a non-accredited sort of GM corn was detected in US-imported corns for feed and processed food. Starlink has been certified for feed in the US, but in Japan it is certified for neither feed nor food. A MHLW official commented in a popular news programme that they entirely trusted the segregation procedures of GM crops conducted by the US government (for import to the Japanese market).¹⁶ The statement illuminates the belated reaction of policy officials in introducing preventative measures in handling food safety cases. The Starlink case was widely reported by the mass media, which led to public perception of public officials as being either ignorant of the real world or playing along with the big players.

Now, the government was obliged to shift its reaction towards more deliberative, reflective discourse actions after the coordinated anti-GMO actions hit the Japanese market and largely destroyed consumer confidence in GM food. Several advisory panels at MAFF held public hearings inviting consumer groups including the No! Campaign that has taken its radical stance. A member of the consumer group commented:

The ministry officials started to listen to us from 1999. Around 1997, they simply objected to our statements. It may be that they needed information from the consumers' side too.¹⁷

It was in this broad context that MAFF announced it would commend more participatory deliberation, namely, a consensus conference on GM crops to be organised in 2000.¹⁸ The combination of complexity and controversy necessitates a new structure of information and communication

¹⁴ *Asahi Shimbun*, Idenshikumikaedaizu, Sapporo mo gakko kyushokukara tuiho, Hokkaido, 2 March 2000, 2.

¹⁵ Like the equivalent European debate, the United States opposed such a mandatory scheme and noted that it could become a trade barrier, quoted in the *Asahi Shimbun*, Bei nomushou kokanga kenen, 28 July 1999.

¹⁶ Quoted in Close up Gendai, NHK Broadcasting Corporation, broadcasted on 10 January 2001.

¹⁷ Interview with a female member, Yokohama, 26 July 2000.

¹⁸ MAFF, Shiminkarano teian ni taosuru project ni tsuite, Press Release, 28 July 2000.

that exceeds the possibilities of conventional forms of debates such as hearings or public inquiries.

5. Increasing pressures for openness

It may be useful to consider briefly why the Japanese government changed its original position and transferred the debate on agricultural biotechnology from the scientific to the public arena. The abrupt change in approach appears to be influenced by consumer dislike of GM foods and the government acknowledgement that stakeholder consultation was a critical component of risk assessment and risk management to ensure all relevant issues had been considered. But this explanation may be a little too short-sighted, for the change was seen more broadly as a response to the public disillusionment about expert science and growing scepticism about food safety in Japan.

In Japan, numerous health, environment and food scandals from the 1980s to date have undermined the credibility of expert science and technology as well as handling of food- and health-related issues by the government, as the case of HIV-contaminated blood products, the Tokaimura nuclear accident and the BSE (bovine spongiform encephalopathy) cases showed (Low *et al.*, 1999; Nature, 2001). An opinion poll conducted by the *Asahi* (Asahi Newspaper) in 2002 showed a high proportion of decline of consumer confidence in food safety in general. Nearly 80% of Japanese were worried about the safety of food (Nyu-i, 2002). A poll by the *Yomiuri* (Yomiuri Newspaper) conducted in 2004 further confirms this high ratio.¹⁹

More fundamentally, the burst of the bubble economy in the late 1980s revealed the ineffectiveness of government institutions that worked behind closed doors. Public administration has since then suffered severe public onslaughts on its secrecy and the lack of transparency, as well as pressures exerted from abroad to open the closed, over-regulated market for foreign competitors. Correspondingly, the Cabinet Ministries in 2000 decided to establish a master plan for the structural change of governmental institutions, the so-called *gyosei kaikaku* (Reform of Public Administration). *Gyosei kaikaku* sets out broad policy objectives and relative priorities, outlines methods for implementing this policy and defines government responsibility. The Public Comment Scheme provides an example of such new policy tools. It invites broader public deliberation on the establishment, alteration and abolition of regulations and aims to enhance fairness and transparency of policy processes.²⁰ Similarly, the promotion of citizen

¹⁹ *Yomiuri Shimbun*, Shokunoanzen seidokao nezuyoi gyokaifushin, *Yomiuri Shimbun* zenkoku yoronchosa, 8 May 2004.

