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Trade, Biodiversity and Sustainable Development

Proceedings of the Training Workshop
October 29-31, 2003
Beijing, China

Editors
Patricia Moore
Wanhua Yang
Trade,
Biodiversity
and
Sustainable Development

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IUCN Regional Environmental Law Programme, Asia
International Institute for Sustainable Development

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and
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Working Groups
Access to Genetic Resources and Benefit Sharing
Biosafety
Intellectual Property Rights and Traditional Knowledge
Sustainable Trade

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ZHU Guangyao
Vice Minister
State Environmental Protection Administration

October is an autumnal season of balmy air and bright sunshine for Beijing. Today, we gather here to hold the Workshop on "Trade, Biological Diversity and Sustainable Development". First of all, please allow me, on behalf of the State Environmental Protection Administration and in my personal name, to give our sincere thanks to the British Ministry of Foreign and Commonwealth Affairs for sponsoring this Workshop and the cosponsors IUCN – The World Conservation Union, the Canada-based International Institute of Sustainable Development and the Swiss International Center for Trade and Sustainable Development for all the work they have done for the smooth staging of this Workshop. I also wish to extend a warm welcome to all Chinese and foreign experts and participants who have come to attend the Workshop.

With growing economic globalization, expanding free trade worldwide and deepening WTO multilateral negotiations, environmental and trade problems have become more outstanding. Among them, issues related to biological diversity and sustainable development such as relationships between the Convention on Biological Diversity, the Biosafety Protocol and other multilateral environmental agreements and relevant WTO rules, access to genetic resources and benefit sharing and trading rules for genetically modified organisms have become one focus of attention for both developed and developing countries.

As early as in 1992, the UN Conference on Environment and Development put forward in its Agenda 21 the guiding principles that should be complied with when trade and environmental problems are handled, namely to use free trade to promote sustainable development and make trade and the environment supplement each other. These principles clearly illustrate the interdependence, mutual promotion and inseparability between trade and the environment and have therefore become the theoretical cornerstone for harmonizing trade and environmental issues.

The World Summit on Sustainable Development held in August 2002 also especially expounded on the issue in its Implementation Plan, namely to take sustainable development as the goal, promote mutual support between multilateral trading systems and multilateral environmental agreements to back the working plans which the World Trade Organization has adopted while recognizing the importance of maintaining the respective integrity of the two systems.

China is a developing country with great biological diversity. Meanwhile, it is also a multi-ethnic country with a long history, culture and traditional knowledge which span 5,000 years. Like other developing countries, China also faces many difficulties and challenges in the conservation and sustainable use of biological diversity. As a new WTO member, China is willing to exchange information and conduct cooperation with other member states and learn from their advanced experiences to improve its understanding of related issues and enhance its ability in WTO environment and trade negotiations.

This Workshop is held with a view to strengthening government departments' concerns with and understanding of issues related to trade, biological diversity and sustainable development and helping China to improve its abilities to cope with such issues at the national strategic level as well as in international
negotiations. Participants in the workshop include representatives of the relevant departments of the central government and local governments as well as researchers from concerned academic institutions. During the next three days, they will study and discuss general and special issues concerning environment, trade and sustainable development, such as relationship between WTO and multilateral environmental agreements in a biological diversity context, access to genetic resources and benefit sharing, traditional knowledge and intellectual property rights and trading rules for genetically modified organisms. Participants will also express their opinions about and make recommendations for the interests, strategy and position that China will have in the new round of WTO multilateral negotiations on trade, biological diversity and sustainable development.

We hope the workshop will engage in in-depth discussions on the interrelationships between trade, biological diversity and sustainable development and help us to deepen our understanding of related issues and lay a good foundation for future work in related fields.
Sir Christopher Hum

Ambassador of the United Kingdom to the People’s Republic of China

On behalf of the British Government, I would like to welcome you here today to this workshop. I would like to start by expressing my thanks to SEPA; to the IUCN; to the International Institute for Sustainable Development; and to the International Centre for Trade and Sustainable Development, for all of their hard work of preparation.

The United Kingdom’s Foreign and Commonwealth Office is delighted to sponsor this workshop. This is one of a number of projects where we work in co-operation with the Chinese Government and other Chinese organisations on environmental issues of interest to both of our countries.

In the Doha Declaration, Ministers agreed to launch negotiations on trade and the environment, including on the relationship between existing WTO rules on the one hand, and specific trade obligations set out in global environmental agreements — of which there are about two hundred — on the other. The objective is to clarify the relationship between trade measures in the environmental agreements, and WTO rules. It is a complex task.

One of the objectives of this workshop is to enhance the capacity of China to participate in WTO negotiations and to engage in working through this complicated web of issues.

Another objective is to build awareness, and support for integrating trade, bio-diversity conservation and sustainable development policies.

I see that a wide range of Ministries, academic institutions and regional Environmental Protection Bureaux are represented here today — reflecting the fact that awareness of these issues needs to be built at all levels.

There is some excellent work available in China which this workshop can build on. The Trade and Environment Task Force of the China Council on Co-operation on Environment and Development, has looked at the environmental impacts of China’s accession to the WTO.

The Task Force looked at some of the complications and uncertainties arising from membership. The WTO has been criticised for having a poor environmental record — and it is clear that rapid trade growth can have significant adverse impacts on the ecological environment. On the other hand, membership also offers environmental opportunities — for example in helping to promote green products and technologies.

The Task Force concluded that work was needed to enhance awareness and understanding of these issues, to exchange views between various Ministries and other bodies with an interest, and to strengthen international co-operation with other countries in information exchange and capacity building. I hope that this workshop will assist in this regard.
We too are working to bring together the trade and environment agendas. We are finding that our Environment Ministry and Trade Ministry need to co-operate closely, for example in developing the UK's new long term energy strategy; and on fulfilling commitments made at the World Summit on Sustainable Development. The aims are to promote more sustainable patterns of production and consumption; to help develop new and better environmental technologies; and to combine environmental sustainability with continued economic growth.

There has been bilateral co-operation between China and the UK which helped to strengthen understanding on both sides. In March this year, representatives of a number of Chinese Ministries visited the UK and had two day talks on the relationship between trade and the environment and sustainable development.

These talks were a good step towards deepening the understanding of the approaches taken by both of our Governments towards these important issues. I am pleased that some members of the delegation who visited the UK are present here today.

I would like to thank you for attending and to wish you a successful and productive workshop.
Summary and Conclusions

Aban Marker Kabraji
IUCN

The objectives of this workshop were to enhance individual and institutional capacity to:

- address the environmental aspects of trade issues that will arise as a result of China’s WTO membership;
- participate in WTO negotiations and develop proactive positions in the WTO;
- implement the Convention on Biological Diversity and the Cartagena Protocol on Biosafety, and improve the implementation of CITES;
- local and national support for the integration of trade, biodiversity conservation and sustainable development policies.

The first two days were spent in intensive listening and questioning on the trade and sustainable development issues in the Doha Round of negotiations in the WTO. The discussions also probed the relationships between multilateral environment agreements (MEAs) and the WTO, the CBD and TRIPs, labeling, market access and sustainable trade, access to genetic resources and benefit sharing, traditional knowledge, intellectual property rights and trade, and biosafety and the Cartagena Protocol and the WTO.

On the last day there were even more intensive discussions on access and benefit sharing, traditional knowledge and intellectual property rights, biosafety, and sustainable trade. The highlights of the discussions are recommendations:

- that China should play a more active role in forums and organizations that set international standards for trade;
- for integrating economic, social, conservation and development considerations into policy and research for regulating access to genetic resources;
- that China needs to factor issues of safe use of biotechnology into its bilateral and regional trade negotiations;
- for a 8-point process to initiate a national action plan for the protection of traditional knowledge in China.

All participants stressed the need for building awareness and capacity on all the issues related to trade and biodiversity. The outputs of this workshop and the longer-term outcomes will contribute to this general call for information and training.

The outputs of this workshop will include:

- a publication in Chinese of the proceedings of the workshop; and
- a plan for a programme to continue this kind of orientation and awareness building that will include:
  - an improved programme like this workshop that can be held again in one or more other cities in China;
  - workshops on specific issues like traditional knowledge and intellectual property rights; and
  - workshops for specific target groups – central and provincial government officials, lawyers, and negotiators.
We hope that the outcomes of the workshop will be to:

- initiate a dialogue among government officials, academics and representatives of the private sector on the interaction of trade and environment;
- enhance individual and institutional awareness of the environmental challenges related to trade in biological resources; and
- increase local and national support for integrating trade, biodiversity conservation and sustainable development policies at provincial and national levels.

The immediate outcome of this workshop is the most important – this group of government officials and academicians is more aware of the issues at the interface between biodiversity conservation and trade and that these issues are crucial for China.

This workshop has focused on China's domestic interests in the trade and biodiversity debate. But China is also focusing outward on the trade and biodiversity agenda and has enormous potential for influencing that debate in Asia and in the rest of the world.

China is one of four Asian countries that are members of the Group of Megadiverse Countries – 15 countries that contain more than 70% of the world’s estimated biological resources. This group has the potential for significant impact on the way biological resources are traded and used in the future.

China’s economy is expanding rapidly. Other countries recognize China as the market of the future. Its economic power and potential give its positions considerable weight in Asia regional and global debates on trade and biodiversity conservation.

For the first years of its WTO membership, China was watching and listening. After Cancun, where China assumed a leadership position among developing countries, that phase is over. China can be a major voice for developing countries and for Asia in all the fora where trade, development, and environment are on the agenda.

This group is one of the best examples of what makes China so appropriate to take on this leadership role – a group of excellent, well-trained professionals who are aware of domestic and international issues and able to focus clearly on how to address them.

All of the partners who collaborated to hold this workshop are happy to have been able to work with you over the past three days and eager to continuing working with you and your institutions in the future.

Our thanks go especially to our partner SEPA, which has done a tremendous job to bring together the national experts and coordinate all the logistics to make this workshop a success.
The Debate on Trade and the Environment: WTO Rules, Institutions and Developing Countries

Simon S C Tay
National University of Singapore

Introduction: the ebbs and flows of attention
The issue of trade and the environment did not feature strongly in the failed 2003 World Trade Organization (WTO) talks in Cancun. This does not mean, however, that there has been much progress in this controversial area, or that the issues have been settled. Concerns over trade and the environment at Cancun remained a "silent issue", un-stated and unseen but nevertheless felt. The history of trade and environment issues is marked by both strong controversy and grudging allowance within the WTO, with an ebb and flow of attention.

Before the conclusion of the Uruguay Round in 1994, controversy abounded in the wake of the 1991 Tuna-Dolphin dispute. (1) This led in 1994 to Members allowing for the establishment of a Committee on Trade and Environment (CTE) to study the issues and report on actions to be undertaken. The CTE report was presented at the 1996 WTO Ministerial Meeting in Singapore, with little substance and less attention as the issue was held captive to discussions about agriculture.

Progress on the issue was again punctured by a controversial case: the 1998 Shrimp-Turtle decision by the WTO dispute settlement panels and Appellate Body. (2) Further controversy erupted at the 1999 Ministerial Meeting in Seattle. The environment cause was allied to others in street protests that questioned the pace and direction of globalisation and free trade as embodied by the WTO, and dramatically disrupted the meeting.

Allowance and accommodation were once again the order of the day at the 2001 Ministerial Meeting in Doha, where agreement was reached on negotiations on trade and the environment in several specific areas. These areas included the relationship between WTO rules and specific trade obligations in multilateral environmental agreements (MEAs), information exchanges with MEA secretariats and reductions in tariffs on environmental goods. The work programme also promised to identify win-win situations in which reductions in trade barriers would benefit trade and the environment, and to examine labelling requirements for environmental purposes.

Progress on this work has to date been slow. But if history is any indicator, then despite the silence on

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this issue at Cancun, we may expect further contestations over trade and the environment as differences sharpen between developed and developing countries.

The recurrence of trade-environment issues often mystifies and irritates trade experts and officials. Their instinct is that environmental issues belong elsewhere or, at best, are peripheral to the WTO. They feel, with a considerable degree of truth, that the WTO agenda on trade alone is already sufficiently complex and divided. Cancun, certainly, witnessed strong divisions over agriculture and the so-called "Singapore issues" of investment, competition policy, government procurement and trade facilitation.

Yet, trade-environment issues are not irrelevant or necessarily peripheral to the WTO and its Member states. Trade-environment issues relate to a broad range of pressing questions about the WTO. These include (i) questions of doctrine and legal approaches, as trade-environment controversies have been considered and decided in the General Agreement on Tariffs and Trade (GATT)/WTO dispute settlement processes; (ii) questions of the WTO as an institution, as trade-environment issues have impacted or potentially impact questions of those dispute settlement processes and some seek to amend the GATT text; (iii) questions of global governance, to consider how the WTO can and should be linked to other institutions of global governance; and (iv) political concerns expressed by developing countries that relate to other trade issues such as agriculture.

Even when officials and negotiators slow down the examination of trade-environment issues, other outlets within the WTO give vent to them, especially the disputes brought under the Dispute Settlement Understanding (DSU). Litigation on trade-environment issues has proved controversial and deeply divisive, as with US-shrimp/Turtle. The dispute followed United States (US) laws restricting imports of shrimp from processes that resulted in the accidental killing of sea turtles. This was but one challenge in a long line of disputes over environment-related trade measures, almost all of which were resolved in favour of free trade (WTO 1998; Sands 1995). The recurrence of trade-environment cases has meant that such issues have had a disproportionate influence over the early directions and development of the WTO DSU in both procedure and approach to decision making (Cameron and Campbell 1998; Barfield 2001).

It is in this context that this paper will consider the connections between trade and the environment, with particular reference to the concerns of developing countries.

This paper is divided into three sections. The first section briefly considers the controversies that surround the links between trade and environmental protection by broadly identifying the different debates that underpin the controversies. This is followed by an examination of the GATT clauses and principles that seem most relevant to environmental protection, and proposals to deal with trade-environment linkages. The broader principles emerging in international law and policy that touch on these links are also considered. In the third section institutions, including those outside the WTO, that are relevant to addressing the links between trade and environmental issues are considered, along with the possible compromise that might help end the impasse. This paper will seek to address the concerns of developing countries throughout these three sections. It concludes by sketching a potential agenda for developing

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(3) There is, however, an article titled "The environment: a new high profile" on the WTO website. See http://www.wto.org. (4) See note 2.
countries beyond the present impasse.

The trade-environment debate in the WTO is a beggared choice. There is the choice, on one hand, of ignoring the interdependence of trade and economic issues and the protection and promotion of the environment, thereby risking further public protests against the WTO and misunderstandings about the benefits of freer trade. On the other hand, many seek to link these issues in a negative way, centred on sanctions, that can wrongfully hurt trade and market access with particular detriment to the interests of developing countries. If we are going to move beyond the impasse, it is important to find a new balance and new approaches.

**Controversies and underlying debates**

Those in favour of links between environment and trade believe that environmental protection is indisputably a public good that the international community should promote and protect. They argue that international principles have grown in both these areas, with dynamic developments in international environmental law and sustainable development. As such, they urge, there is a need for the WTO to promote sustainable development and not simply freer trade and economic growth. They fear that freer trade will spark more environmental degradation and more human misery in a “race to the bottom” in standards of both environmental and worker protection (Rodrik 1997; Greider 1997; Brecher and Costello 1994; Chatterjee and Finger 1994; Nader et al. 1993).

Those opposed to the links emphasise that freer trade and economic growth are already complex and difficult issues. Trade issues, such as the resolution of agricultural issues, are more important to the real needs of developing and least-developed countries than taking on issues such as the environment. Moreover, those who focus on trade see a potential pretext for protectionism. They emphasise that the success of the WTO/GATT is linked to the fact that it has focused on trade and trade-related economic issues.

Against this broad backdrop, the discussion of trade-environment issues has proliferated into an increasing number of sub-issues. These range from the discussion on distinguishing between trade measures taken on unilateral or multilateral bases, to developing country concerns over non-compulsory environmental measures such as eco-labelling and the environmental impacts of subsidies used in agriculture and fisheries. Rather than reciting the full range of issues, this paper broadly identifies three different debates that underpin most of these controversies: (i) economic spillovers, competitiveness and protectionism; (ii) unilateralism and compulsion; and (iii) “moral” spillovers.

In some ways, those three broad debates correspond to quite simple questions of why, how and what: why trade and environment questions intersect, how trade measures are at present most often employed for so-called environmental causes, and what it is that we choose to prefer when we debate trade and environment issues.

1. **Economic spillovers, competitiveness and protectionism**

Those concerned with competitiveness see environmental protection as one of the cost factors that affects the overall ability of a country to produce goods at attractive prices compared to other countries. Companies operating in developed and other countries that set higher standards in these areas are put at a cost disadvantage compared to those in countries with lower standards. Many environmentalists fear the “race to the bottom” in which countries participating in the global trade regime may lose their incentive to set higher domestic environmental standards.
There are clear differences in attitude toward the issue between developed and developing countries, partly due to lack of adequate legislation or weak implementation capacity, and partly due to different capacities to absorb and tolerate pollution. Environmental priorities also differ. (5)

Despite the recognition in the Rio Declaration (Principle 11) that one country's standards may be inappropriate for another, some still see lower environmental standards as an "unfair" advantage. Their view is that countries will lower their standards of environmental protection to attract investors which in turn will lead to sweatshops and "pollution havens", much in the same way as tax havens come into being. Competition to lower standards or a "race to the bottom" will then ensue (Brecher and Costello 1994; Chatterjee and Finger 1994; Nader et al. 1993). Although these fears have not been borne out in empirical studies on industrial migration (Revesz 1992; Stewart 1992; Esty 1996), perceptions about a "race to the bottom" remain popular.

If some fear a "race to the bottom", many other countries, especially in the developing world, are more concerned with the spectre of protectionism. There is reason to suspect that where environmental protection is offered as a justification for trade measures, there may well be underlying efforts to protect domestic commerce against imports.

(2) Unilateralism and compulsion
This concern is magnified because in most cases to-date trade measures have been taken by the European Union (EU) and the US, acting unilaterally in defining what they consider to be important environmental objectives. These unilateral measures are then used as a form of pressure or sanction to affect the behaviour of other states by threatening to close access to domestic markets.

Unilateral actions per se are not illegal under international law (Murase 1996). They have, however, been discouraged both in the WTO and in environmental fora such as the Rio Earth Summit (Rio Declaration, Principle 12). As already noted, a number of unilateral measures for environmental protection have been struck down by the WTO as being incompatible with trade rules. The preference for multilateral solutions over unilateral action was strongly reinforced in US-Shrimp/Turtle, the most recent dispute settled by the WTO. Nevertheless, unilateral measures continued, provoking resentment and suspicion amongst many developing countries (Shahin 1999; Tay 1997; Intal 1996).

There are two key factors at play here. First, such measures are seen as a form of compulsion, practised by larger and richer states against developing countries. Second, measures ostensibly taken for environmental protection are suspected to be disguised forms of protectionism.

In this connection, it is notable that existing international environmental regimes and treaties are seen to be lacking in compulsion. Instead, the vast majority of MEAs seek to promote compliance through monitoring and reporting systems, as well as by assisting states in meeting their obligations. For example, in the Montreal Protocol, which regulates the phasing out of ozone-depleting substances, the compliance process is not one of castigation and public blame. Rather, an effort is made to identify the reasons for non-compliance and to provide technical, financial and other resources to allow the state to

(5) In the US, for example, protecting rare wildlife such as the bald eagle and excessive radon levels in homes are among the average person’s most important environmental concerns. In other countries, key environmental issues may be lack of clean water and sanitation.
comply (French 1997). Such efforts and assistance are justified in this and other treaties by the principle of common but differentiated responsibility: while countries share a common responsibility for the global environment, their ability to contribute to discharging those responsibilities differs. States, especially developing ones, have recognised that trade measures can play a part in fostering compliance, alongside measures such as assistance and monitoring (Weiss 1997; Weiss and Jacobson 1998; Chayes and Chayes 1995). It is, however, quite another matter to rely on trade sanctions alone to compel compliance, especially on measures decided unilaterally.

(3) Moral spillovers
Beyond the economic debate of protectionism and competitiveness, environmental issues include elements of individual and shared global morality in the context of nature. A broad range of conservationists insist on the special or even sacred characteristics of nature, for which economics provides at best a surrogate value in evolving concepts and measures such as existence value. Some things, some conservationists insist, are beyond price.

Moreover, they suggest that the evolution of international concerns and legal principles for environmental protection, though a relatively recent phenomenon, have fundamentally altered the concept of development, leading us beyond economic growth to more qualitative notions of sustainable and human development. In terms of environmental concerns, emerging principles of international law have legitimised the intervention of the international community when a nation fails to respect areas of common concern and causes environmental harm that affects another state's territory or the global commons (Sands 1995). This is especially true for issues such as nuclear or other ultra-hazardous waste, or the trade in or affecting endangered species of certain charismatic animals such as the elephant, rhinoceros and tiger.\(^6\)

By and large, developing countries accused of violations do not seek to justify their actions in the name of sovereignty. Rather, their response has been to articulate an alternative moral view that emphasises a lack of equity and also the ineffectiveness of using trade sanctions in resolving such imbalances.

Many argue that trade measures are only a "second-best" response to pollution and other harm. By this they mean that trade in a product is stopped only after the environmental harm has already been inflicted. In addition, they point to how trade sanctions can have secondary impacts on economic development and the provision of basic necessities to countries that are already poor and to impoverished sectors within countries. In contrast, they call for intervention and assistance in the production process which would prevent environmental damage. Only then, they argue, can true environmental protection be ensured.

As such, the common defence against the moral spillover argument is most often not a debate about the morality of nature and conservation. The stronger rebuttal to these concerns is related to the effectiveness of using trade measures to address the moral issue in question (Vaughan and Dehlavi 1998) and, more broadly, whether then lens of morality must be expanded to take other social and human factors into consideration.

\(^6\) The international regime dealing with trade in endangered species is the 1973 Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).
Environment in GATT/WTO

There has been a wide range of suggestions to amend the WTO in response to the controversies surrounding the trade and environment linkages. The process and politics of amendment are, however, highly complex (Reiterer 1996). In any case, before one considers amendments, it is important to first study the existing text of the GATT/WTO agreements, the extent to which they already allow for an integration of social and environmental concerns and how the approach in the WTO system differs from that of other international institutions.

The most-favoured-nation (MFN) concept, which upholds the like treatment of all foreign goods irrespective of origin, is a core principle of GATT. (7) Under MFN treatment, all member countries are placed on an equal footing. (8) The MFN principle is important to developing countries and those without power to press or persuade others. It ensures that developing countries and those with little economic leverage are afforded optimal trading conditions whenever and wherever they are negotiated.

A second key principle is that of national treatment, which requires that equal treatment be given to both foreign and domestic goods and services once the foreign goods are imported. (9) The concept of non-discrimination attempts to prevent the abuse of environmental polices and their disguised use as protectionism measures. It ensures that national environmental protection policies cannot arbitrarily discriminate between foreign- and domestically-made products, or between products imported from different trading partners. Built into the idea of non-discrimination is the requirement that states treat like goods alike. GATT also makes provisions that bar the imposition of restrictions on imports by quantity (quantitative restrictions).

In this regard, GATT is largely a scheme of "negative rules" that emphasise what a state cannot do, rather than positive rules that more fully and explicitly describe what a state should and must do.

General exceptions to GATT obligations are found in Article XX. Other exceptions also exist regarding issues such as anti-dumping, emergency measures, the creation and consistency of regional trade agreements and special preferences for developing countries. We may observe that exceptions to GATT rules (which are few and "negative") outnumber the rules themselves.

Any dispute about whether a country is correctly observing its GATT obligations is referred to a WTO dispute panel which has a quasi-judicial function. Further adjudication can be brought before the Appellate Body. Over time, GATT and WTO panels have achieved a credible reputation. The WTO is armed with perhaps the most comprehensive and potentially effective dispute settlement mechanism in international law. This credibility is, however, limited to the WTO’s area of expertise-trade.

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(7) This is set out in Article I of the General Agreement on Tariffs and Trade (GATT), which is the principal WTO agreement dealing with the rules of trade in goods. It is also specified in Article II of the General Agreement on Trade in Services (GATS) and Article 4 of the Agreement on Trade - Related Aspects of Intellectual Property Rights (TRIPs).

(8) An exception to most-favoured-nation (MFN) treatment is made in certain circumstances such as under regional free-trade agreements or preferential treatment for developing country exports.

(9) Article III of GATT stipulates that once goods have entered a market, they must be treated no less favourably than equivalent domestically-produced goods. Article XVII of GATS sets out a similar principle for services, although its application is more limited. Article 3 of TRIPs also specifies national treatment for intellectual property protection.
The organisation and its predecessor, the GATT secretariat, are not noted for their knowledge and consideration of environmental matters. Yet if a country takes environment-related measures, these steps may be subject to challenge by an affected party in the WTO system, provided that both countries are WTO Members and some prima facie breach of GATT obligations can be argued. If so, the WTO Member is in breach of treaty obligations unless the country can prove that it is acting in accordance with an exception allowed by GATT itself.

Despite the considerable number of exceptions in Article XX, we find no specific mention of the environment or of MEAs. As these have not been amended, those who propose that conservation principles in MEAs should be accepted as exceptions to trade rules have to draw these connections from more general or limited wording.

For the environment, Article XX(b) allows an exception if the measures are "necessary to protect human, animal or plant life or health." Additionally, Article XX(g) allows an exception to be made if the measure relates to the conservation of exhaustible natural resources and has been applied not just to international trade but to domestic production as well. The chapeau of Article XX also contains the requirement that "such measures are not applied in a manner which would constitute a means of arbitrary or unjustifiable discrimination between countries where the same conditions prevail, or a disguised restriction on international trade."

Additionally, the preamble to the WTO treaty states that "sustainable development" is one of the objectives of the WTO. The legal status of this provision is however determinative, given that it is only part of the preamble and not a substantive clause in the text of the treaty itself. If Articles XX(b) and (g) were widely construed, the right to make exceptions to trade rules would not necessarily be limited to the environmental purposes agreed to by the majority of countries. Each country could also decide on its own which environmental objectives it wishes to pursue. However, awarding a wide scope for unilaterally decided standards would seriously undermine the coherence, stability and strength of the international trade regime.

Two other general points should be noted about these attempts to find exceptions within the existing GATT language. First, the chapeau of Article XX is open to different interpretations. Although it states that measures should not be applied arbitrarily or in an unjustifiably discriminatory manner, some have suggested that the WTO must therefore take pains to try to discern genuine environmental concerns from disguised protectionism. In contrast, some have suggested that the WTO can and should give more leeway to sincere attempts by nations to legislate their exceptions in the areas of concern identified by Article XX.

Second, concerns about environmental protection most often relate to production and process methods (PPMs) rather than to the products themselves. For example, there are environmental treaties that severely limit trade in endangered species of flora and fauna and impose conditions on transboundary

(10) Among the newer WTO agreements, the Agreement on Technical Barriers to Trade (TBT) makes specific reference to "environment" in its preamble. In contrast, the Agreement on the Application of Sanitary and Phytosanitary Measures (SPS) follows the wording of GATT Article XX.
trade in hazardous waste. These treaties have been generally accepted, with no challenge in the WTO to date. On the other hand, there is considerable controversy over cases in which it is the PPMs that are considered to be environmentally harmful or in violation of labour standards. At their root, these cases question the traditional trade view of treating “like” goods alike. For example, is a can of tuna caught without any accidental killing of dolphins different from one that is caught with such cost? Or is a football made by the sweat of child labour under poor workplace conditions any different from one that is made by reasonably-paid adults in a proper factory? Those who care for the environment or for labour rights would say they most definitely are. From the perspective of trade rules, however, they are not.

While these arguments can be made about Article XX, they have not to date been successful in complaints brought to the dispute settlement mechanisms of the global trade regime. In all disputes on trade-related environmental measures brought before GATT since the 1980s, the measures in question were found, in part at least, to be discriminatory, trade-restrictive and contrary to GATT obligations (Petersmann 1997; Sands 1995). This trend continued with the first complaint decided by a dispute settlement panel under the WTO, which involved US air pollution control laws that banned oil imports from some South American countries on the grounds that the oil harmed the environment.

More recently, however, the attitude of the WTO in conflict resolution has been more open to environmental concerns. In EC-Asbestos, a decision was made to allow trade restrictions on this material given the strong scientific evidence of harm to human health.

The recent decision in US-Shrimp/Turtle again confirmed the long-standing trend against unilateral measures taken for the sake of the environment. However, the reasoning here is more supportive of environmental protection. The Appellate Body decision is notable for its support for the idea that international law—and not simply trade law—is the context for decision making, and that this can and does include international environmental rules, especially where an MEA evidences widespread acceptance of those environmental concerns.

The Appellate Body upheld the right of states to take trade action to protect the environment. It disallowed the US measures not because of the attempt to protect sea turtles involved trade measures but because the measures discriminated against some states, which were not provided assistance to meet US requirements while others were.

As such, while the result of the dispute may reassure those who favour the promotion of freer trade over environmental concerns, its logic potentially opens up Article XX exceptions to due consideration of environmental concerns in cases where such concerns are supported by evidence of an international consensus on the issue. Such a reading of US-Shrimp/Turtle signals a small shift—if not a stark change—in thinking regarding the connection between trade and the environment. Still, many may be uncomfortable with the case-by-case approach taken by the dispute settlement panels.


In this regard, we must recognise that interpretations of the same GATT text vary from case to case. This applies not only to the outcome of the dispute but to the thinking and approach to interpretation of these clauses. A simplified range of interpretations may be offered, suggesting how "pro-trade" and "pro-environment" views might differ (see Box 1).

**Box 1: Differences in interpretation**

<table>
<thead>
<tr>
<th>Terms/clauses</th>
<th>Pro-trade interpretation</th>
<th>Pro-environment interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;necessary&quot;</td>
<td>Least trade-restrictive</td>
<td>Has positive effects and is reasonable</td>
</tr>
<tr>
<td>&quot;like goods alike&quot;</td>
<td>The good itself</td>
<td>Production and process methods (PPMs)</td>
</tr>
<tr>
<td>Context and laws to be applied</td>
<td>Trade rules</td>
<td>International law and goal of sustainable development</td>
</tr>
<tr>
<td>multilateral environmental agreement (MEA)</td>
<td>Apply trade rules</td>
<td>Acknowledge international consensus</td>
</tr>
</tbody>
</table>

There is increasing agreement among WTO Members about the need to distinguish between measures agreed on a unilateral basis and those supported by MEAs. Those who would uphold MEAs ask that these be accepted on par with trade rules under GATT and as exceptions under Article XX, because they reflect an existing international consensus. Those in favour of trade measures upholding MEAs may still be uncomfortable with the possibility of unilateralism. In this sense, referring back to the earlier discussion of underlying debates, there is a separation between the debate over moral spillovers and concerns of unilateralism and compulsion.

To try and allow for MEAs, there has therefore been a long and wide-ranging discussion about amending GATT articles, especially Article XX, to expressly make MEAs an exception. This would fortify and formalise the points discussed in the US-Shrimp/Turtle appeal. Conceptually, there is no strong opposition to this idea. Differences and difficulties lie in the details of substance and process.

First, substance; which MEAs should be included and on what criteria? There is a division here between those who wish to specifically name a certain number of MEAs that use trade measures, and those who instead want to specify criteria for what is or is not an MEA that qualifies. Those wishing to specify MEAs by name then debate which ones should be named, while those who want to specify criteria then deliberate over which criteria and what thresholds to set. For example, should the criteria for "unilateralism" be 60 countries, 100 countries or more, and must they be from different geographical areas?

Second, by what process should the WTO change its rules? There are debates about the feasibility of amending the GATT text. This requires unanimity, which is difficult to achieve among so many states, and the process may be held hostage to politicking over other issues. Other existing procedures for waivers or an Understanding may have practical effect but cause concern among those who argue that GATT should not be making exceptions for MEAs as it is assumed to be superior, a trump to those
treaties. There are also suggestions that it would only be necessary to issue guidelines to negotiators of MEAs so they can avoid GATT-inconsistent measures.

Thirdly, and related to the first point above, there is increasing debate about categorising MEAs on the basis of the degree to which their provisions relate to trade. Some wish to restrict this to trade measures that are specific treaty obligations (STOs) with clear wording in the operative parts of the MEA, or in agreed protocols, amendments and annexes. Others propose, however, that MEA measures be allowed as exceptions even when measures affecting trade are not specifically called for but are shown to be effective in helping achieve the agreed aims of the MEA. The problem is further complicated because a number of MEAs leave it up to States to take stronger measures if they wish to do so.

Beyond the MEAs debate, even those who may not be overly enamoured of environmental issues share three concerns in the context of the current situation. First, several decisions seem to suggest that even multilateral treaties on the environment must give way to trade rules. Although the appellate decision in US-Shrimp/Turtle is an exception to this trend, there is no guarantee the same thinking will be followed in subsequent disputes. Second, the interpretations made by various Dispute Settlement Body (DSB) panels pre-empt the roles and ability of WTO Members to legislate and reach agreement on this issue. Officials may prefer to reach a political decision rather than being handed decisions based on interpretations of the law. The third and connected concern is that even though there is considerable improvement in procedures, a number of disputes related to trade and the environment have demonstrated deficiencies in the dispute settlement process. These include the role of non-governmental entities which have in some cases been allowed to submit opinions to the dispute panels and appellate bodies.

Three basic deficiencies in the dispute settlement process have emerged in the light of trade and environment disputes. First, panels often employ a narrow and pro-trade interpretation of GATT, especially Article XX. Second, the premises on which decisions are based sometimes appear to be weak; some decisions reveal a lack of expertise and interest in issues other than trade while others have aimed beyond trade law and attempted to enter the realm of more general public international law, which would include environmental and labour concerns. Third, the process by which non-governmental organisations (NGOs) and other interest groups gain access to dispute settlement proceedings has come into question. The WTO charter allows environmental experts to be appointed to sit on panels and permits interested third parties to present their case. In most cases, few of these possibilities have been explored or practised (Lang 1996). Where these provisions have been used to allow NGOs and others to voice their views, the participation of non-state actors has been questioned, especially by developing states.

The narrow trade view of the WTO's mandate has, however, come to be challenged in several ways. There are arguments that seek to situate the GATT/WTO in the context of new and dynamically changing concepts of development, including environment and sustainable development, human rights, human development and human security. In contrast, other international institutions appear to have better embraced sustainable and human development as part of economic development.

Yet ideas in institutions and international settings outside of the WTO cannot easily be squared with the "trade first" emphasis within the WTO. In the concept of sustainable development, international envi-
ronmental law and policy are conjoined with economic activity. This concept forms the basis for such practices as environmental impact assessments, now elaborated and widely used by both national governments and international organisations such as the World Bank. The idea is referred to in opinions of the International Court of Justice (ICJ) as an important concept in international law that states must consider, even if it is not currently considered a part of customary international law (see the Gabčíkovo-Nagymaros Dam Case [Danube Dam Case] and ICJ Advisory Opinion on Nuclear Weapons 1996).

This emphasis is based on principles such as "intragenerational equity", "common but differentiated responsibility" and "the right to development" (Weiss 1998; Sands 1995; Evans 1993). These ideas seek to recognise the interdependence of the world as much as the interrelation between economic and other spheres of life.

These concepts have developed relatively recently and in institutions other than the WTO, largely in the United Nations (UN) and UN-related organs and conferences. Although concessions have been made to these issues in the WTO Charter, they have not been embraced by the WTO. In the Preamble to the Charter, which provides the context for interpreting its text, the connection between trade and sustainable development is emphasised. Ministerial statements from the WTO regularly mention the needs of least-developed countries. However, the WTO remains focused on trade, with little or no connection made between the promotion of freer trade and these larger concepts. There is, as such, a perceptible gap between the breadth of our concepts of development and the narrowness of institutions such as the WTO that promote economic policy. In this regard, discussions on the proposed links between trade and the environment are a debate not only about issues but also about institutions.

The question of institutions

The international community is an anarchic place, with no democracy, equity or world government. In the absence of these qualities and institutions, effective cooperation between sovereign nations is impossible without agreement and difficult even where agreement is reached. The international cooperation and institutions that do exist are fractured by different subjects and responsibilities, functioning with little coordination despite the umbrella of the UN. In a national system or within strong regional regimes such as the European Community, there are institutions of state with universal authority over different subjects, both economic and human or environmental. Lawmakers are entitled to balance one against the other, or the executive or judicial authorities will do so. These institutions have no equivalent in the international system. These characteristics of the international system rank among the fundamental reasons for the controversy about links between trade and environmental protection.

Since its early days, the UN chose to set up specialised agencies to focus on different subjects. This was especially so with the three Bretton Woods institutions, the World Bank, International Monetary Fund and GATT. While this approach has allowed focus and specialisation, it has also divided international economic policy from other aspects of international policy that have developed over time-peace and security concerns, labour rights, human rights and environmental protection. This has placed economic institutions such as the WTO in a quandary when approaching issues beyond their original mandate of trade, such as linking trade with labour rights and environmental protection. There have, as a

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(14) For a comparative study of EC and US law in this area, see Geradin (1977).
result, been many suggestions to amend GATT and even to create new international institutions.

The WTO is not the only international institution that is being questioned. There have been widespread calls for reform of the UN as a whole and, specifically, its organs related to environmental protection. There is no single central entity equivalent to the WTO for environmental protection (French 1995). [15]

This absence has in fact led to calls by some, including the former WTO Secretary-General, Renato Ruggiero, to propose a “world environment organisation” to counterbalance the WTO in the trade-environment debate. While these proposals may seem an ideal solution, others have dismissed them as unrealistic and even harmful to developing countries. There appears to be little political will among states to create more international institutions.

Another result of the division between the WTO and environmental regimes, and the relative “weakness” of the latter, is that some may choose to pursue their disputes in the WTO even when both trade and environmental issues are raised. The recent dispute between the EU and Chile over a ban on the import and transit of swordfish is one such example where parallel cases were pursued in the WTO and the International Tribunal for the Law of the Sea. Some suggest that states will “forum-shop” and select the WTO, where they hope for a pro-trade decision. In this process, some suggest, the WTO would become a kind of constitutional court for the international community (Petersman 1997).

A more useful approach in the shorter term is to suggest ways to foster greater coordination among existing institutions. Others suggest focusing on the WTO but ask that its rules be amended and its mandate enlarged to cover both trade and social concerns. There is merit in distinguishing between suggestions for change in the WTO that require formal amendment and others that relate only to the present practice or culture and habits (Sampson 1999). In the latter case, a framework already exists for moves towards integrating trade with social concerns. Its steps include:

- Greater transparency and timely public access to WTO documents;
- Policy discussions with civil society, especially NGOs and other groups working on social concerns; [16]
- Allowing access and participation of NGOs and experts in the dispute settlement process (Lang 1996);
- Increasing dialogue and cooperation between the WTO and international environmental bodies, such as the secretariats of MEAs and the UNEP; and
- Increasing coordination between economic and trade agencies and their environmental counterparts at the national level.

(15) Daniel Esty (1994) proposes a global environmental organisation on par with the WTO; and Secretary-General Ruggiero’s opening remarks at the High-Level Symposium on Trade and the Environment, in Geneva on 15 March 1999, also called for such an institution. The UN Environment Programme is not a central body, either in mandate or in resources. The Commission on Sustainable Development, created at the 1992 UN Conference on Environment and Development, has the mandate of reviewing actions taken in different spheres, but does not have powers to supervise or correct them.

(16) Pursuant to Article V:2 of the Marrakesh Agreement Establishing the World Trade Organization, the General Council in mid-1986 adopted guidelines for arrangements on relations with NGOs. For a general discussion of NGOs in the WTO, see Charnovitz (1996) and Esty (1999).
By such means, coordination between trade and social policies might be increased. (17) This would better achieve the first-best solution of reconciling differing concerns at the level of the production of goods rather than their trade. Similarly, cooperation between different institutions would be increased, allowing for better understanding. This could be done both at the international level and within national governments.

There is also a need for greater assistance and mediation on social concerns outside the WTO, especially with regard to assistance and resources to comply with environmental obligations. The WTO may face several limitations as an institution in dealing directly with these issues. First, it lacks expertise, will and culture. Second, there is scepticism about the WTO among some developing countries, which feel it represents certain Northern interests in promoting freer trade. Third, the prospect of discussions in the WTO appears threatening, as it could lead to new rules that may bind. Fourth, and perhaps most important, the WTO has no strong mechanism or principles of assistance. (18)

As such, efforts to deal with contentious issues of social concern may be better received and more effectively implemented in other institutions and processes. What the WTO must then do is to be open to greater exchange, improved access and better coordination with these different institutions and processes.

The above recommendations should be seen as achievable and effective in the short to medium term. A more positive context for coordination and cooperation in the longer run may be tentatively sketched as follows (Runnals 1996; Tay 1997):

- Accept the equality of MEAs and trade rules, and work towards their congruence. In contrast, unilateral measures should be avoided.
- Emphasise international assistance for human and sustainable development. In contrast, economic growth and unsustainable, “opulent development” should be eschewed.
- Recognise that efforts at the state level must be emphasised for a first-best reconciliation of trade and social concerns in the production and manufacture of goods. Such a reconciliation should be demonstrated both in policies and in different institutions of state.
- Emphasise cooperation and assistance in compliance with environmental obligations. This is especially important for developing countries and for vulnerable sectors (for example, small- and medium-sized enterprises).
- Avoid trade sanctions and measures to restrict or prohibit market access.
- Recognise the appropriate role of specialised fora on the environment, and increase their dialogue and coordination with the WTO. In contrast, proposals for wide-scale amendment to the GATT/WTO or the creation of new international institutions should be put to one side, at least in the short to medium term.

The WTO has taken steps to address some of these issues. For example, on the issue of transparency and access, WTO documents have become much more accessible to academics and the public in recent

(17) The WTO has of late come to recognise these needs and to take steps to meet them. For instance, the CIE has invited UNEP and selected MEA secretariats on an ad-hoc, informal basis to participate in certain parts of its special sessions. A number of symposia with NGOs have also been held since 1994.

(18) The general preference for developing countries is at best a vestigial principle in the WTO. There have been some calls for assistance to least developed countries in the WTO, but these have focused on technical assistance and training for trade matters and trade facilitation rather than broader developmental assistance and resource transfers.
years. The Internet as well as the interest of NGOs, such as the International Centre for Trade and Sustainable Development, in following the WTO process have contributed to this improvement. More can and should be done, however. Changing the WTO’s approach would help create a more positive context for the WTO and the international community as a whole to deal with the intersections between trade and social concerns over the environment and labour rights, and foster better coordination and cooperation. Clearly, however, there will still be a demand for more concrete actions.

**Sketching a potential positive agenda**

Given the controversies and polarities that this paper has sketched, it is no surprise that the proposed agendas for the WTO to move forward on these issues have varied widely, according to the predisposition of different writers toward the issues themselves as well as the WTO. The proposed agendas have also changed somewhat over time. This is not because past agendas have been successfully achieved, but rather because an impasse was reached on certain issues. Where items on the agenda were thought too difficult to implement immediately, others were tabled for consideration. Proposals on the trade-environment agenda are particularly prolific. This is likely a reflection of the ability of the CTE to generate discussion even if its work has not thus far yielded a consensus on what should be done.

The variety of proposals on the trade-environment debate can be analysed in broad categories of North and South. This allows us to see the different priorities that each gives to different strands of the debate.

MEAs. Many developed countries seek reconciliation between existing and potential MEAs and trade rules. This can take place by means of an express amendment to GATT articles, especially Article XX, or through countries negotiating and making an express Understanding of the scope of existing articles. Developing countries for their part tend to support MEAs over the use of unilateral measures. They are, however, suspicious of attempts to amend Article XX for fear that environmental protection might be used as a basis for trade protectionism. There is also considerable debate over the criteria for deciding which MEAs should be granted exceptions to trade rules. (20)

Eco-labelling. Many developed countries wish to ensure that trade rules will accommodate the use of trade measures based on non-product-related PPMs on environmental grounds, especially eco-labelling. Developing countries complain, however, that such trade measures and eco-labels vary considerably from country to country and change from time to time. The scientific basis for their criteria is often also questionable. Information and the management of information is a key problem. Harmonisation of standards is one recommendation. Countries like China and Singapore have taken the alternative path of starting their own eco-labels, although acceptance of these labels remains to be seen.

The precautionary principle. A number of developed countries emphasise that trade rules should be construed in light of the precautionary principle. This principle is drawn from international environmental lawmaking and suggests that certain actions to protect the environment are justified even where science has not yet established that environmental harm will definitely result. Using the principle in construing trade rules can be predicted to have considerable impact on what environmental measures are

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(19) An Understanding would be an authoritative statement by WTO Members and could be referred to in disputes between Members brought before the WTO dispute panels. An Understanding is non-binding by nature.

