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THE GLOBAL GOVERNANCE
OF BIOTECHNOLOGY:
MEDIATING CHINESE
AND CANADIAN INTERESTS

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ABSTRACT¹

Canada and China share a common interest in the science and development of agricultural biotechnology. Canada has seen genetic engineering (GE) as a key driver for future agricultural productivity and has become a major producer and exporter; China has invested heavily in GE research, becoming the second largest research base in the technology after the US.

However, the regulatory side of technology has put Canada and China in different international camps. While Canada has adopted permissive regulations that see GE crops as equivalent to conventional ones and do not require mandatory labelling, China has followed a more precautionary approach with much slower approval for the production of GE crops and mandatory labelling. Canada has followed a close integration with the US on these issues and has been very responsive to the preferences of the biotechnology industry and farmers. China, on the other hand, has followed a path that is closer to those of the European Union and Japan on the regulatory side. The introduction of labelling requirements by China and the change in its approval system led to a collapse in canola exports from Canada to China.

Interestingly, the Chinese position has shifted to more precaution mainly as a result of a concern for the preferences of the urban middle class (which is increasingly similar to the Japanese or South Korean urban middle class and wary of GE food), as well as bottom-up pressures from civil society. Meanwhile, the Canadian government has been resisting non-governmental organizations pressures as well as clear public preferences for mandatory labelling and for the ratification of the Cartagena Protocol.

Agricultural biotechnology is one issue area where the Chinese position is closer to the international majority position and to the preferences of global civil society. On the other hand, Canada's hands have been tied in this matter by NAFTA and the need to integrate regulations with the US. There is a need for dialogue and regulatory convergence over time, but the process should be done in collaboration with the US.

RÉSUMÉ

Le Canada et la Chine partagent le même intérêt pour la science et le développement des biotechnologies agricoles. Le Canada a fait du génie génétique (GG) un élément clé de sa productivité agricole et en est devenu un important producteur et exportateur. De son côté, la Chine a massivement investi dans la recherche en GG, au point d'en être aujourd'hui la deuxième base de recherche mondiale après les États-Unis.

Mais en matière de réglementation technologique, les deux pays se trouvent dans des camps opposés sur l'échiquier international. Car le Canada a adopté des règlements permissifs selon lesquels les cultures issues du GG sont jugées équivalentes aux cultures traditionnelles et ne sont soumises à aucun étiquetage obligatoire, alors que la Chine applique une approche plus préventive axée sur un processus d'approbation des cultures beaucoup plus lent et l'étiquetage obligatoire. En fait, le Canada a privilégié sur ces questions une étroite intégration avec les États-Unis, se montrant très réceptif aux préférences du secteur des biotechnologies et des fermiers. En revanche, la Chine a suivi une voie inspirée de la réglementation en vigueur au sein de l'Union européenne et au Japon. C'est ainsi qu'elle a mis en œuvre des exigences d'étiquetage et modifié son système d'approbation, ce qui entraîné la chute des exportations de canola entre le Canada et la Chine.

Chose intéressante, la Chine s'est tournée vers une approche préventive en réaction aux préoccupations de sa classe moyenne des grandes villes (qui ressemble de plus en plus à celle du Japon ou de la Corée du Sud, méfiante à l'égard des aliments issus du GG) et aux pressions émanant de la société civile. Entre-temps, le gouvernement canadien résistait aux pressions des organisations non gouvernementales tout autant qu'à la préférence marquée du public pour l'étiquetage obligatoire et à la ratification du Protocole de Cartagena.

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L'agriculture biotechnologique est l'un des secteurs d'intérêt où la démarche chinoise est plus proche de l'approche internationale majoritaire et des préférences de la société civile mondiale. Pour sa part, le Canada s'est retrouvé les mains liées en raison de l'ALENA et de la nécessité d'intégrer ses règlements à ceux des Américains. D'où l'importance d'ouvrir un dialogue et de viser une convergence réglementaire, suivant un processus qui devra se faire en collaboration avec les États-Unis.

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INTRODUCTION: CHINA, CANADA AND THE GLOBAL BATTLE OVER THE GOVERNANCE OF GE FOOD

Since the mid-1990s, a global political battle has unfolded 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 (NGO), key states (the EU, Japan and South Korea) and international organizations. The battle plays out along 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 key fault lines in globalization. The overall outcome of the battle has been a fragmentation of global governance and polarization around two main clusters: a cluster centred on the US, Canada and key commodity exporters that champions a light-touch regulatory approach (and the principle of “substantial equivalence”) and a cluster centred on the European Union and, to some extent, Japan, South Korea and other food importers that champions precautionary principles and a more extensive set of regulations. The climax of the battle was reached in September 2006, when the World Trade Organization (WTO) dispute-settlement body produced the largest report in the WTO’s history and ruled in favour of the US, Canada and Argentina in their case against the EU’s quasi moratorium on GE approvals between 1999 and 2004. In this particular case, China was a neutral bystander, although the US and Canada intended to use this key case as a signal to scare off other countries (including China) from adopting strict labelling regimes.

State policy with respect to GE includes both national regulations and support for global standards in international negotiations such as the 2000 Cartagena Biosafety Protocol (CBP). For many developed countries, the battle over GE food has been less one of simple protectionism and more a larger societal debate about the optimal regulation of scientific innovation in the life sciences in a way that is both supportive of progress and compatible with democratic accountability. In many countries, the process of delegating regulatory decisions to technical committees consisting mainly of scientists with ties to industry is increasingly seen as illegitimate and unable to grapple with larger questions involving the public good, such as issues of transparency, biodiversity protection and long-term risks. As different societies came up with different answers to such larger questions, a split occurred in the global regulatory regimes necessary for smooth trade flows.