²⁰ Under the scheme, relevant agencies are obliged to announce the application of the scheme via the Internet and newspaper, for example, and the public are invited to give their comments. The emails demanding MAFF create a labelling scheme were, for instance, an integral part of this new political initiative.

engagement in science and technology policy was more clearly acknowledged in the Science and Technology Basic Plan of 2001 for the first time (Japanese Government, 2001). The plan postulates the importance of the link between science/technology and society. It emphasises that:

It emphasizes that: ... It is also necessary to increase opportunity and to widen channels to transmit opinions and demands from society to S&T (science and technology), and S&T experts must work on and respond thereto seriously and appropriately (Article 4, Clause 1).

As in other industrialised countries (Behrens *et al.*, 1997; Levidow and Marris, 2001), it was this combination of uncertainties associated with the advancements of science and technology in society (in this case genetic modification) and the declining public trust towards risk institutions that led the Japanese government to adopt the deliberation approach as part of the ambiguity management of GM crops.

6. The Japanese consensus conference on GM crops (2000)

This consensus conference held in 2000 was the first consensus conference hosted by the government of Japan and was structured akin to the standard Danish consensus model (Kobayashi, 2004; Nishizawa, 2003, forthcoming; Wakamatsu, 1999). A Danish-model consensus conference is a three- to four-day public conference at which both technically and socially relevant aspects of a new technology are discussed. It is usually divided into four stages: selection of an overall topic; recruitment and selection of the lay panel members; two preparatory weekends; and the main conference. The citizen panel then produces the conference report (Joss, 2000; Joss and Durant, 1995). The most distinct feature of a consensus conference is that it is the members of the public, not experts, who seek to explore the extent to which they are able to agree on the future direction of certain developments in science and technology. Its main aims include opening up a dialogue among the public, experts and politicians about science and technology or, at times, influencing the process of risk decision-making by policymakers (Andersen and Jaeger, 1999; Science Museum, 1994; UK CEED, 1999).

To date, around 50 Danish-model consensus conferences have been held worldwide: 19 consensus conferences were held in Denmark, followed by trials in Japan, Canada, New Zealand and Switzerland, the Netherlands, Norway, South Korea, the UK, and the USA (e.g. Australian Museum, 1999; Korean National Commission for Unesco, 1998; Marris and Joly, 1999; Mørkrid, 2001; Science Museum, 1994; Wakamatsu, 1999).²¹ Fourteen of these conferences were commissioned as discussion forums concerning GM plants and food. This shows that this particular type of participatory

²¹ According to the Loka Institute, www.loka.org/pages/worldpanels.htm (accessed on 14 February 2005).

deliberation has been viewed suitable for discussion of the ecological and socio-economic concerns of GM technology in agriculture. Based on previous experience with consensus conferences on the subject in Europe and elsewhere, the Japanese government decided to use this novel form of citizen participation for looking into GMO-related policy issues.

Lay panel members for the Japanese consensus conference were widely called for through various media, and 18 members were selected out of nearly 500 applications to form the lay panel (STAFF, 2001). They were selected across Japan in an attempt to avoid possible selection bias by geographical location, sex, age and occupation. After two preparatory weekends in September 2000, the consensus conference took place over three days in October/November 2000. Experts representing different positions were invited and presented their views on GM crops. The lay panel prepared their final report with their views and recommendations, and publicly disclosed it at the end of the exercise.²²

The panel neither strongly supported nor rejected the advancement of genetically modified crops. Rather, it gave cautious approval on condition that the benefits and risks of the GM technique (from the viewpoints of both the natural sciences and social science) be widely addressed, assessed and deliberated. The report emphasised benefits and risks of plant biotechnology. It was then submitted to MAFF and MHLW for consideration of future public policy of GM crops in Japan. In response to this panel report, varying actions were taken after the consensus conference. More than four research projects such as long-term monitoring of environmental impacts of GM plants were launched at public research institutes (*ibid.*).