(20) While everyone agrees that MEAs, to be recognised by the WTO, must enjoy an “international consensus”, there is no agreement on the specific benchmarks that would constitute such a consensus.
thought. "necessary". Many developing countries would argue that the precautionary principle is an established international norm, binding on all parties, on par with GATT rules. They emphasise, moreover, that the very general nature of the precautionary principle would make it impossible to determine precisely which measures are permissible. In this regard, the cost of measures and the value attached in protecting against environmental harm may vary from country to country.

Mainstreaming. In addition, developed countries have begun to call for environmental issues to be "mainstreamed" in the WTO. (21) Mainstreaming envisages that trade-environment issues should be considered not only in the CTE, which currently carries this mandate, but in all the different areas of WTO/GATT activity and agreement. Most developing countries have resisted the idea of mainstreaming as it would complicate negotiations across sectors and widen a debate over which they continue to have reservations (Jha and Vossenaaar 1999).

For their part, developing countries are also beginning to evolve a "positive" agenda. (22) The issues on this agenda have been quite different and separate from those of the developed countries, as reviewed above. The issues that developing countries typically raise are:

Domestically prohibited goods (DPGs). The complaint is that while developed countries decry environmental impacts of trade, they themselves are free to export goods to developing countries that have been banned under their own national laws. Developing countries have to date won some commitment from developed countries to give notification of such DPGs. It is not clear, however, how widely this commitment is practised and where this issue can go in the future.

Trade-related intellectual property rights. The connections between the Agreement on Trade-Related Intellectual Property Rights (TRIPs) and the environment are manifold. One aspect relates to the compatibility between trade rules, the Convention on Biological Diversity (CBD) and the Cartagena Protocol on Biosafety. Another, broader concern is the impact of TRIPs on biodiversity conservation. A third concern relates to the sharing of benefits from the exploitation of biological resources, particularly genetic resources. Broadly speaking, the CBD proposes the need for benefits to be shared between countries that have these resources (mainly in the developing world) and companies with the knowledge and technology to develop and exploit them (mainly from developed countries). In contrast, a concern with TRIPS is that it tends to legitimise the idea of the commercial enterprise as the sole owner of the property that arises from such development.

Market access. Preferential market access and trade preferences are of critical importance for many developing countries, and especially so for the least developed. The overriding concern in terms of environmental standards (and indeed labour rights) is that they might provide a pretext for limiting such access or ending trade preferences. The question of market access is, however, broader than this and can provide possibilities for progress on trade-environment issues. On the issue of subsidies for fishing, for example, the suggestion is that cutting subsidies creates a "win-win" solution for both environmentalists and developing countries. This is because subsidies promote unsustainable practices that are

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(21) The European Union proposed mainstreaming in its official communication to the High-Level Trade and Environment Meeting, WT/L/273, July 1998. The US did not use the term mainstreaming, but has called for the CTE to systematically review different areas of the WTO (WTO 1999).

(22) The positive trade agenda of developing countries was initiated by the Secretary-General of the UN Conference on Trade and Development (UNCTAD), Rubens Ricupero. This followed the 1996 WTO meeting in Singapore.
damaging to the environment and also distort market access for developing countries. A similar argument can be made for subsidies for agriculture.

Of the seven proposals reviewed, two have enjoyed a growing consensus for some time: MEAs and market access. For MEAs, the Biosafety Protocol to the CBD demonstrates the need for resolution between trade rules and environmental policy. There is agreement that something needs to be done, but debate will continue on what exactly and how. One potential bridge between these differences is an Understanding on MEAs.

An Understanding would be an authoritative statement by WTO members and could be referred to in disputes between Members brought before WTO dispute panels. An Understanding is non-binding by nature and falls short of an amendment in this regard but secures some of the same benefits. Moreover, it does so without the difficulty of formal consent by all Parties. Some in the environmental community have tended not to prefer the Understanding approach because they think it subordinates environmental concerns to legally-binding trade rules. In the run-up to the Singapore Ministerial meeting, earlier proposals for an Understanding on MEAs were submitted by Norway and Japan but did not achieve consensus.

It is possible, however, that some developing countries may be willing to consider an Understanding as a compromise that is sufficient to meet the genuine needs for reconciliation between WTO and MEA rules, without opening up the difficulties and potential dangers in amending the GATT text.

The second possibility for some progress is to deal with market access issues and cut subsidies. This option is increasingly endorsed and aired by a variety of academics, NGOs and governments as a possible way forward for the trade-environment debate. It is attractive as a "win-win" formula, good for both the environment and for the economic rationality and benefit of free trade. It is also justifiable in that these areas have been held outside the ambit of the WTO for too long as increasingly obvious exceptions to general principles. (23)

Potentially, the issue of subsidies could create an alliance between environmentalists and developing country exporters. For agriculture, the US and the Cairns Group, led by Australia, would also likely be in favour of reducing or indeed ending subsidies. So too has the G-20/22 bloc emerged strongly in Cancun. However, Japan and the EU continue to argue for the need to continue such subsidies. There has also been some concern about the impact on small-scale farmers if subsidies are removed. (24) It is clear in this regard that the subsidies issue generates its own debate and controversies. Thus, while proceeding on this issue may unify different sides of the trade-environment debate, it is less clear whether there can indeed be progress on the issue.

The agreement reached at Doha includes negotiations on MEAs, reductions in tariffs on environmental goods and information exchanges with the Secretariats of MEAs (WTO 2001). In addition, it includes a request for the CTE to assess the effect of environmental measures on market access and examine situations in which the elimination or reduction of trade restrictions would benefit trade, the environment and development. Clearly, this agenda contains issues of interest to both North and South as well as

(23) On fishing subsidies, see Schorr (1999, note 6).
(24) This is based on the assumption that small farmers benefit from subsidies. There is a contrary suggestion that the main beneficiaries are large-scale agricultural businesses.
the potential to make significant progress in this area, although not without the potential for controversy.

The discussion emphasises how increasingly complex and interwoven WTO issues are becoming, not just in the context of trade-environment issues but also their intersections with other areas of WTO concern. The connections between trade-environment issues and agriculture, a pivotal issue in the failed Cancun meeting, are both complex and particularly important given the differences between Japan/Europe and the USA on the one hand and the G-20/22 on the other. It may therefore be necessary to re- emphasise the importance not so much of an agenda for immediate action because of a lack of consensus but of exchange, cooperation and equality. Only then might governments begin to develop a context and foundation for future agreement.

Conclusion

The controversies amongst different nations over environmental protection are likely to continue and indeed grow. Tensions between North and South over these issues remain high. Recent incidents and disputes, such as the US-Shrimp/Turtle, have polarised discussion further.

In approaching new issues, the initial reaction of many individuals and institutions is to avoid changes in paradigms. This is wholly understandable as the saying goes, “if it ain’t broke, don’t fix it”. This is especially so for the WTO, which many have judged a success in its field of focus.

On the other hand, events leading up to Seattle showed that there are those who embrace change and see the need for vast and dramatic changes to the WTO and other international institutions. The failure at Cancun too suggests that the Doha Round will struggle unless agriculture and other issues that divide developed and developing countries, and the developed world itself, can be bridged. The thinking behind these calls is that something is broken. Those who make the call for sweeping change share this view even if what precisely is broken and what the remedy might be remain debatable.

Many are making these calls and many are opposed to them. Countless agendas and counter-agendas have arisen and more will no doubt be floated. This has created an impasse on environmental issues. There are no easy solutions. This paper sketches a desirable context for bringing different states together on issues. It does not pretend to have a “magic bullet” solution, but there may be starting points for broader agreement. For any agreement to be reached, it must be seen that the WTO does not stand in isolation. It stands within a wider international community that has other dynamic concerns outside trade, such as protection of the environment. The WTO was created in the Uruguay Round to handle many new issues outside the traditional purview of trade in goods. In many instances, it did not take on these new areas in their entirety but, as with investment policy and intellectual property rights, strived to find and deal with the nexus of these issues with trade.

There is good reason to negotiate a similar approach to environmental protection, and there are reasonable ways to go about it. It is wrong to call for the WTO to become an environmental organisation. But it would be equally wrong to ignore the legitimate economic, social and political imperatives that call for improved dialogue, better coordination and mutually supportive policies and institutions in the international community. A new context for improved coordination and exchange is therefore needed. This is necessary before (and for) deciding any agreed agenda. Such a context can and should be the foundation for progress on these issues.
The limited negotiating agenda on trade and the environment developed at Doha may prove to be the starting point for progress on trade and environment issues in the WTO. The issues identified for negotiation, particularly the relationship between MEAs and WTO rules, must be dealt with either through explicit rule-making or by dispute settlement. As Barfield (2001) has argued, it is probably better that this be done explicitly. Further study on issues such as TRIPs and eco-labelling also appears to be an urgent need.

The failure of the WTO at Cancun is being attributed to a number of different but linked factors. Perhaps chief amongst these has been the issue of agriculture and the G-20/22 position regarding market access under WTO disciplines in this area. Some may therefore argue that trade and environment issues can and should be left to one side for the present and even permanently.

Another view, however, is that the short but controversial history of the WTO shows that trade-environment issues are perennial and perhaps growing controversies that need to be systemically addressed. This will require efforts both inside the WTO and in other appropriate international institutions. It will also require the participation and joining of issues by both developed and developing countries. The promise of freer trade is, after all, that there can and should be benefits for all. The principle of special and differentiated treatment of developing countries has been part of GATT and the WTO, and should be revived in the current Doha “development” Round. Protection of the environment has come to a similar position with the principles of cooperation, assistance, equity and “common but differentiated responsibilities” on environment issues between rich and poor. Divisions on trade-environment issues therefore stand to be bridged not in terms of the sanctions and market restrictions that have marked so many of the controversies to date. A new compact based on cooperation and assistance between developing and developed countries must instead be reached on these issues.

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Prospects for Trade, Environment and Sustainable Development in China

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As economic globalisation intensifies, international trade today plays an increasing role in pushing forward economic growth, at the same time giving rise to global environmental problems. Protecting the environment and expanding trade are two important and closely related aspects of social and economic development. From the trade perspective, rapid trade growth can provide impetus to the cause of environmental protection. From the environmental protection perspective, strengthening environmental management will bring tremendous trade opportunities for environmentally sound products. Under certain conditions, however, trade and environment may also contradict each other. On the one hand, environmental protection puts forward new requirements for trade development while environmental laws and regulations restrict or even prohibit international trade in many products. On the other hand, if sustainable development is not taken as its basis, excessive growth of foreign trade will cause significant negative impacts on the ecological environment.

Development of China’s foreign trade
Since the reforms and opening up of the 1980s, China’s national economy has experienced rapid growth. In 2000, the country fulfilled its goal of doubling its 1980 gross domestic product (GDP) ahead of plan. In 2002, China’s GDP reached 10.2398 trillion Yuan, representing an annual growth of 8%. As its domestic economy expands, China has also made huge progress in imports and exports. In 1970, import and export volume in the country stood at only US $4.59 billion. This figure rose to US $20.64 billion in 1978. During the Ninth Five-Year Period, China’s import and export volume increased from US $280.8 billion to US $474.3 billion, up 1.68 times and representing an annual growth of 11%. In 2002, total imports and exports reached US $620.7 billion, up 21.8% over the previous year. This raised China’s ranking in the world trade list to 5th place from 11th in 1995. (1)
Since the reforms and opening up of the economy, China’s foreign trade has grown faster than its GDP. The growth ratio between total imports and exports and GDP has stayed between 26% and 43% since the 1990s. Foreign trade is now a major component of China’s national economy. (2)

In the past, China was for the most part an exporter of agricultural products and raw materials. Primary product exports accounted for 50% of the country’s total exports. Entering the 1980s, exports of finished industrial products for the first time accounted for over half of China’s total exports, reaching 51.8%. This figure has grown ever since, reaching 77.5% in 1991. By 1997, the Chinese economy had grown to new heights. This was reflected in the fact that finished industrial products accounted for 86.9% of China’s total exports that year, while primary product exports fell to 13.1%. In 2001, the latter dropped further to 9.9% with machinery and electrical equipment heading the list of exports in terms of value. At the same time, the added value of exported products also grew significantly. Since

then, China’s export product structure has continued to improve while the range of exported products has also been expanding. (3)

The purpose of import trade is to meet both the day-to-day needs of the people and the requirements of economic development. Imports are affected by the development of domestic industry. In the early 1980s, food accounted for a majority of China’s imports. In 1982, primary product imports accounted for 39.7% of China’s total imports. In the middle and late 1980s, the urban industrial system underwent reform following similar reforms in China’s rural economy. Industrialisation and urbanisation have since picked up pace, leading to rising imports of finished industrial products. In 1985, China imported US $36.963 billion worth of finished industrial products, which accounted for 87.48% of its total imports. In 2001, the figure reached US $197.840 billion, accounting for 81.21% of total imports.

Trade and environmental policies, laws and regulations in China
With the establishment of the Ninth Five-Year Plan and the development goals for 2010, China has proposed two fundamental changes that it sees as necessary for realising its primary objectives. Both are of overall significance. One is to change China’s economic system from a traditional planned economy to a socialist market economy. The other is that the mode of economic growth should switch from extensive to intensive. As an important part of the national economy, foreign trade must also adapt to economic development needs under the new situation and follow a path of intensive and cost-effective growth.

Foreign trade policies, laws and regulations
China’s basic guidelines and philosophy in drawing up foreign trade policies, laws and regulations are: equality and mutual benefit; encouraging exports; quality first; actively, rationally and effectively absorbing and utilising foreign investment; and expanding the breadth and depth of opening up to the outside world. (4)

Currently, China has established a foreign trade law system with the Constitution of the People’s Republic of China as the basis and the Foreign Trade Law of the People’s Republic of China as the principal instrument. Other major legislation involving foreign trade includes more than 20 laws and related regulations. These include:

- Law of the People’s Republic of China on Contracts Involving Foreign Economic Activities;
- Law of the People’s Republic of China on Sino-Foreign Joint Ventures;
- Law of the People’s Republic of China on Sino-Foreign Cooperative Enterprises;
- Law of the People’s Republic of China on Foreign-Funded Enterprises and Income Tax for Foreign Enterprises;
- Customs Law of the People’s Republic of China;
- Law of the People’s Republic of China on the Inspection of Import and Export Commodities; and

China’s major foreign trade policies and measures at present include quota, permit and import administration policies; value-added tax and export rebate policies; foreign trade management examination and approval policies; foreign exchange system policies; and customs policies.

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(3) Data from China Statistical Yearbook and customs statistics for the years concerned; see footnote 1.
To adapt to the new situation following China’s accession to the World Trade Organization (WTO), the National People’s Congress and Chinese government have sped up efforts to bring related laws and regulations in line with WTO rules. In the area of foreign trade, a series of laws and regulations have been revised and supplementary regulations to the Foreign Trade Law have been issued. These include the Anti-Dumping Regulations, Anti-Subsidy Regulations, Regulations Governing Safeguard Measures, Regulations Governing Administration of Import and Export of Goods, and Regulations Governing Technology Import and Export.

Environmental policies, laws and regulations

Environmental protection is one of China’s basic national policies. While strengthening environmental protection, the country has also formulated a whole set of environmental protection policies, laws and regulations and established supplementary administrative mechanisms.\(^5\)

The basic principles for environmental protection policies, laws and regulations in China are: coordinated economic development and environmental protection; equal importance given to pollution prevention and control and ecological protection; comprehensive prevention and control, with the emphasis on prevention; developers must protect; and polluters must control.

China’s current system of environmental laws and regulations is based on the Constitution of the People’s Republic of China. China has issued a number of special environmental protection laws and natural resource conservation laws, including the Law on Prevention and Control of Water Pollution, Law on Prevention and Control of Atmospheric Pollution, Law on Prevention and Control of Environmental Pollution by Solid Waste, Marine Environment Protection Law, Law on Prevention of Pollution From Environmental Noise, Forest Law, Grassland Law, Fisheries Law, Mineral Resources Law, Land Administration Law, Water Law, Law on the Protection of Wild Animals, Soil and Water Conservation Law, and Agricultural Law. In addition, China has also formulated over 30 administrative regulations and more than 600 local regulations related to environmental protection.

Environmental standards are a key component of the environmental legal and regulatory system, which includes environmental quality standards, pollutant discharge standards, environmental benchmark standards, specimen standards and method standards. Environmental quality standards and pollutant discharge standards are divided into national standards and local standards. So far, China has issued over 400 national environmental standards.

Based on China’s basic environmental protection principles, the country has gradually formed a series of effective environmental administration systems with Chinese characteristics. These include the environmental impact assessment system, ‘Three Concurrency’ system, pollutant discharge fee system, environmental protection target responsibility system, quantitative assessment system for integrated rectification of urban environment, pollutant discharge verification system, centralised pollution control system, system of pollution control within a set time limit, system of elimination of backward techniques and equipment within a set time limit, system of deputised administrative execution of dangerous waste disposal, and total pollutant discharge control system.

International rules affecting trade and the environment

International environmental protection conventions

In joint efforts to protect the global environment, many countries have signed a number of bilateral and multilateral environmental agreements after hard negotiations. Of the 200 or so multilateral environmental agreements, more than 20 contain trade clauses, using trade measures as a means to achieve protection goals. These provisions have produced varying impacts on international trade. Examples of such conventions include the Convention on International Trade in Endangered Species of Wild Fauna and Flora, Vienna Convention for the Protection of the Ozone Layer, Montreal Protocol on Substances that Deplete the Ozone Layer, Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, Convention on Biological Diversity, United Nations Framework Convention on Climate Change, Kyoto Protocol, Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade, Cartagena Protocol on Biosafety, and the Stockholm Convention on Persistent Organic Pollutants. \(^6\)

Relevant provisions of the WTO

The basic tenet of the WTO is to promote free trade. Its basic principles are non-discrimination, market access and fair trade. All multilateral agreements under the WTO are rules that all Members must comply with. However, the level of social and economic development varies greatly from country to country. To take into consideration the different interests of its Members, the WTO has made certain provisions for exceptions. In the areas of trade in goods and services, 10 and six general exception measures, respectively, have been stipulated. Environment-related measures include those essential for protecting human, animal and plant life or health, and measures for protecting exhaustible natural resources. The Agreement on Technical Barriers to Trade and the Agreement on the Application of Sanitary and Phytosanitary Measures, adopted during the Uruguay Round, contain specific provisions allowing Members to adopt technical and sanitary measures to protect human, animal and plant life or health as well as the environment. The Agreement on Technical Barriers to Trade has a wide scope, involving almost all industries. Except for the application of sanitary and phytosanitary measures in fields related to food safety, and animal and plant sanitation, all technical regulations, standards and conformity evaluation procedures for all other products are subject to the jurisdiction of this Agreement. In addition, there are also environment-related clauses in the Agreement on Agriculture, Agreement on Trade-Related Investment Measures, Agreement on Rules of Origin, Agreement on Subsidy and Countervailing Measures, Agreement on Trade-Related Aspects of Intellectual Property Rights and General Agreement on Trade in Services.

Environmental administration laws and regulations, standards and voluntary environmental measures in various countries

Environmental laws, regulations, standards, sanitary and quarantine measures, and voluntary environmental measures in various countries, particularly developed countries, have important impacts on international trade. Introducing environmental protection rules in international trade can play an active role in protecting the global environment. It also promotes the development of new trading areas, including markets for green products, clean production technology, environmental protection technology and equipment, and environmental protection services. However, a growing number of environmental standards for products, and particularly environmental requirements for production processes and methods, are creating more and more restrictions on market access, affecting international trade in goods.

and services.

Environmental laws and regulations related to trade introduced by China's major trade partners are aimed at pollution prevention and control; noise pollution prevention and control; chemicals management; pesticide management; prevention and control of pollution by waste; and conservation of natural resources, animals and plants. In addition, some countries have also issued special environmental laws and regulations related to trade. For example, the United States (US) has performance standards, under the Electronic Product Radiation Control Provisions of the Federal Food, Drug, and Cosmetic Act, for imported electronic products including televisions; and the National Appliance Energy Conservation Act for certain household electrical appliances. In addition, the US has also enacted laws related to consumer safety, including the Federal Flammable Fabrics Act; Food, Drug and Cosmetic Act; Import Milk Act; and Public Health Service Act. In January 2003, the European Union (EU) adopted a directive on waste electrical and electronic equipment (2002/96/EC) and a directive to restrict the use of hazardous substances in electrical and electronic equipment (2002/95/EC). Both will have a major influence on the access of foreign electronic and electric equipment to EU markets.

Environmental standards are the specific embodiment of environmental laws and regulations, forming the yardstick and basis for law enforcement. Laws and regulations are inseparable from standards. In foreign countries, new environmental standards and requirements for products are being set on a regular basis. Because of different levels of productivity, various countries have remarkably different environmental standards. Environmental standards in developed countries are generally higher than those in developing countries and their scope, too, is wider. To meet the environmental standards of developed countries, developing countries must improve the technology used in their products and strengthen environmental management. This will result in an increase in costs and a decline in competitiveness.

The main voluntary environmental measures include the ISO14000 standard developed by the International Organization for Standardization, eco-labels, clean production programmes, life-cycle analysis, and Hazard Analysis and Critical Control Point (HACCP) monitoring. These measures essentially involve production processes and methods. Many developed countries are now making ecological and environmental protection a reason for imposing production process and method requirements on the entry of imported products to their markets. For many developing countries, environmental management of the production process is a relatively weak area, making it difficult for them to meet requirements set by developed countries. Because of their impact on market access, production processes and methods have received wide attention from the international trading community.

Packaging is an inseparable part of international commodity trade, playing a vital role in protecting commodities, facilitating storage and transportation, promoting sales, and allowing for convenient consumption. In their production, transportation, storage, use and consumption, however, packaged products are likely to negatively impact the environment. Packaged waste, in particular, can pollute the environment. Many countries and particularly developed countries have issued various laws and regulations regarding packaging, such as those for packaging and packaged waste in the EU, quantity reduction and disposal of packaged waste in Germany, anti-toxic packaging regulations and new anti-pol-

lution provisions for packaging of retail drugs in the US, toy safety in Canada and new packaging guidelines in Japan. These countries have set requirements for special treatment of packaging materials produced from certain natural substances. They also require sanitary and quarantine measures to prevent the entry of plant and animal pests.

Trade/environment issues worth attention

Green barriers to trade

Green barriers are one form of technical barriers to trade. They refer to the means or measures adopted by importing countries to set direct or indirect restrictions over, or even ban, trade in products from foreign countries on the grounds of protecting human, animal or plant life or health as well as the environment. A relatively recent development, the emergence of green barriers reflects the attention paid to environmental issues in international trade. Some countries have used environmental protection as a pretext to realise their trade-protection objectives. This is manifested in the following examples:

- In breach of the free-trade principle of the General Agreement on Tariffs and Trade (GATT), some countries set higher requirements for imported commodities than for their own products;
- Some importing countries unilaterally issue environmental protection laws, regulations and technical standards contrary to related international conventions or trade agreements, creating unnecessary barriers to international trade.

Whether to protect the environment or trade, green barriers hamper the import of products that fail to meet the set environmental requirements.

Green barriers have several characteristics. One is their wide scope. Green barriers involve almost all products, including primary products, agricultural produce, food, industrial products, intermediary products and finished goods. The second is their relativity and limited time of validity. Green barriers are normally only valid for a certain period. After exporters adopt improvement measures and their products meet the requirements of the importing country, green barriers no longer apply. The third is the difficulty in determining the basis for such measures. Green barriers are implemented to protect the environment and human, animal and plant health, or to protect the market. Even when the second objective is targeted, protecting the environment or human, animal and plant health is still cited as the reason for such barriers. This makes it hard to distinguish between the rational and discriminatory aspects of green barriers. A fourth characteristic of green barriers is their role in promoting technological progress. Strict environmental standards and environmental requirements lie at the heart of green barriers, and progress in science and technology is the key to breaking down such barriers. Sometimes, industrial restructuring is also needed. As such, green barriers may play a role in promoting technological progress.

Process and production methods (PPM)

The PPM issue is a highly complicated one. Before entering a market, all products must pass through technical processes and production methods. Depending on their impact on products, PPMs may or may not be related to the performance of end products. According to the WTO’s non-discrimination principle and its provisions regarding most-favoured-nation and national treatment, no like product from any country should be treated differently by importing countries. The WTO has provided no definition of what constitutes like products, and they are normally determined according to product use, performance and features, including product substitutability. Provided that PPMs do not affect product use or performance, goods made by using different PPMs should not be treated differently. Still, a number of PPM-based trade disputes have come to the fore. One example is the 1991 dispute in which the US
banned the import of tuna and its finished products from Mexico on the grounds that Mexican fishing methods endangered sea dolphins. (8)

Different PPMs will have different effects on the environment. From the environmental protection perspective, PPMs causing no unfavourable environmental impact should be encouraged. However, adopting differentiated trade measures based on PPMs will result in many problems and disputes in international trade, particularly between developed and developing countries, where production technology and environmental management levels differ. If developed country standards are used to frame PPM requirements for products imported from developing countries, market access for the latter will become increasingly difficult. Trade protectionism can also take advantage of the PPM issue.

In addition, PPMs may have different effects depending on the conditions and development priorities in different countries. At times, complicated cross-border environmental issues may also be involved. All this confounds the problem.

Impacts of foreign environmental measures on China’s foreign trade

In terms of trade revenues, China’s major trading partner countries and regions in 2002 were, in descending order, Japan, the US, the EU, Hong Kong, the Association of South East Asian Nations (ASEAN), Taiwan Province, Russia, Australia and Canada. Its major export markets were the US, Hong Kong, Japan, the EU, ASEAN, South Korea, Taiwan Province, Australia, Canada and Russia. (9)

Most of China’s trade partners are developed countries and regions, and China’s export trade in particular is affected by the environmental and trade measures in these countries and regions. The impact of international environmental protection agreements is mainly felt in the fields of the issues they are intended to govern, and the products and industries affected are relatively concentrated in those fields. In the context of China’s foreign trade, the influence of relevant WTO measures is reflected most in the country’s trade relations with its major trading partners. Compared to developed countries, environmental management levels and environmental requirements for production are lower in China. As far as the environmental protection standards for many commodities are concerned, there is a definite gap between the two. The failure of China’s environmental standards to meet the requirements of importing countries is now clearly hampering the export of some of its commodities.

Taking agricultural products and food as an example, only 62 pesticides are covered by China’s standards for maximum residues in food. Japan, meanwhile, has provisions for 96 pesticides, the US for 115 and Canada for 87. Many developed countries have also provided for different maximum pesticide residues in different types of food. For example, Japan has standards for maximum residues in rice for 52 pesticides. Meanwhile, the US has provisions for residues in pome fruits for 128 pesticides, and for maximum residues in stalk, chaff and forage for 123 pesticides. Germany has determined the standard for residues in vegetables and fruits for 168 pesticides. In contrast, China has yet to develop sound provisions for maximum residues of different pesticides in different types of food.

Meanwhile, major environmental protection laws and regulations that significantly influence trade in

(8) See footnote 6.
(9) See footnote 1.
machinery and electronic equipment include those on energy conservation and on preventing and controlling air pollution, noise pollution and electromagnetic pollution. Environmental protection laws and regulations in Europe, the US and Japan have caused considerable restriction on China’s export of machinery and electronic equipment. For example, a 2002 EU Directive banning the use of azo dyes in certain consumer goods, and the internationally accepted Oeko-Tex100 textile certification labels have put pressure on China’s production and export of textiles, dye, paint and clothing. The EU, Japan and the US have set a number of technical barriers to products from China. Sometimes these barriers are discriminatory and carry a strong trade-protectionism flavour.

One survey conducted by the Ministry of Commerce shows that foreign technical barriers to trade are exerting a growing influence on China’s exports. In 2002, over 71% of China’s export enterprises met with varying restrictions from foreign technical barriers to trade. Some 39% of its exported products were affected in varying degrees, causing losses of over US $17 billion, equivalent to 5.2% of China’s total exports during the entire year. In 2002, the respective figures were 66%, 25% and US $11 billion. [10]

Standards that are based on environmental and technological conditions or are related to production processes in exporting countries normally mean increased costs for producers in developing countries. The higher the technical requirements and standards, the higher the cost. All such expenses are bound to affect the competitiveness of the export products of many enterprises. In this scenario, China’s product export market is likely to shrink if its enterprises cannot meet the environmental management requirements of importing countries.

Strict environmental management measures in developed countries may, however, also provide opportunities for China to expand its foreign trade. China takes sustainable development as the basis for its social and economic development strategy. This requires the country to change from the traditional extensive growth model to an intensive model, improve resource utilisation efficiency, reduce energy consumption and strengthen ecological and environmental protection. In a positive sense, therefore, strict environmental management requirements will provoke export-related enterprises in China to strengthen environmental management and adopt new technologies and processes to lower energy and raw material consumption, develop green products and enhance the competitiveness of their products. This would help overcome green barriers and, at the same time, aid efforts to meet the requirements of China’s own sustainable development strategy.

To adapt to environmental management requirements in international trade, the concerned administrative authorities in China have adopted a series of measures. These including implementing ISO14000, undertaking eco-label certification, promoting clean production techniques, developing green products, establishing green packaging systems, and strengthening the inspection and quarantine of import and export commodities. China began implementing an ISO14000 certification programme in 1996. To date, it has established a corresponding certification and recognition management system. By the end of 2001, over 1,300 enterprises and organisations had passed ISO14000 certification. China began its eco-label certification programme in 1993 and by 2001 the country had issued 44 technical requirements for eco-labels for products. Currently, more than 400 products from over 150 manufacturers across China have obtained eco-label certification.

Food is an important green product in China. The country has already developed a wide range of green food, covering 29 sub-categories in the seven major categories of China’s Agricultural Product Classification Standard. Some of these foods have successfully entered markets in countries and regions such as Japan, the US, Europe and the Middle East. In keeping with its green-food objectives, China has also developed organic food. Currently, almost 100 varieties of green food in China have passed certification, many of which are exported to the US, Canada, Japan and Europe. In 1997, export revenues from green food topped US $8 million.

**Impact of accession to the WTO on China’s trade, environment and sustainable development**

Accession to the WTO demonstrated China’s need to widen its reforms, open up further to the outside world, establish a socialist market economy and develop its economy. It can also be seen as yet another step taken by China to become integrated with the global economy. The move is having a profound influence on China’s social and economic development.

Accession to the WTO means that China must commit itself to lowering tariffs, abolishing non-tariff measures that are not in line with WTO rules, opening its domestic market and offering more relaxed terms for market access. In 2002, China’s tariff was 15% but this will be reduced to 9.44% in 2005. China will gradually open its domestic market, including the market for agricultural and industrial products and services. In the agricultural sector, export subsidies will be abolished and domestic support will account for 8.5% of the country’s agricultural production value. Tariffs will be lowered from 22.1% to 17% and for some products the rate will be reduced to 14.5-15%. Tariff quotas will be implemented for wheat, maize, rice, cotton, barley, wool, sugar, palm oil and rape-seed oil.

**Accession to WTO helps China to restructure its industries and solve structural environmental problems**

There will continue to be profound changes to China’s economic and industrial structure following its accession to the WTO. The accession is affecting all productive elements including capital, labour, resources and the environment. Its social and economic impacts are multifaceted.

Economic globalisation and free trade promote worldwide industrial restructuring. In this process, China will find opportunities for accelerated growth but will also face fierce international competition. Changes in market access, trade structure and trade volume will result in tremendous changes to China’s economic structure, thus leading to changes in its environment.

The overall status of China’s environment will be determined largely by its economic and industrial structure, and the level of technology and equipment in its leading industries. At present, secondary industry accounts for some 50% of China’s total industries while the share of tertiary industry is fairly low at about 30%. Energy-intensive sectors account for roughly 35% of China’s industrial manufacturing sector. In recent years, the high- and new-technology industry has made rapid progress but China’s economic growth still depends to a great extent on traditional industries. Because of ageing equipment and backward technology, China’s traditional industries and particularly capital-intensive industries such as metallurgy, the chemical industry and machinery are beset by problems of high resource consumption and pollution.

In terms of resources, size and performance, China’s agriculture sector is still not on par with international standards. Land-intensive products such as grain, cotton and oil retain their dominant position. The basic unit of agricultural production and operations is still the household, and low levels of indus-
trialisation and poor technology prevail. Despite low labour costs, agricultural productivity in China remains low. Inputs of fertiliser and pesticide are high but utilisation efficiency remains low, causing various types of losses. This has caused serious non-point source agricultural pollution.

Accession to the WTO allows China to better use global funds and technological resources. The country can take advantage of both domestic and international markets and more effectively allocate resources based on its comparative advantages. Accession is creating tremendous opportunities for China to solve its structural problems of environmental pollution and ecological destruction.

With China's accession to the WTO, the Chinese market must open up further. Chinese enterprises will face intense market pressures both at home and from abroad. This will force them to improve technology and corporate management, and establish a modern corporate system to enhance competitiveness. This will play a major role in promoting China's industrial restructuring and optimisation. The introduction of advanced technologies and management experiences from abroad will push this process forward. It will help the formation of an economic growth model based on high efficiency of resources and energy utilisation coupled with low environmental impact.

Through industrial restructuring, China will vastly improve the position of tertiary industry in the national economy. Labour-intensive industries will expand, while knowledge-intensive high- and new-technology industries will grow faster. There will be a gradual fall in the proportion of resource- and energy-intensive traditional industries. Discharge of pollutants per unit of industrial production value will drop, allowing China to solve its long-term structural problem of industrial pollution.

In its agricultural restructuring, China will optimise agricultural production geography on the basis of regional characteristics and comparative advantages. Under the precondition of ensuring national grain security, the country will guide some regions to shift from production of traditional crops such as grain, oil and cotton to non-land-intensive industries such as livestock as well as aquatic and horticultural products which offer certain comparative advantages. In the process of participating in economic globalisation, China will take advantage of the domestic as well as world market. Apart from importing some basic land-intensive agricultural products, China should increase through free trade its import of rare resources and products of high environmental cost, such as timber and petroleum. This will help the country ease the massive pressure on its resources and environment brought by population growth and rapid economic development. It will also aid efforts to push forward ecological protection and foster projects such as reforestation, soil and water conservation, desertification control and the Grain for Green Project. It will be a boon for China to gradually solve non-point source fertiliser and pesticide pollution problems.

**Accession to WTO will promote environmental management reforms and improvement in China**

China's laws, regulations, policies and administrative systems have evolved over a long period during which the country functioned under a planned economy. As such, there are many instances of discord with internationally-practised rules based on a market economy. China's accession to the WTO first impacted its public sector administration, leading it to conform to international practice. Since its reforms and opening up, China has embarked on the shift from a planned to a market economy and has to date succeeded in establishing the basis for a socialist market economy with Chinese characteristics. In time, the country will develop a basic system of corresponding laws and regulations. Unified nationwide law enforcement is one basic underlying principle on which China can build its legal framework.
According to its commitments under the WTO, China will revise and amend its laws, regulations, and administrative and judicial procedures concerning trade in goods and services, trade-related intellectual property rights and trade-related investment measures. Some 40 such instruments, which represent only a fraction of China's laws and administrative regulations, will need reformulation or modification. Most of the revision or modification work has already been planned. Clearly, China's accession to the WTO has played a promotional role in the revision and formulation of these laws and regulations.\footnote{Qiao Xiaoyang. 2002. Impact of Accession to the WTO on Lawmaking in China. People's Daily, 27 March 2002.}

In the area of environmental protection, certain adjustment and modification is required in laws, regulations and administrative systems formed under the planned economy. The idea now is to adapt them to international practice. Environmental policies, laws and regulations in China need to conform to the provisions of the international environmental agreements that the country has signed. At the same time, they must comply with the basic principles and provisions of the WTO.

In accordance with the protocol on China's accession to the WTO, the Chinese government has made available in its official publications and on its website all formal and informal standards used as the basis for technical regulations, standards or conformity evaluation procedures. It has also informed the WTO of all laws, regulations and other measures relating to sanitary and phytosanitary controls. Besides open publication, the Gazette of the State Council of the People's Republic of China has seen its distribution expand to the lowest grassroots administrative organisations across the country. This allows enterprises and individuals to access information about government policies and regulations, including those related to the environment.

Environmental standards are the primary yardstick for implementing environmental laws and regulations, and as such exert considerable influence on import and export trade and on attracting foreign capital. Although China's environmental standards are being brought closer to those observed globally, there is still some way to go before the country can fulfil WTO requirements and come up to par with international levels. This is particularly true in the enforcement area.

Accession to the WTO has accelerated China's efforts to establish a market economy, favouring greater adoption of economic instruments such as environmental taxes and pollutant discharge transactions. Economic and technical measures will supplement each other. This can improve the efficiency of environmental administration. Greater transparency will meanwhile help raise public awareness about the environment and encourage public participation. Environmental groups and organisations are expected to be more active, which will in turn aid the government in supervising and improving environmental administration.

\textbf{Accession to WTO brings challenges and opportunities for China to develop its environmental protection industry}

China's environmental protection industry has developed gradually since the reform and opening-up drive of the 1980s. Industrial sectors now exist that cover environmental protection, production, technology development, environmental protection services, comprehensive resources utilisation and ecological conservation. However, the industry as a whole is still in a preliminary stage of development and lags behind global standards. Less than 4% of China's major environmental protection products match...
the current world standards. Some 20% conform to global standards of the 1980s while roughly 30% are at a level developed countries attained in the 1960s. Product standardisation and serialisation remain poor. For a long time, China had no unified standards and this has affected specialisation and large-scale production in the environmental protection industry. Environmental protection enterprises in China are generally small in size. Of the 9,000-plus environmental protection enterprises and institutions across the country, only 4.3% operate on a large scale. The environmental protection market is yet to be standardised and the services market needs significant improvement. Local protectionism and overlapping product certification or administrative designations also exist alongside unfair market competition. As it stands, China’s environmental protection industry is unable to meet its development needs. (12)

During the Tenth Five-Year Plan Period, China will strengthen its environmental protection efforts. Investment in environmental protection will also increase and is ultimately expected to exceed 1.3% of GDP. As such, the future of China’s environmental protection market is bright. The opening up of the market and the entry of foreign enterprises will bring fierce competition to domestic environmental protection enterprises but will at the same time create opportunities for domestic businesses to access foreign capital, advanced technology and management experience. This will bolster efforts to restructure the environmental protection industry and will promote progress in product technology. China’s environmental protection enterprises enjoy labour resource advantages and have reached a fairly high level of technological sophistication in the areas of smoke- and dust-removal, water pollution control, solid waste treatment and disposal, and noise and vibration control. They also enjoy an edge over potential foreign competitors in terms of familiarity with national conditions, market demand, policies and information channels. In the future, joint ventures, cooperative business operations and technical cooperation should be promoted among environmental protection enterprises. This will be an important development direction for the environmental protection industry in the wake of China’s accession to the WTO.

A market-oriented approach is still largely missing in the operation and management of China’s environmental protection facilities. Pollution-control facilities are traditionally built, operated and managed by pollutant-discharging enterprises. Generally speaking, pollution-control facilities bring no direct economic returns to companies. Public pollution control facilities are built with government investment and operated with public funds. Since no professional or public services are available, operation and management of pollution-control facilities are inefficient and costly, and become a burden for enterprises and the government alike.

But things are beginning to change. In recent years, professional and public sector-based pollution control has started to flourish thanks to government advocacy. Pollutant-discharging enterprises and public pollution control facilities are being contracted to environmental protection companies for operation by the public sector. Since China’s accession to the WTO, the entry of foreign environmental protection enterprises will accelerate the process of professional and public-sector-based operation of pollution-control facilities, and promote the formation and growth of the environmental protection market. The establishment of a market economy and the unified implementation of laws, regulations and standards will promote the standardisation of China’s environmental protection market. Local protectionism and unfair competition will be overcome. This will create a favourable environment for the healthy de-

velopment of the environmental protection industry. There is also huge market potential in other environmental services such as environmental technology development, engineering design and construction, environmental impact assessment, and environmental consulting and training.

_Promote harmonious development between trade and environment_

To bring trade development in harmony with environmental protection and to promote sustainable social and economic development, China should:

- Accelerate changes in its economic growth model and pay attention to harmonising the relationship between social and economic development and environmental protection. The country should seize the opportunity offered by economic restructuring and develop high- and new-technology industries and embark on technological renovation of its traditional industries. China should promote industrial restructuring along the lines of high efficiency and low pollution. It should also facilitate a solution to the long-term structural problem of industrial pollution. In its agricultural restructuring, China should optimise geographical distribution of its agricultural production and guide some regions towards shifting from the production of traditional crops such as grain, oil and cotton to non-land-intensive industries with comparative advantages. It should take advantage of domestic and international markets, import a certain amount of basic land-intensive agricultural products to promote ecological protection, foster projects such as Grain for Green and gradually solve non-point source pollution problems caused by agricultural fertilisers and pesticides.

- Formulate a sustainable export development strategy, establish a sustainable export commodity structure and link export restructuring and optimisation to the restructuring and optimisation of industries. China should reduce energy and raw material consumption, improve the environmental competitiveness of its exported products, and reduce or restrict the export of primary products which are at odds with ecological and natural resources protection or add minimal value. The country should pay attention to developing eco-labelling, actively promote mutual international recognition and encourage eligible enterprises to apply for eco-labels from China’s major trading partners. The country needs to further boost the establishment and management of its green food and organic food standards and certification system, and actively produce and export green food and organic food.

- Formulate a sustainable import development strategy, adjust its import commodity structure and actively introduce advanced technology and equipment, and applicable clean production technology and equipment from abroad. In order to effectively protect its ecological environment as well as human, animal and plant life and health, China should strengthen its inspection and testing of imported commodities based on WTO rules and international trading practice, and prevent the entry into its market of products that harm human, animal and plant life or health.

- Reform and improve its trade and environmental policies, laws and regulations, and strengthen the use of economic instruments in environmental management. China should enhance environmental management in enterprises and raise environmental standards for products to improve their international competitiveness. The country should spare no effort to bring its environmental standards and national quality standards into conformity with international standards.

- Make full use of the opportunities offered by the country’s accession to the WTO to adjust its plans and programmes for developing the environment protection industry, get the most out of domestic and international markets, and introduce and develop new technologies and new products to push the en-
environmental protection industry forward while strengthening natural resource conservation and environmental protection and increasing investment.

'Establish effective coordination mechanisms between concerned State ministries and commissions, between the central and local governments, and particularly between the departments of foreign trade, environmental protection and quality inspection. China should fully develop government information centres and industry associations. It should collect up-to-date information about and conduct research on technical regulations, standards, certification requirements, inspection and quarantine measures, and administrative requirements in other countries, particularly its major trading partners, promptly provide this information to the concerned departments and enterprises. China should also help enterprises overcome technical barriers to international trade.
China's Position, Strategy on and Prospect of Trade, Environment and Sustainable Development in the Doha Round

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1. The necessity and overall situation of China's participation in the Doha Development Agenda

1. Background to the Doha Development Agenda

In 2001, the Fourth Ministerial Conference of the World Trade Organization (WTO) in Doha adopted the decision on China's accession to the WTO. After 15 years of negotiation, China finally became a Member of this multilateral trading system, enjoying its rights and assuming its obligations. At this Conference, ministers of the WTO Members unanimously adopted the Ministerial Declaration (Doha Declaration) which included an extensive work programme, part of which was to launch the new round of multilateral negotiations with mandates and time lines. The current round of negotiations focuses on development, therefore the name Doha Development Agenda (DDA).

The DDA covers agriculture, services, market access for non-agricultural products (NAMA), trade-related aspects of intellectual property rights (TRIPs), WTO rules (anti-dumping and subsidies), the Dispute Settlement Understanding (DSU), trade and environment, Singapore issues (including trade and investment, trade and competition policy, trade facilitation and transparency of government procurement), as well as special and differential treatment issues of concern to developing countries. Singapore issues and trade and environment issues are both new issues in this round. The negotiation on trade and environment has already started; Singapore issues are still not negotiation items due to Members' divergence over the issues.

2. Significance of the new round for China in the context of globalisation

Since the initiation of reform and the opening up policy in China, foreign trade and foreign investment inflows have grown rapidly, especially since the early 1990s when the country set a goal to establish a socialist market economy. Significant development in all areas has contributed greatly to the swift and stable development of the national economy. Entering the new century, China achieved its accession to the WTO in 2001. This event has ushered China into a new era of opening up. China's development has now been closely linked with that of the rest of the world.