Canada formed its position in the late 1980s and early 1990s and adopted the “substantial equivalence” principle, deciding against building too steep obstacles in the adoption of technology and against mandatory labelling. Canada, along with the US, also refused to ratify the CBP, due to the high costs it might inflict on the exports of GE products. Canada was among the top three nations producing the first generation of GE grains in 1996 (with the US and Argentina) and remains the fifth largest producer today. The key crops are canola, as well as corn and soybeans. Next in line in the near future are sugar beets and wheat. In taking a strong pro-GE stance, the Canadian government followed both a belief in the adoption of the latest technology in agriculture and a conviction that Canada’s regulations could not be at odds from those of the US in agriculture, given the strong integration of the two markets. Interestingly, the regulatory regime is partly at odds with public preferences, at least with regards to mandatory labelling (something that the Canadian public is wishing for with majorities in the 80-90-percent range).

China, as well as India, are increasingly seen as the two key pivotal players with the most potential to affect the future global regime. Given the strong divisions and relatively balanced global coalitions led respectively by the US and the EU, China and India will play a key role in tilting the balance one way or the other. Where China goes, global governance will follow, with significant implications for Canada and the US.

China’s position on GE is still fluid and evolving. At the same time, the outcome so far is relatively surprising. It is clear that China potentially has a higher stake in GE technology than any other country due to concerns

about food security and diminishing agricultural productivity.² Yet, to the surprise of many, China's regulatory stance took a strong turn toward the precautionary principle after 2000. Over the past eight years, China has imposed and enforced mandatory labelling with a demanding threshold (0 percent) on many selected products. China has held back on approving GE rice until late 2009, and, as a result, almost only grows GE cotton at this point. China also took a strong international position by ratifying the CBP in 2005. This reports argues that upward pressures from urban consumers and civil society, not protectionist instincts, have played an important role in swaying the Chinese government toward a regulatory position.

The precautionary position taken by China has had initial negative trade impacts for Canadian canola exports in 2000-2001, given the abrupt introduction of the approval and labelling requirements. Negotiations with the US did find a pathway that allowed Canadian exporters to adjust, but the level of canola exports never fully recovered. More importantly, it pits China and Canada in two opposite camps on the global governance of GE food, beginning with the CBP. This is a case where China is siding with the world's majority of countries, and with Europe and Japan in particular, in pushing for global regulations on the trade and labelling of GE food, while Canada is not, preferring to remain within the framework of the WTO. Interestingly, the Canadian position is the result of a particular coalition of interests and may not have majority support within Canadian public opinion.

The remainder of this report follows three sections. The first section presents the facts of GE adoption and GE regulation in China, as it navigates between support for entrepreneurialism and precaution. After a review of arguments about trade interests and bureaucratic competition, the section also presents data on the two core coalitions that clash over GE regulations in China and on the balancing act that the State Council and the Ministry of Agriculture (MOA) have chosen to follow. Survey data on consumer interests is also provided. The next section turns to the long-standing Canadian position on GE food and the Cartagena Protocol for Biosafety. The final section focuses on the consequences for Canadian foreign policy and for Canada-China relations. It explores options for progress ahead.

CHINA'S BALANCING ACT: BETWEEN ENTREPRENEURIALISM AND PRECAUTION

China's domestic governance of GE food and position in the debate over the global governance of biotechnology represents an interesting balancing act. With its huge population and stagnating agricultural production, China is under strong pressure to use agricultural biotechnology in order to boost productivity. In terms of research, testing and imports, China is already a strong player in the field. At the same time, China's regulatory position is relatively precautionary and closer to that of the EU and Japan.

GE Development in China

The structural pressures toward introducing productivity-enhancing technology such as agricultural biotechnology are great in China. China is feeding about 20 percent of the world's population with less than 7-10 percent of the world's arable land³ (even 7 percent by some estimates). China is a huge agricultural producer. With about 30 percent of world rice production, 26 percent of cotton production, 16 percent of wheat production and 32 percent of canola production, China is the leader for a lot of such commodities.⁴

However, China has recently lost its self-sufficient position and become a major importer of grains and soy. After an early boom stimulated by institutional change in the early 1980s, grain and soy production stopped

² China has poured money into GE research, investing over \$120 million per year in recent years and establishing itself as the second largest research base after the US. By 2006, over 100 different crops have been tested in open field tests. Operational varieties of GE rice have been tested and readied for years.

³ Blas and Dyer, "China Sows Seeds."

⁴ Lu, "Agriculture Biotechnology."

increasing.⁵ Since joining the WTO in 2001, China has become a major player in the international commodities market. Imports shot up from about \$10 billion in 2000 to nearly \$60 billion in 2008. China was a net exporter of soybeans and corn until 1995.⁶ Now, China is the world's largest importer of soybeans and has retained only a barely positive position on corn. China remains largely self-sufficient in wheat and rice. However, China anticipates losing its position of self-sufficiency in wheat, rice and corn by about 2020, unless it drastically increases productivity. Rice is particularly vulnerable, given the strong limits of China's water supply.

In response to these challenges, China has put a strong emphasis on research in agricultural biotechnology, spending about \$120 million annually from 2000 to 2006.⁷ In July 2008, the State Council upped the ante by approving a special science and technology fund of ¥20 billion (approximately \$2.9 billion) for research on new varieties of GE crops between 2008 and 2010.⁸

China has developed the largest plant biotechnology capacity outside the US. It has tested GE technology with novel traits in rice, wheat, potatoes, peanuts and many others that are distinct from research conducted in all other countries.⁹ The figures from the Biosafety office under MOA show that 2,361 experiments on GE food were approved between 2002 and 2007.¹⁰

All Chinese research is conducted by state institutions. Nearly 50 universities and research institutes, as well as 150 local laboratories are involved in the process.¹¹ Appendix 1 summarizes some of the key GE traits developed and tested in China and the key research institutes associated with the research.