7. Tension between the radical and conventional policy processes

The consensus conference on GM crops was essentially a new attempt in public consultation about risk, but it reflected the nervousness of the governmental sponsor about the citizen deliberation that was seen as radical in the conventional Japanese political style and culture. MAFF appointed an organisation affiliated to them as the organiser, and unlike the standard Danish model consensus conference method, the panel was not entrusted to select experts for hearing.

The uneasiness of the ministry was particularly seen in setting goals of the deliberation. MAFF commissioned the consensus conference to principally identify future research subjects that would take into account suggestions by members of the general public. Therefore, the Ministry expressed ambiguity about inclusion of the panel recommendations into policymaking. A MAFF official commented that: 'Depending on the proposals of the lay panel, we might reflect them into public policy. The long-term research that was

²²The report is also available in English: STAFF (2001) Brief Report Consensus Conference on Genetically Modified Crops (English translation), Tokyo, STAFF.

launched according to the lay panel report can be regarded as policy-reflection'.²³ On another occasion, another MAFF official explained that the Ministry did not intend to consider the direct reflection of the proposals by the lay panel into their policy.²⁴ STAFF after the consensus conference submitted both the lay panel report and the steering committee report to MAFF and MHLW in the form of *yobosho* (a wish list), and no responses from the ministries have been officially reported. This is to say that whether a request may be heard or not would be at discretion of the ministries. Although a MAFF official explained that the consensus conference received a positive response from other departments of the ministry,²⁵ no formal responses have been delivered from either agency to date.

The ambiguity, however, seemed to be also brought about by other factors beside the prevalent policy style and political culture. There has been an enduring tension at MAFF between its role as the practitioner of national biotechnology projects, and the government framework for increased transparency and public dialogues. While MAFF was seen to acknowledge the necessity of public deliberation, the integration of the outcome into management decisions was lacking and created a tension between the panel members and the political decision-makers (Nishizawa, 2003, forthcoming). Also, there has been the wider, at times conflicting political framework for the protection of the domestic agricultural market such as rice, and the heavy reliance on inexpensive import of crops from North America. That is, the government fosters GM rice and maintains stable imports of GM crops such as corn and soybean, but it may remain reluctant to import GM rice.²⁶ Because of this complex context, the principal mandate of the consensus conference was basically to ask members to identify future research subjects and the ministry retained its freedom of action with respect to policy issues and regulations. Hence, while the deliberation contributed to establishing accountability of the risk institution, the organisation of the consensus conference in Japan demonstrated certain fundamental features of the traditional Japanese technology policy process. In other words, the innovative but 'radical' nature of public deliberation potentially challenged

²³ Telephone interview with a senior civil servant, Technology and Industry Division, MAFF, 20 August 2001.

²⁴ A statement was made by a MAFF official at the review symposium of the consensus conference organised by STAFF, Tokyo, 21 February 2001.

²⁵ *ibid.*

²⁶ As to rice, Japan imports around 8% of its entire domestic supply. As to other crops, the country relies 95% on import for the supply of soybeans and 100% of corn (for cattle feed). Between 2001 and 2003, the import of corn and soybean increased about 10% (MAFF, Wagakunino shokuryo jyukyu deta, <http://www.kanbou.maff.go.jp/www/anpo/sub3/sub3.htm>; AFFEC, Idenshikumikaenikansurusakumotu Q&A, Heisei 16nen12gatu6nichisakusei, www.s.affrc.go.jp/docs/anzenka/qanda.htm; AFFEC, Idenshikumikaesakumotsutono kankyorisukukanrinikansuru kondankai hokokusho, heisei14nen9gatsu (accessed on 14 February 2005).

the established understanding of how technological policymaking should be conducted in Japan. Conversely, because of this complex setting, the Japanese experience presented an interesting case to show the dichotomy between traditional decision-making and a discursive process.