(1) Opportunities for economic and trade development for China in the context of economic globalisation

According to WTO statistics, in 2002 China became the fifth largest trading partner in the world, as the country's total trade volume reached US $ 620.7 billion, up 21.8% over the previous year. Figures for 2003 show that China's foreign trade has been increasing at the rate of 30%. With both imports and exports exceeding US $ 30 billion every month, a new situation of large-scale import as well as export has emerged in foreign trade development. From January to August 2003, China's total trade volume stood at US $ 522.7 billion, up 36.3% over the same period of the previous year. Based on these figures, China's total trade volume was projected to reach US $ 800 million in 2003. Against the backdrop of sluggish economic development worldwide, China's trade in goods has outperformed other countries, surpassing Canada in 2001, the United Kingdom (UK) in 2002 and perhaps others in the
future.

According to the 2002 World Investment Report published by the United Nations Conference on Trade and Development (UNCTAD), foreign direct investment (FDI) inflow in China is expected to maintain steady growth in the years to come. In 2002, under the pressure of an international investment slowdown, China approved more than 34,100 foreign-invested enterprises with a total contractual foreign capital of over US $ 82.7 billion, up 30.7% and 19.6% respectively. Actual paid-in foreign capital reached US $ 52.7 billion, up 12.5% over the previous year, which allowed China to overtake the United States (US) and become the largest FDI inflow country in the world that year. Entering 2003, FDI inflow maintained the momentum with almost 30,000 new projects approved from January to September, for a total contractual foreign capital of US $ 79.2 billion, up 18.59% and 35.9% respectively. The actual paid-in capital exceeded US $ 40.2 billion, up 11.8%.

These figures demonstrate that in the context of economic globalisation and under the positive influence of China’s accession to the WTO, foreign trade and investment development in China maintained strong momentum, an outstanding performance compared to that of other major trading partners who are still struggling with their growth problems.

(2) China’s contribution to the world economy

China has benefited a great deal from economic globalisation. Measures to open markets and improve its investment environment after accession to the WTO have improved the market situation in China significantly. The new government has set the goal of building a prosperous society and quadrupling the 2000 gross domestic product (GDP) by 2020. This also means that China’s market size and general demand would quadruple in 20 years time, making China the second largest market in the world. Other countries could find enormous business opportunities in China’s development. For example, China’s imports during the period 1998-2002 totalled US $ 1 trillion. From January to August 2003, imports per month reached US $ 32 billion, supporting the prediction that total imports over the next three years will reach US $ 1 trillion. By the year 2010, the same level of imports will be achieved every two years.

It is a similar case in the investment arena. FDI has played an important role in China’s participation in global industrial restructuring and made China an important link in the global industrial chain. Four hundred of the Fortune 500 companies have invested in China. According to a recent survey by Deloitte Touche (UK), after China’s accession to the WTO, 90% of companies in the Asia and Pacific region, 70% of US companies and 80% of European companies have planned to expand either their investment or their business in China. The country has become a manufacturing centre for many multinationals which have also started to move their regional headquarters and research and development (R&D) centres into China in order to benefit from the country’s cheap labour costs and high quality research resources. FDI also helped explore market potential in China and created jobs both in China and abroad. Meanwhile, China’s implementation of the strategy of “going outwards” also has brought progress in investing outside the country, which in turn contributes to domestic economic development.

History has proved, and the future will prove again, that China’s development is an important historical opportunity for world economic development.

(3) Improvement of the multilateral trading environment and participation in the DDA are in conformity with China’s general interests
Figures indicate that China’s foreign trade makes up 25% of its GDP and foreign investment trade volume amounts to more than 50% of China’s total. The reliance of China’s economy on external conditions has been growing, which also testifies to the importance of the international trading environment to China’s economic development.

As an international trade organisation, the WTO has pushed forward trade liberalisation and multilateral rule-making through round after round of negotiations. All the negotiations under the DDA are closely connected to China’s economic interests. For example, the result of negotiations on agriculture, market access for non-agricultural products, and services will directly affect tariff and non-tariff barriers in China’s export markets over the next 10 – 20 years. China is the largest victim of the abusive use of anti-dumping measures. The result of anti-dumping negotiations will strengthen discipline on the use of such measures. The results of the trade and environment negotiations will directly affect the interrelations between these two issues and will have impacts on China’s implementation of its sustainable development strategy. It is therefore clear that the DDA negotiations are conducive to the formation of a favourable external environment for the development of China’s foreign trade and investment. Another positive aspect of the DDA is its conformity with China’s goal of quadrupling its GDP in the next 20 years.

At the same time, participation in the DDA is also an important right for China as a WTO Member, and has created a new channel for China to push for economic and trade development. In the past, China mainly relied on bilateral dialogue in promoting trade or solving disputes. Today, China’s foreign trade strategy can be promoted at bilateral, regional and multilateral levels.

(4) China’s participation in the DDA
Since 2002, China has been participating actively in all DDA-related negotiations. Developed and developing country Members alike are extremely interested in China’s positions in the DDA and hope that China will play a constructive role in the Agenda. In 2002, the Chinese government established interagency negotiation coordination groups on different issues. On trade and environment, the Ministry of Commerce has been working closely with the State Environmental Protection Administration (SEPA) and other related agencies to improve internal communications. To date, more than 80 negotiating teams have been organised to participate in negotiations in Geneva. For trade and environment negotiations, four teams went to Geneva in 2002 and two in 2003.

Since the launching of the DDA, progress has been slow. There is divergence between the US and the European Union (EU), between developed and developing country Members, among different interest groups, and among newer and older Members. Members differ on almost all issues and the deadlines set by the Doha Declaration have all passed. Despite the conclusion before Cancun of negotiations on public health issues, all negotiations are experiencing difficulty in making progress.

China’s comment on the current DDA is as follows:
• The timely conclusion and a balanced outcome of the negotiations will be beneficial to both developed and developing country Members. Any outcome benefiting the developing country Members will in the end bring benefit to the developed country Members;
• The slow progress is mainly due to the lack of flexibility on the part of the developed country Members. These Members, who benefit the most from the multilateral trading system, should make it a priority to take on more responsibility and show more political willingness and flexibility in addressing the concerns of developing country Members in order to ensure their effective participation and the
realisation of their interests in the DDA;

- The DDA should take into full consideration and recognise the extensive commitments made by newly acceded Members in their accession negotiations. Their implementation of the commitments should be regarded as their contribution to the DDA and be supported and recognised by all Members.

At the fifth Ministerial Conference in Cancun in September 2003, Members could not reach a consensus on agriculture and Singapore issues, and the Conference did not achieve its expected results. This outcome has cast shadows on the development of the DDA. Despite this setback, China has not changed its supportive attitude towards the multilateral trade system and the DDA. In his meeting with the press after the conference, Mr. Lu Fuyuan, Minister of Commerce of China, reiterated China’s position and expressed willingness to work with other Members in order to achieve a breakthrough as soon as possible. At the APEC summit meeting in Bangkok in October 2003, China worked to form a consensus among APEC members on pushing forward the DDA. Currently the Chairman of the General Council of the WTO is conducting consultations on DDA issues, and Ambassador Sun Zhenyu and his team are working actively in this process.

II. China’s position, strategy and prospects for trade and environment negotiations in the WTO

Trade and environment is a new negotiation item on the DDA. Trade and environment was, however, an issue of debate in the General Agreement on Tariffs and Trade (GATT) in the early 1970s. After the establishment of the WTO, the Committee on Trade and Environment (CTE) was created to address issues of concern to Members. Headed by the EU, some developed country Members have been pushing for new rule-making and negotiations concerning trade and environment in the WTO. Some developing country Members have been worried by the impacts of such negotiations on their access to developed country Members’ markets and view the negotiations in a negative light. After the conclusion of the Uruguay Round, developed country Members intended to launch a “green round”. The 1999 Seattle Ministerial Conference failed partly due to the insistence by developed country Members on negotiating environment and labour issues, and the resistance to this move by developing country Members. Before the Doha Conference in 2001, the world economy was slowing down. The events of September 11, 2001 brought significant change to the international political and economic situation. After intensive bargaining at the Conference, trade and environment was listed for the first time on the negotiation agenda as part of a single undertaking.

Now let us look at the mandates in the Doha Declaration concerning trade and environment and sustainable development. These mandates form the basis for trade and environment work under the DDA.

1. Relevant statements in the Doha Declaration

   (1) Negotiation mandate in Paragraph 31

31. With a view to enhancing the mutual supportiveness of trade and environment, we agree to negotiations, without prejudging their outcome, on:

   (i) the relationship between existing WTO rules and specific trade obligations set out in multilateral environmental agreements (MEAs). The negotiations shall be limited in scope to the applicability of such existing WTO rules as among parties to the MEA in question. The negotiations shall not prejudice the WTO rights of any Member that is not a party to the MEA in question;

   (ii) procedures for regular information exchange between MEA Secretariats and the relevant WTO committees, and the criteria for the granting of observer status;

   (iii) the reduction or, as appropriate, elimination of tariff and non-tariff barriers to environmental goods and services.
We note that fisheries subsidies form part of the negotiations provided for in paragraph 28.

(2) Priority discussion mandate in Paragraph 32

32. We instruct the Committee on Trade and Environment, in pursuing work on all items on its agenda within its current terms of reference, to give particular attention to:

(i) the effect of environmental measures on market access, especially in relation to developing countries, in particular the least-developed among them, and those situations in which the elimination or reduction of trade restrictions and distortions would benefit trade, the environment and development;

(ii) the relevant provisions of the Agreement on Trade-Related Aspects of Intellectual Property Rights; and

(iii) labeling requirements for environmental purposes.

(3) Negotiation conditions in Paragraph 32

Work on these issues should include the identification of any need to clarify relevant WTO rules. The Committee shall report to the Fifth Session of the Ministerial Conference, and make recommendations, where appropriate, with respect to future action, including the desirability of negotiations. The outcome of this work as well as the negotiations carried out under paragraph 31(i) and (ii) shall be compatible with the open and non-discriminatory nature of the multilateral trading system, shall not add to or diminish the rights and obligations of members under existing WTO agreements, in particular the Agreement on the Application of Sanitary and Phytosanitary Measures, nor alter the balance of these rights and obligations, and will take into account the needs of developing and least-developed countries.

(4) Technical assistance in Paragraph 33

33. We recognize the importance of technical assistance and capacity building in the field of trade and environment to developing countries, in particular the least-developed among them. We also encourage that expertise and experience be shared with members wishing to perform environmental reviews at the national level. A report shall be prepared on these activities for the Fifth Session.

(5) Other relevant provisions on sustainable development

Paragraph 51. The Committee on Trade and Development and the Committee on Trade and Environment shall, within their respective mandates, each act as a forum to identify and debate developmental and environmental aspects of the negotiations, in order to help achieve the objective of having sustainable development appropriately reflected.

Paragraph 6. We strongly reaffirm our commitment to the objective of sustainable development, as stated in the Preamble to the Marrakesh Agreement. We are convinced that the aims of upholding and safeguarding an open and non-discriminatory multilateral trading system, and acting for the protection of the environment and the promotion of sustainable development cannot be pursued in a manner which would constitute a means of arbitrary or unjustifiable discrimination between countries where the same conditions prevail, or a disguised restriction on international trade, and are otherwise in accordance with the provisions of the WTO Agreements. We welcome the WTO's continued cooperation with UNEP and other inter-governmental environmental organizations. We encourage efforts to promote cooperation between the WTO and relevant international environmental and developmental organizations, especially in the
lead-up to the World Summit on Sustainable Development to be held in Johannesburg, South Africa, in September 2002.

2. China's position on trade and environment and its strategy and prospects
The issues of trade and environment and sustainable development have been attracting worldwide attention. China has been active in this field and participated actively in relevant international initiatives, beginning with the United Nations Conference on Environment and Development (UNCED), also known as the Earth Summit, in 1992. China participated along with leaders from 100 countries, representatives from 178 countries and 17,000 attendees. The Summit adopted a political declaration, the Rio Declaration on Environment and Development, and an action plan, Agenda 21, as well as the UN Framework Convention on Climate Change (UNFCCC) and the Convention on Biological Diversity (CBD). The then Chinese Prime Minister Li Peng led a delegation to the Conference and China has been participating actively in follow-up activities.

In September 2002, Prime Minister Zhu Rongji led a delegation to the Johannesburg World Summit on Sustainable Development (WSSD) in South Africa and explained China's general position on issues of sustainable development, including trade and environment. The Summit adopted a political declaration and an implementation plan, which represented the consensus of all participating countries on the issues of sustainable development and trade and environment. The implementation plan specifically mentions actions to be taken by the WTO under the DDA.

The WTO is a global trading organisation with the responsibility of promoting open markets among its members and corresponding necessary rule-making at the multilateral level. Sustainable development is a basic goal of the WTO, as expressed in the preamble of the Agreement establishing the Organization. Some WTO agreements also have provisions on trade and environment issues. GATT Article XX on General Exceptions lists two exceptions related to the environment: one for the protection of human, animal and plant life and health, and the other for the conservation of exhaustible natural resources. The Agreements on Technical Barriers to Trade (TBT) and on the Application of Sanitary and Phytosanitary Measures (SPS) also include environment-related provisions. Despite these provisions, the WTO has not reached a consensus on trade and environment and negotiations on the issue did not begin until the Doha Declaration specifically mandated them.

(1) The starting points for China in considering trade and environment negotiations in the WTO are:
- To abide by the government's general position and guidelines on sustainable development and trade and environment based on the overall needs of the national economy; and
- To formulate specific positions on trade and environment in the WTO according to the overall strategy and needs of China in the DDA.

(2) China's general position on trade and environment negotiations in the WTO
The relationship between trade and environment significantly influences sustainable development. Negotiations in the WTO should help promote international trade, especially the growth of trade with developing and least-developed country (LDC) Members. Developed country Members have the responsibility to provide developing country Members with technical assistance and assistance in capacity building. China is opposed to protectionism under the guise of environmental protection.

(3) China's specific position on paragraphs 31, 32, 33 and 51 of the Doha Declaration
(a) Paragraph 31(i). The WTO is an international organisation dealing with trading relationships be-
tween Members. Its purpose is to establish a fair and reasonable set of trading rules. GATT already had rules for environmental protection that have played an important role in dealing with trade and environment issues. Specific trade obligations (STOs) in some MEAs carry the potential for conflict with WTO rules. To date, however, no WTO Member has challenged any measures in MEAs. Such potential for conflict should not be exaggerated.

China supports the Doha mandate and hopes the results of the negotiations will contribute to the reduction of trade disputes. China suggests that Members should first reach a consensus on the scope of the mandate and ways to pursue the negotiations before entering into substantive negotiations. China supports the identification of STOs in MEAs, followed by the identification of related WTO rules, in order to clarify their relationships. With this information, negotiations can be carried out on any practical problems and reasonable solutions found. Developing country and LDC Members' concerns should be taken fully into account in the negotiations.

(b) Paragraph 31(ii). China agreed that the United Nations Environment Programme (UNEP) and 13 MEAs should be invited to the Special Session of the CTE in October 2002. Their participation was helpful for information exchange and for the current stage of the negotiations. However, it must be pointed out that the participation of these particular MEAs should not prejudice the definition of MEAs as mentioned in the Doha Declaration. China supports the view that the granting of observer status should be dealt with at the General Council level.

(c) Paragraph 31(iii). Negotiations on environmental goods and services should take place in market access negotiation groups together with negotiations on other types of goods and services. In negotiating market access, the issue of technology transfer in the environment protection area is important, with special emphasis on raising the technological level of developing countries. The developed country Members should adopt concrete measures to promote technology transfer to developing country Members.

(d) Paragraph 32(i). Export products from developing country Members have been facing green barriers in developed country Members. China suffers significantly in the areas of agriculture, food, textile and apparels, mechanical products, light industrial products and pharmaceutical products. For example, China's export of poultry products to a WTO Member was banned in 1995 for quarantine reasons. This led to a loss of US $100 million. China invested more than US $1 billion to improve industrial infrastructure and related systems before the ban was lifted, and then only on some enterprises and with the imposition of very strict conditions, such as an appointed inspection agency. The fee is US $3,000 per inspection and it can be 30 days before results are available, which means that stocking costs accrue in the interim. It is obvious that green barriers have big impacts on exports from developing country Members.

China supports WTO regulations on the protection of the environment and human life and respects other Members' rights in this regard. China opposes trade protectionism under the pretense of environmental protection. The Doha mandate called for the reduction or elimination of non-tariff barriers to products of export interest to developing country Members. Therefore, the green barriers in developed country Members should be addressed in the DDA. Environmental measures that are consistent with WTO rules in developed country Members also have impacts on the market access of developing country Members. Developed country Members have the obligation to provide developing country Members with technical assistance and assistance with capacity building in order to help them achieve sustainable development.
(e) Paragraph 32 (ii). The TRIPs Agreement has an important role in promoting technological progress, cultural development and economic growth. However, it also limits to a certain extent developing country Members' ability to gain access to necessary technologies, especially environmentally-friendly technologies. Developed country Members are largely responsible for the global environment degradation that has resulted from their own development processes. They possess most of the environment protection technologies today and should play a leading role in protecting the world environment and help developing country and LDC Members to address their problems. One way to do this is to transfer environmentally-sound technologies on a preferential and non-commercial basis.

On the relationship between TRIPs and the CBD, China believes that the two agreements can be mutually supportive in the context of promoting development. They serve the same purpose of common and sustainable development but deal with separate issues through different international legal systems. Consistency needs to be improved, however. For example, the CBD recognises the principles of national sovereignty, prior consent and benefit sharing with respect to traditional knowledge (including traditional innovations, production methods, ways of life, skills and practices). The TRIPs Agreement, on the other hand, recognises private ownership and exclusive rights to intellectual property under certain conditions. Coordination between the two systems is necessary and amendments to the TRIPs Agreement are required to achieve the sustainable development goal expressed in Paragraph 6 of the Doha Declaration.

Specific recommendations include requiring applicants for patents based on biological resources and traditional knowledge to; (i) disclose the source of the biological resources and traditional knowledge; (ii) provide certification of prior informed consent issued by the competent authority of the source country or countries; and (iii) provide certification of benefit sharing issued by the competent authority of the source country or countries. Such conditions should be met before a patent is approved. One way to facilitate effective administration of patents related to genetic resources and traditional knowledge is to establish a database of biological resources and traditional knowledge at the multilateral level and allow Members to require compensation for disclosure of information.

(f) Paragraph 32 (iii). Eco-labelling is an effective environmental policy measure. It should be used in accordance with the non-discrimination principle of the WTO when international trade is involved. Eco-labelling organisations should consider following the rules of the TBT Agreement, especially the Code of Good Practice for the Preparation, Adoption and Application of Standards (Annex 3). Developed country Members should improve the transparency of their eco-labelling systems and provide accurate information to consumers and producers in a timely manner to reduce negative impacts on developing country Members' exports. Eco-labelling systems and technology in developing and developed country Members differ due to variations in their respective states of economic development. International consultation and cooperation is needed for: (i) mutual recognition, (ii) establishment of bilateral and multilateral cooperation on the creation and use of eco-labelling systems, and (iii) avoiding discrimination against imported products and foreign eco-labels and the formation of new trade barriers. Special needs of developing country and LDC Members should be met through technical assistance. In developing its own eco-labelling system, China will adapt to international standards and increase its participation in the formulation of international standards. Mutual recognition will be pursued through strengthened cooperation at both multilateral and bilateral levels. China is willing to introduce its eco-labelling regime to any importers of Chinese goods and consumers in other WTO Members and improve its transparency.
(g) Paragraph 33. Developing countries need to improve their understanding of trade and environment issues. China hopes that during the negotiations, the technical assistance and capacity building called for in Paragraph 33 of the Doha Declaration will be strengthened in order to improve developing country Members' capacity to participate in the negotiations.

(h) Paragraph 51. The DDA should contribute to a win-win-win situation among trade, environment and sustainable development. The needs of developing country and LDC Members deserve special attention. China supports related work in the Committee on Trade and Development (CTD) and the CTE. The WSSD in September 2002 produced a detailed implementation plan of which trade measures form a key part. Related activities under the DDA should progress quickly.

III. Post-Cancun Prospects
Despite the setback in Cancun, the DDA will continue. Although trade and environment was not the focus in Cancun, it is, however, closely related to other negotiation topics under the DDA. According to Paragraph 31(iii), Members should negotiate the reduction or elimination of tariff and non-tariff barriers to environmental goods and services. This is closely connected to market access negotiations in other negotiation groups. According to the Chairperson’s report to the Trade Negotiations Committee (TNC) in July 2003, future negotiations in the CTE will focus on this part of the mandate. Although the negotiations in Geneva may face difficulties, trade and environment negotiations will not stop. We still need to continue our work, participate actively in the post-Cancun negotiations and contribute to the development of the multilateral trading system.
Implementation of the Convention on Biological Diversity and other Multilateral Environmental Agreements with Specific Trade Obligations: A Case Study in China

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I. Implementation of the CBD in China
The Convention on Biological Diversity (CBD) was signed on 5 June 1992 and came into force on 29 December 1993. By 1 August 2003, the number of signatories to the CBD had reached 187, of which 140 are World Trade Organization (WTO) Members.\(^1\)

The Chinese government has in the last decade made every effort to implement the CBD in order to conserve biodiversity, which serves to promote social development and the sustainable development of the national economy, as well as to protect the country’s unique ecosystems and contribute to species and genetic resources conservation.\(^2\)

1. Measures to strengthen biodiversity conservation and implement the CBD
In order to strengthen biodiversity conservation and effectively implement the CBD, China has taken a number of measures including:
   - Establishing a national coordination mechanism;
   - Strengthening legislation and enforcement;
   - Advocating in-situ conservation;
   - Strengthening public education; and
   - Promoting global cooperation.

2. China’s task for biodiversity conservation is a huge challenge
China has taken various measures to conserve and restore biodiversity, such as strengthening the establishment and management of nature reserves, undertaking restoration and reforestation of farmlands and grasslands, imposing a ban on logging in natural forests, and establishing ecological function and demonstration zones. Although the natural environment in some areas has improved, the trend of biodiversity deterioration is not yet under effective control. This is due to natural causes such as climate change as well as human intervention, including deforestation, the conversion of grassland into farmland, inappropriate fishing and hunting, and environmental pollution. Major conservation issues in China today are as follows:
   - Accelerated biodiversity loss and endangerment of species;
   - Threats from invasive alien species;
   - Weakness of biosafety management;
   - Conservation and management of genetic resources; and

\(^{(1)}\) WTO. TN/TE/S/111. 25 April 2003.
Protection and conservation of biodiversity in western China.

3. China's biodiversity conservation priorities
For the coming years, China's biodiversity conservation priorities include:
- Revising China's Biodiversity Conservation Action Plan;
- Strengthening legislation and enforcement;
- Giving priority to the conservation of key components of biodiversity;
- Increasing financial inputs and promoting capacity building for biodiversity conservation at the national level; and
- Strengthening education, training and public participation.

It is vitally important to conserve China's ecosystems, species, and genetic resources not only for the purpose of implementing China's sustainable development strategy but also for global environmental and human health and safety. As the largest developing country in the world, China will make every effort to promote its biodiversity. At the same time, technological and financial support from the international community will also be essential.

4. Implementation of trade-related measures
Most WTO Members agree that the CBD contains no specific trade obligations (STOs). It is also generally agreed, however, that the CBD contains trade-related provisions. These may be found in Article 7 (c) on identification and monitoring, Article 8 on in-situ conservation, Article 10 on the sustainable use of components of biological diversity, Article 11 on incentives, Article 14 on impact assessment and minimising adverse impacts, Article 15 on access to genetic resources, Article 16 on access to and the transfer of technology, Article 19 on the handling of biotechnology and the distribution of its benefits, and Article 22 on the relationship of the CBD with other international conventions. Trade-related Decisions adopted by various Conferences of the Parties (COPs) include: Decision III/18 (Incentive Measures), Decision IV/10 (Measures to implement CBD), Decision IV/15 (The relationship of the CBD with the Commission on Sustainable Development and biodiversity-related conventions, other international agreements, institutions and processes of relevance), Decision V/16 (Article 8(j) and other related articles), Decision V/26 (Access of Genetic Resources), Decision VI/10 (Article 8(j) and related provisions), Decision VI/15 (Incentive Measures), Decision VI/20 (Cooperation with other organisations, initiatives and conventions), Decision VI/23 (Alien invasive species), and Decision VI/24 (Access and benefit sharing as related to genetic resources).

The implementation in China of the CBD's trade-related provisions is as follows:

(1) Article 7 (Identification and Monitoring)
Over the years China has studied major ecosystems, key species and important genetic resources, and undertaken monitoring of major ecosystems and key species. As a result of these efforts, a large amount of data has been collected. However, identification and monitoring are only an intermediate priority owing to the lack of technological and financial support. [3]

(2) Article 8 (In-situ Conservation)

Trade-related measures are mentioned in Article 8(h), (j) and (i).

a. Article 8(h) (Management of alien species)
China has already identified the main alien species and assessed the risks and impacts of such species on ecosystems, the natural environment and other species. Some measures have been taken to prevent, control and eradicate those alien species which threaten ecosystems, habitats or other species. The Chinese government places high priority on the prevention and control of invasive alien species. A number of policies and regulations have been formulated and measures taken to disseminate information on invasive alien species but many problems remain to be addressed.

b. Article 8(j) (Traditional knowledge)
China has adopted a number of measures to preserve and maintain the knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant to conservation and the sustainable use of biological diversity.

c. Decision V/16 (Article 8(j) and related provisions)
China has formulated policies and regulations to protect the rights and benefits of indigenous and local communities, collected and recorded their traditional knowledge, and encouraged indigenous and local communities to take part in biodiversity conservation. However, some problems still exist in maintaining and using traditional knowledge.

d. Article 8(1) (Control and management of adverse effects)
The Chinese government has largely regulated or managed the relevant processes and categories of activities which have significant adverse effects on biological diversity.

(3) Article 10 (Sustainable Use of Components of Biological Diversity)
The Chinese government has invested a great deal of manpower and funds to ensure the sustainable use of the components of biological diversity. In order to fully implement CBD obligations, more funds and human resources are needed, which is beyond the government’s existing financial ability. The funding shortfall is quite large.

At the national policy-making level, the government has attached high importance to biodiversity conservation and sustainable use of components of biological diversity, and has worked out corresponding policies, plans and measures.

(4) Article 11 and Decision III/18 (Incentive Measures); Decision IV/10 (Measures for Implementing the CBD)
Incentive measures are necessary for the conservation and sustainable use of components of biological diversity. In a developing country like China, which has limited financial resources, the adoption of economically and socially sound measures will provide considerable motivation for biodiversity conservation.

Based on existing problems in biodiversity conservation, the Chinese government has identified the root causes of biodiversity loss, reviewed relevant laws and economic policies, and adopted incentive measures for sustainable use of biological diversity components. These measures include revising relevant laws, adopting favourable economic policies and undertaking various appraisal activities.
(5) Article 14 (Impact Assessment and Minimizing Adverse Impacts); Decision IV/10 (Measures for implementing the CBD)

China has made tremendous efforts to carry out environmental impact assessments and minimise adverse impacts. However, a lot of work still needs to be done and lack of funds remains a problem. In the environmental impact assessment process, analysis of the impacts on biodiversity is weak. Therefore, efforts should be made to enhance knowledge on biodiversity impact assessment, promote technological development and experience exchange, strengthen personnel training, and enhance capability to handle emergency situations.

(6) Article 15 and Decision V/26 (Access to Genetic Resources)

In order to establish a rational mechanism for access to genetic resources and benefit sharing, and to facilitate the development of agriculture, forestry and pharmaceutical industries, China has formulated a number of laws and regulations and has actively participated in international cooperation on access to and use of genetic resources.

(7) Article 16 (Access to and Transfer of Technology)

Chinese patent laws protect technologies for the conservation and sustainable use of biodiversity, including inventions of production methods for new animal or plant species and for pharmaceuticals. Based on their conservation status in China, new species of rice, maize and chrysanthemum have been listed as new plant species under special protection. However, conservation and sustainable use of biodiversity is still constrained by shortfalls in funds, manpower and technology.

Based on the three objectives of the CBD and the need for international economic development, China has formulated its own regulatory regime for intellectual property rights protection and technology transfer. Nevertheless, much still needs to be done to improve this regime.

(8) Article 19 (Handling of Biotechnology and Distribution of its Benefits)

Since China's ability to research and use genetic resources is limited, the country pays particular attention to those Contracting Parties that provide genetic resources, their participation in biotechnology research, and whether they are given access to the final results on a fair and equitable basis and a share of the benefits arising from biotechnologies based on the genetic resources they provide. Final results and benefits include patents, production process, products and profits.

China has formulated policies and laws to support and encourage those who provide genetic resources to effectively take part in biotechnological research activities. The Chinese government advocates the principle of prevention and places high priority on the safe transfer, handling and use of living modified organisms resulting from biotechnology that may have adverse effects on conservation and sustainable use of biological diversity. Efforts have also been made to strengthen biosafety legislation and management, and to promote international cooperation.

II. Implementation of CITES in China

1. CITES

The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) was signed in 1973 in Washington DC. By September 2003, a total of 163 contracting Parties had ratified CITES, of which 133 are WTO Members. China became a Party to CITES on 8 January 1981.

The objective of the Convention is to protect endangered species of wild fauna and flora from over-ex-
ploitation through international trade. (4) The species covered by CITES are listed in three Appendices, according to their biological and trade status. Parties may not trade in specimens of species included in Appendices I, II and III except in accordance with the provisions of the Convention.

2. Trade-related provisions and STOs
WTO members generally agree that trade-related provisions in CITES may be found in Article II (Fundamental Principles), Article III (Regulation of Trade in Specimens of Species Included in Appendix I), Article IV (Regulation of Trade in Specimens of Species Included in Appendix II), Article V (Regulation of Trade in Specimens of Species Included in Appendix III), Article VI (Permits and Certificates), Article VII (Exemptions and Other Special Provisions Relating to Trade), Article VIII (Measures to be Taken by the Parties), Article IX (Management and Scientific Authorities), and Article XIV (Effect on Domestic Legislation and International Conventions). Some additional trade-related measures can also be found in Resolutions and Decisions adopted by the Conference of the Parties to CITES.

Most WTO Members are of the view that Article III, Article IV, Article V and Article VI of CITES contain STOs but some members—the United States (US), for example—hold the view that Article II.4 and Article IX also contain STOs.

3. Implementation of CITES in China
(1) Domestic policies and regulations, and implementation measures

China adopted two types of permit certificates to control the import and export of endangered wild fauna and flora. One covers species defined in the Appendices of CITES and the other is for species not included in the Appendices, including domestic and alien species.

(2) Major problems in implementation of CITES
Although China signed CITES more than 20 years ago, it has yet to adopt an implementing domestic law. China is still listed by the CITES Secretariat as a Class II state with incomplete domestic legislation. (5) Other problems in the implementation of this Convention are as follows:
• Laws and regulations concerning wildlife need further improvement;
• Actual wildlife resources and trade volumes are yet to be quantified;
• There are too many wildlife trading ports;
• Wildlife smuggling and illegal trade are widespread;
• There are no strong mechanisms for quarantine or for supervision of the production, distribution and processing of wildlife products.

III. Implementation of the Montreal Protocol in China

1. Montreal Protocol on Substances that Deplete the Ozone Layer

After a prolonged effort, the Vienna Convention for the Protection of the Ozone Layer was finally agreed upon in Vienna in 1985. In order to implement this Convention, the Montreal Protocol on Substances that Deplete the Ozone Layer was agreed upon on 16 September 1987. By 9 September 2003 it had been signed by 184 Parties, 144 of which are WTO Members. China became a Party to the Vienna Convention on 11 September 1989 and to the Montreal Protocol on 14 June 1991.

The objective of the Protocol is to protect the ozone layer by means of precautionary measures to control global emissions of substances that deplete the ozone layer, with the ultimate objective of phasing out such emissions, relying on scientific technology developments and taking into account economic and technical feasibilities. To ensure the involvement of developing countries, the Protocol takes their needs into account.

There are many shortcomings in the Protocol. At the request of the international community, the Montreal Protocol was amended in London in 1990. This revision is called the London Amendment and took effect in August 1992. Since then, the Protocol has undergone a number of further amendments: the Copenhagen Amendment (1992), Montreal Amendment (1997), Beijing Amendment (1999), Vienna Adjustment (1995) and Montreal Adjustment (1997). The amendments/adjustments specify controlled substances and lay out a timetable for phasing out these substances. Only those Parties which ratify the amendments/adjustments assume the obligations set out in them. China has ratified the London Amendment and Copenhagen Amendment.

2. Trade-related provisions and STOs

Most WTO members agree that trade-related provisions in the Montreal Protocol include: Article 2 (control measures); Article 2A-2I (control measures for chlorofluorocarbons (CFCs); halons, other fully halogenated CFCs, methyl chloroform, hydrochlorofluorocarbons (HCFC), hydrobromofluorocarbons, methyl bromide, bromochloromethane); Article 4 (control of trade with non-Parties); Article 4A (control of trade with Parties); and Article 4B (licensing). In addition, some of the decisions adopted at meetings of the Parties involve trade-related measures. Some WTO members are of the view that Article IV and Article IVA contain STOs.

3. Implementation of the Montreal Protocol in China

The Chinese government has actively participated in international conferences on ozone layer protection and made efforts to foster international negotiations. Owing to China’s proposal, a multilateral foundation mechanism was established under the Protocol to assist developing countries in implementing the Protocol. In addition, the Chinese government has launched a series of programmes to implement the Protocol:

(1) Establishing an effective institutional management system

Comprising members from 18 ministries and commissions, a State Leading Group for the Protection of

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the Ozone Layer was formed to organise and coordinate implementation of the Protocol. In the last decade, a strong expert support system has also been established.

(2) Establishing a policy and legal regulatory system
Since China has ratified the London Amendment and Copenhagen Amendment, Article 45 and Article 59 relating to the phasing out of ozone depleting substances (ODS) were added to the Air Pollution Prevention and Control Law of the People's Republic of China, amended in 2000.

In 1993, China worked out a National Plan for Phasing Out Ozone Depleting Substances, which was amended in 1999. Based on the Amendments, the Chinese government committed to phase out the production and consumption of ODS in accordance with the Protocol, under the condition of receiving financial support from the Global Environment Fund (GEF) and transfer of substitute technologies under preferential terms. The National Plan reiterated China’s compliance with the goal and the timetable of ODS control set out in the Protocol.

In the context of the National Plan, China has established a comprehensive policy and regulation system consisting of ODS import and export control, control of ODS production and consumption, pollution discharge registration, supervision and management of ODS, quality control, environmental labelling, levy policy, and management of GEF funds. The Chinese government has also adopted a number of trade-related policies for ODS import and export control including the Management Measures for Import and Export of ODS.

(3) Substantial progress implementing the Protocol
By 2001, China had been granted US $ 576 million from the GEF. More than 70 tons of ODS will be phased out, and production lines with a total capacity of 51,321 tons of CFCs and 10,568 tons of halons will be shut down.

(4) Future perspectives: fulfilling the obligations of phasing out ODS
- Fulfil obligations through “Four Concerted Steps”: (i) the closure of ODS production, (ii) alternative consumption, (iii) production of substitutes, and (iv) legislative and policy measures. These four concerted steps will integrate the work of ODS phase-out into national planning.
- Advocate sectoral mechanisms. Sectoral mechanisms promote management and supervision of national or departmental planning, increase implementation efficiency and reduce risks.
- Strengthen legislation and enforcement, and reinforce policy regulatory efficiency. Based on progress achieved so far in phasing out ODS, continue to formulate policies for ODS control and for production of ODS substitutes, strengthen enforcement of existing regulations, improve policies and regulations in implementation and enforcement, strengthen sectoral management and supervision, and improve working efficiency.
- Select or develop appropriate technologies for substitutes. ODS substitution will be carried out in two steps. First, select technically mature and economically feasible substitutes for hydrofluorocarbons (HFC) and HCFC and replace most ODS within a relatively short time. Second, simultaneously make every effort to develop new ODS substitutes and production technologies.
- Actively participate in international cooperation on ozone layer protection, seek more financial support and accelerate the work of phasing out ODS in China.
- Enhance education and improve public awareness on ozone layer protection.

IV. Implementation of the Basel Convention on the Control of Transboundary Movements of
Hazardous Wastes and their Disposal

1. Background
With industrial development, especially the development of the chemical industry, hazardous waste production has increased and become a formidable risk for all countries. Owing to limited disposal sites, technological complexity and high costs, the safe handling of these dangerous substances has become a serious challenge. Some western industrialised nations such as Germany and the US, the leading hazardous waste generators, transported their hazardous wastes to other countries, typically to developing countries. The US and Germany used to be the largest hazardous waste exporters with their annual export of hazardous waste totalling several million tons. (8)

After years of effort, the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal was finally agreed upon on 22 March 1989 and came into force on 5 May 1992. By 10 June 2003 there were 158 Parties to the Convention, of which 145 are WTO Members. China ratified the Basel Convention in December 1991.

The Basel Convention regulates the transboundary movement and disposal of hazardous wastes. (9) Due to uncertainty regarding the impacts on ecology and human health, the focus of the Convention is the prevention principle.

2. Trade-related provisions and STOs
Most WTO members agree that trade-related provisions in the Basel Convention include Article 3 (National Definitions of Hazardous Wastes), Article 4 (General Obligations), Article 5 (Designation of Competent Authorities and Focal Points), Article 6 (Transboundary Movement between Parties), Article 8 (Duty to Re-import) and Article 9 (Illegal Traffic). In addition, some members are of the view that Article 4.1(b), Article 4.1(c), Article 4.2(e), Article 4.6, Article 6 and Article 8 contain STOs. The US, a non-Party to the Basel Convention, holds the view that Article 3.1, Article 3.2, Article 4.2(f), Article 4.2(g), Articles 4.7-4.10, Article 5.1, Article 9.2, Article 13.2, Article 13.3(a) and Article 13.4 all contain STOs. Article 13 contains provisions concerning “Transmission of Information”.

3. Implementation of the Basel Convention
(1) Current status of transboundary movements of hazardous wastes in China
When China ratified the Basel Convention, the control of transboundary movements of hazardous wastes and their disposal was incorporated into the country’s environmental protection laws and regulations. (10) In recent years, however, foreign hazardous wastes have been smuggled into some regions of China while some companies have illegally imported domestic rubbish and industrial or hazardous wastes. Some joint ventures have transported hazardous wastes mixed with reusable wastes to China as raw materials, which poses a serious challenge to China’s environmental protection.

(2) Relevant domestic legislation
To better implement the Convention, China has in the last decade strengthened its legislation on the control of transboundary movements of hazardous wastes. Dozens of regulations or policies have been

formulated, including the Notification on the Transboundary Movement of Strictly Controlled Hazardous Wastes into China. More new laws have been submitted to the National People’s Congress for approval. These laws and policies are playing a vital role in controlling the movement of “foreign rubbish” into China.

(3) **Analysis of existing problems**

Lack of public environmental awareness, incomplete legislation, lack of strong enforcement and capacity to reuse or dispose hazardous wastes safely are common problems in developing countries. The main problems in China are as follows:

- The country’s hazardous waste management system is incomplete and professional capability to manage hazardous wastes is limited. Some environmental protection agencies do not even have special personnel or departments for hazardous waste control;
- Inappropriate disposal methods for hazardous wastes. For example, in some regions hazardous wastes are mixed with domestic wastes and dumped in landfills or incinerated in open areas;
- There is a need to encourage commercialised hazardous waste treatment services and to establish market mechanisms to expedite hazardous waste disposal.

For the future, China should strengthen legislation on control of transboundary movements of hazardous wastes, enhance personnel education and training, develop capable technologies for hazardous wastes disposal, establish market mechanisms and enhance public environmental awareness.
Intellectual Property and Environment Issues in the WTO

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1. Introduction
The World Trade Organization (WTO) Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPs) establishes minimum standards for the protection of intellectual property rights (IPRs) including patents, copyrights, trademarks and trade secrets. A certain level of protection for intellectual property, supported by an appropriate institutional pro-competitive framework, has been proved to promote innovation and the development of new technologies. Overly strong IPRs have, however, raised many concerns in recent years regarding their potential negative impact on environmental, health, scientific, educational and development policies. Concerns specifically related to the environment include the effect of IPRs on (i) access to and the transfer of environmentally sound technologies, (ii) efforts to conserve biodiversity, (iii) the direction of scientific research and (iv) the safety and environmental risks associated with biotechnology.

Links between intellectual property and the environment are not new to the WTO agenda. The 1994 WTO Decision on Trade and Environment asked the Committee on Trade and Environment (CTE) to “consider in its work the relevant provisions of the Agreement on Trade-Related Aspects of Intellectual Property Rights as an integral part of its work.” In 1999, when Article 27.3(1) of the TRIPs Agreement came under review, environmental issues and, more specifically, issues linked to biodiversity and the patentability of life forms were placed before the TRIPs Council of the WTO.

The 2001 WTO Ministerial Conference in Doha issued two mandates—one to the TRIPs Council and the other to the CTE—to deal specifically with the relationship between the TRIPs Agreement and the Convention on Biological Diversity (CBD) and other related issues. (2) To date, the most important issues discussed in the TRIPs Council and CTE regarding intellectual property and the environment have been the following: (i) the relationship between the CBD and the TRIPs Agreement, (ii) the protection of traditional knowledge (TK), (iii) the patentability of life forms and (iv) the technology transfer clauses in Multilateral Environmental Agreements.

This note will provide background information on issues related to intellectual property and the environment, and will briefly outline developments that might be expected in the WTO post-Cancun phase.

2. The relationship between the CBD and TRIPs Agreement
The Doha Ministerial Declaration recognised the need to examine the relationship between the TRIPs A-
greement and the CBD, and to examine the protection of TK and folklore. The Declaration states that in “undertaking this work, the TRIPs Council shall be guided by the objectives and principles set in Articles 7 and 8 of the TRIPs Agreement and shall take fully into account the development dimension.” Additional references to the CBD can also be found in the list of outstanding implementation issues (particularly in notes 88 and 95), as referred to in paragraph 12 of the Declaration. Accordingly, the TRIPs Council was to report on these issues to the Trade Negotiations Committee (TNC) by the end of 2002.

The 2002 Report of the TRIPS Council basically reflected different WTO members’ opinions on issues covered by paragraph 19 of the Doha Ministerial Declaration, showing no consensus on possible options to move forward. In 2003, owing to the failure of the Cancun Ministerial Meeting, no actions were agreed upon at the Ministerial level. Since then, the review process has been in static mode. WTO members do not agree on whether issues under paragraph 19 are just a review of the implementation of current TRIPs commitments under article 27.3(b) or a negotiation that would open up the question of resolving implementation issues regarding the CBD.

The current debate on the relationship between the intellectual property system and biodiversity issues, including TK, is shifting to some extent from the WTO to the Conference of the Parties (COP) of the CBD and Intergovernmental Committee (IGC) of the World Intellectual Property Organization (WIPO). In these fora, work is already underway on the World Summit on Sustainable Development mandate to negotiate an international regime on benefit sharing, as well as the new IGC mandate to continue work on the international dimension of issues linked to intellectual property genetic resources and TK, including the possible development of an international instrument or instruments.

The CTE is also mandated to work on TRIPs-CBD issues. In paragraph 32, the Doha Declaration instructs “the CTE, in pursuing work on all items on its agenda within its current terms of reference, to give particular attention to [...] the relevant provisions of the Agreement on Trade-Related Aspects of Intellectual Property Rights.”

The relationship between the CBD and the TRIPs Agreement has been the subject of continuous debate in the TRIPs Council, especially under the review of Article 27.3(b) and paragraph 19 of the Doha Ministerial Declaration. A central focus of these discussions has been the recognition of the objectives and principles of the CBD, and the need to incorporate these objectives into the text of the TRIPs Agreement. The establishment of legal safeguards aimed at ensuring that the TRIPs Agreement—including provisions requiring disclosure of the origin of and/or proof of legal access to genetic resources or TK—is considered an essential means to achieve CBD objectives.

In the TRIPs Council, various developing countries led by India and Brazil presented a paper which reiterated earlier proposals to amend the TRIPs Agreement in light of the CBD. The proposals included a requirement for patent applicants to (i) disclose the source of origin of the biological resource and associated TK, and (ii) provide evidence of prior informed consent and benefit sharing. This proposal

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(3) Doha Ministerial Declaration, paragraph 19.
(4) Ibid.
(6) Paper presented by Brazil, Bolivia, Cuba, Dominican Republic, Ecuador, India, Thailand, Peru and Venezuela, 28 May 2003 (IP/C/W/403).
was strongly supported by the African Group and other developing countries.