Imports of GE Food by China

China has authorized the import and processing of a large number of GE crops, including five types of cotton traits, two types of soybeans, seven types of canola and 10 types of corn.¹² Significantly, China has become the largest importer of GE soybeans in the world. As of 2007, China imported from the US alone over \$4.1 billion of soybeans (12 million metric tons),¹³ representing 41 percent of US exports. Nearly 90 percent of US soy production is GE. Next, China is also a large importer of GE cotton from the US and elsewhere (\$1.46 billion in imports from the US in 2007). But it is so far an insignificant importer of GE corn.

For Canada, the most relevant GE crop is canola, most of which is GE in Canada. China was a major importer of canola from Canada in the late 1990s and early 2000s (absorbing between 31 and 39 percent of Canadian canola exports), but that share collapsed in the wake of the introduction of new GE regulations in China in 2001. As shown below in Table 1, canola exports from Canada to China has never recovered from that regulatory shock.

5 Fang, "China's Agricultural Reform." The agricultural reforms introduced by Deng Xiaoping after 1978 had a positive impact on agricultural production and productivity, raising grain production from about 300 million metric tonnes in 1978 to 500 million tonnes by 1996. Yet, those gains were largely one-time gains from major institutional changes; the loss of agricultural land since the early 1990s has put negative pressures on production. Production dipped slowly to a low of 430 million tonnes in 2002, only to recover the 500 million level in 2007.

6 See Blas and Dyer. Meanwhile, exports of agricultural products increased from \$10 billion a year in 2000 to about \$30 billion in 2008.

7 See Lu. As argued by Huang Jikun, director of the Center for Chinese Agricultural Policy at the Chinese Academy of Social Sciences, agricultural biotechnology was targeted early as a top priority for Chinese technology, given the potential impact on food security and rural incomes. See also Dyer.

8 Petry and Wu, "China."

9 Huang, et al., "Plant Biotechnology in China."

10 Wu.

11 Lu.

12 Petry and Wu.

13 Becker, "CRS Report for Congress."

Table 1. Canada's Canola Exports to China (in 000 tonnes, August 1 to July 31 Crop Year)¹⁴

Year	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008
Exports to Canada	1,211	1,890	214	0	401	275	614	873	659
% of total	31%	39%	8%	0%	11%	8%	11%	16%	12%
Total World Canola Exports	3,885	4,859	2,524	2,394	3,754	3,412	5,412	5,435	5,661

Source: Canola Council, "Seed Exports (Historic)." http://www.canolacouncil.org/seed_exports_historic.aspx.

Chinese Production of GE Crops

China has also become a major player in the production of GE crops since 1997, with six crops having been approved for production so far (cotton, tomatoes, sweet peppers, chili papers, petunias and papayas). Early reports in late November 2009 indicate that China has also approved two indigenous rice traits. However, only cotton has been widely adopted by farmers, other crops not being produced or produced in extremely small amounts. As of 2007, it is estimated that 69 percent of all of China's cotton acreage are GE (3.8 million hectares out of 5.5 million hectares in total).¹⁵ A rough estimation is that Monsanto and other foreign firms have about a 60-percent global market share in cottonseed, while Chinese producers have the other 40 percent. Chinese farmers have been very responsive and rapid in adopting new technology.¹⁶

These figures need to be placed in perspective. The acreage devoted to GE agriculture in China have been constant for several years – remaining at 3.8 million hectares in 2008, less than 3 percent of the total world acreage devoted to GE crops.¹⁷ In 2000, China was the fourth largest GE producer in the world; but by 2008, it has slipped to the sixth largest. Even India now has 7.6 million hectares occupied by GE production.

GE Governance in China: Strong Precautionary Elements

The production data noted above points to a strong resistance to the rapid adoption of new GE technology in China, despite strong economic pressures. Most importantly, no single major food crop (rice, wheat, corn and soy) has so far been approved for GE production in China. It was long expected that China would be the first country to authorize GE rice (Iran did so in 2007). However, the delays are indicative of the political sensitivity of these issues and battles concerning the authorization of GE crops that have prevailed over the last five to eight years and postponed again in January 2008.¹⁸ Early reports late November 2009 indicate that the Biosafety office may have finally approved two strands of GE rice.

The MOA's Biosafety office is the key actor in Chinese GE governance, particularly when it comes to the granting of safety certificates for the import or production of GE crops. It operates under regulations promulgated in 2001 by the State Council and updated in 2009. However, other ministries are also involved, particularly the Ministry of Environmental Protection (MEP) as the lead ministry on the CBP, the Ministry of Science and Technology (MOST) regarding research funds and the Ministry of Commerce for trade issues. Ultimately, the State Council is the arbiter for key decisions. The 2001 regulations require both food safety and

¹⁴ It is worth noting that the figures above do not include exports of canola oil and meal. However, these exports are not sufficient to affect the larger trend (a maximum of 249,000 tonnes in 2007-2008) and have not offset the larger trend shown in Table 1.

¹⁵ Petry and Wu.

¹⁶ Personal Interview with Professor Xue Dayuan, May 14, 2008. At least in the early years, a decrease in the use of pesticides and increase in revenues was reported, although other scholars have questioned the sustainability of these results.

¹⁷ Clive, "Global Status."