8. Discussions

The cases drawn from Japan have illustrated the dynamics of political strategies to deal with ambiguous risks such as GM crops in particular socio-political contexts. To summarise the risk-handling process of GM crops in Japan, the issue was first seen as a purely scientific question, which at best would necessitate a discourse among specialists. When it became clear that obvious risks were not present but serious long-term impacts were not excluded amidst a large cloud of uncertainty, the Japanese government responded by expanding the platform for decision-making. MAFF and MHLW opened their decision-making bodies to involve major parties as part of a 'crisis-response' strategy. This opening towards stakeholders was accompanied by selecting more precautionary measures. When it became clear that both discourse types were insufficient for dealing with public dissent and ambiguity, Japan included participatory discourse elements. These elements, however, were meant to foster public acceptance rather than bring public concerns back to the table of the regulators. This was particularly true for Japan where the consensus conference was given the prime mandate to look into future research questions rather than to assess and evaluate management options. It therefore seemed that these procedures were more a reflection of administrative frustration in respect of public alienation and the desire for public pacification than a genuine interest in taking public concerns more seriously.²⁷

A purely scientific approach to manage possible risks of GM crops has failed in gaining public assurance in food safety in Japan. The public often sees that taking precautionary measures as an indication that one's intuitive concerns are probably more justified than initially thought. A deliberative approach was therefore a tempting thought as a measure to convince the sceptical audience. However, the process of citizen deliberation was not entirely isolated from its wider social, political and cultural contexts surrounding GM debate in Japan.²⁸ The fact that particular deliberative mechanisms have been found to work relatively well in practice in a societal environment (like in Denmark, see Andersen and Jaeger, 1999; Joss and Durant, 1995) does not mean that they will necessarily work equally well in

²⁷ For further discussions about the Japanese experiment, see Nishizawa, forthcoming. Similar problems were seen at consensus conferences on plant biotechnology in France and the UK (Levidow, 1998; Marris and Joly, 1999; Purdue, 1995, 1996).

²⁸ Similar limitations were observed in other consensus conferences in Japan and Germany (Nishizawa, 2002, 2003, forthcoming).

another (Nishizawa, 2003). We may infer from our observation that without both an acknowledgement and a better understanding of the dynamics of the relationship between citizen deliberation and the societal environment, the success in practice of deliberative approaches may be severely limited.

Despite the present limitation of a citizen-deliberation event, it should be seen as encouraging signs that the Japanese risk institutions has acknowledged that dealing with uncertainty in risk management requires a program that incorporates scientific, social and economic concerns and arguments, and makes the risk-appraisal process more transparent and, to varying extents, discursive. Following the 2000 consensus conference, the MAFF hosted three further public deliberation events on GM foods in subsequent years (STAFF, 2003). The Internet homepage of the Biotechnology Safety Division of MAFF is now linked to a range of other sites that concern public communication (although the public acceptance of GM crops is still actively pursued).²⁹ This would indicate that the deliberation exercise contributed to 'institutional learning' at MAFF and potentially a more open handling of publicly contested issues.

Moreover, after several BSE cases were found in Japan from late 2001, an investigation committee formed by the government submitted a report that criticised the organisational deficiency of MAFF and MHLW. This led to organisational changes within them. One notable outcome was the foundation of *Shokuhin anzen iinkai*, an inter-governmental Food Safety Committee that is independent of MAFF and MHLW and oversees risk analysis-related food safety. The Committee, established in July 2003, is also responsible for enhancing risk communication related to food safety. The foundation of this new organisation could trigger the gradual removal of institutional inefficiency from which current risk institutions have suffered.

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²⁹ STAFF, Idenshikumikaenosakumotu no kaihatu fukyu, <http://web.staff.or.jp> (accessed on 14 February 2005).

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