In contrast to the developing country submissions, Switzerland’s position was that these issues should be discussed outside the WTO.\(^7\) The Swiss submission specifically proposed an amendment to the WIPO Patent Cooperation Treaty that would enable countries to require patent applicants to declare the source of any genetic resources and TK used. On the CBD-TRIPs Agreement relationship, Switzerland noted that the two “can and should” be implemented without conflict and that there was no need to modify the provisions of either.

For its part, the European Union (EU) noted that it shared several of Switzerland’s ideas, although it did not specify whether it believed that the issue should be addressed in the WTO or in WIPO. The EU once again signalled its willingness to discuss mandatory disclosure of origin requirements as stated in its concept paper submitted in September 2002.\(^8\) Specifically, the EU proposed the inclusion of a “self-standing” requirement to include information on the geographic origin of genetic resources and TK. Such a requirement, however, should not constitute an additional formal or substantial patentability criterion, the EU added. Thus, the EU stance is that failure to disclose should lie outside patent law but should, for instance, be regulated by civil or administrative law.

Related discussions have also taken place in the CTE under paragraph 32(ii) of the Doha Declaration, which identifies “relevant provisions of the TRIPs Agreement” as an item deserving particular attention from the CTE. Discussions here have largely mirrored those in the TRIPs Council. The EC has been the only Member to submit a paper—the same document that it presented at the TRIPs Council. Perhaps the only difference between the CTE and TRIPS Council debates is that some Members, including Colombia, Costa Rica and Peru, presented their experiences with introducing national legislation to implement the CBD. Members generally agreed that the TRIPs Council was dealing adequately with key aspects of the TRIPs-CBD relationship and that the CTE should therefore avoid duplicating work.

**Prospects for the post-Cancun phase.** Various developing countries will continue to push for the transformation of outstanding implementation issues and paragraph 19 of the Doha Declaration into a negotiating mandate to reform TRIPs in light of the CBD. They will also call for the introduction of legal safeguards to ensure lawful access to genetic resources. Negotiating blocs and alliances among developed countries could, however, prevent CBD issues from influencing the ongoing trade agenda. While the EU and Switzerland might not put up strong opposition, Australia, Japan and the United States could block any advancement in this area. Strong political pressure in favour of these issues from a coalition of developing countries, whether or not they are part of the G-20, will be necessary if the current discussions are to evolve into negotiations.

3. **The protection of traditional knowledge**

The TK of indigenous and local communities is of central importance to the conservation and sustainable use of biodiversity in general. This was highlighted by the Food and Agriculture Organization (FAO) International Undertaking process in the early 1980s as well as the CBD process a decade later. Annex II of FAO Resolution 5/89 (1989) established and provided international recognition to “farmers’ rights”, which were defined to include rights arising from past, present and future contributions by

\(^{7}\) IP/C/W/400.
\(^{8}\) IP/C/W/383.
farmers to the conservation and maintenance of plant genetic resources for food and agriculture (PGRFA). This move constituted an explicit recognition of the value and importance of farmers' (or communities') knowledge, innovations and practices related to PGRFA.

Building on the FAO debate, Article 8(j) of the CBD specifically states that, subject to national legislation, Contracting Parties should “respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity.” Article 8(j) also requires promoting the “wider application” of using TK with the approval and involvement of its holders. Similarly, Article (10)(c) provides that CBD Parties shall “protect and encourage customary use of biological resources in accordance with traditional cultural practices that are compatible with conservation or sustainable use requirements.”

Articles 8(j) and 10, the recognition of farmers’ rights and paragraph 19 of the Doha Declaration have collectively served as the trigger for setting up processes to address the protection of TK outside the CBD and FAO, 10 such as the WIPO Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore.

In the TRIPs Council, proposals requiring disclosure in patent filing procedures of the origin of genetic resources also applied to TK. This is indicative of the heavy pressure from most developing country Members to formulate defensive protection measures against continuous “misappropriation”.

Various WTO Members in the TRIPs Council have also proposed the need for positive protection of TK. As opposed to defensive protection, positive protection refers to the development of a legal regime that establishes the rights of holders of indigenous and traditional knowledge regarding access to, and use of, their knowledge. Depending on the scope of protection, this could imply (i) compensating right holders, (ii) establishing exclusive rights to impede use (similar to a patent right), (iii) maintaining (through databases or registers) or controlling the use of TK and (iv) establishing measures to promote the continuous use of traditional practices. The African Group presented the only substantive proposal in the TRIPs Council regarding positive protection of TK. This proposal seeks to classify TK as a category of intellectual property rights, and presents for adoption by the TRIPs Council a draft Decision that would provide certain rights to TK holders.

Prospects for the post-Cancun phase. Initiating negotiations for a TK protection regime within the WTO context would certainly put TK in the spotlight. However, even if this negotiating option were avail-

(9) Article 9 (farmers’ rights) of the Food and Agriculture Organization International Treaty on Plant Genetic Resources for Food and Agriculture (2001), derived from the earlier International Undertaking, establishes that the responsibility for implementing farmers’ rights rests with national governments (Article 9.2) and that the protection and promotion of farmers’ rights could include (i) the protection of traditional knowledge (TK) as it relates to plant genetic resources for food and agriculture, (ii) the right to participate in benefits arising from their use and (iii) the right to participate in decision making (Articles 9.2(a), (b) and (c)). Article 9.3 safeguards the right of farmers to save, use and exchange farm-saved seeds subject to national law.

(10) Conference of the Parties (COP) to the Convention on Biological Diversity Decision IV/9 formally established the Ad Hoc Open Ended Intergessional Working Group on Implementation of Article 8(j) with a specific work programme and terms of reference for its activities.

(11) Defensive protection of TK refers to the use of the intellectual property rights system with additional substantial or procedural requirements to ensure legitimate and legal granting of rights over products or processes which might directly or indirectly incorporate TK, with due recognition and consideration for indigenous peoples’ rights and interests over their TK.
able, IPR considerations may prevail in terms of the process itself, affecting substantive and effective proposals to address the protection of TK in the TRIPs Council. The recent submissions by the African Group and India on behalf of several developing countries will help keep these issues on the agenda. Developing countries need to prepare themselves and make efforts to find coherence in multi-forum processes including the WTO, WIPO, CBD and United Nations Educational, Scientific and Cultural Organization (UNESCO).

4. The patentability of life forms
TRIPs Article 27.3(b) allows Members to, with certain provisos, exclude plants and animals other than micro-organisms from patentability. Environmental concerns regarding the patentability of life most commonly voiced by certain sectors of the scientific community, academia and civil society include (i) the promotion of research in genetically modified organisms without appropriate risk assessments, (ii) the existence of proprietary control over life forms and (iii) the creation of incentives to monoculture. An African submission has recently called for Article 27.3(b) to be revised on ethical, religious, environmental and safety grounds so as to prohibit the patenting of plants, animals and micro-organisms. (12) This proposal has not been explicitly supported by other developing countries. Rather, large developing countries like Argentina, Brazil and India have recently begun to show interest in biotechnology activities, and have started to allow the patenting of certain types of life forms.

Prospects for the post-Cancun phase. Little debate is expected on the patentability of life forms. The main “demandeurs” on these issues are African countries, which have already spent most of their negotiating capital on obtaining an interim solution for the problems of countries without sufficient domestic capacity to produce drugs, in accordance with paragraph 6 of the Doha Declaration on TRIPs and Public Health.

5. Technology transfer clauses in multilateral environmental agreements
Paragraph 31 of the Doha Ministerial Declaration states that:

With a view to enhancing the mutual supportiveness of trade and environment, we agree to negotiations, without prejudging their outcome, on:

(i) the relationship between existing WTO rules and specific trade obligations set out in multilateral environmental agreements (MEAs). The negotiations shall be limited in scope to the applicability of such existing WTO rules as among parties to the MEA in question. The negotiations shall not prejudice the WTO rights of any Member that is not a party to the MEA in question;

(ii) procedures for regular information exchange between MEA Secretariats and the relevant WTO committees, and the criteria for the granting of observer status...

Like some of the WTO Agreements, most MEAs contain clauses on technology transfer or technological capacity building. Some MEA technology transfer clauses are binding, whereas others are merely “best endeavour” type clauses. In the Matrix prepared by the WTO Secretariat on trade measures pursuant to selected MEAs, (13) all of the technology transfer clauses in the selected MEAs are considered to be trade-related measures. Technology transfer clauses exist in the Basel and Climate Change Conventions, the Montreal Protocol and the CBD. In the CTE discussions, no specific focus has been placed on these clauses. The reason for this seems to be a general perception that such clauses are not in di-

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(12) IP/C/W/404.
(13) WT/CTE/W/160/Rev.2. The note has selected 13 multilateral environmental agreements that contain trade related measures.

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rect conflict with trade rules.

Regarding procedures for the regular exchange of information between the WTO and MEA Secretariats, there has been some focused discussion in the CTE on how to exchange information on technology transfer issues. Some WTO members noted the value of investigating potential synergies between technology transfer provisions in MEAs and the WTO, with a view to enhancing them. The United Nations Environment Programme (UNEP) Secretariat specifically stated in the CTE that technology transfer was not only an issue for the WTO, but for all MEAs. In UNEP’s view, the challenge was to go beyond simply exchanging information to finding ways in which technology transfers could be used as a tool to make the implementation of environmental and trade agreements mutually supportive. Thus far, MEAs and the WTO had worked independently on this matter.

Prospects for the post-Cancun phase. Specific discussions on the relationship between MEA technology transfer clauses and WTO rules are not expected in the post-Cancun era. Discussions on technology transfer will basically be centralised in the WTO Working Group on Trade and Technology Transfer.

(14) TN/TE/R/4.
Status of Implementation of the Agreement on Trade
—Related Aspects of Intellectual Property Rights in China
in the Context of the Convention on Biological Diversity

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1. Introduction

1. Agreement on Trade-Related Aspects of Intellectual Property Rights
The Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPs) was one of the 60 or so agreements signed during the 1986 – 1994 Uruguay Round negotiations, and its purpose was to strengthen intellectual property protection. The TRIPs Agreement, which represented Annex 1C of the Marrakesh Agreement Establishing the World Trade Organization (WTO), signed in April 1994, came into force on 1 January 1995 and has since been recognised as one of the more important agreements reached under the aegis of the WTO.

The TRIPs Agreement comprises a total of 73 articles, laid out in seven Parts:
- General Provisions and Basic Principles;
- Standards Concerning the Availability, Scope and Use of Intellectual Property Rights;
- Enforcement of Intellectual Property Rights;
- Acquisition and Maintenance of Intellectual Property Rights and Related Inter-Party Procedures;
- Dispute Prevention and Settlement;
- Transitional Arrangements; and
- Institutional Arrangements and Final Provisions.

One of the most basic features of the TRIPs Agreement is its intended aim to make intellectual property protection part of a multilateral trading system. The TRIPs Agreement is usually described as one of the three pillar agreements of the WTO, the other two being the Agreement on Trade in Goods (an area traditionally addressed by the General Agreement on Tariffs and Trade [GATT]) and the Agreement on Trade in Services. It is clear that the TRIPs Agreement is a key component of the WTO multilateral trading system.

The TRIPs Agreement sets the minimum standards for intellectual property protection. It allows WTO Members to adapt and expand their intellectual property systems to include additional forms of protection in order to achieve the policy objectives of the Convention on Biological Diversity (CBD), and to bring these objectives in line with domestic policy systems.

2. Convention on Biological Diversity
The CBD is one of the two binding agreements signed at the June 1992 United Nations Conference on Environment and Development, held in Rio de Janeiro, Brazil. The CBD, which formally came into force on 29 December 1993, is the first multilateral environmental agreement on the conservation and
sustainable use of biological diversity. Currently, there are 188 Contracting Parties to the Convention.

The CBD has three major objectives:
- Conservation of biological diversity;
- Sustainable use of components of biological diversity; and
- Fair and equitable sharing of the commercial benefits arising out of the utilisation of genetic resources.

Containing a total of 42 articles and two annexes, the main themes of the CBD include:
- Measures and incentives for the conservation and sustainable use of biological diversity;
- Access to genetic resources;
- Access to and transfer of technology, including biotechnology;
- Exchange of information and cooperation in science and technology;
- Impact assessment;
- Education and public awareness;
- Sources of funding; and
- National reports on fulfilment of CBD obligations.

The CBD reaffirms the sovereign rights of states over their own biological resources. It recognises that states have right of access to such resources in accordance with their own laws, with the ultimate aim of promoting the sustainable use of these resources. The CBD establishes that access to biological resources shall be subject to prior informed consent and an agreement on equitably sharing the results of research and development as well as the benefits arising from the utilisation of resources. These effectively constitute three leading principles of the CBD: (i) national sovereign rights over biological resources, (ii) prior informed consent and (iii) benefit sharing.

The CBD stipulates that access to genetic resources and sharing of the benefits resulting from their use shall be consistent with "proper and effective protection of intellectual property". Governments, particularly those of developing countries, should formulate policies that ensure access to genetic resources under mutually agreed terms. The CBD recognises that patents and other intellectual property rights may influence the implementation of the Convention, and that Parties should ensure intellectual property support for access and benefit sharing as long as doing so is not in conflict with either national or international law.

The TRIPs Agreement and the CBD are two completely different yet closely related agreements. The TRIPs Agreement is aimed at strengthening intellectual property protection within the WTO framework, while the CBD is a binding multilateral environmental agreement that purports to conserve biological diversity and emphasise national sovereignty under the United Nations framework. The link between TRIPs and the CBD is reflected in two ways. First, many Contracting Parties to the CBD are also WTO Members, and are thereby subject to the binding force of both agreements. Second, some of the articles of these two agreements are to a certain extent related.

II. Relationship between TRIPs and the CBD in WTO negotiations over environment and trade
In 2001, the WTO Ministerial Conference in Doha authorised the TRIPs Council to examine the relationship between the TRIPs Agreement, the CBD and protection of traditional knowledge (Doha Declaration, paragraph 19). The Meeting also instructed the WTO Committee on Trade and Environment (CET) to pay particular attention to related clauses of the TRIPs Agreement (Doha Declaration, Para-
In WTO negotiations over trade and environment, a major issue for the CTE has been the consistency or compatibility of TRIPs objectives with those of the CBD. On the issue of objective consistency between TRIPs and the CBD, opinion amongst WTO Members is divided.

Some Members hold that the TRIPs Agreement is consistent with the objectives of the CBD. The reasoning here is that since TRIPs and the CBD were agreed under different frameworks, their objectives and principles are independent of each other. As such, there is no conflict between the two. Some even argue that TRIPs will in fact help further the objectives of the CBD. Inventions or creations patented on the basis of biological resources or traditional knowledge are normally commercialised, it is maintained, and only commercialisation can produce benefits and, in turn, the benefit sharing advocated in the CBD. This view is mostly held by developed Member states that are in a position of advantage in terms of biotechnology.

Others, however, take a completely different line. Their contention is that while TRIPs lays down certain criteria for awarding patent rights on the basis of biological or genetic resources and traditional knowledge, these conditions do not include prior informed consent or an agreement on benefit sharing. The CBD safeguards national sovereign rights over genetic resources and traditional knowledge, but TRIPs contains no clauses that express support for such a principle. It follows that foreign companies may gain private rights based on other nations' resources, without offering to share benefits. Therefore, the argument goes, implementation of the TRIPs Agreement is likely to impede the fulfilment of CBD objectives. It is held that there are conflicts and contradictions between the two agreements, which is the very crux of the problem. Proponents of this view are mostly developing Member states that are rich in biological diversity, biological resources and traditional knowledge, but are relatively weak in biotechnology.

Some of those who think there is no conflict between the CBD and the TRIPs Agreement also recognise in principle the obligations set out in the CBD. It is understood that any attempt by companies to commercialise the use of biological resources or traditional knowledge without receiving prior informed consent and reaching an agreement on benefit sharing will be illegal, and likely to cause international contradictions and disputes.

However, practical difficulties stand in the way of fulfilling the prior informed consent and benefit sharing requirements of the CBD. This is because the cost of transactions, namely supervision and negotiations, is too high. In addition, in the case of disputes, developing country Members often find themselves on the losing side. Their ability to negotiate and supervise is limited, and this puts them in a weak position at the negotiation table. On occasion, developing countries have been able to eventually defend their legitimate national rights and interests, as in the case of Indian margosa oil. Nevertheless, these examples represent the exception and not the norm where biological resource misappropriation is concerned. A far greater number of similar problems are far from resolved. For this reason, system innovation within the WTO framework is required at both the national and international level, which is the only way to reduce transaction costs. In WTO negotiations over environment and trade, the issue of consistency between TRIPs and the CBD is now progressing along these lines.

A Member of the WTO, China is the largest developing country in the world and possesses rich biological diversity and genetic resources. Moreover, China is a country with numerous ethnic minorities, and
a culture and traditional knowledge base that goes back 5,000 years. In WTO negotiations over the relationship between TRIPs and the CBD, China proposes that relevant TRIPs articles should be amended so as to embody the principles of national sovereign rights, prior informed consent and benefit sharing, thereby ensuring that the objectives of the CBD are fulfilled. This will have a major and positive impact on the conservation of biological diversity, not just in China but globally.

III. Status of implementation of the TRIPs Agreement in China in the CBD context

1. CBD clauses related to the TRIPs Agreement

The Third Meeting of the Conference of the Parties (COP) to the Convention on Biological Diversity was held in November 1996. Even at that early stage, there was a realisation that the relationship between intellectual property, relevant clauses of the TRIPs Agreement and the CBD must be understood in its entirety. It was noted that particular attention should be paid to issues related to the transfer of technology; the conservation and sustainable use of biological diversity; and fair and equitable sharing of the benefits arising out of the utilisation of genetic resources, including the protection of knowledge, innovations and practices of indigenous and local communities. Such communities were thought to embody traditional lifestyles relevant to the conservation and sustainable use of biological diversity.

In Paragraph 2 of Section B of the COP Decision V/26, the Meeting invited the WTO to understand the relevant articles of the CBD, consider the fact that some articles of the TRIPs Agreement and the CBD are interrelated, and recognise the need to examine this relationship.

In June 2002, the CBD Secretariat submitted a report to the CTE and Members of the TRIPs Council. Titled “Examination of Article 27.3(b) of the TRIPs Agreement, Relationship Between the TRIPs Agreement and the CBD and Protection of Indigenous Knowledge”, this document made note of CBD clauses that were related to the TRIPs Agreement. These include:

(1) Article 15: Access to Genetic Resources
Recognizing the sovereign rights of States over their natural resources, the authority to determine access to genetic resources rests with the national governments and is subject to national legislation.... Access to genetic resources shall be subject to prior informed consent of the Contracting Party providing such resources, unless otherwise determined by that Party.... Each Contracting Party shall endeavour to develop and carry out scientific research based on genetic resources provided by other Contracting Parties with the full participation of, and where possible, such Contracting Parties.... Each Contracting Party shall take legislative, administrative or policy measures... with the aim of sharing in a fair and equitable way the results of research and development and the benefits arising from the commercial and other utilization of genetic resources with the Contracting Party providing such resources. Such sharing shall be upon mutually agreed terms.

(2) Article 8(j): Traditional knowledge, innovations and practices
Subject to its national legislation, respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity and promote their wider application with the approval and involvement of the holders of such knowledge, innovations and practices and encourage the equitable sharing of the benefits arising from the utilization of such knowledge, innovations and practices...

(3) Article 16: Access to and transfer of technology
Access to and transfer of technology... to developing countries shall be provided and/or facilitated un-
nder fair and most favorable terms, including on concessional and preferential terms where mutually agreed. In the case of technology subject to patents and other intellectual property rights, such access and transfer shall be provided on terms which recognize and are consistent with the adequate and effective protection of intellectual property rights. Each Contracting Party shall take legislative, administrative or policy measures, as appropriate, with the aim that Contracting Parties, in particular those that are developing countries, which provide genetic resources are provided access to and transfer of technology which makes use of those resources, on mutually agreed terms, including technology protected by patents and other intellectual property rights. The Contracting Parties, recognizing that patents and other intellectual property rights may have an influence on the implementation of this Convention, shall cooperate in this regard subject to national legislation and international law in order to ensure that such rights are supportive of and do not run counter to its objectives.

(4) Article 19 Handling of biotechnology and distribution of its benefits
Each Contracting Party shall take all practicable measures to promote and advance priority access on a fair and equitable basis by Contracting Parties, especially developing countries, to the results and benefits arising from biotechnologies based upon genetic resources provided by those Contracting Parties. Such access shall be on mutually agreed terms. The Parties shall consider the need for and modalities of a protocol setting out appropriate procedures including, in particular, advance informed agreement, in the field of the safe transfer, handling and use of any living modified organism resulting from biotechnology that may have adverse effect on the conservation and sustainable use of biological diversity.

2. Implementation of the TRIPs Agreement in China in a CBD context
China may be a new member of the WTO but a fairly sound intellectual property regime has been in place in the country for a number of years. Since its accession to the WTO, China has continued to make telling efforts to improve its intellectual property system. Despite this, there are still considerable gaps that China needs to bridge in its implementation of the WTO Agreement, and eventually ensure that its intellectual property system can help achieve the objectives of the CBD. More in-depth and wider efforts and research are needed in many fields and regarding many issues. The status of the implementation of the TRIPs Agreement in China in the CBD context is discussed below.

(1) Access to genetic resources
Many countries are currently drawing up and improving their laws concerning genetic resources and access to traditional knowledge. Patent laws in some countries now require that applicants disclose the genetic resources or traditional knowledge used in their biotechnology, and provide evidence of prior informed consent and the agreement reached on benefit sharing. Such provisions are specifically laid down in the patent laws of India and other countries. In its Directive on the legal protection of biotechnological inventions, the European Union for its part clearly specifies that no patent will be awarded on plant and animal varieties, nor on inventions whose commercial applications would be counter to public interests or social ethics.

China is one of the earliest signatories to the CBD. Since the CBD formally came into force in 1993, the Chinese government has made a series of effective efforts to conserve biological diversity. The Chinese government has been seriously considering specific ways of incorporating the major principles of the CBD into the country's Patent Law and its detailed implementation rules. Article 26 of China's Patent Law states:
Where an application for a utility patent or a patent for another type of invention is filed, a request, a
description and its abstract, and claims shall be submitted.

The request shall state the title of the invention or utility model, the name of the inventor or creator, the name and the address of the applicant and other related matters.

The description shall set forth the invention or utility model in a manner sufficiently clear and complete so as to enable a person skilled in the relevant field of technology to carry it out; where necessary, drawings are required. The abstract shall state briefly the main technical points of the invention or utility model.

The claims shall be supported by the description and shall state the extent of the patent protection asked for.

Despite certain provisions, it is clear that no specific articles in China’s Patent Law require patent applicants to provide information about the source of materials related to their biotechnological inventions, prior informed consent obtained from people holding rights to such materials in the place of their origin, or the benefit-sharing agreement reached with such rightsholders. Therefore, much work needs to be done if China’s Patent Law is to be brought in line with the primary principles of the CBD. However, the provisions listed above form a good foundation for future improvement.

(2) Traditional knowledge, innovations and practices

In terms of the relationship between intellectual property and protection of traditional knowledge, the main problem lies in how the existing intellectual property protection system can—or whether it should—adapt to the protection of indigenous and traditional knowledge of local communities in the context of biological diversity. What “special” mechanisms or other measures should be adopted is also problematic.

In fact, the existing intellectual property system—in particular, the patent system—is not effective in protecting traditional knowledge, innovations and practices. This is because under the current system, knowledge relevant to biological resources is unlikely to meet all the prerequisites for receiving special intellectual property protection, such as novelty, steps of invention and industrial applicability.

Conflicts between the existing intellectual property system and the protection of traditional knowledge include the following:
- Intellectual property is based on the protection of personal property, while traditional knowledge is often collectively created, improved and passed on;
- Traditional knowledge is often developed and formed during a certain period of time and passed on orally from generation to generation. Therefore, it does not meet the terms of novelty and steps of invention which are essential to the granting of patent rights;
- Knowledge is often owned by several different and independent communities;
- Protection of patent rights is governed by a time limit, while traditional knowledge is passed on between generations.

It is possible for traditional knowledge-based technological inventions or creations to be awarded patent rights through the biotechnological industry. This is so because the biotechnology industry can make unique inventions on the basis of these resources and related knowledge. Therefore, the nature and characteristics of access to traditional knowledge are similar to those of access to genetic resources,
mentioned above.

There is no sound regime or effective set of measures in China's current intellectual property system to protect traditional knowledge. Even so, China has made some progress in building traditional knowledge databases. In August 2001, for example, China's Traditional Chinese Medicine Patent Database and Search System Experimental Bank passed a searching test conducted by the World Intellectual Property Organization (WIPO) Working Group on Traditional Knowledge. The database has collected all the traditional Chinese medicine patents published in China since 1985 and currently comprises over 19,000 patent entries and almost 40,000 traditional prescriptions. Expansion of this database is an ongoing process.

China has also made progress in protecting traditional knowledge. However, most of the country's traditional knowledge, innovations and practices are scattered across various quarters of civil society and are thus not well organised or properly documented. Awareness of the need to protect traditional knowledge remains poor, and relevant national policies, strategies and legislation need to be strengthened. No mechanisms have been established for the equitable sharing of the benefits arising out of the utilisation of traditional knowledge, innovations and practices. Clearly, China is yet to enhance its national capacity and skills for protecting traditional knowledge.

(3) Access to and transfer of technology

China began protecting biotechnological intellectual property in the mid-1980s. Its Patent Law, which came into effect on 1 April 1985, protects biotechnological inventions including those for obtaining and producing fauna and flora germplasm as well as pharmaceuticals. The Patent Law was amended on 4 September 1992 and 25 August 2000, bringing most biotechnological products and materials under the ambit of its protection. But Item 4 of Article 25 of the Law still stipulates that no patent shall be awarded to fauna or flora varieties.

Article 27 of the TRIPs Agreement stipulates that protection should be given to new plant varieties, either through patents, an effective sui generis system, or any combination thereof. Based on its current legislation and level of national economic development, China released the Regulations for the Protection of New Plant Varieties (hereafter referred to as Protection Regulations) on 20 March 1997. The sections on agriculture and forestry in the supplementary Detailed Rules for Implementation of the Regulations for the Protection of New Plant Varieties have also been implemented, improving the legal regime. In all, 18 species and genera have been listed in the first batch of varieties targeted for protection: alfalfa, camellia, China fir, Chinese cabbage, Chinese white poplar, chrysanthemum, Cymbidium goeringii Rchb. f., dianthus, Gladiolus hybridus Hort., Kentucky bluegrass, magnolia, maize, Paeonia suffruticosa Andr., paulownia, plum, potato, rice and rose.

According to the Protection Regulations, China grants rights over new plant varieties to those applications that meet set criteria. By the end of 2000, China had received 391 applications for rights over new plant varieties from both domestic and foreign parties, and approved 68 such applications. In addition, the Supreme People's Court has released the "Interpretations Concerning Some Issues in Hearing Cases of Disputes Over Right to New Plant Varieties". The introduction of this judicial interpretation is bound to play an active role in ensuring that people's courts will handle and hear cases concerning disputes over rights to new plant varieties according to the law. This document also guarantees unified law enforcement.
China became a member of WIPO in 1980. In 1985, the country became a Party to the Paris Convention on the Protection of Industrial Property, and in 1989 to the Madrid Agreement Concerning the International Registration of Marks. On 23 April 1999, China became a member of the International Union for the Protection of New Varieties of Plants. With its participation in these international agreements, China has reached a reasonable level of conformity with the international intellectual property system.

China has already developed a legal framework for the protection of intellectual property protection and transfer of technology. Its legal system, however, still needs improvement.

(4) Handling of biotechnology and distribution of benefits

Article 27.3(b) of the TRIPs Agreement stipulates that to protect human, animal and plant life or health, or to avoid causing serious damage to the environment, Members may exclude certain inventions from patentability. In addition, Member countries may also exclude from patentability plants, animals and organisms, or the biotechnology that produces them, if such measures will aid the conservation of biological diversity.

China’s current Patent Law contains provisions for examining patent applications for chemical inventions. In particular, it provides legal interpretations for special problems involving biotechnological inventions.

(i) Micro-organisms

Item (4) of Paragraph 1 of Article 25 of China’s Patent Law stipulates that no patent shall be awarded to animal or plant varieties. But since micro-organisms are held to be neither animal nor plant, they are not covered under Item (4) of above. However, micro-organisms that are not treated by man-made technology and exist naturally in the physical world are considered scientific discoveries that possess no industrial applicability. As such they cannot be patented. Micro-organisms can qualify for patent protection only when they are separated, become a pure cultured object and possess specific industrial utility.

(ii) Genes

Genes are DNA sequences with special physiological functions. Essentially, both genes and DNA fragments are chemical substances but genes separated and extracted from organisms are considered natural substances. Genes or their DNA fragments existing in a natural form in the physical world but discovered by people constitute a “scientific discovery”. As stipulated in Item (1) of Paragraph 1 of Article 25 of the Patent Law, such discoveries cannot be awarded patent rights. However, the same does not hold true for genes or DNA fragments that are separated or extracted from the natural world for the first time, grouped in a sequence not previously recorded in existing technology and deemed to possess industrial value. In such cases, the genes or DNA fragments themselves, as well as the method used to obtain them, may qualify for patent protection. Human genes may also qualify for patent protection if they are separated or extracted for the first time and meet the other related requirements mentioned above.

(iii) Transgenic animals and plants

Transgenic animals and plants are animals or plants obtained from biological methods, such as recombinant DNA technology in gene engineering. According to the provisions of Item (4) of Paragraph 1 of Article 25 of the Patent Law, they cannot be patented.
(iv) Biotechnology-related inventions to which no patent can be awarded
Article 5 of the Patent Law stipulates that patent rights cannot be granted to biotechnology-related inventions whose commercial development runs counter to social ethics or harms public interests. The following inventions fall in this category:
- Methods of human cloning and cloned humans;
- Methods that change the genetic identity of the human reproductive system;
- Use of human embryos for industrial or commercial purposes; and
- Methods that are likely to cause pain and suffering to animals and offer no substantive benefit to the medical treatment of humans or animals and that change the genetic identity of animals; and animals obtained from such methods.

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Tribal and rural men and women conserve and improve our natural resources for public and commercial good at personal cost. Often they live in poverty, while those who utilise their knowledge and resources prosper. There are several proponents of the theory that only value addition can make a resource useful and marketable. Indeed, whether it is a traditional crop or medicinal plant, the value of raw materials will be low unless researchers invest time, money and intellect to develop new varieties or drugs. This, however, should not undermine the fact that the benefits arising out of value addition are based on resources that belong to such communities and the knowledge that comes from them. As such, natural resources and traditional knowledge both play a significant role in the development of marketable products.

It is now widely accepted that the contribution of tribal and rural communities to genetic resources conservation and enhancement ought to be recognised and rewarded. This concept of equity in benefit sharing was christened "farmers' rights" by the Food and Agriculture Organization (FAO) of the United Nations over 15 years ago. With the coming into force of the Convention on Biological Diversity (CBD) in 1993, the principles of equity and ethics in benefit sharing have since acquired international legal status.

The objectives of the CBD include three major goals: conservation of biodiversity, sustainable use of biodiversity and equitable sharing of benefits arising out of such use. While progress is being made with reference to the first two goals, initiatives relating to equitable sharing of benefits remain inadequate.

In addition to the CBD, the Agreement Establishing the World Trade Organization (WTO) and its provisions laid out in the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPs) are now also in force. WTO Members are to provide for the protection of plant varieties either through a patents regime, an effective sui generis system or a combination of these measures.

With the strengthening and widening of the intellectual property rights (IPR) regime, there are growing attempts in industrialised countries to patent material based on traditional knowledge and genetic strains. Genetic material grown in developing countries for centuries, and whose medicinal and other beneficial properties have been known to countless generations, have in recent years been subjected to IPR claims in industrialised countries. Neem and turmeric are two such examples. Even plant material of well established geographical identity, such as basmati rice grown in Pakistan and India, has been the target of IPR claims. This has led to calls for a moratorium on IPR claims on genetic resources held in common, and on resources belonging to other countries. A case in point is the moratorium imposed on seeds held in trust in gene banks at the international agricultural research centres of the Consultative
Group on International Agricultural Research (CGIAR), including the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) in Hyderabad, India, and the International Rice Research Institute (IRRI) located at Los Banos in the Philippines.

Intellectual property laws were previously viewed only as engines of industrial and cultural progress. Recently, however, they have received attention as a tool to achieve the broader goals of conserving biodiversity while promoting sustainable development and the equitable sharing of resulting benefits. It is therefore necessary to outline how IPRs can be applied to new technologies, commercial practices and ethical standards of biodiversity prospecting, and to examine the merits of creating new biodiversity prospecting rights. The CBD calls upon countries to establish such a framework. The specific mix of laws and institutions developed will vary from country to country, depending on local concerns and legal traditions.

Generally, IPRs are justified on the grounds that they (i) serve as an incentive to innovators, (ii) establish a system that promotes public disclosure of new information, (ii) reward those creating commercial or cultural value, (iv) satisfy principles of moral rights by allowing creators to control the fate of their creations and (v) facilitate technology transfer. The basic argument in favour of applying IPRs to biodiversity conservation is as follows: if those who control a habitat hold proprietary rights to develop its biological resources, this allows them to derive economic benefits which in turn serve as an incentive to conserve rather than destroy those resources.

A rigorous analysis of intellectual property in a particular habitat, such as a rainforest or reef, would require research and analysis of applicable local legislation, executive regulations and judicial decisions. The cultural context of the law would have to be assessed as well, since the rule of law counts much more in some countries than others. In this paper, the more modest goal is to explore, in general terms, those intellectual property doctrines and strategies which are appropriate to and consistent with conserving biodiversity in wild habitats.

The CBD allows countries to assert sovereignty over their genetic resources, and to ensure that the benefits arising from their utilisation are shared fairly and equitably. Countries must move fast, however, to take advantage of this opportunity by establishing biodiversity-related national legislation on access and benefit sharing. Just as importantly, countries must develop procedures and institutional capacities to implement that legislation. For example, the Philippines Executive Order 247 governing access to biological and genetic resources in that country establishes a framework to regulate biodiversity prospecting by using the following mechanisms:

- A system of mandatory research agreements between collectors and the government, containing minimum terms concerning the provision of information and samples, technology cooperation and benefit sharing;
- An Inter-Agency Committee on Biological and Genetic Resources to consider, enter into, monitor and enforce compliance with research agreements, as well as to coordinate further institutional, policy and technology development;
- A requirement for obtaining prior informed consent (PIC) from local and indigenous communities where material is collected, coupled with minimum process standards; and
- Minimum requirements to conform to environmental protection laws and regulations.

Ways forward
There is an urgent need to harmonise the provisions of TRIPs with the equitable benefit sharing and PIC
provisions of the CBD. What is needed is a new global trade and transactions order - a “TRIPS Plus”, if you will, where the “Plus” refers to equity and ethics in IPR claims. Since the same governments are both Members of the WTO and Parties to the CBD, coordinated action is required in matters relating to biodiversity. In this context, the recent move by the World Intellectual Property Organization (WIPO) to consider questions relating to the recognition of traditional knowledge systems and informal innovations is particularly relevant. Traditional and formal knowledge systems represent a continuum, and it would be unethical to merely recognize the tip of the iceberg in the innovation chain. Synergy between traditional knowledge and modern science is often essential to introduce dimensions of ecological and social sustainability into the process of technology development and dissemination.

Pending the enactment of appropriate legislation to give effect to the provisions of the CBD, we have to think in terms of introducing immediate steps, such as codes of conduct for academic researchers as well as commercial entrepreneurs and companies, and information and material transfer agreements for the purpose of implementing the PIC and benefit sharing provisions of the CBD. Know-how licences of the kind introduced in Peru will also be valuable to regulate the flow of information and resources. Knowledge and the resources to which that knowledge relates often go together.

Several significant voluntary initiatives in the areas of PIC and benefit sharing, such as the Tropical Botanic Garden and Research Institute (TBCRI) as well as the India and University of California models, have been developed by research institutions, botanical gardens and commercial companies. These efforts have included the development of institutional policies and codes of conduct on access and benefit sharing. The experience gained here provides valuable lessons in developing transparent and implementable procedures to ensure equity and ethics in the use of traditional knowledge and genetic resources. Case studies on the experience of the Philippines and the Andean Pact countries in enforcing legal measures for access and benefit sharing also provide important insights that will be useful to other countries currently developing legislation relating to the CBD.

Before commencing any activity on collection, use and value addition under the purview of the CBD, parties must obtain PIC, on mutually agreed terms, from the communities that own the resources. Article 15(5) of the CBD clearly states that access to genetic resources shall be subject to PIC. The next step is to address the issue of benefits and their appropriation.

Voluntary codes of conduct are often seen as a possible solution in the short-term. Key features of such a code include:

- Commitment to comply with international, national, and local research policies and codes of conduct;
- Collaboration with local communities on product development and technology transfer;
- Respect for the rights and right to privacy of information of indigenous peoples;
- Promotion of sustainable development and conservation;
- Description of the conditions under which negotiations for patent rights are conducted; and
- Benefit sharing and fair compensation with short-, medium- and long-term reciprocity.

A voluntary code must also be based on the undertaking that:

- No standard procedure is adequate for all circumstances;
- Flexibility and diversity are important tools for all parties involved; and
- Only a transparent government administrative authority, working exclusively on these issues, can streamline the process.
If the benefits of genetic resource utilisation are to be shared fairly and equitably, governments will need to design specific mechanisms to ensure that those rewards actually reach the intended beneficiaries, be they local communities, national research institutions, government agencies or non-governmental organisations. The nature of the intended beneficiary will influence decisions on how to appropriately allocate different kinds of benefits. At the same time, training and technological empowerment will enable them to improve their economic condition, while remaining true to conservation ethics. The policy and institutional instruments being developed in Brazil and India for the purpose of regulating access and promoting benefit sharing are examples of such initiatives.

One simple and feasible change would bring the IPR regime more in line with the benefit sharing provisions of the CBD. Governments, primarily in developed countries, could amend their IPR systems to include a requirement that patent applications disclose information relating to the country of origin or sources of the genetic material used in research leading to the innovation. This information could be protected and used solely to deal with issues related to benefit sharing.

The CBD seeks to initiate a process that will lead to a transition from an exploitative and inequitable relationship between the providers and users of biodiversity, to a partnership based on the principles of equity and ethics. The CDB recognises the right of sovereign states to regulate access to genetic resources and associated knowledge according to national conservation and developmental priorities. By formulating the principles that should guide national access and benefit sharing regulations, the CBD sets the stage for states to ensure that genetic resources benefit communities in perpetuity, rather than working against their interests.
Access to Genetic Resources and Benefit Sharing: Implementation of CBD Article 15 in China

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Introduction

Definition of genetic resources
The Convention on Biological Diversity (CBD) defines biological resources to include genetic resources, organisms or parts thereof, populations, or any other biotic component of ecosystems with actual or potential use or value for humanity. Here, genetic resources are defined as genetic material of actual or potential value, where genetic material refers to any material of plant, animal, microbial or other origin containing functional units of heredity. Genetic resources are therefore included in the concept of biological resources, namely all biological units of heredity including species and units under genus (subspecies, mutations, variants, varieties, strains and types) and their genetic material (including tissues, cells, chromosomes, genes and DNA fragments).

Challenges for access to genetic resources and benefit sharing
In negotiations leading up to the CBD, developing countries expressed grave concern about sovereign rights to genetic resources. Their fears regarding the loss of genetic resources, and the unfair and inequitable sharing of benefits, is borne out by their experience. Indeed, some developing countries have received unfair treatment and gradually come to realise the importance of fair access to genetic resources and benefit sharing.

As the pace of economic globalisation intensifies, multinational companies in developed countries are accelerating efforts to not merely increase their presence in developing country markets but to acquire a monopoly. In the case of biotechnology, though, multinational companies frequently develop technology using genetic resources derived from developing countries. Companies collect genetic resources, employ advanced biotechnology to develop new transgenic varieties and then apply for patent protection. These patented technologies and products are then sold back to developing countries at a high price. As a result, multinational companies are able to monopolise developing country markets and reap rich rewards in the process, causing huge economic losses to developing nations. Even countries that provide the original genetic resource are subject to this fate.

In the case of seeds, 10 multinational companies now control 32% of the global seed market, valued at US $ 23 billion. Similarly, a United States (US) company successfully applied in 1997 to patent basmati rice, a prime variety indigenous to South Asia. As a result, India faced a serious threat to its basmati rice exports, estimated at US $ 300 million annually. Although the Indian government subsequent-
ly did its best to rectify the damage, 16 patents were still lost. Recently, another US company successfully used modern biotechnology to develop new varieties of scented rice with qualities very similar to Thailand’s jasmine scented rice. The company is now preparing to apply for patent protection for the new varieties, something the Thai public has protested against strongly. Similarly, Dupont recently rushed to register in Europe for a patent over Mexico’s high oil-yield maize, a move which led to protests from various international organisations including Greenpeace and strong opposition from the international community. The application was subsequently turned down by the European Patent Office. In 2001, the Chinese press also hotly debated and contested the Monsanto drive to patent the genes of wild Chinese soybean.

**Article 15 of the CBD**

Paragraph 1 of Article 15 of the CBD recognises “the sovereign rights of States over their natural resources,” adding that “the authority to determine access to genetic resources rests with the national governments and is subject to national legislation.” Paragraph 2 requires that all Contracting Parties “shall endeavour to create conditions to facilitate access to genetic resources for environmentally sound uses by other Contracting Parties and not to impose restrictions that run counter to the objectives of this Convention.” Paragraph 4 states that access, “where granted, shall be on mutually agreed terms and subject to the provisions of this Article” while Paragraph 5 establishes that access to genetic resources “shall be subject to prior informed consent of the Contracting Party providing such resources, unless otherwise determined by that Party.” Finally, Paragraph 6 of Article 15 states that Contracting Parties “shall endeavour to develop and carry out scientific research based on genetic resources provided by other Contracting Parties with the full participation of, and where possible in, such Contracting Parties.”

**Objectives and focus of the Bonn Guidelines**

The sixth Conference of the Parties to the CBD in 2002 adopted the Bonn Guidelines on Access to Genetic Resources and Fair and Equitable Sharing of the Benefits Arising Out of Their Utilization. The objectives of the Guidelines are to (i) provide Contracting Parties and stakeholders a transparent framework to promote access to genetic resources and fair and equitable sharing of benefits; (ii) provide capacity building to developing countries, in particular least developed countries and small island developing countries, in order to ensure effective negotiations and implement arrangements for access and benefit sharing; and (iii) strengthen clearing-house mechanisms and help Contracting Parties establish mechanisms to protect the traditional knowledge, innovations and practices of indigenous communities, and to develop a benefit sharing system. The implementation focus of the Bonn Guidelines is on prior informed consent procedures to ensure that access to genetic resources is undertaken under mutually agreed terms that promote benefit sharing.

**I. National laws, regulations and policies for genetic resources acquisition**

China signed and ratified the CBD in 1992 and 1993, respectively. Since then, the country has undertaken a great deal of work with respect to Article 15 and other clauses of the CBD related to genetic resources conservation and management. China’s efforts have focused on areas such as policy, law and regulations; conservation and management; promotion of access and benefit sharing; and publicity and education.

1. **Policies for genetic resources management and conservation formulated after accession to the CBD**

China signed the CBD at the 1992 United Nations Conference on Environment and Development, held
in Brazil. Immediately thereafter, China included in its national strategies and policies the commitments made to the CBD. In November 1992, with the approval of the Central Committee of the Communist Party of China and the State Council, the General Office of the State Council forwarded the Report on Attendance at the United Nations Conference on Environment and Development and Relevant Countermeasures, submitted by the Ministry of Foreign Affairs and the State Environmental Protection Administration.

The Report proposed that accelerated efforts should be made to (i) investigate biological resources and determine the status of endangered species in China; (ii) further strengthen the conservation and rational use of biological diversity; (iii) develop plans to establish conservation and breeding centres for rare wild species, superior quality fowl, domesticated animals, crops and superior quality medicinal species; (iv) do good work to conserve, develop and use species and genes; and (v) strengthen export administration.

In 1994, the State Council released China's Agenda 21, a white paper on China’s population, environment and development in the 21st century. Chapter 15 of this Agenda sets out the goals of biological diversity conservation and lists conservation of genetic resources as a key goal and priority field.

In the same year, the Chinese government also issued China’s Biological Diversity Conservation Action Plan. Objective 4 of this Plan is “to conserve the genetic resources of crops and domesticated animals.” Three priority actions are listed under this objective:

- Action 13: To conserve the genetic resources of crops, forage grasses and vegetable crops;
- Action 14: To conserve the genetic resources of domesticated animals; and
- Action 15: To conserve the genetic resources of trees.