¹⁸ See Wu. When the decision on GE rice was postponed again in January 2008, a top MOA official explained that tests on food and environmental safety were still ongoing. He also indicated, however, that "market acceptance" was also a crucial factor. Interview with Biosafety office, May 15, 2008.

environmental safety tests before granting a safety certificate, a position that puts China closer to the EU than to the US or Canada.¹⁹

The other key precautionary component of China's approach to GE governance is the implementation of mandatory labelling after 2001. The initial decision was taken suddenly by the State Council and caused significant trade frictions with both the US and Canada. The imposition of mandatory labelling with a 0-percent threshold puts China in the same camp as the EU and Japan. However, like Japan and unlike the EU, China restricts the applicability of mandatory labelling to specific products: soybean seeds and oil, corn seeds and oil, canola seeds and oil, cotton seeds and tomatoes. Papayas, for example, are excluded. In addition, China has taken a middle position on the scope of labelling by only requiring the labelling of raw seeds or seeds that underwent primary processing only (for example, soybean tofu or oil), but not secondary processing (such as chocolate bars with soy lecithin or cookies made with soy oil). Such a position is different from the strict process-based labelling in the EU and more similar to Japan's pragmatic labelling approach. It allows avoiding labelling the bulk of soybean imports from the US once they enter the processing circuit. Preliminary reports from Greenpeace are that labelling guidelines are generally enforced in China.²⁰

The last plank in the precautionary approach taken by China is the ratification of the CBP, a process that was accomplished in April 2005 under the leadership of the State Environmental Protection Agency (SEPA) and Professor Xue Dayuan, the head of the Biodiversity Institute at the Central University for Nationalities (*Zhongyang Minzu Daxue*) in Beijing. This process of ratification has motivated MEP to seek an overall Biosafety Law, although it has not yet happened. The ratification of the CBP was a major move that indicated support for a global regulatory approach and for a precautionary approach in general, a decision that brought China closer to the EU and Japan in terms of principles than to the approach pursued by the US or Canada. It is also important to note that China was faster in ratifying the CBP than its neighbour South Korea, despite the strong civil society and democratic pressures to ratify.

Origins of China's Position: Trade Interests and Beyond

What lies behind the split in China's approach to GE food and its shift toward a more precautionary approach in 2001 and 2005? It is often argued that China's position is primarily the result of trade interests and trade arbitrage.²¹ There are three possible strands to this argument. At the most basic level, it is often argued that China is concerned about export markets in Japan and South Korea for soy products and in Europe for corn or processed goods. This allows upstream pressures from European and Japanese or South Korean regulations into China through trade links to counter domestic pressures from economic stakeholders. This argument is generally presented for China and other developing countries as one vector explaining excessive caution in countries that have major unmet food needs.²² Falkner has presented an upgraded version of this argument in work showing that a trading-up effect may have been at work in China, as controversies and regulations in important markets shifted the preferences of China's exporters.²³ In particular, a 2000 temporary halt on Chinese exports of soy sauce in the EU drove home the reality of "market exclusion."²⁴

A second more sophisticated version of that argument is one that sees China as a consummate mercantilist nation, thanks to its strong centralized state that has figured out the existence of a significant premium for GE-free crops in the world market (due to strong demand in Europe, Japan and South Korea). Thus, for instance, it is performing trade arbitrage by importing cheaper GE soy for domestic consumption while producing and

19 Foreign importers have reported occasional long delays with these certificates (beyond the 270 days committed under the regulation) and strict requirements for stacked events. In addition, China has a strict 0-percent threshold for unauthorized events, a position that is even stricter than that of the EU.

20 Personal interview with Greenpeace, Beijing, May 15, 2008.

21 Cf. among others, personal conversations with Robert Paarlberg at Harvard University in fall 2005 and at the Canadian Embassy in Beijing in May 2008.

22 Paarlberg, *The Politics of Precaution*.

23 Falkner, "International Sources."

24 *Ibid.*, 487.

exporting more expensive GE soy for export to Japan and South Korea. This would explain the regulatory gap between the authorization of GE soy for import and processing, but not for domestic production.²⁵ However, the actual data seem to belie these interpretations, given that China has almost ceased to matter as an exporter of soybeans (or corn for that matter) since joining the WTO.²⁶ In this context, China's export interests in soybeans to Japan and South Korea can only be seen as a minor footnote at best.²⁷

A third trade argument relates to the control of future GE technology, intellectual property rights and patents. This argument emphasizes the sale and production of seeds, not trade flows of crops and food. It is plausible to argue that China is gaining time by opening the door to imports of crops, but making it harder for seeds to be used in China in an attempt to ensure that Chinese developers have control of the technology and its patents before it is widely used for production in China. The US Department of Agriculture report on biotechnology notes that China puts significant restrictions on investment in biotechnology or control over intellectual property. In addition, there is potential concern over conflicts of interest in the approval system, given that many laboratories involved in testing new foreign seeds for MOA are active technology developers themselves.²⁸ Greenpeace has reported that their argument on a potentially dangerous dependence on foreign patents for some key sequences if China approved GE rice has had much traction with the government.²⁹

This third argument is definitely a stronger one and seems to play a role in China's behaviour. Patents and intellectual property rights are clearly the key battlefield in the long-term struggle over the control of the technology. Though this argument is probably not sufficient to explain China's choices on its own (as shown below), it is nevertheless part of the story.

International Socialization?

Another potential explanation for China's precautionary behaviour in GE food and support for the CBP may be connected to international socialization. Falkner has argued that the interactions of Chinese diplomats, academics and civil society actors with European, Japanese and UN circles has provided a mechanism for the transmission of global environmental concerns and norms into China.³⁰

This argument is again plausible and socialization played an important role in China's ratification of the CBP. However, it cannot explain on its own why China took a turn toward precaution, particularly in its domestic relations, due to two main weaknesses. First, biosafety and GE food constitute one issue area where international norms are divided. When norms and international standards are fragmented, there is more room for domestic choice and socialization is less likely to be a dominant force. Why would EU-led socialization dominate over US-led socialization? Second, domestic regulations on approvals and labelling constitute a more important component of a nation's GE governance than its ratification of the CBP. The CBP is a relatively light treaty that often does not lead to drastic change of national laws.

25 An idea first presented to me by Robert Paarlberg in a conversation at Harvard University in the fall of 2005.

26 While China was a major exporter of soybeans as late as 1995, China has instead turned into the world's largest importer in the early 2000s. As of 2005, China produced 18 million tonnes of soybeans but consumed 45 million tonnes, leaving a gap of 27 million tonnes for imports (41 percent of world soybean imports), about 40 percent of which came from the US. By 2007, as Chinese production became more expensive than imports from the US, Argentina or Brazil, it dropped further to 14 million tonnes, putting China in the fifth position after India for the first time. Meanwhile, imports have kept increasing, reaching 37.4 million tonnes in 2008 (40 percent of which is from the US). To avoid a total collapse of Chinese production, the government purchased 6 million tonnes of soybeans from farmers. By comparison, the US produced 73 million tonnes, Brazil 58 million tonnes and Argentina 48 million tonnes. See Workman, "Top Soybean Countries"; FAOSTAT; American Chamber of Commerce, "US Soybean Exports."

27 The most recent 2009 data shows that China exported 0.5 million tonnes of soybeans, soy meal and soy oil between January and May 2009. The leading markets were Japan (nearly 0.2 million tonnes) and South Korea (0.15 million tonnes), followed by Vietnam, North Korea and the US. This translates into nearly 0.5 million tonnes of exports to Japan on an annual basis (for total Japanese imports of 3 million tonnes) and a bit less than that of South Korea. These are high-value GE-free exports. But given the very small scale of these exports in comparison to the massive imports, it is hard to see signs of a conscious arbitrage strategy. One may, however, note that there could be a timing issue involved. When key decisions were taken in 2000-2001, soybean exports were still significant and may have played some role in China's decision. The long-term trends should nonetheless have been clear.

28 Petry and Wu.

29 Personal Interview with Greenpeace in China, Beijing, May 2008.

30 Falkner; Kent, "China's International Socialization."

Fragmented Authoritarianism

Another part of the puzzle has to do with the bureaucratic divisions within Chinese governance. This division is particularly salient in a multi-functional issue such as GE food that involves (as noted above) MOA, MEP, the Ministry of Health and Welfare, the Ministry of Science and Technology, but also MOFTEC and the Ministry of Foreign Affairs, in addition to several powerful provincial governments with large stakes in Agriculture biotechnology. Much has been argued about the notorious divisions within the Chinese government and competition among Chinese ministries, a situation that has been named “fragmented authoritarianism.”³¹

In the case of key decisions on GE governance, it is clear that the relevant ministries take different stances from each other. MOST has been aggressively lobbying for research funds as well as rapid approvals and looser labelling, while MEP (previously SEPA) has been the key vector pushing for tougher biosafety regulations. MOA acts as the pivotal player. It has been supportive of biotechnology, yet also careful to integrate other elements of voice into decision making. Ultimately, the State Council has acted as the arbitrator of last resort on all key decisions. What is interesting, however, is that on paper, the balance of power in favour of agriculture biotechnology was over determined with stronger ministries supporting the technology and SEPA usually not powerful enough to hold its own against MOA and MOST. In this sense, a pure balance of power model at the bureaucratic level is not enough to explain why the pendulum tilted toward precaution.

Representation Without Institutions

Trade interests and fragmented governance are only partial components of the story.³² To understand why the balance tilted toward more precaution, it is essential to add one more dimension, namely that of public voice. MOA and the State Council decided to move toward precaution primarily because of a choice to integrate the opinion and interests of urban consumers, as channeled by NGOs, consumer associations, the media and key academics. This process of integration of grassroots public goods concerns from the middle class followed what I call a process of *representation without institutions*. It led to an outcome that is relatively similar to that of the EU and Japan, despite the absence of democratic institutions that were critical in those systems. The outcome may, however, be temporary, as the channels for public voice integration are not institutionalized.

The ongoing representation without institutions is as an interactive process whereby the interests of the state (the pursuit of legitimate governance) and those of new coalitions between grassroots activists and policy entrepreneurs such as academics can meet and lead to participatory governance.

This process is facilitated, or even enabled, by the existence of inter-ministerial gaps (“fragmented authoritarianism”), which ensures the absence of a clear elite consensus. It primarily means that the government is seeking to respond to bottom-up public goods concerns and integrate preferences of urban consumers in its governance outcomes, even if the channels for the expression of this public voice are not formally institutionalized. The process emphasizes a primary domestic audience for policy outcomes and a degree of dialogue between state and society.

Public Opinion: General Public vs. Urban Consumers in Large Cities

The key element in this process is public opinion. Interestingly, public opinion is divided. It has been widely reported that Chinese opinion as a whole is both ill-informed about agriculture biotechnology and open to it. For example, the 2008 biotechnology report of the USDA writes: “China’s consumers are by and large open to and accept biotechnology products.”³³ It cites a study showing that 60 percent of consumers nation-wide were willing

31 The concept of “fragmented authoritarianism” was advanced in Lieberthal and Oksenberg, *Bureaucratic Politics and Chinese Energy Development* and Lieberthal and Lampton, *Bureaucracy, Politics, and Decision Making in Post-Mao China*.

32 This argument is based on field research and interviews with a dozen key players conducted by the author in 2008.

33 Petry and Wu.

to purchase biotech foods without any price discrimination, while 75 percent of Chinese respondents as a whole were not much aware of GE food.