Between 1995 and 1997, the State Environmental Protection Administration played a leading role in compiling a Research Report on National Conditions for Biological Diversity in China. This report provides a systematic summary of the status of biological genetic resources conservation in China as well as threats to resource conservation, and proposes a series of conservation policies and measures.

The Ministry of Science and Technology also rallied experts to complete China's Biological Germplasm Resources Conservation Action Plan. The germplasm resources covered by the Plan include agricultural crops, trees, wild plants, medicinal plants, domesticated animals, aquatic organisms and agricultural micro-organisms. Between 2002 and 2003, the State Environmental Protection Administration played a leading role in bringing together various experts to complete the Research Report on Benchmark Status of Genetic Resources in China and Measures for Their Protection. This Report is specifically concerned with the implementation in China of CBD Article 15.

Recently, the State Council also began considering a Circular Concerning Strengthening of the Administration of Biological Genetic Resources. The Circular is expected to stress the importance of the conservation and administration of biological genetic resources, and call for further work to investigate genetic resources, improve collection and cataloguing, develop conservation and utilisation plans, improve infrastructure and strengthen conservation efforts. The Circular will also call for efforts to (i) improve laws and regulations related to conservation and management of biological genetic resources, (ii) strengthen administration and (iii) prevent loss of genetic resources. A number of additional measures are expected, such as strengthening scientific research, increasing funding, improving conservation, and enhancing organisation and coordination. The Circular will also specify sectoral responsibilities.
2. Major laws and regulations for genetic resources management formulated after accession to the CBD

Since ratifying the CBD, China has sped up efforts to enact legislation related to genetic resources. These laws and regulations embody both the concept of sovereign rights to genetic resources and efforts to promote access to biological genetic resources and benefit sharing.

(1) Seed Law

In 2000, China promulgated a revised Seed Law. Chapter 2 of this Law is concerned with the protection of germplasm resources. Article 8 stipulates that the State shall conserve germplasm resources according to the law, and that no unit or individual shall misappropriate or destroy germplasm resources. Under Article 9, the State shall plan to collect, sort, appraise, register, preserve, exchange and utilise germplasm resources, and regularly release catalogues of germplasm resources available for use.

Article 10 further determines that the State enjoys sovereign rights over germplasm resources. Units or individuals planning to provide germplasm resources to an overseas party may do so subject to the approval of the State Council’s administrative authorities for agriculture and forestry. Similarly, units or individuals planning to introduce germplasm resources from overseas are required to follow the procedures stipulated by the State Council’s administrative authorities for agriculture and forestry.

The Ministry of Agriculture and the State Forestry Administration have also drawn up detailed implementation measures with respect to the administration of crop and tree seeds.

(2) Interim Measures for Administration of Import and Export of Crop Seeds/Seedlings

In 1997, the Ministry of Agriculture issued and implemented the Interim Measures for Administration of Import and Export of Crop Seeds/Seedlings. The Interim Measures govern the introduction and provision of germplasm resources for research purposes, and the import and export of seeds or seedlings for production uses (including experimental, field and external breeding purposes).

Chapter 2 of the Interim Measures concerns the import and export of germplasm resources. According to Article 4, germplasm resources provided overseas shall be administered according to the crop germplasm resources classification catalogue. Where germplasm resources may be “conditionally exchanged with the outside world” or “exchanged with the outside world”, the provincial administrative department for agriculture shall examine and approve the transfer. Germplasm resources that “cannot be exchanged with the outside world” or have not been indexed in the national unified catalogue shall not be provided overseas. Article 5 stipulates the application, examination and approval procedures for providing germplasm resources to the outside world.

(3) Regulations for Administration of Breeder Livestock and Fowl

In 1994, the State Council released the Regulations for Administration of Breeder Livestock and Fowl. Under Chapter 2 of the Regulation, which addresses the protection of livestock and fowl resources, the State is responsible for implementing graded protection for livestock and fowl variety resources; drawing up plans to establish livestock and fowl variety resources protection areas, gene banks and measurement stations; and providing special protection for endangered livestock and fowl varieties of value for domestic use. In 1998, the Ministry of Agriculture issued the Detailed Implementing Rules for Regulations for Administration of Breeder Livestock and Fowl Varieties.
More recently, the Ministry of Agriculture issued a public bulletin on Livestock and Fowl Varieties Resources for National Protection. Issued in 2000, this bulletin lists 78 livestock and fowl varieties designated for national protection.

(4) Regulations for the Protection of New Plant Varieties
The State Council issued and implemented the Regulations for the Protection of New Plant Varieties in 1997 to provide intellectual property protection for new plant varieties. In Article 9, the Regulations establish that the rights to apply for new plant varieties and rights to new plant varieties may be transferred. Where units or individuals in China transfer to foreigners the right to apply for, and their rights to, new plant varieties bred in China, the transaction shall be approved by the examination and approval body. The Ministry of Agriculture and the State Forestry Administration have drawn up detailed implementing rules for the Regulations with regard to the protection of crop and tree varieties.

(5) Wildlife Protection Law
In 1988, the Standing Committee of the National People's Congress promulgated the Wildlife Protection Law. In 1996, the State Council issued the Regulations for the Protection of Wild Plants, setting out provisions for the collection, hunting, domesticated reproduction, conservation, and entry and exit of wildlife, particularly rare and endangered animals and plants. In addition, for the purpose of conserving in situ wildlife species and wild sibling species of cultivated crops, China has established more than 1,000 natural reserves. In 1994, the State Council issued and implemented the Regulations for Natural Reserves.

3. Special laws and regulations currently in formulation concerning access to genetic resources and benefit sharing
To ensure full compliance with the provisions of the CBD and other relevant international treaties and multilateral mechanisms, China has been drafting a new national law over the last three years—the Law on the Protection of Biological Genetic Resources or Regulations for the Protection of Biological Genetic Resources. The new Law or Regulations will:

- Establish prior informed consent procedures and set out the terms for access to genetic resources. These measures will include grading and classification standards; lists of genetic resources; and examination and approval procedures for applications to access genetic resources. A number of other matters will also be specified, including departments for centralised administration and their operation systems; a system for establishing responsive State bodies and contact offices, and their working system; and prior informed consent principles, procedures and scope of applicability.
- Formulate mechanisms for sharing benefits arising out of utilisation of genetic resources. Such measures include the principles, method and terms for participation in providing research and development of genetic resources; mechanisms for sharing research results and distribution of benefits; mechanisms for the provision and sharing of materials, information and facilities; and forms of benefit (monetary or non-monetary).
- Protect traditional knowledge, innovations and practices related to genetic resources, and promote benefit sharing.
- Establish an intellectual property system for genetic resources that suits China's national conditions.
- Formulate supplementary administration systems to the Law or Regulations, and release a catalogue of important genetic resources for protection.

II. Identification, cataloguing and preservation of genetic resources
1. Identification of biological genetic resources after accession to the CBD
The CBD calls upon Contracting Parties to identify their genetic resources. Since the Sixth Five-Year Plan Period, China has listed the investigation and cataloguing of biological genetic resources as a key project in its national science and technology master programme. The country has also invested in establishing germplasm resources preservation banks.

Since becoming a Party to the CBD, China has strengthened supplementary surveys of crop genetic resources in key regions. Surveys of agricultural germplasm resources in 62 counties and cities in the Mt Daba area (including south-west Sichuan), and mountainous areas in south Guizhou and west Guangxi were completed before 1995, with 14,689 varieties of crop germplasm collected. Between 1996 and 2000, China conducted evaluation and research on the germplasm resources of major agricultural crops and trees, and surveyed genetic resources in 35 counties in the Three Gorges Reservoir area and the mountain development areas along the Beijing-Kowloon railway (south Jiangxi and north Guangdong), collecting 5,478 types of crop genetic resources. Departments for animal husbandry, aquatic production, and ornamental and medicinal plants have also strengthened efforts to survey, sort and catalogue genetic resources in their respective fields.

2. Cataloguing of biological genetic sources after accession to the CBD
Since ratifying the CBD, China has sped up efforts to catalogue its genetic resources. So far, 161 crops have been catalogued and preserved in the National Crop Germplasm Long-term Bank, including 30,174 genera and over 600 species (including subspecies). The National Germplasm Resources Garden has preserved more than 50 crops belonging to 1,026 varieties (including subspecies). A total of 377,000 crop germplasm resources materials have also been preserved. Among them, 350,000 are cultivated varieties including 234,000 cereal crops, 86,000 cash crops, 11,000 fruit tree crops, 35,000 vegetable crops, 4,000 fodder and green manure crops and some 20,000 wildlife resources.

China has catalogued more than 150 ornamental plant families native to the country. These cover 1,595 species in 554 genera, with over 400 arbour trees, more than 600 shrubs and nearly 600 herbs. So far, the number of cultivated varieties already identified for various species are as follows: peony, over 800; mume flower, more than 360; azalea, some 300; camellia, over 300; chrysanthemum, more than 30,000; lotus, over 250; Chinese rose, more than 100; and sweet osmanthus flower, over 90.

According to past variety resources surveys and verification carried out in 2001 by the China Committee on Examination and Verification of Domesticated Animals and Fowl, there are 20 major species of domesticated animals and fowl in China, totalling 570 varieties. Among them are 437 local varieties, 62 bred varieties and 75 introduced varieties.

It is generally believed that some 804 types of fresh water fish are found in China, accounting for 10% of the world total. Of these, the majority belongs to the cyprinid order, at 623, accounting for 77.2% of the country’s total fresh water species. In addition, 238 types of migratory fish are also found in China.

3. Preservation and conservation of biological genetic resources after accession to the CBD
Since becoming a Party to the CBD, China has accelerated its germplasm preservation work. By the end of 2000, a total of 332,000 germplasm resources were stored in the national principal Germplasm Resources Bank (Beijing) and the national backup Germplasm Resources Bank (Xining). In addition, 32 germplasm resources gardens and two test-tube seedling banks had been established in 16 provinces, where 45,000 germplasm resources were stored by the end of 2000.
In particular, China has made impressive progress in its effort to preserve tree germplasm resources. Currently, 10 tree germplasm preservation banks have been set up in five climatic zones across China. They store 15,000 resources of 76 leading trees, including arbour trees, shrubs and flowers. Together with breeding germplasm materials, the number of resources stored has reached 55,000. This has effectively opened a new field for preserving, evaluating and utilising tree germplasm resources in China.

In various domesticated animal production areas, over 1,700 breeding fields have been successfully established for horse, cow, sheep, pig, fowl, hare and bee varieties. Some protected areas have also been set up and a number of existing rare local varieties have been preserved. The Ministry of Sericulture, for its part, has established a National Centre for Preservation and Utilisation of Domesticated Animals and Fowl Germplasm Resources. Currently, this centre stores frozen embryos and frozen sperm for 16 varieties of domesticated animals, including cow and sheep, along with 60 local Chinese pig varieties and almost 3,600 individual DNA samples from introduced pig varieties.

III. Background research on access to and use of genetic resources

In accordance with Article 15 of the CBD, the State Environmental Protection Administration asked experts from eight departments to complete the Research Report on Benchmark Status of Genetic Resources in China and Measures for Their Protection. This Report provides information on the genetic resources that foreign countries have acquired from China, as well as the genetic resources that China has acquired from abroad, both in the past and at present, as well as information about their benefits.

1. Foreign access to China’s genetic resources

Agriculture in China has a long history. The country is one of the eight centres of origin of genetic diversity in the world. As long as 2,000 years ago, genetic resources from China were transferred to various parts of the world via the Silk Road, aiding significantly the development and growth of world agriculture. In modern times, China’s genetic resources continue to play a critically important role in global agricultural production. As far as crop germplasm resources are concerned, China provides genetic resources of particular economic value in the form of DiJiaoWuJian (a short-stalk rice variety), China Spring (a spring wheat variety with good hybrid affinity) and the Beijing black small bean (a soybean variety used for anti-sporocyst nematodiiasis breeding), as well as a whole series of soybean resources and a large number of fruit tree and horticultural resources.

Taking crop variety resources as an example, preliminary statistics from official records show that China transferred resources to foreign countries an average of about 1,400 times per year between 1972 and 1991. The total number of resource transfers for the period was close to 30,000. With the implementation of a policy of reform to open up China’s exchanges of crop germplasm with other countries, this number has been increasing steadily. In 1983, China exchanged 95 crops with other countries, involving 4,899 varieties. In 1989, this expanded to 21,444 varieties of 159 crops. The country is also breeding seeds for over 6,000 varieties, which are in great demand abroad. China has consistently provided germplasm resources to almost 50 institutions or scientists in more than 20 countries, regions or international organisations.

The primary exit route for China’s biological genetic resources is through cooperative research with foreign countries. Through visits to foreign countries and cooperative research, Chinese researchers have provided foreign research institutions with a large number of germplasm resources of superior quality crops, domesticated animals and fowl, flowers, and medicinal plants. The exact figure is difficult to
estimate.

2. China's access to foreign genetic resources
According to statistics, about 600 major crops are cultivated in China. Of these some 300 originated in China, while the remainder were successfully introduced to the country. Maize was originally grown in the Americas but is now an important crop in China, second only to rice and wheat. Cotton is one of the China's most important cash crops. The country's most widely cultivated and highest yield upland cotton, which offers fine fibre quality, was actually introduced from abroad. Sugar beet and sugar cane are the country's most important sugar crops, while peanut and sesame are key oil crops. All these crops are of foreign origin. Of the 209 cultivated vegetables in China, only 41 originated in the country. This figure includes varieties introduced so long ago that they have come to be thought of as indigenous. Vegetables introduced from abroad account for 80% of all cultivated vegetable types in China.

3. Use of and benefits from crop genetic resources
From 1984 to 1998, the Institute of Crop Germplasm Resources of the Chinese Academy of Sciences has conducted research on the distribution, exchange and utilisation of germplasm resources. Through questionnaires distributed to both domestic and foreign interviewees, literature review, on-spot surveys and workshops, the Institute has been able to assess the status of rice, wheat, soybean, maize, cotton, orange, tea, mulberry, cabbage and cucumber, stored in national and local crop germplasm banks in China.

The survey findings show that a total of 184,743 germplasm resource transfers were made to 8,635 breeding, production and teaching units by 10 crop germplasm resources banks and gardens in China during the 15 years covered by the study. Of the distributed germplasm resources, bred varieties accounted for 38.8%, high-generation materials constituted 32.5%, local varieties 22.4%, wild materials 4.1% and genetic materials 2.2%.

The findings also indicate four types of germplasm utilisation: screening for superior quality germplasm, breeding, basic research and direct use. Of the 13,682 germplasm resources received during the 15-year study period, 8% was used for breeding activities, 9% for basic research and 21% for screening superior quality germplasm, while almost 60% was not used at all.

IV. Current systems and major actions for genetic resources management
Between April and May 2003, State President Hu Jintao, Premier Wen Jiabao and other leaders of the State Council issued special instructions calling for accelerated efforts to fulfil the country's obligations under the CBD and to promote the conservation, management, access to and sharing of benefits from biological genetic resources in China. Thereafter, the State Council immediately convened departments concerned with genetic resources to coordinate their work. In addition, on 13 May 2003 the State Council formed a Coordination Opinion in which it is stated that the State Environmental Protection Administration shall take a leading role in the unified coordination of management and access to biological genetic resources across China. Specific requirements are also laid down concerning China's obligations under various conventions related to genetic resources. The concerned departments are now implementing the Coordination Opinion, with efforts in the following areas:

1. Inter-Ministerial Joint Meeting system
A number of departments are involved in matters related to biological genetic resources. To avoid ad-
ministrative confusion and multiple sources of policy making, the State Council has approved the establishment of an Inter-Ministerial Joint Meeting system, led by the State Environmental Protection Administration and represented by 18 concerned departments. Xie Zhenhua, Minister of the State Environmental Protection Administration, serves as chairman of the Joint Meeting while members include vice ministers for development and reform, foreign affairs, finance, agriculture, science and technology, education, health, commerce, forestry, food and drugs, ocean, intellectual property, inspection and quarantine, customs, industry and commerce, and the Chinese Academy of Sciences. The Inter-Ministerial Joint Meeting system has already begun operations. Its main responsibilities are to take decisions on major issues related to the administration of biological genetic resources and to provide policy guidance on China’s position in international genetic resources negotiations under the CBD and Bonn Guidelines. The working body of the Inter-Ministerial Joint Meeting is the Office for Fulfilment of the Convention on Biological Diversity, established within the State Environmental Protection Administration.

2. Expert Committee on the Conservation of Biological Genetic Resources
In accordance with the Coordination Opinion of the State Council, the State Environmental Protection Administration, along with other concerned departments, established a national Expert Committee on the Conservation of Biological Genetic Resources, which held its first meeting on 4 – 5 September 2003. The Expert Committee consists of specialists from 17 different disciplines recommended by more than 10 ministries and commissions. Many are members of the Chinese Academy of Sciences and the Chinese Academy of Engineering. The main responsibilities of the Expert Committee are to provide input on scientific and technological issues, such as evaluating genetic resources which are to be provided to foreign countries, recommend a list of genetic resources to be exported to foreign countries and to be introduced to China, offer professional guidance on benefit sharing mechanisms and offer advice on science and technology matters.

3. Inspections of biological genetic resources administration
In its Coordination Opinion, the State Council calls upon all concerned departments to inspect the status of genetic resources administration and pinpoint problems in implementing the requirements of current laws and regulations. It further asks that all concerned departments quickly adopt stringent measures to solve any and all problems of poor administration uncovered during inspections. In the Coordination Opinion, the State Council also instructs the State Environmental Protection Administration, along with other concerned departments, to carry out a cross-sectoral inspection of related law enforcement in China and suggest countermeasures for problems that might exist.

In accordance with the Coordination Opinion of the State Council, the First Inter-Ministerial Joint Meeting held on 21 August 2003 decided to conduct an inspection of the administration of biological genetic resources across China, beginning in the second half of 2003. The inspection was two-pronged. The first stage commenced in September 2003, during which various concerned departments conducted internal inspections to examine their law enforcement and locate loopholes in their work. The second stage was devoted to key inspections. Based on the internal inspection by individual departments, cross-sectoral inspections of key areas and weak spots were carried out. The findings of the inspections were reported to the State Council towards the end of 2003.

4. Surveys and cataloguing of biological genetic resources
In its Coordination Opinion, the State Council has called for general surveys of genetic resources to be carried out in key sectors and regions in 2004. This exercise will focus on the following:
1) **Key areas and existing problems**
   - Inadequate information regarding plant resources of economic value, such as medicinal plants, and horticultural and ornamental plants;
   - Inadequate information related to basic resources, such as fishery organisms and special domesticated animals of economic value.
   - Inadequate information and gaps in knowledge about micro-organism resources.

2) **Key regions and items for investigation**
   - General surveys in key regions in western China: wild plant resources surveys in karst regions in Yunnan, Guizhou and Guangxi in south-west China; general aquatic organism surveys in western provinces like Gansu, Qinghai, Xinjiang, Ningxia, Sichuan and Yunnan.
   - Resources surveys in key regions: surveys to assess collection, preservation and distribution of wild sibling species of major agricultural crops and their conservation needs; surveys of core germplasm resources of unique commercial forests, medicinal plants and horticultural plants; surveys and cataloguing the number and distribution of core germplasm resources for 100 unique species.

5. **Publicity and educational work on biological genetic resources conservation**
   The State Council has particularly stressed that work should be strengthened to publicise and raise public awareness about genetic resources conservation. The following objectives and mechanisms have been outlined:
   - Emphasis should be placed on training individuals engaged in biological genetic resources research, market management, trade, customs, inspection and quarantine, and persons involved in the conservation, production, operation, breeding and consumption of biological genetic resources. Work should also be directed towards publicising laws and regulations, and cracking down on illegal access to and sale, consumption and smuggling of biological genetic resources.
   - Raising public awareness, with particular focus on small ethnic minority regions, and encouraging participation in collecting, sorting, managing, conserving, developing and utilising biological genetic resources and traditional knowledge. Along with lectures and publicity pictorials, the media-including radio, film, television and newspapers—should be widely used to educate and train, spread knowledge about genetic resource conservation and raise public awareness about the country's wealth of biological genetic resources.

**Main References**


China’s Intellectual Property System and Ways of Adapting It to Meet the Needs for Protecting Traditional Knowledge

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Chapter 1. Protection of Traditional Knowledge
With the growing globalization of the world economy and particularly with rapid progress in biotechnological research, genetic resources and traditional knowledge are drawing increasing attention. While fully enjoying the tremendous benefits brought to them by modern science and technology, people are now returning to an appreciation of the values of traditional cultures. The approach to dealing with traditional knowledge has shifted from preservation to exploitation and use. Consequently, significant problems have arisen out of the need to provide rational legal protection for traditional knowledge.

1. Scope of Traditional Knowledge and Reasons for its Protection
1. Scope of traditional knowledge
According to a definition used by the World Intellectual Property Organization (WIPO), traditional knowledge refers to literary, artistic or scientific works, performances, scientific discoveries, designs, marks, names and symbols, and undisclosed information generated from traditions, and tradition-based innovations and creations produced by intellectual activities in all other industrial, scientific, literary or artistic fields. “Tradition-based” in the definition refers to certain kinds of knowledge systems, creations, innovations and ways of cultural expression that are passed on between generations and pertain to a particular ethnic group or the place where they live and continuously evolve in a changing environment.

According to current thinking traditional knowledge includes, for example, information about organisms or other materials used in medicine and agriculture, production processes, designs, literature, music, religious rituals and other technologies and techniques. This broad scope also covers information of a functional and aesthetic nature, namely all methods, products and intangible cultural attributes that can be used in agriculture or industry. Traditional knowledge may have drastically different formative backgrounds and forms of expression. Some traditional knowledge has been “literalized”, or formally expressed in a certain way, such as textile designs and traditional medicine. However, a greater part of traditional knowledge is not literalized. This includes folklore and tribal or indigenous medicine that is based on traditional beliefs, guidelines and practices and orally passed on through generations of family-based trial and error, successes and failures.

Traditional knowledge can be held by individuals or by groups. It includes different types of information used for different purposes, that originated in the distant past and has developed and adapted over time. Traditional knowledge is expressed in various literary and non-literary forms. Depending on its potential or practical uses, traditional knowledge may have commercial value.

2. Reasons for protecting traditional knowledge
At present, there is no unified theory favoring the use of intellectual property systems to protect traditional knowledge. One important reason is that there are many understandings of the concept of protection. Some scholars base their understanding of the concept on intellectual property and think that protection mainly implies excluding unauthorized use by third parties. Other scholars see protection as a
tool for preventing unfair use of traditional knowledge and avoiding negative impacts on the life and culture of the societies that produce and use traditional knowledge.

On the whole, reasons for giving intellectual property protection to traditional knowledge mainly include: considerations of fairness and preservation; maintaining traditional industries and culture; preventing components of traditional culture from being infringed upon by unauthorized use; and promoting use of traditional culture and improving its importance in development.

II. Legal Instruments for Protecting Intellectual Property in Traditional Knowledge

1. The existing intellectual property system

The existing intellectual property system can be fully used to protect traditional knowledge. For example, some kinds of traditional medicine can receive patent protection. However, most traditional knowledge was not developed in modern times, but rather has evolved through practical application over a long period of time. Therefore, it is very difficult for traditional knowledge to meet the novelty and creativity requirements necessary for patent protection.

Some valuable traditional knowledge can be protected as a trade secret. Holders of such knowledge can use rules against unfair competition to prevent disclosure and get protection without the need for advance registration or other requirements.

Protection of folklore provides a possible solution for this type of problem. Provided that the problem of collective creatorship can be solved, copyright and design patents can be used to protect artistic works. Under copyright protection, there is a difference between thoughts and their expression. Works may be eligible for copyright protection for their forms of expression but not for the thoughts underlying such expressions. Therefore, copyright cannot be used to protect methods or knowledge.

The most serious obstacle likely to be faced by any right holder, regardless of the kind of intellectual property protection sought, is the price of acquiring the right, including for example the costs of administrative examination and approval procedures required for patent and trademark rights. In most circumstances the greatest difficulty is exercising these rights, particularly the high cost of judicial procedures which are likely to be protracted. For the people who are likely to seek rights over their traditional knowledge, it is very difficult in practice to use existing intellectual property systems to protect it.

2. Special new legal regimes

Many experts and scholars have suggested that a special intellectual property system should be established. This would be an independent legal regime especially established to respond to the nature and characteristics of traditional knowledge. As early as in 1994, the Third World Network circulated a model national Community Intellectual Rights Act. While this proposal has received great attention in the literature, progress in actually executing such protection has been slow.

In addition, some experts have suggested establishing databases on traditional knowledge and improving traditional knowledge information search and retrieval systems to provide increased protection of traditional knowledge.

Chapter 2. China's Intellectual Property System

China’s intellectual property regime consists of:

- provisions for protecting science, technology, culture and arts in the Constitution of the People’s Re-
public of China;


administrative provisions concerning intellectual property protection formulated and issued by the State Council;

sectoral rules and regulations regarding intellectual property protection issued by the State Intellectual Property Administration, the State Administration for Industry and Commerce and the State Copyright Bureau;

local rules and regulations concerning intellectual property protection issued by relevant provinces, autonomous regions and municipalities; and

judicial interpretations regarding intellectual property protection issued by the Supreme People's Court.

The principal intellectual property laws and regulations that China has adopted include:

• The Trademark Law of the People's Republic of China
  (Adopted by the Standing Committee of the National People's Congress on August 23, 1982, effective as of March 1, 1983, first amendment on February 22, 1993, and second amendment on October 27, 2001);

• Detailed Rules for the Implementation of the Trademark Law of the People's Republic of China
  (Approved and promulgated by the State Council in 1983, amendment approved by the State Council in 1988, second amendment approved by the State Council in 1993, third amendment approved by the State Council in 1995 and fourth amendment approved by the State Council in September 2002);

• The Patent Law of the People's Republic of China
  (Adopted by the Standing Committee of the National People's Congress on March 12, 1984, effective as of April 1, 1985, first amendment on September 4, 1992, and second amendment on August 25, 2000);

• Detailed Rules for the Implementation of the Patent Law of the People's Republic of China
  (Approved and promulgated by the State Council in 1985, first amendment approved by the State Council in 1992, second amendment approved by the State Council in 2001 and third amendment approved by the State Council in December 2002);

• The Copyright Law of the People's Republic of China
  (Adopted by the Standing Committee of the National People's Congress on September 7, 1990, effective as of June 1, 1991 and amended on October 27, 2001);

• Regulations for the Implementation of the Copyright Law of the People's Republic of China
  (Approved and promulgated by the State Council in 1991 and amended by the State Council in September 2002);

• The General Principles of Civil Law of the People's Republic of China
  (Adopted by the Standing Committee of the National People's Congress on April 12, 1986 and effective as of January 1, 1987. Section 3 of Chapter 5 of the Law confirms the entirety of intellectual property as the civil rights of citizens and legal persons);

• The Anti-Unfair Competition Law of the People's Republic of China
  (Adopted by the Standing Committee of the National People's Congress on September 2, 1993 and effective as of December 1, 1993);

• Regulations for the Protection of Computer Software
(Issued by the State Council in 1991 and revised by the State Council in December 2001);

• Provisions Governing the Implementation of International Copyright Treaties
  (Issued by the State Council in 1992);

• Regulations of the People’s Republic of China for Customs Protection of Intellectual Property
  (Issued by the State Council in 1995);

• Regulations for the Protection of Integrated Circuit Layout Designs
  (Issued by the State Council in 2001);

• Regulations of the People’s Republic of China for the Protection of New Plant Varieties
  (Issued by the State Council on March 20, 1997 and effective on October 1, 1997);

• Regulations for the Protection of Traditional Chinese Medicine Varieties
  (Issued as Order No. 106 of the State Council of the People’s Republic of China on October 14,
  1992 and effective on January 1, 1993);

• Detailed Implementing Rules for Regulations for the Protection of New Plant Varieties
  (Forestry Part) (Issued by the State Forestry Administration on August 10, 1999);

• Detailed Implementing Rules for Regulations for the Protection of New Plant Varieties
  (Agriculture Part) (Adopted on April 27, 1999 and issued on June 16, 1999);

• Regulations for Administrative Protection of Drugs
  (Approved by the State Council on December 12, 1992).

Major international intellectual property organizations and international treaties to which China has become a Party or a Member include:

• World Intellectual Property Organization (WIPO) (China became a WIPO member on June 3, 1980);

• Paris Convention on the Protection of Industrial Property (China became a Party on March 19, 1985);

• Madrid Agreement Concerning the International Registration of Marks (China became a Party on October 4, 1989);

• Washington Treaty on Intellectual Property in Respect of Integrated Circuits (adopted on 26 May 1989; China was one of the earliest Signatories);

• Berne Convention for the Protection of Literary and Artistic Works (China became a Party on October 15, 1992);

• World Copyright Convention (China joined the Convention in 1992);

• Convention for the Protection of Producers of Phonograms Against Unauthorized Duplication of Their Phonograms (China became a Party on April 30, 1993);

• Patent Cooperation Treaty (China became a Party on January 1, 1994);

• Nice Agreement Concerning the International Classification of Goods and Services for the Purpose of the Registration of Marks (China became a Party on 9 August 1994);

• WTO Agreement on Trade-Related Aspects of Intellectual Property (the TRIPs Agreement) (China became a Member of the WTO on 11 December 2001).

The remaining sections of this chapter provide an overview of patent and trademark rights generally and in China specifically.

I. Patent Right
   1. Overview

A patent right is a type of property right. It is exclusive, is granted for a specified period of time, and forbids unauthorized use of the patented invention or creations during that time. Provided that there are
no restrictions in other laws and agreements, the validity of a patent is confined to the jurisdiction of the country that grants it.

Whether an invention or creation can be granted a patent right depends on whether it meets the criteria of the Patent Law. The conditions for granting a patent right may be categorized as formal and substantive. Formal conditions are the relevant procedural requirements, including the format and contents of the application documents. Substantive conditions for patentability are stipulated in the Patent Law and may be further divided into negative conditions and positive conditions. Negative conditions provide for identifying those inventions and creations which are not patentable and for which a patent will not be granted for any reason. These include inventions and creations that run counter to the law or social ethics, harm public interests, and fall within certain technical categories that are specified as un-patentable. Positive conditions define the characteristics that inventions and creations must possess before qualifying for patent eligibility. These conditions are, specifically: novelty, creativity, and utility.

2. Application for a patent

The granting of a patent in all countries is subject to certain examination and approval procedures that must be made public. On adopting its patent system, China established a system of early publication, request for examination, and approval for patent applications.

China conducts preliminary examinations and substantive examinations of patent applications. Upon receipt of an application, the State Patent Administration will assign an application number and record the date of application for applications that comply with the formal application procedure. When the preliminary examination is conducted on a patent application, the State Intellectual Property Office will publish it promptly after the expiration of 18 months from the date of filing (or the date of the right of priority for those with such right). Within three years from the date of filing (or the date of the right of priority for those with such right), the applicant must make a request for examination. If an applicant fails to request an examination, its application shall be deemed as having been withdrawn. Where an applicant makes a request for substantive examination, the State Intellectual Property Office will evaluate the novelty, creativity and utility of the invention. If there is no reason for refusal, the Office issues a patent certificate and registers and publishes it.

3. Legal protection for patent right

A patent right is a type of exclusive right. It excludes any person other than the patent holder from the right to manufacture, use and sell, without permission from the patentee, the latter's patented product or process.

To effectively protect patents, it is important to first determine whether an act of infringement has occurred. This includes verifying the validity of the patent, its scope of protection, and evaluating the alleged infringing act with respect to the patented product or process concerned.

Infringement of a patent right is any act that exploits a patented product or process without permission from the patent holder. The scope of patent protection is determined by the claims statement made in the application. In China, interpretation of patent claims is not confined to the literal meaning of the claims. The scope of protection of design patents, for example, relies on the design as expressed in its picture or photo as the determining factor.
Patent infringement is subject to civil liability and may be subject to criminal penalties as well. According to the provisions of the General Principles of Civil Law and the Patent Law of China, the principal civil remedies are injunction to halt infringement and compensation for damages.

II. Trademark right

1. Concept and contents of trademark right

Trademarks help to promote the domestic and foreign commercial circulation of commodities and services. In law, “trademark” refers to marks with notable features that consist of characters, figures, letters, numbers, three-dimensional signs or color combinations or mixtures of these elements which producers, operators or service providers adopt for their commodities or the services that they produce, process, select or deal in so as to differentiate sources of commodities or services. The true value of a trademark does not lie in its features per se, but in its linkage to an enterprise as the symbol of that enterprise. Trademarks that represent product quality and corporate reputation and that enjoy a good reputation themselves are an important intangible asset of enterprises. For example, “Coca Cola” in the United States is estimated to be worth $30 billion as a trademark.

China’s Trademark Law follows ten major basic principles: (i) protection for exclusive rights to trademarks; (ii) protection for consumers; (iii) registration to provide institutional guarantee for exclusive trademark rights; (iv) examination procedures for trademark rights; (v) first application has priority for attributing exclusive trademark rights; (vi) voluntary trademark registration; (vii) a unified trademark application, examination and registration system; (viii) graded trademark administration; (ix) national treatment; and (x) national priority.

2. Registration of trademark

China’s Trademark Law uses the registration principle. Exclusive right to a trademark arises from registration, and is limited to trademarks approved for registration upon verification and approval of the corresponding commodities. Applicants for a registered trademark must meet statutory requirements.

The procedure for registering a trademark determines the exclusive right to the mark. The first step is formal examination of the application, reviewing the applicant’s qualifications, the application letter, and the commodity category. Substantive examination then determines whether the mark complies with the provisions of the Trademark Law. Preliminary approval is the first step in the substantive examination procedure followed by the Trademark Bureau. Trademark applications that receive preliminary approval are publicized. If there is no objection within three months from the date of the public announcement or if an objection is determined to be invalid, the Trademark Bureau approves and registers the trademark.

3. Legal protection for trademark right

China’s Trademark Law protects exclusive trademark rights through legal measures to stop and sanction all acts that infringe on trademarks. Under the Trademark Law, the State Administration for Industry and Commerce and the People’s Courts have the power to investigate and prosecute trademark infringement. This two-tier system is one feature of intellectual property protection in China. Concerned parties are free to choose between the two options. If the State Administration for Industry and Commerce determines that infringement has occurred, it may order the infringing party to immediately stop the infringing acts, confiscate and destroy infringing commodities and tools used to make infringing commodities or to forge logos of registered trademarks, and impose fines. At the request of the parties concerned, the State Administration for Industry and Commerce may mediate in a determination of the
amount of compensation to be awarded for trademark infringement. If mediation fails, or if the parties refuse to accept as final a decision made by the State Administration for Industry and Commerce, they may bring suit in the People’s Court within 15 days of receipt of the notice of the decision. If the infringer neither appeals nor complies with the decision, the State Administration for Industry and Commerce may apply to the People’s Court for forcible execution of its decision.

According to the provisions of the General Principles of Civil Law of the People’s Republic of China, civil liability for trademark infringement include stopping the infringement, mitigating its effects, and compensating for damages. Criminal penalties apply in certain cases of trademark infringement.

III. Other intellectual property regimes

“Copyright” as defined in the Copyright Law means intellectual achievements in literary, artistic and scientific fields that possess originality and can be reproduced in certain tangible forms. The Copyright Law is enacted according to the Constitution with a view to: (i) protecting copyrights and related rights of authors of literary, artistic and scientific works; (ii) encouraging the creation and communication of works that promote material, cultural and ethnic progress; and (iii) promoting the development and prosperity of socialist cultural and scientific undertakings. Regardless of whether they have been published or not, works by Chinese citizens, both legal and natural persons, are entitled to copyright protection under the Law. There is no restriction on the term of protection for citizens’ works and authors’ rights to authorship and integrity of the works concerned. The term of protection for an author’s right to publication, use and royalty covers the author’s lifetime and terminates on December 31 of the fiftieth year after the author’s death.

“New plant variety” refers to a plant variety that is cultured artificially or developed from discovered wild plants, possesses novelty, uniqueness, consistency and stability, and is properly named. Novelty means that the materials used to breed the new plant variety for which a plant breeder’s right is applied have not been sold prior to the date of application for the right or that, with permission from the breeder, the breeding materials for the variety have been sold for not more than one year within the territory of China. For vines, trees, fruit trees and ornamental trees and shrub varieties sold outside the territory of China, novelty means that the materials for breeding the varieties have not been sold or more than six years. For other plant varieties, the term is less than four years. Legal and natural persons in China applying for a plant breeder’s right may apply directly to the examination and approval body or may apply through an agency.

Unfair competition refers to illegal acts that harm the lawful rights and interests of others, and disrupt the social and economic order. Prohibited practices include: unauthorized use of registered trademarks; unauthorized use of the name, packaging and decorations unique to famous commodities, or use of names; packaging and decorations similar to those of famous commodities, which may cause confusion and mislead buyers; unauthorized use of a corporate name; forging or falsely using quality signs such as certification marks and superior quality marks on commodities; forging the place of origin; and making misleading and false statements about commodity quality.

“Trade secret” refers to technical and economic information that is not known to the public, can bring economic benefit to the right holder, has practical use, and for which the right holder has adopted confidentiality measures. Access to, use, or disclosure of a trade secret is deemed an infringement.

A trade name is the name, with notable characteristic features, used by a commercial entity to operate
its business. Exclusive right to a trade name is obtained by legally registering it. Registered trade names, like registered trademarks, protect intellectual property and are entitled to indefinite protection.

Chapter 3. China's Intellectual Property System and Ways of Adaptation to Meet the Needs for Traditional Knowledge Protection

I. How to use the existing system to protect traditional knowledge

The focus of this paper is on how to use the existing intellectual property system to protect traditional knowledge. The existing patent system can be used to protect inventions that demonstrate novelty, creativity and utility. Patents may be awarded to products that are separated, synthesized or developed from gene structures, microorganisms, plants, animals and other organisms that currently exist in the natural world. Patent rights may also be granted for the processes related to the utilization and development of these resources and the traditional knowledge that is related to them. Any inventions based on the use of genes and other biological resources and associated non-published technologies can also, in principle, receive patent protection.

Products made, and services provided by, craftsmen, artisans and technicians of traditional knowledge or bodies which represent them or to which they belong may be eligible for protection through a commodity trademark or a services trademark.

Copyright can be used to protect holders of traditional knowledge, which may include literary works (such as stories, legends and fables, tales and poems), dramatic works, pictorials, textiles (such as knitwear, clothing, mixed knitwear, tapestry and carpets), musical works and three-dimensional objects, such as pottery.

Plant breeders can get protection for their rights over new plants and varieties and variants of all the plants that they breed. Holders of traditional knowledge can also use plant breeders' rights to get legal protection for plant varieties they have developed.

Traditional knowledge may be categorized as undisclosed information. Legal measures prohibiting unfair competition may thus be used to protect undisclosed traditional knowledge.

While the existing intellectual property system has certain limitations for protecting traditional knowledge, it still remains a favorable instrument for this purpose.

II. How to adjust and improve the current system to protect traditional knowledge

China is a country with a long history and with a great accumulation of achievements in traditional knowledge that have made tremendous contributions to modern civilization. Today, as science and technology progress rapidly, traditional knowledge still plays a role but its protection has been ignored. One result is that other countries have registered patents for such traditional Chinese medicines as the "Instant Heart-Saving Pill" and the "Calculus Bovis Internal Heat-Relieving Pill".

As a developing country, China has experienced some awkward situations concerning international protection of intellectual property in its traditional knowledge. One reason for this is that public awareness of the need for such protection still needs to be improved. Another reason is that protection of developing countries' traditional knowledge has not been formally included in the scope of international intellectual property protection. Speeding up legislation and establishing domestic legal systems to protect
traditional knowledge have become priorities for developing countries.

Developing Country Experience Implementing Environmental, Health and Safety Standards and Technical Regulations

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I. Introduction
With tariff levels dropping in the wake of the successful implementation of the World Trade Organization (WTO)'s binding schedules, non-tariff (or technical) barriers to trade have become relatively more important for developing country market access. A growing list of environmental, health and safety (EH&S) standards and technical regulations threatens to restrict the access of developing countries to markets within the Organisation for Economic Co-operation and Development (OECD).

The WTO Agreement on Technical Barriers to Trade (TBT) establishes rights and obligations that seek to ensure that standards and technical regulations do not unnecessarily restrict trade. (1) However, experience to date suggests that without certain basic institutional infrastructure in place, developing countries cannot benefit from the provisions in the TBT Agreement. Indeed, in the absence of requisite institutional capacities, standards and technical regulations can restrict trade whether or not a company or product is in compliance with the relevant requirements.

EH&S requirements are intended to promote the public good in support of sustainable development. However, if these requirements also unfairly restrict market access, they may harm economic development-one of the three pillars of sustainable development. As governments increasingly turn to market-based tools such as eco-labels and certification systems to promote sustainable production and consumption, efforts must be made to ensure that these mechanisms do not harm the trading opportunities of companies in developing countries. The eight-year-long unresolved debate in the WTO surrounding “eco-labelling” (labelling for environmental purposes) stands as a testament to the conflict in this area. Implementation of the TBT Agreement should thus be of particular concern to those interested in sustainable development and the relationship between trade and the environment.

This paper will review the experience of some developing countries in implementing EH&S standards and technical regulations, and will attempt to identify areas in which problems exist. It will argue that, in a fundamental way, EH&S requirements are no different from other product quality requirements: both are necessary for market access, and both are developed and implemented within a complex framework of “quality institutions”. This paper will also examine concerns related to eco-labelling.

II. Quality institutions
The extension of international sourcing practices and the prevalence of “just-in-time” production and distribution strategies mean that companies might find their entire production lines delayed by the delivery of a few flawed component parts. As a result, suppliers have had to find ways to ensure that their goods and services are accompanied by the necessary quality assurances.

Over time, a relatively complex institutional structure has evolved at the national, regional and international levels to accommodate the growing focus on quality assurance. This structure is based on the three “quality institutions”: rule making (standardisation and regulation), conformity assessment and accreditation. Together, these institutions play an important role in facilitating international trade and investment by enabling producers to establish what is required of them and credibly demonstrate their compliance with a wide variety of quality standards.

The importance of quality assurances is no longer strictly limited to physical product quality and technical requirements. New quality assurance demands have been placed on suppliers, as environmental and social issues are increasingly integrated into individual purchasing decisions as well as corporate sourcing requirements. Just as with product quality, environmental and social quality assurances—sometimes voluntary, sometimes mandatory through regulation—have now become important for access to many markets, particularly in developing countries. The same basic institutional infrastructure that is crucial to the implementation of technical product quality standards is also the foundation for environmental and social quality assurances.

As mentioned above, three institutions form the basis of any quality assurance regime:

i. Rule making, including the development of both mandatory technical regulations and voluntary standards;

ii. Conformity assessment; and

iii. Accreditation.

Without adequate infrastructure in each of these institutions, companies—especially those in developing countries—may not be able to access information about relevant requirements, nor will they be able to credibly demonstrate compliance with the same. Such companies will find themselves facing the technical barriers to trade that can often be related to quality assurance requirements.

With globalisation, the architecture of each of these institutions is increasingly being crafted at the international level. Without a sound national infrastructure, most countries will find it difficult to participate in international activities. At its extreme, this can lead to a situation where environmental and social quality requirements unfairly restrict market access.

1. Rule making: standards and technical regulations

Standards and technical regulations are documents that clearly list the commonly accepted guidelines, rules and criteria that help determine whether a product, process or service is suited to its intended purpose. If clearly defined and easily obtained, standards and technical regulations enable companies to precisely, consistently and efficiently communicate quality requirements to suppliers and customers alike.

Whereas standards (usually set by purchasing companies or non-governmental standardising bodies) are voluntary, technical regulations (usually set by governments) are mandatory. The WTO’s TBT Agreement sets out slightly different requirements for the development of standards and technical regulations.

Most countries have designated national standards bodies (NSBs) that develop standards and technical regulations, and also provide other services such as information on standards and regulations being developed in other countries of importance to the export sector. Only a government body, or one that is mandated by a government agency, can formally establish mandatory technical regulations.

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In developed countries, NSBs are frequently private organisations with close links to the private sector user community. In developing countries, NSBs are frequently public bodies with close links to other government agencies, and possibly responsible for developing both national standards and technical regulations. Increasingly, a host of private, non-governmental organisations (NGOs) are taking the lead in developing environmental and social standards, although few are members of international standards bodies (ISBs). To date, no environmental or social standard developed by a private standards body has been adopted as a mandatory technical regulation. (2)

1. Types of standards

Discussions that address standards and technical regulations from a trade policy perspective have traditionally identified two main types of standards: product-related standards that influence the physical characteristics of the final product, and process and production method (PPM) standards that govern the process by which a product is made and traded. (3) Although this analytical distinction may be a useful model in the context of trade law, it is not particularly helpful in considering the real-world obstacles imposed on companies by standards and technical regulations. While PPMS will be considered from the perspective of eco-labels, this paper primarily distinguishes between standards and technical regulations based on their intended purpose, and identifies two main purposes: the promotion of trade and the promotion of public policy objectives. In both cases, there is growing pressure to harmonise requirements at the international level through the development of international standards.