Greenpeace's own survey of urban consumers in three large cities (Beijing, Shanghai and Guangzhou) paints a very different picture, even though it is challenged by pro-GE scientists on the count of sample problems.³⁴ It found that 65 percent of consumers show a preference for non-GE in all four main categories surveyed (soy oil, rice, other food products of a plant origin and food products from an animal origin). Specifically:

- 79 percent choose non-GE soy oil over GE soy oil
- 77 percent choose non-GE rice over GE rice
- 85 percent choose non-GE food from an animal origin over their GE counterparts
- 80 percent of the consumers oppose the use of GE ingredients in baby food.³⁵

If confirmed by other polls, these results could indicate a growing convergence of Chinese urban consumers and middle class with urban consumers in South Korea or Japan, itself a very interesting trend.

MOA's Biosafety office confirms both results. Namely, the government is aware that there are wide opinions in China. But it is particularly aware of "rising public awareness," particularly in large cities. MOA conducts its own investigations and surveys. It also organizes its own workshops and study groups. It is aware of Greenpeace's results and confirms that they have reproduced them. The office confirms that labelling came to be seen as "the right to know for consumers."³⁶

Public Voice Channels in Chinese GE Governance

Interviews with various actors point to four channels for the integration of the public voice of urban consumers and the middle class into GE governance.

- 1) **NGOs (Greenpeace):** Greenpeace has been able to operate in China (and Hong Kong) with relative effectiveness. It understands that it can only have a role if it keeps within key boundaries and does not challenge the government head-on. It has focused its work on collecting data and working with academics to produce quality reports (consumer surveys, analysis of patent issues, etc.). Yet, these reports are widely read both by academics and by the MOA and MEP. It seems that the government accepts this role of information provision and input into governance. Greenpeace adds that it is relatively at ease with government regulations, given that the government has moved toward precaution and seems to be implementing labelling regulations quite carefully.
- 2) **Consumer Council:** This government-controlled broad-based organization gathers information from consumers at the grassroots level and passes it on to higher levels and to the central government. They also organize training on risk management and information sessions for the public. Informal interviews indicate that the Consumer Council is aware of misgivings among urban consumers and have passed on that information.
- 3) **Academic Entrepreneurs:** Several key academic entrepreneurs, such as Xue Dayuan based at the Central University of Minorities, play a key interface role with the international environment and as vectors to represent public interests. Professor Xue played a key role in the ratification of the CBP and in mediating between ministries and various actors. Other academics play a key role on the other side of the debate by linking with industry and economic interests and represent those interests to the government.

³⁴ Personal interview with Huang Jikun, May 15, 2008.

³⁵ Survey results shown during interview at Greenpeace's office, Beijing, May 15, 2008.

³⁶ Personal interview with head of Biosafety office, May 15, 2008.

- 4) **International Norms (from the EU and Japan):** A final interesting input in governance, even if it is an international one, is international norms. They filter down to some actors and NGOs and come back up to the government. Interviews at the MOA, MEP and with key academics involved with those two ministries confirm that the Chinese government has thoroughly studied regulations from both the EU and Japan before writing its own rules on safety assessment and labelling. The CBP negotiations did provide ample occasion for exchanges and socialization.

A Delicate Balance Between Two Multi-Level Coalitions

GE governance in China involves an interesting confrontation between two large multi-level coalitions. With GE governance, we are facing a fluid and fragmented governance situation, rather than that of, say, a unified mercantilist state.

CANADA'S LONGSTANDING POSITION ON AGRICULTURE BIOTECHNOLOGY AND THE NON-RATIFICATION OF THE CBP

Canadian governments and farmers have supported agricultural biotechnology early on, seeing it as both benign and carrying the seeds of higher productivity and multiple benefits.³⁷ Canada quickly moved to pass supportive legislation and regulations. In 1990, it passed legislation to protect the intellectual property rights of biotechnology.³⁸ As for the approval of regulations, Canada followed the OECD's guidelines developed since 1986. In 1993, Canada adopted a *Regulatory Framework for Biotechnology*, which incorporated the substantial equivalence principles. Agricultural Canada, a pro-GE actor, remained the key authority in charge, successfully keeping Environment Canada to a very limited position.³⁹ Health Canada shares some of the authority in issuing certificates. The first authorizations for general production were issued in 1995, in line with the US process. GE production quickly increased to 7.6 million hectares in 2008.⁴⁰ The majority of Canada's canola production is now genetically modified. The decision was also taken in the early 1990s against mandatory labelling, due to the likely cost involved in segregating GE and non-GE products, as well as the desire not to stigmatize GE crops.

Politically, there was no wide political or parliamentary debate around these regulations. Regulations were adopted through ministerial statutory authority.⁴¹ There was no multi-stakeholder participatory process. Rather, decisions were made through closed policy networks of industry representatives, farming representatives, scientific experts and government officials.⁴² A large debate did take place in 2000-2001 when the Royal Society of Canada issued a pointedly critical report of Canada's overly permissive approach to agriculture biotechnology. The government dismissed many of the recommendations from the Royal Society as impractical or unnecessary. In 2001, the NDP and the Bloc Quebecois pushed for a bill on mandatory labelling and a Liberal MP, Charles Caccia, introduced a private member's bill to that effect. The bill was defeated in October 2001, despite support from then Health Minister Alan Rock.⁴³ At this point, the argument against labelling included fears that it would violate NAFTA legislation and would lead to an American retaliatory action. In 2004, the Auditor General issued a report that was also critical of the permissiveness of the GE assessment regime.

With regard to the CBP, Canada did take part in the negotiations (unlike the US) as a signatory to the Convention on Biodiversity. The last round of negotiations took place in Montreal in January 2000 and the Secretariat of the Biosafety Protocol is based in Montreal. However, Canada was the last country holding out against the agreement in Montreal, in part because of the incorporation of the precautionary principle into the

37 Skogstad, *Internationalization and Canadian Agriculture*, 209-210.

38 Ibid., 213.

39 Ibid., 215.

40 Clive.

41 Skogstad, 215.

42 Ibid.

43 Ibid., 232.

Protocol and because of fears of inconsistencies with the WTO regime. It is only mild prodding by US President Clinton that led to Canada's acquiescence. But Canada did not ratify the CBP, owing to strong lobbying by farmers and exporters who fear the cost of identity preservation systems.⁴⁴

Under current conditions, the Canadian interest lies in keeping global markets open to agricultural biotechnology, an industry seen as a key Canadian comparative advantage. But it is important to note that both the permissive regulatory approval system and the absence of mandatory labelling are controversial within Canada and have led to significant public concern.

IMPLICATIONS FOR CANADA-CHINA POLICY

Canada and China have exhibited some large differences in their respective approaches to agricultural biotechnology, both in principle and in the details of regulations. Yet, agricultural biotechnology is an unusual issue area, since, in contrast with many other issues, it is China that finds itself on the side of a stronger international regulatory regime (with the EU, Japan, South Korea and others). Canada (together with the US) is championing a more market-based regime that is less burdened by other public goods concerns.

Multi-Level Opportunities: Sub-State Convergence Below National Regulatory Divergences

Interestingly, while state-level regulations diverge due to different balances of power within each domestic regime, there is much more convergence at the level of business, scientific, NGO and consumer interests. This convergence offers many opportunities for cooperation and intense engagement at the sub-state level.

In both countries, the biotech industry sees agricultural biotechnology as a crucial science that will set the future of agriculture and play a vital role in national competitiveness. Biotechnology is booming in China and there remains many opportunities for cooperation in research at universities, agricultural production and industrial processing. If anything, China's biotech industry is more developed and benefits from a powerful academic and scientific base, as well as rich public funding, and connections to provincial governments and supportive farmers. Opportunities for the Canadian biotech industry to partner with or tap into the Chinese market are great. US companies have been quick to seize this opportunity.

In both countries, civil society is active and pushing for a stronger regulatory regime with a careful safety and environmental process and mandatory labelling. Greenpeace plays an important role in both countries. Ironically, while NGOs are freer, more protected and more organized in Canada, it is in China that they seem to have had more impact on the regulatory issue. The Canadian regulatory regime relies on closed committees that make "science-based" decisions and give a dominant voice to industry, scientists involved with industry and agricultural and trade interests. As shown by Skogstad, industry and farmers have for the most part been on the same page, supporting a permissive regulatory regime that is closely integrated with the US regulatory regime. NGOs have essentially been shut out of the regulatory process. In China, NGOs are now participating in the decision-making process; their close tracking of urban public opinion and their linkages with key academics have enabled them to gain a degree of voice in the consultation process. The government has chosen to integrate this voice in its decision making, partly as part of its larger set of policies targeting the rising urban middle class. Greenpeace has been surprisingly supportive of China's policies, while being very critical of Canada's regime.

Finally, in both countries, urban consumers are expressing similar positions. They indicate a desire to proceed cautiously with the authorization of GE crops. In both cases, they are concerned with a wider set of public goods issues, such as long-term health and biodiversity impact, issues that are often not incorporated in the purely "science-based" approval mechanism followed by Canada and the US. Consumers in both countries also have a strong preference for accountability and mandatory labelling. In China, however, rural consumers are

⁴⁴ Ibid., 222.

more price-sensitive and less informed about GE food, offering a large reservoir of demand for cheaper products with less public goods concerns.

All these sub-state similarities offer strong opportunities for sub-state linkages and cooperation. It is important to emphasize that the origins of China's position have more to do with the emerging preferences of urban consumers (such as accountability and precaution) than with trade protectionism. In the context of divided global governance, the diffusion of norms from Europe, Japan and South Korea has also played a reinforcing role. On this basis, it may be wise to develop links with sub-state actors who play a key role in channeling upwards the interests of consumers, actors such as NGOs (including Greenpeace), the Consumer Council and other consumer groups and key academics involved in the process.

Policy Suggestions: Mediating the Regulatory Gap

Over time, opportunities for Canadian biotech companies and for agricultural exports (particularly when wheat becomes GE-wheat) will be greater if there can be some regulatory convergence between China and Canada.

Regulatory convergence or regulatory compatibility is likely to require some movement on the Canadian side. Given the strong public support in China for mandatory labelling and strong institutional control of agricultural biotechnology, the government is not likely to dilute its regulations easily. At a time when the world expects China to strengthen its food safety regulations, diluting safety regulations and labelling on GE food would be going in the opposite direction. Lobbying for such action seems to be counter-productive for Canada.

At a global level, the prospects for agricultural biotechnology will be greater if global regulatory convergence takes place around a set of globally accepted agreements. A good focal point for such a global convergence to occur is the CBP, which has been ratified by the great majority of countries (with the notable exceptions being the US, Canada, Argentina as well as South Korea). Moving in this direction for Canada would greatly enhance the prospects for progress in regulatory convergence and GE trade between Canada and China. It seems a very wise course of action, especially as it enjoys majority support among Canadian voters.

Given, however, the strong integration of markets and regulations between the US and Canada through NAFTA, Canada's margin for unilateral action on GE labelling or CBP ratification is limited. Such action should be considered in full cooperation with the US as a triangular cooperative process. A grand bargain between China, Canada and the US around GE regulation would go a long way towards advancing food safety concerns with China and Canada-China trade. It would do much, at the same time, to strengthen civil society linkages between Canada and China and linkages between consumer organizations.