Trade promotion. Some standards and technical regulations are solely intended to promote trade. Over long distances in particular, trade in component parts is complicated by difficulties in communicating the necessary technical requirements. Guidelines that clearly define technical product specifications, and which can be used and interpreted consistently, can help overcome communication problems and, in so doing, facilitate international trade. Most trade promotion guidelines are standards set by the industry itself and are voluntary.

The most important aspect of trade promotion standards is that an accepted set of requirements exists, and not necessarily that these requirements are determined at a specific level. For instance, despite the fact that there is nothing inherently "right" about the dimensions of a piece of A4 paper, this codification and the international relationships that it enables make it significantly easier to export paper products, printers, photocopiers and fax machines. In this respect, the specifications of A4 paper are pri-

(2) It should be noted that in some cases governments have adopted policies to encourage the application of environmental or social standards. For example, the Chinese government has integrated the Forest Stewardship Council (FSC) sustainable forest management standards into its national forest strategy. Similarly, the German government recently set new public procurement guidelines requiring that all forest products originate from forests managed according to a recognised international sustainable forest management standard. It has been reported that the German government had intended to refer specifically to the FSC as the only recognised international standard, but relented under pressure from World Trade Organization (WTO) members.

marily intended to promote trade. [4]

Public policy promotion. Although they may happen to facilitate trade, many other standards and technical regulations are primarily intended to achieve broader public policy objectives, such as environmental protection or safeguarding human health and safety. Because of their impact on the public good, the codification of many of these types of guidelines has traditionally been carried out through technical regulation. Particularly in the field of environmental protection and social development, governments have been shifting away from command and control approaches and towards market-based regulation. This move has been accompanied by a shift towards the development of more voluntary standards.

Unlike trade promotion standards, the effectiveness of public policy standards or technical regulation is highly dependent on actual specifications. For example, while the size of A4 paper is arbitrary and all that matters is that everyone agrees on it, the actual dimensions of the holes in a water purifying filter are extremely important. Whereas holes with a diameter less than 1 micron will successfully filter out water-borne diseases such as giardia and amoebic dysentery, holes that are even 0.5 microns larger may not. The mere existence of an accepted set of guidelines is not enough in this case; the guidelines must also be effective.

The distinction between trade promotion and public policy promotion is extremely important background to discussions on the trade implications of environmental standards because, although there are several fundamental differences between their characteristics, they depend on the same quality assurance institutions and are governed by many of the same legal regimes. Although many of the weaknesses that exist in these institutions and legal regimes do not create obstacles in the context of trade promotion, they do pose problems in the context of public policy promotion.

Regulations and standards, even those designed to promote public policy goals, are not always easy to determine. People in different parts of the world may well have different ideas about what goals should be promoted, in terms of labour or environmental standards. Indeed, the debate over whether common international environmental standards are ever appropriate—a premise central to the idea of eco-labelling—has only recently faded following the development of several such standards and labels. But this debate was never resolved. It was simply made redundant by events.

2. Conformity assessment
Conformity assessment is the process of testing compliance with a standard or technical regulation. Access to conformity assessment services enables companies to demonstrate that they comply with the relevant requirements. Depending on the standard or technical regulation in question, conformity assessment services may be provided by laboratories and testing facilities with specialised metrology equipment, or by management system certification companies.

[4] In the short term, the specific requirements of trade promotion may well have important trade implications, since they may require companies to retrofit production processes and technologies in order to produce goods that satisfy new technical specifications. This can have important cost implications. But from a long-term perspective, discounting investments that have been made to accommodate new production requirements, the most important issue is that a common standard for communicating product requirements exists at all.

[5] The quality assurance institutions discussed in this paper are rule making (standards and technical regulations), conformity assessment and accreditation.
In developed countries, conformity assessment is generally carried out by a large number of competing commercial entities. In many developing countries, where the market for conformity assessment is not as large, these services are provided by relatively fewer entities that are frequently state-sponsored labs and testing facilities.

Importantly, certification granted by a conformity assessment body in one country may not necessarily be recognised in another. As such, companies may be required to obtain multiple certifications if they intend to sell in more than one market.

3. Accreditation

Accreditation is defined as the procedure by which an authoritative body gives formal recognition that an entity or individual is competent to carry out specific tasks. When determining the competence of conformity assessment bodies, accreditation agencies generally assess their eligibility against procedural guidelines. These guidelines are set, and assessments are generally performed, by national accreditation agencies that are either part of a government agency or specifically mandated by one. A conformity assessment body cannot operate in a country or test against a specific standard unless it has been licensed by the relevant accreditation agency. Although this is not always the case, particularly in developing countries, international best practice recommends a division of responsibility between standardisation, certification and accreditation activities.

Because national accreditation is not generally recognised between countries, conformity assessment bodies must seek separate accreditation for each country in which they seek to do business. Increasingly, however, regional and international frameworks are being developed to promote mutual recognition of different national accreditations.

4. International architecture

Inconsistent or ambiguous rules create a climate of uncertainty that can reduce the efficiency of business decisions. Temporal and geographical inconsistencies in quality requirements are bad for business and can disproportionately raise the cost of compliance, thereby creating barriers to trade. For instance, if a technical regulation limiting carbon emissions changes frequently over time, it becomes difficult for a company to conduct accurate cost-benefit analyses when deciding, for example, to purchase cleaner production technology. Similarly, it is expensive and complicated for a company to operate multiple production runs to produce goods that need to comply with differing quality requirements in different export markets.

Furthermore, it is widely agreed that increasing transparency, both in the preparation of labelling requirements and the provision of information to exporters, is a priority issue.

The overall goal of the international quality assurance community is to promote a system whereby products are “once tested, once certified, accepted everywhere”. The international harmonisation of rule making, conformity assessment and accreditation procedures is extremely important if a global quality assurance system—be it for product quality assurances or environmental and social quality assurances—is

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(7) There are two issues here. First, it is possible that requirements for different markets vary substantially in scope and require companies to address a larger or smaller number of issues. Second, it is possible that requirements are substantially similar in scope but require companies to comply with different levels of performance. In the latter case, companies can simply accommodate different markets by complying with the more stringent set of requirements. However, this may lead to a situation where the requirements of large export markets become de facto international requirements.
not to unnecessarily restrict trade.

1. Once tested: the harmonisation of rule making

The most straightforward way to reduce the cost of proliferating standards and technical regulations is to create a single set of rules. Indeed, the TBT Agreement is explicitly biased in favour of international standards to reduce costs to business; it requires Members to base all national standards and technical regulations on existing international standards, (8) and encourages Members to participate in the development of international standards. (9) Of course, the promotion of international standards raises the question of what should be considered an international standard.

Until recently, an international standard was fairly straightforward: it was any document developed through an international standards body (ISB), whose membership was open to all NSBs. (10) Most international standards are developed within a select group of formal ISBs. (11) In recent years, however, international trade policy has shifted so that the focus is no longer on the ISB itself, but rather on the process through which international standards are set. (12) This is an important development because it effectively broadens the number of bodies that can develop international standards recognised under the TBT Agreement, making it more difficult for countries to follow-or influence-all international standardisation activities.

Of course, countries and their NSB representatives cannot always agree to a common set of requirements. In addition, countries have recognised that two substantively different standards can still achieve the same overall objective. So, where international standards cannot be agreed but where different standards can achieve the same objective, the TBT Agreement recommends that Members consider recognising each other's standards as technically equivalent. Especially where domestic environmental, social and economic characteristics or technological capacities are different and require slightly varying standards, this is at least in principle a useful way to reduce the cost of the proliferation of standards and technical regulations.

While a strong institutional infrastructure is in place for the negotiation of international standards, a similarly robust infrastructure for the negotiation of technical agreements exists only in the case of san-

(8) WTO Agreement on Technical Barriers to Trade (TBT), Article 2.4; and Annex III, paragraph F.
(9) TBT Agreement, Article 2.6; and Annex III, paragraph G.
(10) It is important to note that international standards are not developed by international standards bodies (ISBs), but rather through them: an ISB is simply a rules-based forum that facilitates negotiations between national standards bodies. Thus, the International Organization for Standardization (ISO) and the Food and Agriculture Organization's Codex Alimentarius Commission do not develop international standards; their members develop them, ISO and Codex simply oversee the development process and then publish them as international standards.
(11) As recently as 1991, the United Nations Industrial Development Organization (UNIDO) estimated that over 85% of all international standards were developed through just three ISBs: the International Telecommunication Union, International Electrotechnical Commission and ISO.
(12) This is the case for the TBT Agreement: guidelines for international standard-setting included in Annex 4 of the Second Triennial Review of the TBT Agreement outline criteria for determining if a standard should be considered international. The WTO Agreement on the Application of Sanitary and Phytosanitary Measures, which addresses a far more limited scope of issues—essentially food safety—lists three bodies that it recognises as ISBs: the FAO's Codex Alimentarius Commission, the Office International des Epizooties (OIE) and the Interim Commission on Phytosanitary Measures of the International Plant Protection Convention (IPPC).
tary measures associated with food import and export inspections.\(^{(13)}\) As a result, although the technical equivalence agreements infrastructure is a very important policy tool, particularly in the case of public policy standards and technical regulations that need to be refined to suit local conditions and priorities, it is rarely used.\(^{(14)}\)

ii. Once certified: harmonisation of conformity assessment
Different countries often impose different rules for testing compliance, even against the same standard or technical regulation. In such cases, even if a harmonised international standard or technical regulation exists, market access can nonetheless be restricted by a proliferation of conformity assessment procedures which could require companies seeking access to many different markets to undertake and pay for a variety of compliance tests.

International standards for conformity assessment are developed by a variety of bodies including traditional ISBs such as the International Organization for Standardization Committee on conformity assessment (ISO/CASCO), conformity assessment trade associations such as the International Laboratory Accreditation Cooperation (ILAC), or United Nations agencies such as the World Health Organization (WHO). In other cases, national conformity assessment procedures, or even procedures promoted by industry associations, can become de facto international conformity assessment standards owing to their prevalence in the marketplace.

The TBT Agreement contains provisions that require Members to accept conformity assessments performed in other countries according to different procedures (Article 6.1), and encourages Members to enter into formal agreements for the mutual recognition of conformity assessment. The Committee on Technical Barriers to Trade has also addressed the issue of mutual recognition in the Second Triennial Review of the TBT Agreement, where Members agreed to include in Annex 5 an Indicative List of Approaches to Facilitate Acceptance of the Results of Conformity Assessment.\(^{(15)}\) This is the first attempt to facilitate implementation of the relevant Articles in the TBT Agreement.

It is important to note that mutual recognition can only be established if both parties use a common international standard or the same national standard, or if they have agreed to treat each other's national standards as equivalent. Without a framework for technical equivalence, the establishment of a well functioning mutual recognition framework may actually increase pressure on developing countries either to adopt international standards that they may not have helped to develop, or to comply with other Members' national standards which may not be appropriate to their own unique environmental, social and economic context.

\(^{(13)}\) At its 25 February–1 March 2001 meeting in Brisbane, Australia, the Codex Committee on Food Import and Export Inspection and Certification Systems published the Draft Guidelines on the Judgment of Equivalence of Sanitary Measures Associated with Food Inspection and Certification Systems. These guidelines help create a structure for the establishment of equivalence between sanitary measures, which are broadly characterised as including infrastructure; programme design, implementation and monitoring; and/or specific requirements. See Codex Committee. 2002. Report of the Tenth Session of the Codex Committee on Food Import And Export Inspection and Certification Systems. ALINORM 03/30, Appendix III.


\(^{(15)}\) G/TBT/9/, 16 November 2000.
iii. Accepted everywhere: harmonisation of accreditation

Even if a single international set of rules is established (or a technical equivalence agreement is in place), and a single internationally accepted set of conformity assessment procedures exists for testing against that standard or technical regulation (or a mutual recognition agreement in place), it is still possible that certification issued by a conformity assessment body in one country will not be accepted in another. This is because of the incomplete harmonisation of accreditation procedures, and the lack of recognition of different accreditation structures.

Accreditation is usually undertaken by a single accreditation agency in each country for each testing, measurement or verification process. A certificate of compliance with a standard or technical regulation will only be accepted if the body that has undertaken the conformity assessment is accredited, or registered, by the national accreditation agency. Therefore, if a quality assurance is required to access a particular market, often the actual certificate of assurance may have to be granted by a company that is registered by the domestic accreditation agency. This can result in increased costs for exporters, who must import conformity assessment services from the country to which they intend to export goods.

Over the course of the last five years, efforts have been made to harmonise the accreditation process. In particular, this includes the multilateral recognition arrangement (MLA) framework developed by the International Accreditation Forum (IAF) and ILAC, under which signatories are obliged to recognise each other’s accredited conformity assessors (and their assessments), as well as submit to peer reviews of the competence and effectiveness of each other’s accreditation systems.\(^{(16)}\)

Although the MLA enables accreditation agencies in different countries to enter into recognition agreements with one another unhindered by heavy bureaucratic obstacles, there is nonetheless a baseline minimum of technical and institutional capacity that an agency must possess in order to be accepted into the agreement. A significant amount of institutional capacity building and technical assistance is needed to bring many developing country accreditation agencies into the IAF/ILAC framework.

5. Regional architecture

Under the international architecture, there is a growing number of regional initiatives to upgrade quality assurance institutions. There remains, however, an uneven focus to this regional cooperation.

Other than the European Union (EU)’s European Committee for Standardisation (CEN), little regional cooperation on standardisation currently takes place, either in terms of the development of common regional standards or the negotiation of regional positions on international standards. A United Nations Industrial Development Organization (UNIDO) project in the West African Economic and Monetary Union (UEMAO) is one exception, where efforts are being made to harmonise standards within the region. This is an area where developing countries may be able to increase cooperation in the future.

Although a relatively greater degree of regional cooperation on conformity assessment exists, its scale is still not large enough. This may be due to the fact that in many countries the conformity assessment community is comprised of competing private companies. The UNIDO/UEMAO initiative, for example, provides technical assistance and capacity building for a range of quality institutions, including helping testing laboratories upgrade technical competence to levels required for accreditation.

\(^{(16)}\) For more information see: www.iaf.nu and www.ilac.org

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There is, on the other hand, a high degree of regional cooperation for accreditation, including the Pacific Accreditation Cooperation (PAC), InterAmerican Accreditation Cooperation (IAAC) and Southern African Development Committee for Accreditation (SADCA). Cooperation on accreditation is facilitated both by the emerging international infrastructure and by the fact that each country generally has a very limited number of accreditation agencies.

III. Implementation problems

The preceding sections presented a generic overview of the three institutions that are required to create a foundation for quality assurance. This section will review some of the implementation problems that developing countries encounter, highlighting specific case studies on environmental and organic agriculture standards wherever possible. It is important to remember, however, that in many cases the institutional framework for addressing standards and technical regulations that promote public policy—such as environmental requirements or organic agriculture standards—cannot be separated from the generic quality institutions needed for regulations that promote trade. It is therefore important to address both types of rules and institutions.

1. Implementation problems: standards and technical regulations

At the level of standards and technical regulations, issues that give rise to implementation problems fall broadly into three categories:

- Transparency, access to information and participation in the development process;
- Technical capacity to implement; and
- International standards and technical equivalence.

1. Transparency, access to information and participation in the development process

Without access to information, neither countries nor companies can deal effectively with the standards and technical regulations that may be required for market access. On a very basic level, if a country is not informed about the existence of a technical regulation, it will not be able to warn its export industries, with the result that industries may find their products turned away at the border. At a more refined level, if a NSB does not have a ready-built network of stakeholders, it may not be able to solicit comments on draft standards within the required time limits.

Although the TBT Agreement, which is the main source of rules and guidance on the development of technical regulations and standards, sets out a robust framework for the development of standards and technical regulations, there are important deficits in the implementation of its rules and guidelines. In most cases, the problem is not with the rights and responsibilities set out in these rules, but with the capacity to take advantage of them.

Problems with the development of standards and technical regulations have to do with a breakdown in communication. Communication is like a chain: it is only as strong as its weakest link. In the case of the development of standards and technical regulations, there are five important links in the communication chain:

- The developer of the standard or technical regulation must communicate with other WTO Members; this is done through the WTO’s notifications procedure in the case of technical regulations, or

(17) For a list of the relevant provisions, please see Annex I.
through ISONET\textsuperscript{(18)} in the case of standards.

- Any WTO Member concerned with the development of a standard or technical regulation must communicate with the relevant national stakeholders, to ensure that they are aware of the measure and have adequate opportunity to comment during the allocated period.
- The concerned domestic stakeholders, whether public or private entities, must communicate their concerns in the form of written comments to their national enquiry point or NSB.
- The comments must be communicated back to the WTO Member or NSB that is developing the document.
- The standard- or technical regulation-developer must indicate any action that it has taken in response to the comments received.

Many developing country Members have neither the capacity to disseminate notifications to relevant national parties, nor the ability to assess the technical regulation's potential impacts on trade and convene a national process to document comments. This is especially relevant for informal sectors of the economy, and small and medium enterprises (SMEs) that are not represented at the national level by industry associations. A recent report on the awareness in the Philippines of ethical issues important to the EU states that:

In general, the textile industry has no or very limited knowledge of ethical issues in the EU... especially with regard to market trends and requirements. There are, however, major differences in awareness between big and smaller companies. [Big] companies have little information problems.... A major reason for the limited knowledge about ethical issues in the EU is that the Philippine textiles/garments industry mainly consists of SMEs.\textsuperscript{(19)}

The variable impact on large and small producers has been noted in several instances, and is an important consideration. Low levels of industry concentration, both in terms of geographic distribution and company size, render effective communication more difficult and can therefore increase the cost to NSBs. Strong national industry associations can help resolve these problems. For instance, in 1995 UNIDO helped to establish the Eastern and Southern Africa Leather Industries Association (ESALIA), which helped increase awareness of European chemical use restrictions among small-scale leather goods producers, and to coordinate technical assistance projects.

Without a well-resourced national standards body, including a network of contact points in national industry associations and companies, it is difficult to raise awareness or solicit comments on technical regulations or standards—regardless of one's rights under the TBT Agreement.

ii. Technical capacity to implement

Of course, knowing about a standard is not even half the battle. Compliance with quality specifications frequently requires a certain amount of technical capacity. In some instances, this may mean that specialised production technologies are required, entailing short-term investment in expensive equipment that may not even be available locally. In other cases, specialised management techniques may be needed to implement a standard. Both can render compliance prohibitively expensive.


\textsuperscript{(19)} CBI-CREM; Dutch Centre for the Promotion of Imports from Developing Countries, and the Consultancy and Research for Environmental Management. 2000. "Ethical" issues in the EU: Opportunities and Threats for Exports from the Philippines. Results of an identification mission, Amsterdam. Quoted in draft OECD case study on formaldehyde standards; on file with author.

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There are three general problems in this area. First, in cases where a company’s comparative advantage lies in maintaining low capital costs and high labour inputs, even a relatively small additional investment in equipment can overstretch available short-term credit limits and result in substantial increases in marginal costs. This is especially true for SMEs. Second, the required equipment or management expertise may not be available locally, and local companies may not have the capacity to conduct international searches for suitable suppliers. Third, even where equipment or consulting services are available locally, they are most likely to be produced externally and will therefore be relatively more expensive in developing countries than in developed countries. Thus, even when companies in developing countries are able to implement standards, their cost of compliance is likely to be relatively higher than that of competitors in developed countries.

Without technical assistance and capacity building initiatives, it has been found that many environmental standards place a relatively larger financial burden on companies in developing countries than on their counterparts in the developed world. Although the WTO TBT Agreement requires Members to provide technical assistance to countries that face difficulties implementing mandatory technical regulations (see Box 1), it is unclear if the scope of Article 11 would include all aspects of voluntary standards. In any case, it is difficult to assess the utility of Article 11 since no developing country has to date made a request for technical assistance under its provisions. Clarification by the TBT Committee on the scope and implementation of Article 11 would be welcome.

iii. International standards and technical equivalence

The TBT Agreement promotes the harmonisation of standards and technical regulations, in particular through the use of international standards and, where possible, technical equivalence. Members are required to use international standards unless they can demonstrate that an international standard would be inappropriate or ineffective owing to specific circumstances, such as geographic or climatic conditions.

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(20) TBT Agreement, Article 11.3.2. Since governments are not responsible for the development of all standards, they cannot be held financially responsible for their trade effects. At the same time, standards bodies have neither the resources nor the capacity to provide technical assistance and training wherever it may be needed. This is an important gap in accountability, but it is unclear how it can be filled.
### Box 1: Technical Assistance Provisions in the World Trade Organization Agreement on Technical Barriers to Trade

Article 11 of the TBT Agreement states that Members shall, if requested, advise other Members, especially the developing country Members, and shall grant them technical assistance on mutually agreed terms and conditions regarding:

<table>
<thead>
<tr>
<th>Article 11.1</th>
<th>The preparation of technical regulations;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Article 11.2</td>
<td>The establishment of national standards bodies, and participation of these bodies in the international standardizing bodies.</td>
</tr>
<tr>
<td>Article 11.3.1</td>
<td>The establishment of regulatory bodies, or bodies for the assessment of conformity with technical regulations;</td>
</tr>
<tr>
<td>Article 11.3.2</td>
<td>Information on how to implement technical regulations;</td>
</tr>
<tr>
<td>Article 11.4</td>
<td>The establishment of bodies for the assessment of conformity with standards adopted within the territory of the requesting Member;</td>
</tr>
<tr>
<td>Article 11.5</td>
<td>The steps that should be taken by their producers if they wish to have access to systems for conformity assessment operated by governmental or non-governmental bodies within the territory of the Member receiving the request.</td>
</tr>
<tr>
<td>Article 11.6</td>
<td>The establishment of the institutions and legal framework that would enable them to fulfill the obligations of membership or participation in regional or international systems of conformity assessment.</td>
</tr>
</tbody>
</table>

Developing countries often become international standards-takers, because they lack the resources to demonstrate that international standards are inappropriate to their particular circumstances. Private companies in developing countries also become standards-takers: they must fulfill the requirements of their principal export markets but may not have the resources to take part in international standard activities, which are primarily developed by private-sector actors. In addition, developing country standards bodies may simply lack the resources necessary to meaningfully engage with stakeholders.

The preponderance of companies from developed countries in ISBs has two important results. First, the international standards developed are most often those that respond to developed country priorities, not to developing country priorities. For example, Colombia has commented on the proliferation of national environmental standards on cut flowers in Europe, noting that since no international standards exist, it is hard to harmonise them. As a result, Colombian exporters need to meet and demonstrate compliance with different criteria for different labelling programmes. Although cut-flower and textile exports are extremely important to many developing countries, they apparently do not have the institutional, technical or financial resources required to initiate the development of relevant international standards.

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(22) In many cases, proposals for new international standards must be accompanied by a commitment by a country to provide secretariat support services, which has both financial and human resource implications. In addition, the proposal must frequently include initial background information, such as data on existing standards, as well as technical analysis and scientific reports supporting the proposal. This requires a high degree of technical capacity.
Second, even where international standards respond to developing country needs, their specifications are more likely to be suited to large, capital-rich multinational companies rather than labour-intensive SMEs.

Without considerable technical and financial assistance, the difficulties that developing countries face with involvement in international standard bodies can be expected to become more serious in the future. The WTO's move towards defining a process through which many bodies can develop international standards can be expected to lead to a greater dispersion of international standards activity. This will make it even more difficult for countries, developed and developing alike, to participate in all international standards activities.

The harmonisation of standards is seen as an important aspect of the labelling debate. However, harmonising rules regarding eco-labels has proved highly problematic. Eco-labels—or, specifically, ways to make eco-labelling programmes and multilateral trade rules mutually supportive—have been on the work plan of the WTO's Committee on Trade and Environment (CTE) from its early days in 1994. The debate arises primarily because many eco-labelling programmes address the environmental impact of a product over its entire life cycle, from cradle to grave. As a result, many eco-labels address not only impacts associated with consumption or use, but also those associated with production (referred to in WTO terminology as “process and production methods”, or PPMs). An additional distinction is drawn between PPMs that have an impact on the physical characteristics of the product (referred to as product-related PPMs, or prPPMs) and those that have no discernable impact on a product’s characteristics (referred to as non-product-related PPMs, or nprPPMs).

To date, it has been generally accepted that labelling programmes that address physical characteristics and prPPMs are included under the scope of the TBT Agreement; the present debate centres on nprPPMs. Most developing countries continue to believe that WTO definitions for technical regulations and standards do not include nprPPMs, since such countries are wary of protectionism in the guise of eco-labels. Many Members claim that the nprPPMs issue strikes at the heart of the multilateral trading system, with important implications for the use of trade measures that discriminate between “like products”.

It is worth noting that the WTO Appellate Body ruling in the Asbestos dispute (23) indicated that health risks may indeed be taken into account when determining “likeness”—that asbestos fibre, because of the health risks it poses, is not like other fibres. It can be presumed that this approach would also apply to instances where the associated risk was to animal or plant health, which is more relevant to the issue of eco-labels.

It is widely agreed that international trade rules must be based on a strict definition of “like product”. On the other hand, it is also suggested that eco-labels are an effective way to help consumers distinguish between “like products” on the basis of whether or not they have been sustainably produced, and that governments should be able to use eco-labels in pursuit of a legitimate public policy objective: for example, promoting sustainable consumption. Nevertheless, the nprPPM debate, for all intents and purposes, will not be resolved within the CTE or TBT Committee, and will particularly not be resolved within the CTE or TBT Committee, and will particularly not be resolved

in the discussion on eco-labels. Indeed, the issue is probably politically irresolvable. Member states will not negotiate on interpretations of "like product", but will continue to seek guidance from Dispute Panel and Appellate Body reports.

Politically intractable as it is, the nprPPMs debate has been holding up discussions on a host of other, resolvable, issues that relate to eco-labels. Fortunately, the debate on nprPPMs has faded recently as Members have recognised that standards and labels that incorporate life-cycle assessments are a fact of life. Instead of concentrating on how to keep these standards outside the WTO, Members are expressing interest in how they can be brought into the framework of the TBT Agreement in order to reduce their trade impacts.

Another issue driving labelling discussions is the mandatory labelling of genetically modified organisms (GMOs). To be properly assessed, countries' positions on the eco-labelling question must be placed in the context of the GMO issue. Led by the United States, exporters of genetically modified (GM) crops believe that countries that do not use, or do not have access to, GM technology are using GMO labelling as an unjustified form of protectionism. Countries seeking to restrict imports of GM crops—like the EU nations foremost among them—state that doubts remain regarding the health and environmental impact of GM technology, and that the scope of possible impacts justifies acting in the absence of conclusive scientific information. The debate centres on a number of issues, including the role of science in public policy, the definition of scientific certainty, the precautionary principle, the role of mandatory versus voluntary labelling, the marketing implications of negative versus positive labelling, the question of who sets standards and criteria, and the length of time that a country can restrict trade in the absence of scientific certainty.

The fundamental conflict between different approaches to regulation, and the problems that this can create for the trading system, has led some to suggest the need for standards of good regulatory practice. Others argue that this would be to sacrifice far too much national sovereignty at the altar of trade liberalisation. It is likely that many objections would be dropped if the EU's labelling regime for GMOs was made voluntary rather than mandatory. However, voluntary labels carry their own problems. For instance, voluntary labels are not subject to the same provisions on transparency, Members are not expected to provide technical assistance to other Members who experience difficulty in implementing standards, and Members are not expected to give positive consideration to technical equivalency requirements for voluntary labels (as they would for mandatory regulation). Perhaps even more importantly, it has been suggested that voluntary eco-labels can have as much impact on market access as mandatory technical regulations.

Another twist in the harmonisation tale is that following the WTO Appellate Body ruling in the Shrimp Turtle dispute, (24) WTO Members can justifiably—albeit under a narrow set of circumstances—implement unilateral trade measures, as long as they are:

- aimed at protecting an exhaustible natural resource;
- taken pursuant to a multilateral environmental agreement (MEA);
- imposed only after bilateral attempts at resolution have failed;
- applied in a least trade-restrictive manner; and

consistent with the principles of Most-Favoured Nation and National Treatment.

In the absence of international standards on which to base technical regulations, the TBT Agreement encourages Members to enter into technical equivalence agreements with Members who have adopted technical regulations that, although substantively different, effectively achieve the same objective. To date, WTO Members have had little success in negotiating equivalence agreements on technical regulations-and, in truth, very little effort has been made in this area. But considering the importance of fine-tuning public policy technical regulations and standards to local economic, social and environmental conditions, these should be an important tool for EH&S standards in particular.

Recent experience suggests that with an enabling international framework, technical equivalence agreements could be a powerful tool for reducing technical barriers to trade. Notably, however, the TBT Agreement requires that Members make efforts to promote technical equivalence agreements for technical regulations only, and not for standards.

2. Implementation problems: conformity assessment

As mentioned above, conformity assessment is the act of testing compliance with quality requirements, be they voluntary standards or mandatory technical regulations. Companies in countries with poor conformity assessment infrastructure face two main problems at this stage of the quality assurance regime: the high relative cost of conformity assessment services, and poor recognition in other markets.

1. High cost of conformity assessment services

There are a number of reasons why companies in developing countries may be subject to relatively more expensive testing and higher certification costs, but the principal reason is related to supply. Whereas a high cost is associated with the proliferation of competing standards bodies and accreditation agencies, conformity assessment services are most efficiently provided by a competitive industry made up of many actors. These actors can be either public or private bodies, but are most frequently a mix of the two. In developed countries, conformity assessment is almost entirely a private-sector activity.

Any company that has been approved by an accreditation authority—which is responsible for assuring the technical competence and consistency of conformity assurance services—is able to provide testing and certification services within its jurisdiction. However, heavy investment is required initially to acquire testing and metrology equipment, and to employ highly specialised staff which may be in low supply. These high start-up costs must either be amortised over a long period of time or over a large number of clients. Apart from a lack of capital to invest in start-up costs, the market for conformity assessment services in many developing countries is just too small to support a competitive industry, while capital costs are too high to permit long payback periods.

As a result, conformity assessment services are frequently provided either by a limited number of public bodies or by foreign service providers. A low supply of service providers raises costs for companies in a number of ways. These include long delays in getting products tested and export licenses issued, or payment of a premium to foreign companies.

(25) For example, the United Nations Food and Agriculture Organization (FAO) and United Nations Conference on Trade and Development (UNCTAD) are convening discussions on the development of a technical assistance framework for organic agriculture standards.
In some cases, the nature of the conformity assessment regime itself tends to limit competition and keep prices high. The Forest Stewardship Council (FSC), for instance, forbids any company from assessing conformity against its sustainable forest management standard if the company in question also audits companies against other sustainable forest management standards. Especially in developing countries, where the supply of conformity assessment services is already low and where exporters may be required to obtain different certifications to access different markets, this policy increases technical barriers to trade in forest products.

In addition, proof of certification may in some cases have to be indicated on the product itself, using a label. This can significantly add to the financial cost and technical difficulties involved in complying with such measures. For example, while the cost of certification under the eco-labelling programme set up by the Flower Campaign—a group of German NGOs and consumer organisations—has been estimated to be as low as US $2,500 per year, exporters must also pay US $1 per label for each crate of exported flowers. For some producers, this could raise costs by as much as US $20,000 annually. The producer generally assumes these costs, since few eco-labels command a significant price premium in the market. For those that do command a price premium, there are also questions about who benefits from the rents. In many instances, it is the retailer that benefits and not the producer.

ii. Poor recognition in other markets
There is another even more important obstacle to the establishment of domestic public or private conformity assessment providers: there is no guarantee that the certificates they issue will be accepted in the target export markets. Partly because of legitimate concerns regarding low levels of technical capacity in developing countries and the consequent inconsistency of test results—and also purportedly because of pressure from large multinational laboratories and certification companies seeking to limit competition—many countries do not accept certificates of compliance issued by companies that have not been accredited by their own domestic accreditation agency.

The Japanese regulation on organic agriculture provides an interesting example of how mutual recognition and foreign licensing agreements can help overcome problems in the supply of conformity assessment services. Besides defining quality and process requirements, the Japanese technical regulation defines who can undertake conformity assessment services. It is a best-practice example of how to increase the supply of conformity assessment services (see Box 2).

The Japanese example follows the framework set out in the TBT Agreement. This requires that countries give positive consideration to accepting conformity assessments undertaken in other countries even if they are conducted according to different procedures, but only so long as the relevant bodies demonstrate “adequate and enduring technical competence”. Without an international benchmark guideline outlining minimum technical requirements, it can be difficult for accreditation agencies in developing countries even to know how to demonstrate adequate technical competence, much less achieve it. The Japanese system is flexible enough to provide companies a variety of options when seeking certification, including after export. The TBT Agreement also encourages Members to enable foreign conformity assessment bodies to participate in their domestic industries “under conditions no less favourable than

(26) See draft OECD case study on cut flowers; on file with author.
(27) Drawn from draft OECD case study on organic agriculture; on file with author.
(28) TBT Agreement, Article 6.1.1.
those accorded to bodies located within their territories.” (29) The Japanese system enables any accredited company to undertake conformity assessments in any third country.

Unfortunately, best practice is more often the exception than the rule, particularly in the case of private, non-governmental standards. In a 1998 report to the WTO’s CTE and TBT Committee, the Colombian government commented on European eco-labelling initiatives for cut flowers. It raised the concern that determinations of compliance, which are crucial to market access, were being undertaken by private organisations "with no qualification as international certifiers and without being subject to any kind of international standards." (30) Many of the private, non-governmental environmental and social certification and labelling programmes control the supply and quality of auditors, including the FSC, the Marine Stewardship Council (MSC) and the International Federation of Organic Agriculture Movements (IFOAM).

Box 2: Maximising the Supply of Conformity Assessment Services in the Japanese Organic Agriculture Regulations

The Japanese technical regulation on organic agriculture defines who is able to undertake conformity assessment services, but does so in a flexible way that both ensures an adequate degree of technical competence and maximises the supply of conformity assessment services in exporting nations. The Japanese law lists four categories of company that can become registered to undertake certifications:

1. Any conformity assessment body based in Japan can undertake audits as long as it satisfies the requirements set out and it has been accredited by the national authority.

2. For a fee, conformity assessment bodies in other countries can obtain accreditation from the Japanese authorities, as long as they are located in a country that has been determined by the Japanese authority as having an equivalent system. These companies can also undertake conformity assessments in third countries, as long as they indicate the scope of their planned activities at the time of registration.

3. Raw agricultural products to be imported into Japan for further processing can be certified by any recognised certifier in the country of export, and then re-certified by a registered Japanese company after processing.

4. Any registered company, either in Japan or in another country, can enter into a “trust contract” with companies in other countries as long as the company is recognised by a national, regional or international organisation with an established reliability, including the International Organic Accreditation Service (IOAS). *

* The IOAS is the accreditation body for the International Federation of Organic Agriculture Movements (IFOAM), the main NGO body involved in organic agriculture standards and labelling.

(29) TBT Agreement, Article 6.4. It should be noted that it is most often developed country conformity assessment providers that enter developing country markets, and that these are most often private companies.

(30) From draft OECD case study on cut flowers; on file with author.
3. Implementation problems: accreditation

As mentioned earlier, one of the main obstacles to increasing the size of the available pool of conformity assessment service providers is the fact that certificates granted in one country are not always recognised in another. One of the main reasons for this is the perception that some national accreditation agencies are not sufficiently effective.

Accreditation agencies are responsible for overseeing the competence and consistency of a country's testing, metrology and certification services. Some developed country accreditation agencies believe that insufficient institutional capacity, technical expertise and financial resources mean that some developing country accreditation agencies do not keep a close enough eye on the national conformity assessment infrastructure. Without trust in the oversight capacity of the testers, it is hard to trust the quality of testers or the reliability of tests.

A concerted effort is being made by the international quality assurance community to develop a robust institutional framework to rationalise the accreditation process. In particular, this includes activities undertaken by the IAF, ILAC and ISO/CASCO. The IAF and ILAC are also developing international MLAs, which have already greatly facilitated the recognition of management system certifications across national boundaries, and will eventually include a similar framework for product testing and metrology.

But even the best international framework does not change the fact that certain basic assistance is needed if accreditation agencies are to develop the technical and institutional capacity needed to benefit from such a framework. Problems related to accreditation will ultimately not be resolved without significant investment to help developing countries acquire the necessary technologies and technical capacity. Although the TBT Agreement requires that Members provide technical assistance to help developing country Members establish bodies for the assessment of conformity for both technical regulations and standards (see Box 1), to date there have been no requests for such assistance from developing countries, making it difficult to assess the adequacy of Article 11's provisions. The EU recently submitted to the TBT Committee a list of all of the technical assistance work that it has funded, \(^{(31)}\) but in general the provision of technical assistance to all developing country Members has been insufficient. This is a difficult issue, since the scope of the problem is both large and relatively undocumented.

IV. Conclusion

Standards and technical regulations present barriers to trade at the level of each of the three quality assurance institutions: rule making (standards and technical regulations), conformity assessment and accreditation. Indeed, even the relatively small number of case studies that have looked into the barriers imposed by environmental standards has shown that very real problems exist at each level.

There is a variable range of complexities associated with each quality assurance institution. The development and implementation of standards and technical regulations involves the most actors including governments, companies, industry associations and consumer groups in both importing and exporting countries—and the range of problems that appear at this level are both the most numerous and the most complicated to address. The assessment of conformity involves relatively fewer actors and is therefore a slightly less complicated issue. The provision of accreditation services involves the fewest actors, and is perhaps the most straightforward to address. Of course, without sufficient levels of technical assist-

tance, no kind of barrier to trade can be easily overcome.

There are many who suggest that the WTO's existing rules on labelling are sufficient, and that the real test—as with many trade and environment issues—will be in the way that these provisions are interpreted by Dispute Panels. Although a sufficient body of WTO jurisprudence exists to indicate the likely direction in which cases involving the WTO and its relation to MEAs would be resolved, there is simply not enough in the area of labelling to suggest how the relevant provisions would be applied.

Without greater investment in quality assurance institutions, quality assurance requirements of all kinds will continue to impose trade barriers on developing countries. Not only will this reduce trading opportunities available to developing countries, it will also begin to discredit the kinds of policy tools that are increasingly being used to promote sustainable development: eco-labels, certification programmes and other market-based mechanisms.

Developing countries must take the initiative to convene national consultation processes to assess their priority needs, and to consider proposals for how the relevant barriers to trade can be addressed. TBT implementation must also be integrated into national economic development and poverty reduction strategies, so that bilateral donors and development assistance agencies hear of these needs from their national contact points. In particular, developing countries must begin to use the provisions of Article 11, which enable them to request funds from developed country members to address many of the relevant technical assistance needs. In response to the proposals that emerge from this process, developed countries must then acknowledge their obligations under Article 11 of the TBT Agreement and begin to invest more in technical assistance to developing countries. There is no other credible alternative.

Annex 1

The WTO Agreement on Technical Barriers to Trade: standards, technical regulations and the quality institutions

This annex outlines the key elements of the TBT Agreement as they relate to the development of standards and technical regulations. It is an indicative list of the relevant provisions, which is intended to give a general sense of the types of issues that they addressed and the capacities required to implement and benefit from the TBT Agreement.

The TBT Agreement is a complex legal document and its provisions must not be read in isolation of either the entire scope of the TBT Agreement nor the GATT text itself. This is not a detailed legal analysis and thus should not be considered exclusive or authoritative.

Technical regulations

The TBT Agreement contains many provisions that are intended to prevent (mandatory) technical regulations from becoming unnecessary barriers to trade. These provisions recommend best practice, and also outline procedural requirements.

Best practice (33): technical regulations

The TBT Agreement describes the conditions under which a technical regulation is rebuttably presumed not to create an unnecessary obstacle to trade, i.e., if it is prepared, adopted or applied for one of the legitimate objectives explicitly mentioned in Paragraph 2 (34), and is in accordance with relevant international standards (2.5).

It also describes several principles of best practice that are mandatory; technical regulations shall not be more trade-restrictive than necessary to fulfill a legitimate objective, taking account of the risks non-fulfillment would create (2.2), nor shall they be maintained if the circumstances or objectives giving rise to their adoption no longer exist or if the changed circumstances or objectives can be addressed in a less trade-restrictive manner (2.3). Where the international standard is not appropriate, the technical regulation must nonetheless be based as closely as possible on the international standard (2.4). Wherever appropriate, members shall also specify technical regulations based on product requirements in terms of performance rather than design or descriptive characteristics (2.8).

Also, recognizing the need for flexibility, members shall consider accepting as equivalent technical regulations of other members, even if these regulations differ from their own, provided they are satisfied that these regulations adequately fulfill the objectives of their own regulations (2.7).

Procedural requirements: technical regulations

When developing technical regulations, members must base them on relevant international standards or on their relevant parts, unless they find that they would be ineffective or inappropriate, e.g., because of fundamental climatic or geographical factors or fundamental technological problems (2.4). As soon as they are requested, members must explain the justification for technical regulations (2.5), and they must also ensure that technical regulations are made available to interested parties in other members as soon as they are introduced or published (2.11), and must allow a reasonable interval between the publication of technical regulations and their entry into force in order to allow time for producers in exporting members to adapt their products or methods of production to the requirements (2.12).

Because of the importance of international standards, members shall play a full part, within the limits of their resources, in the preparation of international standards for products for which they have either adopted, or expect to adopt, technical regulations (2.6). Whenever a relevant international standard does not exist or the technical content of a proposed technical regulation is not in accordance with the technical content of relevant international standards, members shall, at an early appropriate stage (35):

- notify members of their intent to introduce a technical regulation so as to enable interested parties in other members to become acquainted with it (2.9.1);
- notify members of the products to be covered by the proposed technical regulation, together with a brief indication of its objective and rationale (2.9.2);
- upon request, provide to other members particulars or copies of the proposed technical regulation and identify the parts that deviate from relevant international standards (2.9.3); and

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(33) The term “best practice” is used in a conceptual fashion here and is not meant to suggest that the provisions are not mandatory; in reality, most of this “best practice” is required.

(34)2.2 (…) Such legitimate objectives are, inter alia: national security requirements; the prevention of deceptive practices; and protection of human health or safety, animal or plant life or health, or the environment.

(35)2.9.2 and 2.9.4 clarify that the meaning of “an early appropriate stage” is that it should be at a stage when amendments can still be introduced and comments taken into account.
• accept members' written comments and discuss these comments upon request, and take these written comments and the results of these discussions into account (2.9.4).

All of the above provisions are also applied to technical regulations developed by local governments (e.g., municipal or provincial governments) and nongovernmental bodies (Article 3), but there are special provisions that apply when urgent problems of safety, health, environmental protection or national security justify rapid development of technical regulations (2.10).

Standards
The TBT Agreement also contains several provisions that seek to ensure that (voluntary) standards do not impose unnecessary obstacles to trade. As with the treatment of technical regulations, the provisions outline best practice and establish certain procedural requirements. However, because of the voluntary nature of standards, these are subject to slightly different provisions. The case of standards is also complicated by the fact, although many different governmental and nongovernmental agencies can develop standards, the TBT Agreement only imposes requirements on governments. The TBT Agreement has no direct authority over non-governmental standards bodies. As a result, although members must ensure that their central government standardizing bodies comply with the relevant provisions (4.1), most of the provisions themselves appear in a separate annex (Annex 3: the Code of Good Practice for the Preparation, Adoption and Application of Standards, commonly referred to as the Standards Code) [36].

Best practice: standards
Although it is not explicitly stated in the TBT Agreement, it is generally accepted that voluntary requirements are less trade-restrictive than mandatory requirements. As a result, for any given set of requirements that seek to achieve any given objective, a standard would be considered a less trade-restrictive measure than a technical regulation. That said, there are still certain requirements for setting standards. Many of these overlap with the best practice requirements related to technical regulations.

First, national bodies must use relevant international standards or their relevant parts as the basis for national standards, except where this would be ineffective or inappropriate, for instance, because of an insufficient level of protection or fundamental climatic or geographical factors or fundamental technological problems (F). Wherever appropriate, the standards that specify product requirements must be based on performance rather than design or descriptive characteristics (I).