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APPENDIX 1

Selected Key Advances in Chinese GE Research and Associated Research Centres as of 2006

Plant/Animal	Trait	Research Centre
Rice	GE Rice for insect resistance	Institute of Genetics and Developmental Biology, CAS
Poplar trees	Salt tolerance in poplar trees	Institute of Genetics and Developmental Biology, CAS
Rice	GE rice for insect resistance	Zhejiang University
Petunia, Tomatoes, Sweet pepper	Virus resistance and improved traits	Peking University
Corn	Insect resistance and higher lysine content	China Agricultural University
Papaya	Virus resistance and higher quality	South China Agricultural University
Wheat	Pre-harvest sprouting tolerance	Henan Agricultural University
Tomato – pharmacop	GE tomato with capacity to produce Hepatitis-B oral vaccine	Biotechnology Research Institute, CAAS
Cotton	Insect resistance	Biotechnology Research Institute, CAAS
Rice	Bacterial blight resistance	Biotechnology Research Institute, CAAS
Canola	Higher oil content	Zhejiang Academy of Agricultural Sciences
Soybean	Insect resistance (aphids)	Jilin Academy of Agricultural Sciences
Rice	Insect resistance	Huazhong Agricultural University
Carp (fish)	Fish growth hormone	Heilongjiang Fishery Research Institute, CAFS
Cow	Transgenic cloned cattle with human gene expression	China Agricultural University
Goat	Transgenic goat with human lactoferrin or lysozyme genes	Shanghai Genon Bio-Engineering Co.

THE CIC CANADA-CHINA RELATIONS PROJECT

Bilateral relations between the governments of Canada and the People's Republic of China are a matter of strategic interest to Canada. Recent changes in the frequency of high-level visits, the effective style and content of bilateral communications and perspectives held about each country by various sectors of each other's society all suggest that the Canada-China relationship has changed significantly in recent years. Yet China remains vitally important to Canada for a variety of reasons and in a variety of sectors. Political and diplomatic cooperation on issues of direct bilateral concern and also on issues of global import remains critically important. Commercial and trade ties linking Canada with the world's third largest and fastest growing economy are of obvious importance. Cultural and civil society ties, including immigration patterns and the ancillary effects they generate, are also important. In these and other matters, the Canada-China relationship will likely grow in importance in the years to come. While the diversity of links between Canada and China militates in favour of giving due attention to a multiplicity of commercial, academic and civil society links, bilateral cooperation at the federal/central government level remains important.

In keeping with CIC objectives to advance research and dialogue on international affairs issues of importance and interest to Canadians, the CIC Canada-China Relations Project has focused on supporting research and analysis toward building a policy framework for Canada's relationship with China. The project's activities have been developed along three thematic areas that reflect issues of common concern: a) Chinese domestic institutional and normative contexts for engagement; b) Economic relations; c) Collaboration on global issues such as environment, health and security.

- a) Domestic Context for Engagement: The Canada-China relationship can be most effective when it is grounded on complementarity of interests, which in turn requires mutual understanding of domestic normative and institutional conditions in both countries. Canadian initiatives with China, ranging from WTO compliance and business regulation to human rights, can be effective only if they are designed and implemented in light of China's domestic conditions, ranging from popular norms to governmental structures and policy priorities. Similarly, China's success in nurturing productive relationships with Canada will require appreciation of Canadian domestic conditions. The papers for this thematic area were commissioned and directed by Professor Jeremy Paltiel of Carleton University.
- b) Economic Relations: Economic relations between Canada and China are critically important. Economic relations include bilateral trade and investment relations, and also extend to local effects of economic conditions and behaviour. In the trade area, Canada's strengths match up extremely well with China's needs. In trade and investment relations, efforts to promote normative and institutional accommodation in China for Canadian business objectives are consistent with Chinese development policies and also serve important Canadian interests in the areas of good governance. As well, national economic behavior by the two countries in response to changing economic conditions at the global, regional and local level have important effects on the Canada-China relationship. The papers for this thematic area were commissioned and directed by Yuen Pau Woo, President of the Asia Pacific Foundation of Canada.
- c) Collaboration on Global Issues: The importance of China's responsible participation in systems for addressing global policy concerns in areas such as environment, health and security cannot be overstated. Yet China's participation in the global community can be distorted by its responses to apprehension and competition from other global actors, particularly the United States, the European Union and Japan. Canada has a significant role to play in supporting China's responsible participation, not only through direct bilateral programming but also through our capacity to deploy good offices, legitimation and other soft power resources both bilaterally and globally. The papers for this thematic area were commissioned and directed by Professor Brian Job of the University of British Columbia.

The papers here presented in connection with the CIC Canada-China Relations Project offer informed, nonpartisan recommendations for a variety of stakeholders in Canada, including the government and private and public sector institutions and individuals, with a view toward furthering the development of healthy long-term relations between Canada and China. While historical and current conditions may result in disagreement as to how best to manage the Canada-China relationship, China's importance to the world requires our attention. We hope that the papers presented here can further the process of understanding and effective engagement that will strengthen the foundation for productive relations for the long-term interests of both countries.

Dr. Pitman B. Potter

*Chair
CIC China Working Group*

The Canadian International Council (CIC) is a non-partisan, nationwide council established to strengthen Canada's role in international affairs. With local branches nationwide, the CIC seeks to advance research, discussion and debate on international issues by supporting a Canadian foreign policy network that crosses academic disciplines, policy areas and economic sectors.

The CIC features a privately funded fellowship program and a network of issue-specific Working Groups. The goal of the CIC Working Groups is to identify major issues and challenges in their respective areas of study and to suggest and outline the best possible solutions to Canada's strategic foreign policy position on those issues. The CIC aims to generate rigorous foreign policy research and advice.

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