Procedural requirements: standards
National bodies involved in standardization must, within the limits of their resources, participate in the preparation by relevant international standardizing bodies of international standards regarding subject matter for which it either has adopted, or expects to adopt, standards (G). If there is more than one relevant national standards body, they must participate through a single delegation (G). These bodies must also make every effort to avoid duplicating or overlapping with the work of standardizing bodies in other countries, or with the work of international or regional standardizing bodies (H). They shall also make every effort to achieve a national consensus on the standards they develop (H).

[36] In the following text, the references that appear as a capital letter in parentheses correspond to sections of TBT Annex 3.
Before adoption, the standardizing body shall provide, upon request, copies of the draft standard (M), and allow a period of at least 60 days for the submission of comments on the draft standard by interested parties within the territory of a member of the WTO (L). The standardizing body must then take these comments into account, and must reply to comments received from other standard bodies that have accepted the Standards Code, including explanations for any deviations from relevant international standards (N). Once the standard has been adopted, it shall be promptly published (O).

At least once every six months, the standardizing body must publish a work program containing its name and address, the standards it is currently preparing and the standards it adopted in the preceding period (J). On the request of any interested party within the territory of a member of the WTO, the standardizing body shall promptly provide a copy of its most recent work program or of a standard that it produced (P).

**Other relevant provisions**

The TBT Agreement also contains several provisions that seek to ensure that procedures for the assessment of conformity with standards and technical regulations do not themselves impose technical barriers to trade. These provisions are contained in Articles 5 through 9, inclusive.

A main concern of the TBT Agreement is transparency and the provision of information on applicable technical regulations and standards. As a result, it outlines several additional procedural requirements relevant to communication. These include:

- each member shall ensure that an enquiry point exists which is able to answer all reasonable enquiries from other members and interested parties in other members as well as to provide relevant documents (10.1);
- developed country members shall upon request provide English, French or Spanish, translations of the documents covered by a specific notification (10.5); and
- members shall designate a single central government authority that is responsible for the implementation on the national level of the provisions concerning notification procedures under this Agreement except those included in Annex 3 (10.10).

Recognizing the significant institutional capacities required to implement the TBT Agreement, members are also required to provide technical assistance, on agreed terms and conditions, regarding most elements related to the implementation of the above provisions (Article 11). This includes the establishment and institutional development of national standards bodies (11.2), regulatory bodies (11.3.1) and conformity assessment bodies (11.4, 11.5), and participation in international standardization (11.2). It also includes the provision of guidance on the implementation of technical regulations (11.3.2) and involvement in regional cooperation agreements on conformity assessment (11.6, 11.7). In addition, members must provide differential and more favourable treatment to developing country members to this Agreement (Article 12).

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(37) This period may, however, be shortened in cases where urgent problems of safety, health or environment arise or threaten to arise.

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Chinese Law and Practice of Sustainable Trade and Environmental Protection

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Introduction
In its 1987 report, Our Common Future, the World Commission on Environment and Development formally presented the sustainable development model, holding that environmental protection must be fully and organically integrated into social and economic activities in order to ensure the sustained survival and development of mankind.\(^{(1)}\) The report outlined the key principles of sustainable development: first, that the pursuit of development by human society should attach equal importance to the developmental and environmental needs of current and future generations; and second, that environmental protection must become an inseparable part of the development process. In other words, economic development should go hand in hand with environmental protection.\(^{(2)}\)

Sustainable development is embodied in every aspect of the social and economic activities of human society. It includes not only sustainable production and sustainable consumption but sustainable trade as well. Sustainable trade—defined as "international exchanges of goods and services that bring positive social, economic and environmental benefits"—lies at the heart of the sustainable development philosophy.\(^{(3)}\)

The concept of sustainable trade inevitably affects the largest trade organisation in the world, the World Trade Organization (WTO). At the end of 2001, the Fourth WTO Ministerial Conference in Doha adopted a Ministerial Declaration authorising the WTO Committee on Trade and Environment (CTE) to begin negotiations on trade and environment issues. The key issue here is how to reconcile free trade requirements with environmental protection concerns in a way that prevents the use of environmental protection as a pretext for trade restrictions and, at the same time, protects the environment. Striking a balance between these two concerns has long been a testing issue for the international trading community. Once breakthroughs are made in trade and environment negotiations, they will profoundly influence the path of social and economic development in many countries.

A key element of the sustainable development paradigm is the protection of biological diversity,\(^{(4)}\) the benefits of which are felt in areas such as economic development, poverty alleviation, soil and water conservation, and pollution control. The Convention on Biological Diversity (CBD) is the core treaty on the subject. The obligations of Contracting Parties under the CBD and other thematically related


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treaties also affect trade, making it all the more important that the relationship between WTO agreements and biological diversity agreements is handled properly.

China is both a WTO Member and a Party to the CBD, as well as a Party to other treaties related to biological diversity. Fulfilling its obligations under both regimes is a matter of great importance to China. This paper will examine some of the practical problems involved.

I. WTO and sustainable development

Judging from the concerns expressed by the WTO over environment and sustainable development issues, trade under the WTO framework is not meant to be merely free trade. Rather, the WTO envisions a regime under which trade can grow in a sustainable way. Setting out the WTO's objectives, the Preamble to the Agreement Establishing the World Trade Organization notes that apart from specific trade - and economy-related goals-raisin gs standards of living, ensuring full employment, achieving a large and steadily growing volume of real income and effective demand, and expanding the production of and trade in goods and services-consideration should also be given to the equitable and sustainable use of the world's resources and preservation of the environment.

The spirit of sustainable development is also embodied in other WTO agreements and documents, such as Article XX(b) of the General Agreement on Tariffs and Trade (GATT), Article 2.2 of the Agreement on Technical Barriers to Trade (TBT) and Article 2.2 of the Agreement on the Application of Sanitary and Phytosanitary Measures (SPS). According to these articles, Members may, under certain conditions, adopt restrictive measures to protect human, animal or plant life or health, without being deemed to have breached their obligations under the WTO.

The WTO pays more attention to the conservation of biological diversity than its predecessor, GATT. In the 1980s and early 1990s, the GATT's dispute settlement procedure resulted in rulings on environment-related complaints that the environmental legislation from which disputes arose did not comply with requirements for "essentiality", "non-discrimination" and "minimum trade restriction". Clearly, the expert panel adopted a cautious approach to interpreting environmental protection clauses, to prevent both the abuse of such clauses and their use as a pretext for trade barriers.

The WTO's Dispute Settlement Body (DSB), and particularly its Appellate Body, has tended towards more relaxed interpretations of the WTO's environmental protection clauses in the settlement of trade and environmental disputes. This was true in two complaints lodged against the United States (US): US-Gasoline and US-Shrimp/Turtle. The main thrust of these rulings was that the procedures followed in applying environmental standards to international trade were inherently faulty. But the rulings did recognise the use of national environmental standards in international trade. (5)

In the WTO system, agreements related to biological diversity and sustainable development include:

1. SPS Agreement

Paragraph 1 of Article 2 establishes that "Members have the right to take sanitary and phytosanitary measures necessary for the protection of human, animal or plant life or health, provided that such measures are not inconsistent with the provisions of this Agreement." Paragraph 7 of Article 5 states: "In

(5) ibid.

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cases where relevant scientific evidence is insufficient, a Member may provisionally adopt sanitary or phytosanitary measures on the basis of available pertinent information...”

2. Agreement on Agriculture
The Preamble to this Agreement recognises “non-trade concerns, including food security and the need to protect the environment.” Annex 2 of the Agreement stipulates that “Payments under environmental programmes” are eligible for exemption from reduction commitments in domestic support. In other words, it allows green box subsidies.

3. Agreement on Trade-Related Aspects of Intellectual Property (TRIPs)
Paragraph 1 of Article 8 of this Agreement determines that:
Members may, in formulating or amending their laws and regulations, adopt measures necessary to protect public health and nutrition, and to promote the public interest in sectors of vital importance to their socio-economic and technological development, provided that such measures are consistent with the provisions of this Agreement.

Meanwhile, Paragraph 2 of Article 27 states:
Members may exclude from patentability inventions, the prevention within their territory of the commercial exploitation of which is necessary to protect ordre public or morality, including to protect human, animal or plant life or health or to avoid serious prejudice to the environment, provided that such exclusion is not made merely because the exploitation is prohibited by their law.

Finally, Paragraph 3(b) of Article 27 allows Members to exclude from patentability “plants and animals other than micro-organisms, and essentially biological processes for the production of plants or animals other than non-biological and microbiological processes.” However, Members are also required to provide for the “protection of plant varieties either by patents or by an effective sui generis system or by any combination thereof.”

II. International treaties related to biological diversity and sustainable development
The CBD, which came into force in 1993, is the core international agreement on biological diversity. It is the first global convention to develop a biological diversity concept that covers all species, including genetic resources, species and ecosystems. Article 2 of the CBD defines the term biological diversity as:

the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems.

The Preamble to the CBD notes that Parties are:
Conscious of the intrinsic value of biological diversity and of the ecological, genetic, social, economic, scientific, educational, cultural, recreational and aesthetic values of biological diversity and its components,

Conscious also of the importance of biological diversity for evolution and for maintaining life sustaining systems of the biosphere...

Concerned that biological diversity is being significantly reduced by certain human activities...
Noting further that the fundamental requirement for the conservation of biological diversity is the in-situ conservation of ecosystems and natural habitats and the maintenance and recovery of viable populations of species in their natural surroundings...

Acknowledging that substantial investments are required to conserve biological diversity and that there is the expectation of a broad range of environmental, economic and social benefits from those investments...

Aware that conservation and sustainable use of biological diversity is of critical importance for meeting the food, health and other needs of the growing world population, for which purpose access to and sharing of both genetic resources and technologies are essential...

The CBD recognises at the very outset the key role that biological diversity plays in sustainable development. Article 1 states:

The objectives of this Convention, to be pursued in accordance with its relevant provisions, are the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources, including by appropriate access to genetic resources and by appropriate transfer of relevant technologies, taking into account all rights over those resources and to technologies, and by appropriate funding.

CBD Contracting Parties are obligated to:

* develop national strategies, plans or programmes for the conservation and sustainable use of biological diversity, or adapt existing strategies, plans or programmes to serve this purpose (Article 6(a));
* integrate, "as far as possible and as appropriate", conservation and sustainable use of biological diversity into relevant sectoral or cross-sectoral plans, programmes and policies (Article 6(b));
* identify and monitor those components of biological diversity that are important to conservation and sustainable use; identify processes and categories of activities that have or are likely to have significant adverse impacts on the conservation and sustainable use of biological diversity; and monitor their effects (Article 7); and
* establish a system of protected areas for the purpose of in-situ conservation; develop other rehabilitation and restoration programmes; control the risks associated with the use and release of living modified organisms resulting from biotechnology; prevent the introduction of, control or eradicate alien species that threaten ecosystems, habitats or species; preserve and maintain knowledge, innovations and practices relevant to the conservation and sustainable use of biological diversity (Article 8).

The CBD places on Parties the responsibility of undertaking ex-situ conservation (Article 9); ensuring that components of biological diversity are used sustainably (Article 10); and facilitating access to genetic resources for environmentally sound uses by other Contracting Parties, acquiring prior informed consent to access to such resources, and sharing benefits arising from the commercial and other use of genetic resources (Article 15). Parties must facilitate access to and transfer of technology. But in the case of technology subject to patents and other intellectual property rights, access is to be provided on terms that are consistent with the protection of intellectual property rights (Article 16). The CBD also places on Contracting Parties obligations related to the handling of biotechnology and the distribution of its benefits (Article 19).

There is no doubt that the CBD contains comprehensive provisions for the conservation of biological diversity. But the document is only a framework. When it comes to conserving particular biological
species or engineering international coordination or cooperation in specific matters, the CBD still needs to be supplemented by other international agreements. These include:

1. **Cartagena Protocol on Biosafety**
   Signed in 2000 and effective as of 11 September 2003, this agreement was negotiated in accordance with the provisions of the CBD. The Cartagena Protocol aims to ensure the safe transboundary transportation, handling and use of living modified organisms (LMOs), so that LMOs do not harm biological diversity or human health. (6) China has signed this Protocol.

2. **International Treaty on Plant Genetic Resources for Food and Agriculture**
   Adopted in 2001, this Treaty replaces the earlier International Undertaking on Plant Genetic Resources. It is the first international binding agreement on access to and sharing of benefits from plant genetic resources. A basic principle of this Treaty is that plant genetic resources shall be “conserved and utilized in a sustainable way”. Farmers’ rights are given formal, global legal recognition, and the Treaty also establishes a multilateral system for access to genetic resources and benefit sharing.

3. **Statutes of the International Centre for Genetic Engineering and Biotechnology**
   China submitted and deposited in 1986 its instrument of accession to these Statutes adopted in 1983. The primary purpose of this agreement is to establish an international institution for genetic engineering and biotechnology, and to foster international cooperation in this area.

4. **International Convention for the Protection of New Varieties of Plants**
   In 1999, China became a Party to the 1978 version of this Convention, which aims to protect the rights of plant breeders by granting exclusive rights or patents. The Convention sets out the scope, terms and time limit for protection for plant breeders’ rights.

5. **Convention on Wetlands of International Importance especially as Waterfowl Habitat**
   Known as the Ramsar Convention, this agreement was signed in 1971 and came into effect in 1975. The Preamble takes into account the “fundamental ecological functions of wetlands as regulators of water regimes and as habitats supporting a characteristic flora and fauna, especially waterfowl”, and affirms that “wetlands constitute a resource of great economic, cultural, scientific, and recreational value, the loss of which would be irreparable...”

   Under Ramsar, contracting parties are to designate suitable wetlands within their territories for inclusion in a list of Wetlands of International Importance, set up wetland natural reserves, encourage research and the exchange of data and publications regarding wetlands and their flora and fauna, and endeavour through management to increase waterfowl populations in appropriate wetlands. China became a Contracting Party to Ramsar in 1992.

   Referred to as CITES, this agreement was signed in 1973 and came into effect in 1975. China became a Party in 1981. This Convention aims to protect certain wild animal and plant species, and ensure that international trade does not result in the excessive use and exploitation of such endangered

species. Its three annexes contain lists of species that are to be protected, along with the relevant trade provisions.

7. United Nations Convention to Combat Desertification
This Convention, adopted in 1994 and ratified by China in 1997, notes that desertification affects climate, the environment, food security and sustainable development, and holds that desertification is a key cause of poverty. It states that preventing and controlling desertification will help attain the objectives of the UN Framework Convention on Climate Change as well as the CBD and other environment-related agreements. The Convention obliges Parties to prevent and control desertification, and to participate in international cooperative efforts related to this purpose.

8. UN Framework Convention on Climate Change
This Convention, signed in 1992 and ratified by China the following year, aims to control the emission of greenhouse gases in an attempt to avoid climate changes that such gases are likely to produce.

III. Relationship between the WTO and CBD
From the discussion above, it is clear that the WTO and CBD pursue essentially the same objectives of economic growth and ecological conservation, but from very different perspectives. The two agreements are essentially consistent with each other in the long-term in promoting environmental protection and economic development, but may contradict each other at specific or short-term levels.

As the largest multilateral trading system and the global venue for trade rules negotiations, the WTO promotes free global trade. It is not a multilateral environmental agreement. As such, the WTO comprises elements that are harmonious with the interests of biodiversity conservation, as well as aspects that conflict with this purpose. In this connection, what is most often a topic of debate is the mismatch between the TRIPs Agreement and the CBD. (7)

In examining the relationship between the WTO and the CBD, issues arise concerning the understanding and implementation of certain principles of international environmental law. One such well-known principle is precaution, which was recognised in the CBD in 1992 and enshrined in the Cartagena Protocol on Biosafety in 2000. In the late 1980s, the European Union (EU) banned imports of hormone-treated beef. The ban applied to all meat markets in Europe, irrespective of whether the beef was home produced or imported from abroad. Although this measure complied fully with the “non-discrimination principle” of the WTO, the United States (US) nevertheless suffered beef export losses amounting to tens of millions of dollars.

In the EC-Beef Hormones dispute, although the WTO Appellate Body upheld the Panel’s ruling that the EU ban was in breach of WTO Agreements because the risk assessment was insufficient, it refused to accept the EU’s argument based on the precautionary principle.

In the wake of this dispute, US consumer groups complained that the WTO was wrongly involving itself in the domestic health and safety policies of individual countries. The WTO ruling was seen to harm efforts on the part of countries to protect the health and welfare of their own citizens. This is because WTO clauses shift the burden of proof and establish that when Parties want to restrict the use of chemi-

(7) See footnote 4.
cals or food additives, they must present evidence that the chemicals or additives in question are harm-
ful. It is expected that the genetically modified organisms (GMOs) debate will trigger even more seri-
ous trade disputes in the near future. (8)

WTO agreements often state that when exceptions are made to provide for environmental conservation or the protection of human, animal and plant life or health, such measures should not “constitute dis-
guised restriction on international trade”. How this clause relates to environmental treaties is highlight-
ed, for instance, in Paragraph 1 of Article 22 of the CBD, which states that provisions of the Conven-
tion “shall not affect the rights and obligations of any Contracting Party deriving from any existing inter-
national agreement, except where the exercise of those rights and obligations would cause a serious
damage or threat to biological diversity.” This suggests that the key issue is one of evidence. In theo-
ory, how disputes are resolved will depend on which party can produce the stronger evidence. In prac-
tice, however, disputes are not judged entirely on the basis of objective factors. Subjective factors such as people’s tolerance, the economic strength of the countries concerned and their position at the negoti-
ation table also come into play.

IV. Chinese laws and practice concerning biological diversity
To revert the trend of drastic biological diversity depletion and fulfill its obligations to the relevant inter-
national agreements it has joined, China has formulated and issued over 20 laws and regulations related to biological diversity. These laws and regulations form a basic legal framework to conserve biological
diversity, and include the following:

1. Environmental Protection Law
This is China’s basic environmental protection law and defines the term environment to include “the to-
tal body of all natural elements and artificially transformed natural elements affecting human existence and development, which includes the atmosphere, water, seas, land, minerals, forests, grasslands, wildlife, natural and human remains, nature reserves, historic sites and scenic spots, and urban and rural areas.” The Environmental Protection Law states that rare and endangered wild animals and plants should be protected (Article 17); no industrial production facilities that pollute the environment shall be built within scenic spots, natural reserves or other areas that need special protection (Article 18); protection of the agricultural environment should be strengthened (Article 20); and vegetation, water bodies and the natural landscape in urban and rural development should be protected (Article 23).

2. Marine Environment Protection Law
Chapter 3 of the Law deals with “marine ecological conservation”, providing that protection shall be
given to mangroves, coral reefs, coastal wetlands, islands, bays, estuaries, important fishing waters and other typical and representative marine ecological systems, to areas where rare and endangered ma-
rine organisms are naturally concentrated, to regions where marine organisms of important economic values live, and to natural marine historical relics and natural landscapes of great scientific and cultural significance (Article 20).

Article 21 states that in accordance with the need for marine ecosystem conservation, marine nature re-
erves shall be delimited and established, while Article 23 specifies that special marine protection areas

(8) ibid.
shall be established in areas that possess special geographic conditions, ecosystems, living and non-living resources and require special marine development, for which special management shall be provided by adopting effective protection measures and scientific development methods.

Under the provisions of Article 25, the introduction of marine biological species is subject to scientific assessment to avoid damage to marine ecosystems.

3. Agricultural Law
The provisions of this Law are the most closely related to biological diversity. Paragraph 1 of Article 57 stipulates that in the development of agriculture and rural economies, rational protection and utilisation shall be undertaken to natural resources such as land, water, forest, grassland and wild animals and plants... [and that] eco-agriculture shall be promoted and the ecological environment shall be conserved and improved.

This Law provides for strengthened afforestation and forest protection (Article 60), enhanced grass protection (Article 61), increased production of fisheries resources and protection of fisheries waters and the ecological environment (Article 63). Under the provisions of Article 64, the State is required to establish relevant systems for protecting biological germplasm resources related to agricultural production, conserve biological diversity and give key protection to rare, endangered and precious biological resources and their native habitats. Registration or examination and approval shall be undertaken according to law when biological germplasm resources are introduced from overseas and corresponding safety control measures adopted. Various safety control measures shall be strictly followed in accordance with the provisions of the State, when research, experimentation, production, processing, operations and other applications are undertaken on agricultural transgenic organisms.

4. Grassland Law
The purpose of this law is to “protect, build and rationally utilise grassland, improve the ecological environment, conserve biological diversity, modernise animal husbandry and promote sustainable social and economic development” (Article 1). Article 29 states that superior quality grass varieties should be selected, introduced and promoted, and grass seed quality ensured. Article 31 requires improvement in degraded, desertified, salinised, stone desert grasslands and grasslands with soil and water erosion, while Article 43 states that natural reserves for grassland should be established.

5. Fisheries Law
Under the provisions of this Law, the State is to encourage and support the selection, breeding and promotion of superior quality aquatic varieties (Article 16). The Fisheries Law requires that quarantine measures are implemented for imports and exports of aquatic offspring, and safety evaluations are performed when transgenic aquatic offspring are introduced (Article 17). It is established that a fishing quota system shall be implemented (Article 22) and that protected areas for aquatic germplasm resources will be established (Article 29). The law also contains a provision for the protection of rare and endangered aquatic wild animals (Article 37).

6. Forest Law
Article 5 of the Law stipulates that forestry in China shall be based on forest ranging, universal forest protection, large-scale forestation efforts, a combination of cutting and planting, and sustainable utilisation. Article 24 provides for delimiting nature protection areas to strengthen protection and administration in typical forest ecology areas in different natural terrain, forest districts where precious animals
and plants breed and grow, natural tropical rainforest districts and other natural forest districts with special protection value.

Article 38 states that the State forbids or restricts the export of precious trees and their products and derivatives. This is related to China’s obligations under CITES.

7. Law on the Protection of Wild Animals

Article 2 sets the scope of protection, which covers rare and endangered terrestrial and aquatic wild animals or terrestrial wild animals with significant economic and scientific research value. Article 10 provides for the designation of natural reserves and Article 24 sets restrictions on the trade in protected wild animals. These measures are also consistent with China’s obligations under CITES.

8. Regulations for the Protection of Wild Plants

The objectives of the Regulations are to “protect, develop and rationally utilise wild plant resources, conserve biological diversity and maintain ecological equilibrium” (Article 1). The scope of this protection covers rare plants growing naturally in their native habitats, and endangered and rare plants that grow naturally in their native habitats and possess important economic, scientific research and cultural value (Article 2). Article 14 establishes that wherever necessary, protection may be through ex-situ conservation measures, including captive breeding, and germplasm resource banks, among others.

9. Regulations for the Protection of New Plant Varieties

These Regulations stipulate that breeders of new plant varieties shall be granted rights to them (Article 3). Materials used to produce a variety to which a right has been granted cannot be produced or sold without permission from the right holder, nor can they be used to propagate other varieties (Article 6). However, use in breeding and other research activities involving varieties to which a right has been granted for use by farmers is permitted. The Regulations also establish that, for the national or public good, the examination and approval body may decide to implement compulsory permits for new plant varieties (Article 11).

10. Regulations on Administration of Agricultural Genetically Modified Organisms Safety

The purpose of these Regulations is to strengthen administration of the safety of agricultural genetically modified organisms; ensure the safety of human health, animals, plants and micro-organisms; protect the ecological environment; and promote research on agricultural genetically modified organisms (Article 1). Article 3 defines “agricultural genetically modified organisms”, while Article 7 establishes that the country shall develop a safety evaluation system for agricultural genetically modified organisms. Article 8 states that the country shall implement a labelling system for agricultural genetically modified organisms. The Regulations also contain provisions governing research and testing of agricultural genetically modified organisms (Chapter II), production and processing (Chapter III), marketing (Chapter IV), and import and export (Chapter V).

11. Regulations on Nature Reserves

These Regulations are related to China’s obligations as laid down in Article 8 of the CBD. In Article 2 of the Regulations, nature reserves are defined as delimited areas that have been designated for special protection and management, located in areas where representative ecosystems or rare and endangered wild plants and animals are concentrated. The definition includes land areas, and inland or marine waters, that are the habitats of rare or endangered species or where natural formations or other features of special significance are situated. Article 10 sets the criteria for establishing natural reserves, while
Chapter III contains provisions regarding the management of nature reserves.

Since ratifying the CBD in 1993, China has established a Coordinating Group on Implementing the Convention on Biological Diversity in China. Led by the State Environmental Protection Administration, the Coordinating Group consists of representatives from 20 departments of the State Council. Each year, the Group holds meetings and formulates annual work plans. It has organised a series of activities and formed preliminary mechanisms to conserve biological diversity and fulfil China's obligations under the CBD.

In 1992, to implement Article 6 of the CBD and include conservation and sustainable use of biological diversity into its national strategy, China began preparing a National Biological Diversity Strategy and Action Plan. This Action Plan was formally released in June 1994.

The following year, China launched a national biological diversity status research project under which a great deal of data has been collected and analysed. Efforts have been made to conduct a benchmark survey of the status of biological diversity in China. The country's experiences with the conservation and sustainable use of biological diversity have been summarised. The project has also determined the economic value of China's biological diversity, estimated the extra costs of fulfilling its obligations under the CBD and assessed the benefits that will accrue from conserving the country's biological diversity. [9]

In terms of building a protection infrastructure, China has established 799 nature reserves, 512 scenic spots, 755 forest parks, 171 zoos or zoological exhibition areas in parks, 110 botanical gardens or arboreta, and a number of artificial breeding bases for rare and endangered plants. Protected areas now exceed 8% of China's total land territory. In addition, China has also set up a crop germplasm resources preservation system, which consists of medium- and long-term banks and germplasm banks. The germplasm of some 330,000 protected crops has been collected.

As far as ecological rehabilitation and restoration is concerned, China has invested considerable funds to implement a series of afforestation projects and mobilised citizens to participate in these efforts. As a result, the country has achieved a gradual increase in both forested area and accumulated wood volume. China has also implemented sustainable resource utilisation demonstration projects in agriculture, fisheries and green tourism. [10]

In the case of scientific research, the country has organised several large-scale biological diversity benchmark surveys, and published a number of annals and catalogues, including the Red Book on Plants in China (Volume I). China has also released a catalogue of animals and plants earmarked for key national protection. Research has been conducted on conservation ecology, artificial species breeding technology and the establishment of biological diversity monitoring and information systems. All these efforts have resulted in a great number of research achievements. [11] China has also made progress in personnel training, international cooperation, and the publicity and dissemination of knowl-

edge regarding the conservation of biological diversity. (12)

Between 1993 and 1996, the State Council’s Environment Protection Committee and the National People’s Congress’ Committee on Environmental and Resources Protection organised joint enforcement inspections that covered environmental protection and wild animal protection across the country. These inspections involved departments concerned with environmental protection, forestry, agriculture, industrial and business administration, foreign trade, oceans, commerce, public security, judicial administration and the media. Strict punishment was meted out for illegal trading of wild animals and their products; illegal hunting; and purchasing, processing, importing and exporting wild animals. Tens of thousands of such violations were dealt with according to the law. (13)

Conclusion
As the global environmental situation worsens and becomes the focus of increasing public attention, trade can no longer focus narrowly on its own concerns. The trade process must now give equal consideration to sustainable development issues. For the sake of its own trade, economic and environmental interests, China must seek a balance between developing free trade (to fulfil its WTO obligations) and preserving the ecological environment (to fulfil its commitments under multilateral environmental agreements). The fact that the trade and environment issue is included in the latest round of multilateral trade negotiations indicates that proper handling of the relationship between the two will exert a growing influence on international economic development.

Currently, China faces the dual task of promoting economic growth by expanding exports while simultaneously protecting human health and the environment through policies that prevent and control the environmentally damaging effects of international trade. As a developing country Member of the WTO, China is both a major trading nation and a country facing tremendous environmental challenges. WTO negotiations and deliberations on trade and environment will significantly influence the development of environment-related industries and products in China. As such, the country must pay close attention to, follow up and actively participate in relevant multilateral trade negotiations and deliberations. China needs to safeguard its national interests and achieve a balance between promoting economic and trade development, and ensuring environmental protection.

Environmental legislation in China lags behind current requirements and the rules of a market economy are poorly represented in the legal regime. As a result, China’s existing environmental legislation cannot adapt to WTO requirements, which hinge on the basic concepts of free trade and a market economy. Meanwhile, China’s legal framework for environmental protection consists primarily of a large number of administrative regulations and rules, issued by the State Council and its various ministries and commissions. Some are even issued as “red documents” that are not legally binding although they do have executive force. This not only weakens the legal regime but also runs counter to WTO provisions requiring transparency in laws, regulations and trade policies. Moreover, many existing laws and regulations lack technical standards to supplement them, and this has affected enforcement. Finally, the environmental standards that China has set for toxic and harmful pollutants are far lower than those in developed countries. This is likely to give developed countries, some of which are steadily raising their environmental standards, a chance to transfer their already disbanded, heavy-polluting industries

(12) ibid.
(13) 13 See footnote 9.
In light of these issues, the following recommendations are made:

1. **Pay sufficient attention to trade and environment issues in legislation**
   China's position on environmental protection should be stated in its Constitution. China should formulate and improve special laws and regulations for the environmental protection industry to promote its development and foster related technological progress. Meanwhile, the country should also take initiatives to adapt to the principles and rules laid down in the WTO system, and amend those domestic environmental laws that do not conform to WTO rules.

2. **Promote clean production and improve related production technology**
   One basic strategy currently adopted by various countries to address trade and environmental issues is clean production, which can effectively focus attention on the links between economic, social and environmental benefits. To this end, the government has listed clean production technology as a key item in China's Agenda 21. The country has also made clean production a major mechanism for implementing sustainable development and strengthening environmental protection. To ensure implementation, provisions for clean production have been laid down in related laws and regulations, including the Law on Prevention and Control of Environmental Pollution by Solid Waste, the Law on Prevention and Control of Atmospheric Pollution, the Law on Prevention and Control of Water Pollution, and the Law on Prevention and Control of Pollution from Environmental Noise. Future legislation should make these principles more specific, with a view to establishing a whole set of systems and measures for clean production.

3. **Establish and improve environmental labelling systems**
   In 1993, China decided to implement an environmental labelling system. One year later, it established the China Committee on Certification of Products with Environmental Labels. To standardise and systematise environmental labelling, safeguard the legitimate rights and interests of enterprises and consumers, and promote its environmentally sound products in the international market, China should formulate detailed rules for implementing environmental labelling as soon as possible. The idea here is to require permits for their use and to specify examination and verification criteria, terms of use, supervision and administration mechanisms, dispute settlement procedures and the legal liabilities for unauthorised use of such labels. This will help establish the reliability and credibility of China's environmental labels, and bring its system into conformity with international practice.

4. **Promote and implement the ISO14000 standard system**
   The ISO14000 series formulated by the International Organization for Standardization was formally released in 1996. Its objective is to improve the global environment and promote international trade, and the series covers all steps and activities from the development and production of raw materials to manufacturing, use and rejection of products. Any country may refuse to import products that fail to meet the ISO14000 standard. To meet international environmental standards for exported products, China should formulate and implement laws and regulations that conform to the ISO14000 system. Through legislation, China should make the ISO14000 system one of its national standards, and promote and implement it across the country.

5. **Strengthen international cooperation in legislation**
   To strengthen international cooperation, China must adopt a three-pronged approach. First, China can
use the principles of non-discrimination and abolition of general quantity restrictions, provided for in multilateral trade agreements as well as WTO dispute settlement mechanisms, to resolutely resist green trade barriers. Through the WTO, the country may also receive up-to-date information about relevant provisions in other countries. If it finds that the environmental standards for Chinese products in developed countries are higher than those the latter have set for their own goods, China may lodge pleas with the countries in question in accordance with the national and most-favoured nation treatment principles of the WTO. China can use the existing WTO regime to avoid other countries’ abuse of environmental barriers.

Second, China should conduct in-depth research on cases in which the WTO settled trade disputes related to environmental protection. Studying the WTO cases will help China in fully understanding the true meanings of the general and ambiguous terms used in WTO agreements. It will also help China solve possible environment-related trade disputes with other countries.

Third, China should actively participate in current and future international-level discussions and deliberations on trade and environment. It should use these fora to state its position on the trade-environment issue.

China is one of the earliest signatories to the CBD. It has also taken the lead in developing a national programme-China’s Biological Diversity Protection Action Plan. Although the country has made some progress in the field in recent years, this is not cause for optimism. China still faces daunting challenges. Work on the conservation and sustainable use of biological diversity in China is constrained by insufficient information and inadequate technology. The country has yet to gain full knowledge of its biological diversity resources. Extinction mechanisms for most of its protected species are poorly understood at present. China has a long way to go before it is capable of managing biological diversity scientifically and effectively. The country urgently needs to strengthen theoretical research on biological diversity in order to provide sufficient scientific bases for decision making.
Risk Assessment and Precaution: An Overview of Issues and Approaches at the Global Level

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1. INTRODUCTION
The issues-aliens and GMOs
For millennia, human beings have been transporting, trading and introducing organisms that are alien to the environments into which they are brought and released. Sometimes this has been done on purpose and sometimes by accident. When done deliberately, it has usually been for economic reasons, often without careful consideration of all the costs involved. When the consequences become apparent, the price is almost always paid by someone other than those responsible for the introduction. [1]

This situation persists today. Within the last few decades, however, two processes have significantly increased the potential for unintended consequences-biotechnology, which makes it possible to engineer modifications of natural organisms and create new ones; and globalisation of the trading system, which makes it possible to move organisms, natural and engineered, faster than ever before to virtually every part of the planet.

The implications for the natural environment, the health and safety of all species, including human beings, and for economies at all levels from local to global are only imperfectly understood. Impacts of introducing natural alien species into habitats other than their native ones have been documented for more than a century. In China and many other countries, the introduced water hyacinth has become the worst weed in many aquatic habitats, leading to the loss of both plant and animal species. [2] By the mid-1980s it was acknowledged that organisms created through recombinant DNA technology posed risks to biodiversity similar to those created by natural alien organisms. [3] The fact that use of non-native organisms carries risks is generally recognised, but lack of knowledge about the particular risks involved with individual organisms-whether natural or engineered-creates uncertainty about how to make appropriate decisions for managing them.

Precaution and risk assessment are important tools for decision making under conditions of uncertainty, when information is unavailable or insufficient. In many countries, science- and risk-based precaution is already practised by both public and private actors in key sectors, particularly for determining the safety of pharmaceutical products, food and food ingredients for human and animal use. [4] Some of the

[2] Ibid.

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best-known recent examples of precautionary measures are those taken by governments to prohibit imports of cattle or beef products from countries with known incidence of bovine spongiform encephalopathy (BSE), or “mad cow disease”.

Even though governments have practised precaution and used risk/benefit analysis for years, debates during the development of the Cartagena Protocol on Biosafety to the Convention on Biological Diversity (CBD) focused attention on these issues in the particular context of biodiversity conservation and the prospect of conflict with the rules of the global trade system administered by the World Trade Organization (WTO).

Global processes and instruments that address them
International processes that have dealt with trade and sustainable development in the last two decades, as well as multilateral environmental agreements (MEAs) adopted over the course of the last 50 years, address the issues of non-native organisms, precaution and risk assessment (see sections 2.2 and 3.2 below).

In 1992, Agenda 21 recognised that biotechnology can contribute to sustainable development through improvements in human food and animal feed production and supply, health care, and environmental protection. (5) Chapter 16 of the Agenda calls for “environmentally sound management of biotechnology”. (6)

The 1994 General Agreement on Tariffs and Trade (GATT) and its suite of supplementary agreements administered by the WTO provide for exercising precaution in the conduct of international trade as well as for carrying out science-based risk assessment to justify trade-related measures (see sections 2.3 and 3.3 below).

In 2002, the World Summit on Sustainable Development (WSSD) adopted a Plan of Implementation that reaffirms global commitments to the Rio Principles and to the full implementation of Agenda 21. (7) In calling for promoting and improving science-based decision making, the Plan of Implementation reaffirms the precautionary principle and quotes Principle 15 of the Rio Declaration in full. (8) It also calls for greater use of interdisciplinary and intersectoral approaches in carrying out integrated scientific assessments and risk assessments. (9) The Plan of Implementation recognises invasive alien species as one of the main causes of biodiversity loss and calls for strengthening efforts to control them. (10)

There is near universal recognition of the risks posed by natural alien species and broad diversity of opinion over the safety of using genetically modified organisms (GMOs). Long years of experience with natural alien species and relative lack of experience with GMOs indicates that use of both naturally-oc-
curring and biotechnologically-engineered organisms needs to be evaluated and managed with precaution, relying on science-based assessments of their relative risks and benefits.

2. PRECAUTION

Development of the concept of precaution as a legal principle began in the 1970s, as a corollary to the principle of preventing environmental harm. \(^{(11)}\) Precaution is now acknowledged to be a principle of environmental governance. \(^{(12)}\) A substantial body of legal opinion supports the argument that it is also an accepted tenet of international law, although there is not yet a consensus on the issue. \(^{(13)}\) The principle has been included in several binding international agreements, but in different formulations, which creates doubts about its scope and the implications of applying it in practice. \(^{(14)}\)

The formulation of the precautionary principle that is most commonly referred to is Principle 15 of the 1992 Rio Declaration on Environment and Development, which states:

In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation. \(^{(15)}\)

Whatever its status, precaution remains a subject of debate at the global level. In particular, there are concerns that applying the principle of precaution at the national level is a potential source of conflict with the rules of the global trade system.

2.1 Perspectives on precaution

"The Precautionary Principle stands at a nexus where trade, development, food security and conservation interests clash." \(^{(16)}\)

The CBD describes biological diversity as having three components: ecosystems, species, and genes. Our knowledge of ecosystem dynamics and species biology is fragmentary, as is our understanding of the implications of genetic engineering and its impact on species and ecosystems. Just as uncertain is our grasp of the effects on the components of biological diversity of global processes like decentralisation and trade. These uncertainties fuel arguments on both sides of the precaution debate—those who want concrete evidence of harm before limiting exploitation or release of organisms, and those who want to limit exploitation unless there is proof that it is sustainable. \(^{(17)}\)


\(^{(14)}\) Mackenzie et al. 2003; 13.


\(^{(17)}\) Precautionary Principle Project 2003.
In the context of international trade, there are apprehensions that Parties to MEAs will take a conservative, non-risk-based approach to precaution, using their obligations under MEAs as a way to supplant science-based WTO rules. One particular area of concern is with restrictive labelling based on perceptions of harm and uncertainty, particularly labelling guidelines for GMOs. (18)

Proponents of using precaution in the context of biodiversity conservation share a fundamental concern with civil society consumer groups in many countries: GMO use and introduction is currently controlled primarily by the corporate private sector whose profit incentives for developing and introducing GMOs may be greater than the incentives for assessing the potential problems they may cause. Governments’ use of the precautionary principle in regulating non-native and engineered organisms will provide the public-interest checks and balances necessary to monitor and manage profit-motivated activities. (19)

A third perspective on the use of precaution comes from the Southern standpoint in the context of sustainable development, which itself has growing recognition as a fundamental right or principle. In the trade context, many Southern countries are concerned that Northern countries will strictly apply the precautionary principle on environmental or health grounds to block imports of their products. They also note that even in the context of biodiversity conservation, precaution should be applied as a tool for managing biological resources rather than as an absolute rule. (20)

2.2 Precaution in the biodiversity context
The CBD takes note of precaution only in its preamble. Its Cartagena Protocol on Biosafety is discussed in section 2.2.1 below.

Other MEAs incorporate precaution as a fundamental principle: the 1992 United Nations Framework Convention on Climate Change (UNFCCC), (21) the 1995 United Nations Agreement on Straddling Fish Stocks and Highly Migratory Fish Stocks (22) and the 2001 Stockholm Convention on Persistent Organic Pollutants (POPs) (23). The 1971 Ramsar Convention and 1972 Convention on Migratory Species (CMS) (24) pre-date the development of the precautionary principle. Nevertheless, precaution as a principle is implicit in the CMS (25) and explicit in the Ramsar guidelines on the implementation of the

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(20) Ibid. ; 26.
(25) Ibid. : Article II.2.
wise use concept. (26)

2.2.1 The Cartagena Protocol on Biosafety

Although the CBD notes the precautionary principle only in its preamble, precaution is the explicit basis for the CBD’s Cartagena Protocol on Biosafety. (27) During negotiations leading to the Biosafety Protocol, whether and how to integrate precaution and what the Protocol’s relationship with the WTO would be were hotly debated. Although there was considerable controversy, in the end negotiators adopted a Protocol that is fundamentally a precautionary instrument. As of October 2003, 80% of the States that have ratified the Biosafety Protocol are also WTO Members. China signed the Cartagena Protocol on 8 August 2000 and has yet to ratify it.

The Preamble of the Biosafety Protocol reaffirms Rio Principle 15. Similarly, Article 1, which states the objective of the Protocol, begins with the words, “In accordance with the precautionary approach contained in Principle 15 of the Rio Declaration...”, making it clear that precaution is the basis for taking any action related to transferring, handling and using living modified organisms (LMOs). Precaution is not an absolute standard for protection under the Protocol, because Article 1 also sets “an adequate level of protection” as the goal. In practice, assessment of the level of risk involved in individual activities will be used to determine what an “adequate level of protection” means in each case.

Under the Protocol, international movement of LMOs is subject to an Advance Informed Agreement (AIA) procedure, set out in Articles 7-10 and 12. Article 10, on the decision making part of the procedure, reiterates the precautionary principle, stating that lack of scientific certainty shall not prevent a State from deciding whether to allow import of an LMO (Article 10(6)). Article 11, which establishes a specific procedure for LMOs intended for use as food or feed, or for processing (LMO-FFP), repeats the precautionary statement of Article 10 (Article 11(8)). Re-stating the precautionary principle in Article 10 was the subject of considerable debate, but once that had been decided it was included in Article 11 without further discussion. (28) Annex III to the Protocol includes precaution as a general principle of risk assessment as well.

How the precautionary approach of the Protocol would be reconciled with WTO rules was repeatedly discussed during the negotiations, and the Preamble to the Protocol addresses this issue. First, it recognises that trade and environment agreements should be mutually supportive. Then, it includes two paragraphs that counterbalance each other—one stating that the Protocol does not change obligations under any other international agreement and the other stating that the Protocol is not subordinate to other international agreements. (29)

The arguments for and against the use of precaution in the context of trade that were raised during the Protocol negotiations will likely be raised again and again as these relationships are worked out in prac-

tice. Under general principles of treaty interpretation, it could be argued that the Protocol, as the later and more specific agreement, would prevail over WTO rules on issues related to LMOs. (30) Decisions of the WTO dispute resolution system that overturned national precautionary measures for food safety will surely be cited as precedents in settling any future challenges arising from perceived conflicts between the Protocol and WTO rules (see section 2.3 below).

2.2.2 Alien Species

The CBD's Sixth Conference of the Parties (COP6) in 2003 adopted Guiding Principles for the Prevention, Introduction and Mitigation of Impacts of Alien Species that Threaten Ecosystems, Habitats or Species. (31) The precautionary approach, as set out in Principle 15 of the Rio Declaration and in the CBD preamble, is established in Guiding Principle 1 and reiterated in Guiding Principle 10 on intentional introductions. Guiding Principle 1 states that precaution should be applied not only in making decisions on intentional introductions of alien species, but also in considering controlling, containing or eradicating established alien species.

The adoption of the CBD's Guiding Principles at COP6 became controversial, for both substantive and procedural reasons. The substantive reason was a trade-related objection to the perceived lack of clarity regarding how the Guiding Principles deal with precaution. Because of the procedural mechanism used to approve the Guiding Principles, there is still a dispute over whether the Decision containing the Guiding Principles was actually adopted. (32)

The CBD precaution controversy spilled over into the Ramsar Convention's attempt to establish guidelines for managing alien species in wetlands. In order to promote inter-linkages among MEAs and avoid duplicating efforts, Ramsar's Scientific and Technical Review Panel decided to prepare for Ramsar Parties wetlands-specific guidance on the Guiding Principles developed under the CBD. "Guidance on invasive species and wetlands: a guide for Ramsar managers" was drafted and prepared as a background document to be adopted by Ramsar COP8. (33) Because the Ramsar Guide was linked to the CBD Guiding Principles, a similar controversy arose. (34) Ramsar decided not to submit its "Guidance" for consideration and compromise language omitting a reference to the CBD Guiding Principles was instead substituted for the final COP8 Resolution. (35)

The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) (36) is

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(35) Ramsar COP8 Doc. 4, paragraph 61.
the MEA that specifically deals with international species trade and has been identified by the WTO as an MEA with specific trade obligations (STOs). Although the text of the Convention does not use the word “precaution”, the concept is fundamental to it and implied in its provisions and Appendices. CITES requires reciprocal control between exporting and importing countries, but its objectives are to protect rare and endangered species against unsustainable trade rather than to monitor or prevent introductions of species alien to the importing State. CITES is unlikely to be applicable in cases of introductions of alien species unless a species protected in an exporting State is considered potentially invasive in the importing State.

2.3 Precaution in the trade context

The WTO agreements deal with environmental measures indirectly-to the extent that they might affect trade-and seek to ensure that any environment-based trade measures are no more restrictive than necessary to achieve the purpose for which they are adopted. The Doha Ministerial Declaration implicitly provides for consideration of precaution in relation to trade matters by reaffirming the right of governments to set the level of protection they decide is necessary to protect health and the environment.

Precaution is a non-trade concern for the WTO. Several WTO committees and working groups-including the Committee on Agriculture, Committee on Trade and Environment (CTE), Committee on Sanitary and Phytosanitary Measures (SPS), and Committee on Technical Barriers to Trade (TBT)-have raised precaution-related issues in the context of their deliberations. The issue is linked to market access, in particular to food safety labelling for agricultural products. This is of interest to China because the country is expected to be the second-largest grower/producer of genetically modified (GM) crops in the next five years.

GATT and several of the subsidiary trade agreements administered by the WTO reflect the precautionary principle: GATT Article XX; Article XIV of the General Agreement on Trade in Services (GATS); Article 2.2 of the TBT Agreement; and Article 5.7 of the SPS.

Three WTO agreements could apply to precautionary measures taken by a WTO Member in response to a risk posed by an alien species or GMO. GATT applies to all measures and provides two exceptions to


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its own rules that could be applied in the context of the precautionary principle: Article XX(b) for the protection of human, plant or animal life or health; and Article XX(g) for the conservation of exhaustible natural resources. The TBT (Article 2.2) would apply to technical regulations, such as identification or labelling schemes. The SPS would apply to any measure taken to protect human or environmental health or food safety.

WTO Members have the right to take any measures to protect human, plant and animal life or health in their jurisdictions, as long as those measures are:

- consistent with the SPS Agreement;
- applied only to the extent necessary to protect human, plant and animal life or health;
- based and maintained on scientific principles; and
- do not constitute open or disguised restrictions on trade or discrimination against other Members with identical or similar conditions (Article 2.1-3).

Sanitary and phytosanitary measures that are consistent with the SPS Agreement are presumed to conform to the similar provision in Article XX(b) of GATT (SPS Article 2.4).

The SPS Agreement’s Article 5.7 reflects the trade system’s attempt to balance science and precaution. It allows Members to adopt provisional measures when scientific evidence is insufficient, requiring a risk assessment within “a reasonable period of time”, which has been taken in practice to be 15 months.

The WTO’s binding dispute resolution system seeks to either remove or amend any trade-related measure that is inconsistent with WTO rules. It has not yet fully clarified the relationships between GATT and the two subsidiary agreements; some disputes have been resolved on the basis of GATT and others on the basis of either the TBT or SPS.

There have not yet been any decisions from the WTO dispute resolution system concerning either alien species or GMOs, although there have been a number of communications related to trade in GMO products. In a decision unrelated to alien organisms, the WTO Appellate Body affirmed that the SPS Agreement reflects a precautionary approach. Interpretations the WTO Appellate Body has used to resolve cases based on GATT Article XX indicate what a WTO Member would have to do to justify a measure under the SPS Agreement.

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(49) Business Roundtable 2003.


A decision based on GATT Article XX set out a series of criteria that a WTO member must meet in order to justify a measure to protect health or the environment. To defend an exception for the protection of human, plant or animal life or health (Article XX(b)), a WTO Member must show that the policy objective behind its measure falls within the range of policies for that purpose, that the measure is necessary to meet the policy objective, and that there are no reasonably available alternatives that are consistent with WTO rules. An exception for the conservation of exhaustible natural resources (Article XX(g)) must fall within the range of related policies, be related to the conservation policy objective, and be made in conjunction with restrictions on domestic production or consumption. To qualify for either of these exemptions, a WTO Member must also show that its measure is being applied in a way that is neither arbitrary, unjustifiable, nor a disguised restriction on trade. Some commentators read this decision as a narrow interpretation of WTO rules that will make it difficult for WTO Members to defend their trade-related environmental measures through GATT’s Article XX exceptions.

3. RISK ASSESSMENT

One interpretation of risk assessment is that it is a type of precaution. According to this view, precaution is implied in the process of evaluating risks and determining acceptable levels of it. Another perspective is that precaution is a principle to be applied in the context of risk-based decision-making processes. An international private sector organisation points out that risk assessment should be a transparent, science-based review process that is independent of the political pressures that may be involved in risk management.

Risk assessment is understood by some to be one element of an overall process of risk management that includes analysis, assessment and communication of risk. Others define risk analysis as comprising risk assessment and risk management. The WTO’s SPS Agreement deals explicitly with risk assessment. The SPS Agreement does not mention risk management as such, but implies it by defining sanitary and phytosanitary measures as any measure applied to prevent or limit damage from the entry, establishment or spread of pests. None of the international agreements and organisations discussed here that defines risk assessment or risk analysis uses the same definition, although the meanings generally refer to an integrated evaluation of the likelihood and magnitude of potential risks.

Under the Cartagena Protocol, risk assessment and risk management are explicitly separate but related processes. UNEP’s 1995 Technical Guidelines for Safety in Biotechnology define risk assessment as

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[59] Ibid.


"measures to estimate what harm might be caused, how likely it would be to occur and the scale of the estimated damage" while risk management involves "measures to ensure that the production and handling of an organism are safe". (63)

3.1 Risk assessment in the food safety and phytosanitary context
Three international standard-setting organisations issue guidelines and principles that actually or potentially apply to LMOs and alien species. Their existing standards, and any they may issue in the future, are significant because they are officially recognised by the WTO (see section 3.3 below). WTO Member States, whether or not they participate in these organisations or are Parties to their underlying agreements, must pattern their food safety, phytosanitary and animal health standards on those set by these three organisations. (64) All of these organisations focus on human, plant and animal health and safety, rather than on the integrity of ecosystems, species or genes.

3.1.1 The Codex Alimentarius
The Codex Alimentarius is a non-binding Code developed by the Codex Alimentarius Commission, a joint body of the United Nations Food and Agriculture Organization (FAO) and the World Health Organization (WHO). Established in 1963, the Codex Alimentarius Commission sets standards for food safety. (65) China is a member of the Commission. Its Committee on General Principles is developing Draft Working Principles for Risk Analysis. A Task Force on Foods derived from Biotechnology has produced pre-publication versions of Principles for the risk analysis of foods derived from modern biotechnology, Guideline for the Conduct of Food Safety Assessment of Foods Derived from Recombinant-DNA Plants, and Guidelines for the Conduct of Food Safety Assessment of Foods Produced Using Recombinant-DNA Micro-organisms. (66)

3.1.2 International Plant Protection Convention (IPPC)
The IPPC is a binding international agreement that came into force in 1952. Amendments adopted in 1979 came into force in 1991. Amendments adopted in 1997 substantially brought the IPPC in line with the 1995 WTO SPS Agreement but have not yet come into force. The Interim Commission on Phytosanitary Measures (ICPM) functions as the IPPC's governing body until the 1997 amendments come into force. The IPPC potentially applies to both LMOs and alien species. China is not a Party to this Convention.

The IPPC text currently in force does not require risk assessment; the text amended in 1997 does. Even though the current text of the IPPC does not require risk analysis, the ICPM has issued standards for it that must be followed by WTO Members (see above). (67)

The IPPC began setting International Standards for Phytosanitary Measures in the mid-1990s. (68) There are currently 19 approved standards of which three deal specifically with pest risk analysis. (69)

(65) Available: http://www.codexalimentarius.net
(67) Ibid.
(68) Available: http://www.mri.org/NRET/PWB/Inter.html
(69) Available: http://www.ippc.int/IP/En/standards.htm
Pest Risk Analysis for Quarantine Pests including Analysis of Environmental Risks, issued in 2003, provides a detailed step-by-step methodology for plant pest risk analysis. (70)

3.1.3 Office International des Epizooties (OIE)
The OIE is an intergovernmental organisation created by international agreement in 1924. China is a member. The OIE issues standards for animal health and the safety of animal-origin products. (71) Its Standards Commission has an Ad Hoc Working Group on Biotechnology that has to date not issued any international standards that would apply to LMOs, but it does recommend guidelines for risk assessment in the context of translocations of wild animals. (72)

3.1.4 Association of South Eastern Asian Nations (ASEAN)
China and ASEAN have agreed to establish a free trade area by 2010 and want to achieve a goal of US $100 billion of two-way trade by 2005. At the October 2003 ASEAN summit, China acceded to the ASEAN Treaty on Amity and Cooperation, and signed a joint declaration with ASEAN on a strategic partnership for peace and prosperity. Common interests in the issues being debated in the WTO were among the primary incentives cited for China and ASEAN agreeing to collaborate on social and political as well as economic affairs.

ASEAN in 1999 adopted Guidelines on Risk Assessment of Agriculture-Related Genetically Modified Organisms (GMOs) (72) that will be of interest to China as its relationship with ASEAN develops. The Guidelines are non-binding, cover only the release of agriculture-related GMOs, do not take precedence over national legislation and serve to provide a common framework for risk assessment of agriculture-related GMOs in ASEAN Member countries. Under the Guidelines, risk assessment is to be science-based. Basic information required for risk assessment is listed in Appendix 1 to the Guidelines and risk assessment criteria are in Appendix 3. The proponent of any initiative to release agriculture-related GMOs is responsible for providing all required information and ensuring that all national requirements are complied with, as well as for post-release monitoring.

Protocol 8 on Sanitary and Phytosanitary measures to implement ASEAN’s Framework Agreement on the Facilitation of Goods in Transit mentions risk assessment only in the context of defining what sanitary and phytosanitary measures include (Article 1.2)).

3.2 Risk assessment in the biodiversity context
Without using the term “risk assessment”, several articles of the CBD provide scope for its use. Articles 7 and 8(1) require Parties to identify, regulate and manage processes and activities that could have significant adverse impacts on biodiversity. Article 10 calls on Parties to integrate consideration of the conservation and sustainable use of biological resources into national decision making and to adopt measures relating to the use of biological resources to avoid or minimise adverse impacts on biological diversity. Provisions on environmental impact assessment in Article 14 call for introducing appropriate pro-

(70) IPPC 2003. Pest risk analysis for quarantine pests including analysis of environmental risks. ISPM # 11 Rev.
1. Available: http://www.ippc.int/IPP/En/ispm.jsp
(71) Available: http://www.oie.int
cedures and arrangements to ensure that significant adverse impacts on biodiversity are avoided or minimised. All of these actions mentioned in the CBD-identifying risks, taking them into account in decision making, and introducing procedures to avoid or minimise them are elements of risk assessment and management. A Party to the CBD would have to apply the general provisions in Articles 7, 10 and 14 to LMOs and alien species, which are singled out for particular attention in Article 8(g) and (h).

The text of the 1971 Ramsar Convention does not refer to risk assessment but, as implementation of the Convention has evolved, it has been identified as an essential tool for managing wetlands. In 1999, the Conference of the Parties adopted a Wetland Risk Assessment Framework that provides guidelines for predicting and assessing change in the ecological character of wetlands. The Framework particularly focuses on early warning systems and is to be used as an integral part of decision-making processes for planning the management of wetlands. For the reasons explained in section 2.2.2 above, Ramsar does not have specific guidelines on alien species. Ramsar Parties are to use the Framework as guidance for assessing the risks of introducing alien species into wetlands.

POPs and the 1998 Rotterdam Convention on Prior Informed Consent (PIC), although not specifically focused on biodiversity, govern substances and processes that have substantial impacts on biological resources. Both conventions call for risk assessment or evaluation schemes. PIC provides that final regulatory action be taken only after risk evaluation, and that the evaluation be science-based.

3.2.1 The Cartagena Protocol on Biosafety

The objective of risk assessment under the Protocol is to identify and evaluate potential adverse effects of LMOs on the conservation and sustainable use of biodiversity, taking risks to human health into account as well. Risk assessment is to be used to make informed decisions about whether or not to approve import of a LMO and, if import is approved, whether to attach any conditions. The Protocol does not define risk assessment. It does not apply to LMOs that are pharmaceuticals for humans and those that are in transit (Articles 5 and 6).

A Party to the Cartagena Protocol has the right to carry out a risk assessment on any LMO prior to import. Risk assessment is required under the Cartagena Protocol as part of the AIA procedure, which

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(78) PIC. Annex III (b).


applies to the first intentional transboundary movement of an LMO (Article 7). A Party may also require risk assessment for subsequent imports (Article 12). Article 15 and Annex III of the Protocol provide for risk assessment, while Article 16 addresses risk management.

Article 15 requires that risk assessments are carried out in a "scientifically sound manner". The Protocol does not define this term but it does set out in Annex I the kind of scientific information that must be provided. (81) Article 15 also states that risk assessment is to be based on unspecified "other available scientific evidence", in addition to what is specifically called for in Annex I.

Annex III establishes the basic principles for risk assessment and provides a methodology. The basic principles are:

- risk assessment must be carried out in a scientifically sound and transparent manner;
- lack of scientific knowledge or consensus does not necessarily indicate a particular level of risk, an absence of risk, or an acceptable risk;
- comparative risk assessment-risks of LMOs should be considered in the context of risks of non-modified organisms in the potential receiving environment; and
- risk assessment should be carried out on a case-by-case basis. (82)

Annex III also sets out a six-step methodology and provides points to be considered in carrying out a risk assessment. The methodological steps are:

1. identify novel characteristics of the LMO that may have adverse effects on biodiversity and human health in the potential receiving environment;
2. evaluate the likelihood that these adverse effects would occur in the potential receiving environment;
3. evaluate the consequences of these adverse effects occurring;
4. estimate the overall risk based on an evaluation of the likelihood and consequences;
5. recommend whether or not the risks are acceptable or manageable and identify management strategies; and
6. require additional information if there is uncertainty about the level of risk.

Information to be considered on a case-by-case basis during risk assessment includes characteristics of the:

- recipient organism or parental organisms;
- donor organism(s);
- vector;
- insert(s) and/or characteristics of modification;
- LMO itself;
- methods for detection and identification of the LMO;

(81) The scientific information required under Annex I includes: name and identity of the living modified organism (LMO); taxonomic status, common name, point of collection or acquisition and characteristics of donor, parent and recipient organisms; information on the centre of origin and description of the habitats where the organisms may persist or proliferate; and description of the nucleic acid or the modification introduced, the technique used and the characteristics of the resulting organism. Other required information includes: name and details of the exporter and importer; intended use of the LMO; the quantity or volume of the LMO to be transferred; suggested methods for its safe handling and transport; a previous risk assessment report consistent with Annex III; and the regulatory status of the LMO in the state of export.

• intended use; and
• receiving environment.

Socio-economic considerations are not required as part of a risk assessment, but may be taken into account in making a decision on whether or not to import an LMO (Article 26). It was primarily developing countries that insisted on including socio-economic analysis in the decision-making process for importing LMOs. Because of concerns that Parties might use socio-economic considerations to justify trade barriers, Article 26 contains the words "consistent with their international obligations".

The Protocol mentions only one specific consideration—the value of biological diversity to indigenous and local communities (Article 26(1)). This is related to CBD obligations with respect to indigenous and local communities’ traditional knowledge, innovations and practices (Article 8(j)). It would also be relevant to the livelihood security aspects of a country’s poverty reduction strategy, in the sense that introduction of an LMO could have a negative impact on biodiversity on which traditional livelihoods depend.

Although socio-cultural concerns have been dismissed by some in the LMO debate as "traditional mythology", ignoring them can have economic impacts. While GM crops may eventually increase yields, their introduction creates new annual costs for communities that traditionally rely on seed sharing and is therefore likely to favour wealthier farmers over poorer ones. [83] The WTO defines risk assessment as taking economic consequences into account (see Section 3.3 below), which supports the inclusion of socio-economic analysis in risk assessment under the Cartagena Protocol and in other contexts as well.

Risk assessment must be carried out in the context of the potential receiving environment. Risks that might be acceptable or manageable in one environment may not be in another, for biological or socio-economic reasons, or both. It may be necessary to assess risks at various stages of the development of an LMO and prior to releasing one, and to reassess risks after risk management measures have been applied. [84] Parties may also decide to reassess risks at the time of subsequent imports for a number of reasons, including: different intended use of the LMO; different receiving environment; different quantity being imported; and new information available on the LMO or on the original receiving environment. [85]

Under Article 15, the importing party is responsible for making sure that risk assessments are carried out. The importing party has the option of requiring the exporter to carry out the risk assessment and to cover all costs.

3.2.2 Alien species
There are no legally binding obligations to undertake risk assessment for the introduction of alien
species. [86]

The non-binding CBD Guiding Principles emphasise risk analysis, which by definition includes risk assessment and risk management. Decisions on intentional introductions should be based on the precautionary approach, using risk analysis (Guiding Principle 1). Border and quarantine measures should be based on risk analysis (Guiding Principle 7). Risk analysis should be carried out before a decision to authorise introduction of an alien species to a country or to a new area within one country (Guiding Principle 10). The Guiding Principles also provide that risk analysis may include environmental impact assessment (10.1). Whenever appropriate, risk analysis should also be carried out on the known pathways of unintentional introductions of alien species (Guiding Principle 11). [87]

Guidelines developed under the IPPC for evaluating the risks of introducing “pests” that are harmful to plants and animals are also relevant and can be used as a source of guidance (see section 3.1.2 above).

3.3 Risk assessment in the trade context

Of the WTO Agreements, it is the SPS and the TBT agreements that deal with risk assessment; the GATT itself does not refer to risk assessment.

According to the SPS Agreement definition, risk assessment is the evaluation of the likelihood of entry, establishment or spread of a pest or disease within the territory of an importing Member... of the associated potential biological and economic consequences; or the evaluation of the potential for adverse effects on human or animal health arising from the presence of additives, contaminants, toxins or disease-causing organisms in food, beverages or feedstuffs. [88]

Article 5 of the SPS Agreement sets the parameters within which WTO members are to carry out risk assessment for their sanitary and phytosanitary measures. The WTO does not provide guidelines for risk assessment; rather, the SPS Agreement provides that WTO Members must take into account risk assessment techniques developed by the relevant international organisations (Article 5.1; see also sections 3.1.1-3.1.3 above). Risk assessment must be science-based (Article 5.2) and must also take economic factors into account (Article 5.3). The economic factors specifically mentioned in Article 5.3 include potential damage in terms of loss of production or sales in the event of the entry, establishment or spread of a pest or disease, costs of control or eradication in the territory of the importing Member, and the relative cost-effectiveness of alternative approaches to limiting risks.

For national sanitary and phytosanitary regulations to comply with the WTO/SPS Agreement, measures must be justified by objective scientific data and appropriate risk assessment, not be arbitrary and be

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applied consistently. In addition to encouraging its Members to use international standards, the WTO allows them to put higher standards in place as long as those standards are scientifically justified and/or based on appropriate risk assessment. National sanitary and phytosanitary standards must not result in discrimination or a disguised restriction on international trade. WTO Members’ objectives in determining the appropriate level of sanitary and/or phytosanitary protection must be to:

- minimise negative trade effects;
- achieve consistency in applying sanitary or phytosanitary measures by avoiding arbitrary or unjustifiable distinctions in levels of protection; and
- ensure that national measures are not more trade-restrictive than required to achieve their appropriate level of sanitary or phytosanitary protection, taking into account technical and economic feasibility (Article 5.4–5.6).

The key is that any sanitary/phytosanitary measure must be no more trade restrictive than necessary to achieve the level of protection the WTO Member has decided is appropriate in its national context. There may be several ways a country can achieve its chosen level of risk/protection. These alternatives may include, for example, increased inspection, treatment or quarantine. If challenged, a country will have to show that it has selected the alternative for sanitary/phytosanitary protection that is least trade restrictive.\(^{(90)}\)

The SPS Agreement also includes a transparency provision. Any WTO Member that believes a sanitary and/or phytosanitary measure introduced by another Member restrains trade may ask for an explanation of the basis for the measure, which the other WTO Member is required to provide (Article 5.8).

All WTO Members, including least developed countries, were to have measures in place to implement the SPS Agreement by 2000. Developing country WTO Members that needed more time to develop their capacity for implementing the SPS Agreement were allowed to request the SPS Committee to grant them extensions. Membership on the SPS Committee is open to all WTO Members.

Article 2.2 of the TBT Agreement calls for risk assessment in the context of developing technical regulations, which may not be “more trade-restrictive than necessary to fulfill a legitimate objective, taking account of the risks non-fulfillment would create.” The TBT does not define risk assessment, but it does provide that risk assessment should take into account “available scientific and technical information, related processing technology or intended end-uses of products.” Under both the SPS and TBT Agreements, the results of an objective, scientifically- or technically-based risk assessment may be used to justify a standard other than accepted international ones.

As noted in Section 2.3 above, WTO Members have not yet submitted any challenges related to LMOs or alien species to the WTO dispute resolution system. The system has, however, decided several challenges related to food safety that involved challenges to national trade measures intended to regulate threats to human, animal or plant health. All of them involved issues of the adequacy of the scientific basis of the risk assessments involved. All of the WTO decisions overturned national measures on the grounds that the scientific basis of the risk assessment was insufficient and that they violated a WTO


\(^{(90)}\) Ibid.
4. APPLYING PRECAUTION AND RISK ASSESSMENT

Both the precautionary principle and the risk assessment tool are enshrined as obligations in legally binding international agreements and elaborated in non-binding guidelines and standards. Both remain subjects of active controversy in the context of MEAs and of the WTO.

Applying risk assessment as a tool is currently a subject of less controversy than is applying precaution as an overarching principle. Although there are multiple perspectives on how to define and use both precaution and risk assessment, there is a trend to understand precaution as one aspect of a multi-faceted approach to managing risks to biodiversity caused by introduction of alien organisms, whether natural or engineered. In this context, precaution is the threshold condition for risk assessment.

The issue of the scientific sufficiency of risk assessment is likely to arise more and more often in the context of real and perceived conflicts between the international trade regime and MEAs. Because the Cartagena Protocol and the WTO SPS Agreement deal with both precaution and risk assessment, it is foreseeable that these agreements are likely to be the focal points for resolving these differences. One way to approach potential conflicts between the CBD, the Cartagena Protocol on Biosafety and the WTO agreements is to understand the provisions of the Cartagena Protocol as filling some of the gaps in the SPS.

Fortunately, there is a substantial and growing body of guidance from both the trade and environment perspectives on how to work through these issues:

- The IPPC, OIE and Codex Alimentarius standards and guidelines have been developed through processes that have been in place for more than 50 years, in the cases of the IPPC and OIE. Many countries that are Parties to MEAs and Members of the WTO also participate in these processes and have already developed experience in integrating their standards into national measures.

- The Intergovernmental Committee for the Cartagena Protocol developed an implementation tool kit that provides a checklist for the things that a Party will need to do: administrative tasks, legal requirements and/or undertakings, and procedural requirements. UNEP's 1995 International Technical Guidelines for Safety in Biotechnology contain many of the considerations that the tool kit develops and also highlights the associated issues of the need for information management and capacity building.

- Based on the tool kit, IUCN-The World Conservation Union has compiled a list of elements-of which

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(92) See, for example, ICC 2002.
(93) See, for example, IUCN 2003: 26.
(96) UNEP 1995: Sections V-VI.
risk assessment is one that States are considering in developing their National Biosafety Frameworks. (97)

- For specific applications of precaution and risk assessment to species and ecosystems, CBD Parties have adopted guidelines for managing alien species and Ramsar has a risk assessment framework for wetlands.

- Universities, international organisations including the FAO and WHO, and national governments have for some time had in place risk management measures that take risk assessment into account, particularly for contained applications of GMOs. (98) Additional resources include the Organisation for Economic Co-operation and Development (OECD), United Nations Industrial Development Organization (UNIDO), Environment Canada (EC), and Inter-American Institute for Cooperation on Agriculture (IICA).

These guidelines are to a large degree complementary and mutually compatible. The issues will arise in how their elements are applied.

Common elements found in most existing guidance include:
- Apply precaution—there are some non-binding statements that would use precaution as an absolute bar to introduction or use of non-native species, but the trend is to apply precaution as an integral part of the risk assessment process;
- Science-based—there is little dispute that risk assessment should be based on verifiable scientific data. The issues arise in the perceived sufficiency of those data, which in the case of developing countries may be related to the human and institutional capacity they have available to deal with biosafety issues.
- Transparency—in order to verify and share information on how precaution and risk assessment are applied, data and procedures must be recorded and in a format that can be made available domestically and internationally, as required. This includes public awareness of biosafety issues—how alien species and GMOs actually or potentially affect lives and livelihoods—and public access to information about these issues.

Developing national regulatory systems that apply precaution and risk assessment to achieve national objectives and nationally-appropriate levels of protection, and at the same time complement and support each other in the global trade system, is and will continue to be contentious. That tension implies a need to build in flexibility and allow for adaptation. The precaution/risk relationships specifically and the MEA/WTO relationships generally are still being debated. GMO technology is developing rapidly. The capacity for delivering non-native organisms is already sophisticated. National systems will need to

(97) Mackenzie et al. 2003; 21 (Box 8; Possible elements of national biosafety regulations).

be subject to periodic review to accommodate the evolution of these debates and processes. This means that national systems will also have to provide for participation in international mechanisms for information exchange. And it means that national human and institutional capacity will also have to be assessed and adapted.

The contribution that alien species and biotechnology can make to food security, human and plant and animal health, and environmental conservation and protection will depend "on the extent to which information exchange, cooperation, harmonization and agreement can be achieved."

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(100) UNEP 1995: Section IV.
(101) UNEP 1995: Section 1.5.
Implementing the Cartagena Protocol on Biosafety in China

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Since the 1970s, when recombinant DNA technology was first developed, some scientists have feared that its application may pose a threat to human health and the environment. Indeed, adverse impacts on biodiversity and the environment have already been detected in the case of a few genetically modified (GM) plants that were released into the environment. However, the risks associated with genetically modified organisms (GMOs) are characterised by uncertainty and their harmful effects, if any, can only be identified over the long term. The international community's concern over the safety of GMOs gives rise to a debate that has become all the more contentious following the signing of the Convention on Biological Diversity (CBD). Article 19(3) of the CBD states that Parties shall consider the need for a Protocol to deal with the safe transfer, handling and use of any living modified organism (LMO) resulting from the application of biotechnology.

1. Research and development of GMOs and their potential risks

1.1 Research and development of GMOs

More than 120 species of GMOs have been developed worldwide since the first GM plant was created in 1983. Some 51 species of GM crops such as transgenic soybean, cotton, corn, canola and tomato have been commercially planted. According to the International Service for the Acquisition of Agri-biotech Applications, in 2002 the estimated global area under GM crops stood at 58.7 million hectares, 33 times greater than the 1.7 million hectares of GM crops planted in 1996. The principal GM crops in 2002 were soybean, corn, cotton and canola, accounting for more than 99% of the total global area under GM crops. In the same year, four principal countries together covered 99% of the global GM crop area: the United States (US) (66% of global total), Argentina (23%), Canada (6%) and China (4%).

According to primary statistics, 47 species of GM crops and trees have been developed in China with the involvement of over 100 engineered genes. Ten GM crops, including transgenic rice, corn, cotton, soybean, oilseed rape and potato, have been approved for release into the environment while transgenic cotton, tomato, sweet pepper and petunia have been commercialised.

With regard to GM animals, 12 species including mice, rabbits, chicken, cattle, pigs and fish have been genetically transformed. Transgenic animals are currently undergoing trials in contained conditions. No such species have been released into the environment or commercially produced.

China has also developed 21 GM micro-organisms including eight transgenic micro-organisms for application in plants and four for application in domestic animals. All are currently undergoing small-scale trials. GM micro-organisms developed so far include the nitrogen-fixed bacterium used for corn, the rhizobium for soybean and insect-resistant wide-spectrum bacteria.

1.2 Potential risks posed by GMOs

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The risks posed by GMOs that are released into environment may be divided into three categories: (i) invasion of the environment, (ii) direct and indirect effects of the GMO on target and/or non-target species, and (iii) the transfer of engineered genes to other organisms and the resulting ecological impacts. In view of the fact that GM plants are currently dominant in commercial production and field trials, the risks associated with GM plants deserve closer examination.

(1) **GM plants may become weeds.** Some GM plants with insect-, disease- and herbicide-resistance as well as environmental stress-tolerance also possess certain characteristics associated with weeds. Changes in the fitness of the environment caused by the introduction of engineered genes can cause these plants to turn into weeds. GM plants may also become “super weeds” if they hybridise with related weed species in the fields or in natural habitats. Such weeds would be extremely difficult to eradicate. For example, through simultaneous hybridisation, volunteer canola seedlings with tolerance to three different herbicides have been found in Canada in fields where different transgenic herbicide-tolerant canola varieties were grown.

(2) **Effects of toxic proteins expressed by GM plants on non-target species.** A number of transgenic plants have direct or indirect impacts on many beneficial species, even to the extent of killing some species. Once expressed, toxins originally meant to target pests can harm non-target species. For example, Dr. John E. Losey et al. found in May 1995 that the pollen from Bt corn can kill the larvae of the monarch butterfly and that this adverse effect may be observed up to 10 metres from Bt corn field borders.

(3) **Development of pest resistance and evolution of target pest population.** Transgenic insect-resistant plants grown commercially on a large scale exert greater selective pressure on target pests, speeding up evolution and aiding the development of resistance within target pest populations. For example, studies by foreign and domestic scientists have shown that the first and second generations of the cotton bollworm can be killed by Bt cotton, but the third and fourth generations are somewhat resistant to Bt cotton.

(4) **Hybridisation of GM plants with their wild relatives can pollute the gene pool of traditional crop varieties.** For example, a paper by Dr. David Quistand and Dr. Ignacio H. Chapela, titled “Transgenic DNA introgressed into traditional maize landraces in Oaxaca, Mexico”, was published in the 29 November 2001 issue of Nature. The paper revealed that transgenic Bt maize had polluted traditional maize landraces.

(5) **Development of new viruses.** The engineered genes in transgenic virus-resistant plants may recombine with other viruses, increasing the possibility of producing a new virus. For example, through the recombination of the cassava mosaic virus with the East African cassava mosaic virus (EACMV), a new virus developed which is destroying cassava on Ugandan farms.

2. **Negotiation on the Cartagena Protocol on Biosafety**

2.1 What is a Protocol?

A Protocol is a binding international instrument that is related to its parent treaty in basic institutions and procedures and is in line with relevant provisions set forth by the treaty. A protocol must be individually negotiated, signed and eventually ratified. It has its own Parties and creates separate rights and obligations for them. The CBD is the parent treaty of the Cartagena Protocol on Biosafety. The Cartagena Protocol, also called the Biosafety Protocol, was adopted in January 2000 at an extraordinary
meeting of the Conference of the Parties to the CBD held in Montreal, Canada. As of October 2003, 103 countries had signed the Protocol, while 65 had ratified it. The Cartagena Protocol came into force on 11 September 2003.

2.2 Controversial issues related to the Cartagena Protocol on Biosafety
During negotiations leading up to the formulation of the Cartagena Protocol, five distinct negotiating groups of countries emerged, reflecting differences in political and economic advantages, biotechnological development and public attitudes to biotechnology. These groups were the Miami Group (consisting of Argentina, Australia, Canada, Chile, Uruguay and the US), the European Union (EU), the Like-Minded Group (including most developing countries along with China), the Compromise Group (Japan, Korea, Mexico, New Zealand, Norway, Singapore and Switzerland), and the Central and Eastern Europe Group. The Miami Group tried to avoid the infinite expansion of trade protectionism by limiting the scope of the Cartagena Protocol. For its part, the EU hoped that the precautionary principle could be strengthened by its inclusion in the Protocol. Meanwhile the Like-Minded Group, comprising most developing countries, expected that capacity building in the assessment and management of risks resulting from biotechnology would be strengthened by the development of the Protocol. Major contentious issues related to the Cartagena Protocol are as follows:

(1) Scope of the Cartagena Protocol. The scope of the Protocol was a controversial issue right from the start. Developing countries insisted that the Cartagena Protocol apply to all LMOs while developed countries wanted its scope to be more limited. The debate centred on whether LMOs used as pharmaceuticals for humans, LMOs destined for contained use and LMOs in transit should be covered by the Protocol.

Regarding the inclusion in the Protocol of the provision on risks posed by LMOs to human health, some an instrument on biosafety which failed to cover human health issues was not a viable proposition. Others, however, argued that human health should not be covered at all in the context of the Cartagena Protocol and CBD. Ultimately, negotiators compromised with the result that risks to human health are mentioned in various provisions in the final version of the Protocol but are expressed as “taking also into account risks to human health”.

(2) Application of the precautionary principle. The precautionary principle states that uncertainty regarding the threat of serious environmental damage may not be used as a valid reason for not taking preventive measures. During negotiations, debates surrounding the precautionary principle concentrated on whether it should be reflected in the operative provisions of the Cartagena Protocol. Those who opposed operative provisions on precaution argued that the Protocol was itself a precautionary instrument since no specific damage associated with LMOs had been proved. They also feared that the precautionary principle would be used as a justification for protectionist trade measures. Proponents of precautionary provisions stressed the relative novelty of LMOs and the lack of experience with them. They argued that even with proper risk assessment, some uncertainty may remain and that in such circumstances countries should have the right to adopt precautionary measures to protect biodiversity and human health.

(3) Relationship with World Trade Organization (WTO) agreements. One of the most controversial issues in the debate was the compatibility of the Cartagena Protocol with relevant WTO agreements such as the Agreement on Technical Barriers to Trade (TBT) and the Agreement on Sanitary and Phytosanitary Measures (SPS). A number of countries stressed that the rights and obligations of Parties
under the Cartagena Protocol should not conflict with, or take precedence over, rights and obligations of Members under WTO Agreements. They sought to insert a “savings” clause into the Cartagena Protocol, stating that provisions of the Protocol would not affect the rights and obligations of any Party deriving from any existing international agreement (including WTO Agreements). This was unacceptable to many other countries that were concerned that such a provision would limit their right to rely on the Cartagena Protocol to restrict or prohibit the import of LMOs. In the end, it was agreed that the relationship of the Protocol with other international agreements would be dealt with in three paragraphs of the Cartagena Protocol’s Preamble.

(4) Consideration of social and economic issues. During Cartagena Protocol negotiations, most developing countries emphasised the importance of ensuring that socio-economic considerations arising from biotechnology and LMOs should be made part of the Protocol as one of the bases for the conduct of risk assessment and risk management, and should also factor into decision making on the import of LMOs. Most developed countries, however, argued that socio-economic considerations are issues of national domestic concern and difficult to quantify for the purpose of making decisions on LMO imports. For this reason, they held that socio-economic considerations should remain outside the scope of the Protocol.

(5) Liability and redress for damage. Some developing countries argued that liability and redress for damage resulting from LMOs is an indispensable measure for implementing the Protocol, adding that the exporting Party should be held liable for damage to the environment or human health caused by LMOs exported from within its jurisdiction. By the time the Protocol was being finalised, a consensus on the issue could not be achieved. But Article 27 of the Cartagena Protocol states that an endeavour will be made to complete the appropriate elaboration of international rules and procedures for liability and redress within four years of the first Meeting of the Parties.

3. Analysis of major provisions under the Cartagena Protocol
The Cartagena Protocol consists of a Preamble, 40 operative provisions and three technical annexes. A brief analysis of its major provisions follows.

Article 1: Objective. This Article set out what the Cartagena Protocol is designed to achieve. In accordance with the precautionary principle, the Protocol aims to contribute to ensuring an adequate level of protection for the transboundary movement (TBM), transit, handling and use of LMOs that may have adverse impacts on the conservation and sustainable use of biological diversity, and on human health.

Article 4: Scope. This Article specifies the general scope of activities (TBM, transit, handling and use of LMOs) as well as the organisms to which the Cartagena Protocol applies. However, Article 5 states that the Protocol shall not apply to the TBM of LMOs that are used as pharmaceuticals for humans.

Articles 7 – 10: Advance Informed Agreement (AIA) Procedure. The AIA procedure is the central procedural mechanism set out in the Cartagena Protocol for regulating the TBM of LMOs. It starts with a notification from the exporting Party to the competent domestic national authority prior to the intentional TBM of an LMO, followed by an acknowledgement of receipt from the importing Party, which is to be provided within a set period specified in the Protocol. The final step involves decision making on the import of the proposed LMO by the importing Party.
Article 15: Risk Assessment. This Article establishes the basic requirements for risk assessment and sets out general principles and methodology in Annex III. It requires that risk assessment is carried out in a scientifically-sound manner, taking into account internationally recognised risk assessment techniques. In addition, the Protocol allows the importing Party the right to require the notifier to pay for risk assessment.

Article 16: Risk Management. This Article states that each Party is under an obligation to establish and maintain appropriate mechanisms, measures and strategies to regulate, manage and control risks identified in the risk assessment provisions of the Protocol. This means that all Parties need to establish legal and administrative systems for risk management and the control of LMO imports.

Article 18: Handling, Transport, Packaging and Identification. This Article has two main functions: (i) to ensure that LMOs are handled and moved safely, so as to avoid adverse impacts on biodiversity and human health; and (ii) to provide information to those handling LMOs and to the importing Party.

Article 20: Information Sharing and Biosafety Clearing-House (BCH). The BCH is an information exchange mechanism to assist Parties in implementing the Protocol. It is established as part of the Clearing-House Mechanism created under the CBD. The BCH is both an information repository and a central vehicle for implementing the Cartagena Protocol because many provisions under the Cartagena Protocol require Parties to submit information to the BCH.

Article 22: Capacity-Building. It is widely recognised that many developing countries and countries with economies in transition will not fully implement the Cartagena Protocol if they lack adequate human, technical and financial resources in the field of biosafety. The objective of this Article is to address needs related to biosafety capacity-building and specify general obligations for establishing cooperation in this respect.

4. Implementing the Cartagena Protocol and safeguarding national biosafety
The Chinese government has in recent years taken administrative, legal and technical measures to regulate and monitor GMOs that are intended to be released into the environment and put on the market. At the same time, it has made efforts to improve capacity building, speed up scientific research and promote information exchanges in the field of biosafety.

4.1 Ratification of the Cartagena Protocol
China signed the Cartagena Protocol on 8 August 2000. Since 2001, China’s State Environmental Protection Administration (SEPA) has drafted documents required for ratifying the Protocol, held working meetings to promote coordination on national systems, mechanisms and functioning of biosafety regulation between relevant departments under the State Council of China. Special workshops on biosafety have been organised and several research projects launched to deal with the effects of implementing the Cartagena Protocol on China’s biotechnology development, environmental safety and international trade in GM products. Some contentious issues concerning the ratification of the Protocol have been resolved though the Protocol itself has so far not been ratified.

4.2 Improving legislation on biosafety
For the legal regulation of GMOs, the relevant State Council departments have in recent years formulat-
ed and issued several departmental regulations on biosafety. These include:

- Safety Administration Regulation on Genetic Engineering (issued by the former State Science and Technology Commission on 24 December 1993),
- Safety Administration Implementation Regulation on Agricultural Biological Genetic Engineering (issued by the Ministry of Agriculture [MOA] on 10 July 1996),
- Safety Administration Implementation Regulation on Tobacco Genetic Engineering (issued by State Tobacco Monopoly Administration on 25 March 1998), and
- Regulation on Approval of New Biological Products (issued by the State Drug Administration in April 1999).

In view of the fact that existing GMOs are for the most part associated with agricultural species and drugs, the State Council of China issued the Safety Administration Regulation on Agricultural GMOs on 23 May 2001. The regulation established four fundamental safety systems aimed at agricultural GMOs:

1. A cross-sectoral meeting system for the management of agricultural GMO safety was established under the State Council. Participants in the meeting include officials from the MOA as well as the Ministry of Science and Technology (MOST), SEPA, Ministry of Public Health (MOPH), State Inspection and Quarantine Administration (SIQA) and other concerned departments. Important issues related to agricultural GMOs will be discussed and intersectoral functions coordinated through this meeting system.

2. The control of agricultural GMOs is based on their safety level. Agricultural GMOs will be divided into four categories, ranging from Level I (safest) to Level IV (least safe), depending on the potential hazard to humans, animals, plants and micro-organisms as well as the environment.

3. A safety assessment system for agricultural GMOs was established. Safety assessment must be made and approved by the competent departments for activities concerning GMOs which are intended to be used for laboratory research, intermediate trials, environmental release or commercial production trials.

4. A labelling system for agricultural GMOs was established. GMOs included in the List of Agricultural GMOs must be labelled by their manufacturers and distributors before they are placed on the market.

With regard to agricultural GMOs, regulation at the level of the State Council also provides for research, production and processing, sales, import and export, supervision, and inspection. Besides regulations, MOST and SEPA are jointly drafting the National Biosafety Law, proposed for submission to the Chinese People’s Congress, with the objective of further delineating the intersectoral functions of relevant departments in regulating activities involved with all GMOs rather than agricultural GMOs alone. Currently, the draft Law is being circulated for comments from the concerned departments.

4.3 Developing technical guidelines for risk assessment and risk management of GMOs
To provide guidance on implementation of the Safety Administration Regulation on Agricultural GMOs, the MOA issued three departmental rules on 5 January 2002. These were the (i) Management Rule on the Safety Assessment of Agricultural GMOs, (ii) Management Rule on the Safety of the Import of Agricultural GMOs and (iii) Management Rule on the Labelling of Agricultural GMOs. These departmental rules fully describe procedures and methods for risk assessment and risk management with regard
to agricultural GMOs as well as the detection of imported GM products and labelling of agricultural GMOs. In addition, technical guidelines for the release of GMOs into the environment were drafted by SEPA based on the results of international and domestic research into biosafety.

4.4 Speeding up basic research on risk assessment of GMOs
Biosafety is a relatively new environmental issue. Only limited data is currently available for risk assessment of GMOs and as such there is no scientific consensus on the environmental and health risks posed by GMOs. In this uncertain scenario, it is necessary to conduct basic research into the risks associated with GMOs and to monitor their environmental impacts.

In the last five years, MOST, SEPA, MOA, the Chinese Academy of Science and the National Science Foundation of China have funded a number of scientific institutes and universities to conduct research on the risk assessment of GM plants. These projects focused largely on the comparative ecology of transgenic and non-transgenic crops; the effects of insect-resistant transgenic crops on insects, microorganisms and invertebrates; and the monitoring and detection of gene flows.

During the Tenth Five-Year Plan (2001 – 2005) period, relevant departments under the State Council have launched a number of large-scale projects and provided financial assistance for research focusing on three major areas:
1. Assessment of environmental risks associated with GMOs, including the ecological fitness and invasiveness of individual GMOs in natural ecosystems; the direct and indirect impact of the products expressed by engineered genes on target and non-target species; and the mechanisms and consequences of the transfer of engineered genes to other species, including the development of indicators, methodology, model test systems and experiment protocols for risk assessment.
2. Monitoring of the environmental impacts of GMOs, including the environmental behaviour and ecological effects of products expressed by the transgenes; the adverse influences of GMOs, relayed through the food chain and gene transfer, on other species in the country; and the development of indicators and methodologies to assess the environmental impacts of GMOs.
3. Prediction and control of the adverse impacts of GMOs, including the development and application of models which can predict potential harm to the environment, technologies for the prevention and control of adverse impacts, other measures aimed at developing a strategy, and technical countermeasures for controlling potential adverse impacts.

4.5 Establishing a biosafety information clearing-house
In order to improve information sharing on biosafety and to fulfil its obligations under Article 20 of the Cartagena Protocol, SEPA has organised experts to develop a web site dedicated to biosafety information relevant to China. The web site will provide an introduction to the Cartagena Protocol and carry information on national focal points, competent national authorities, biosafety policies and regulations, technical guidelines for biosafety, field trials, commercialisation and TBM of LMOs. Databases of contained use, lists of biosafety experts, biosafety news and links to other biosafety web sites will also be made available. What is needed is to survey, collect and reorganise data and information for release on the web site. It is worth mentioning that a web site on biosafety has been under the supervision of the MOA.

4.6 Conducting biosafety education, publicity and training activities
To enhance expertise in the risk assessment and risk management of GMOs, a number of departments under the State Council have in the last several years held workshops and training seminars on biosafe-
During implementation of the National Biosafety Framework project, funded by the United Nations Environment Programme (UNEP) through the Global Environment Facility (GEF) from 1998 to 1999, SEPA held three workshops attended by officials and scientists from various departments. Advances in biotechnology; principles, procedures and methodologies of risk assessment and risk management of GMOs; and global biosafety legislation were discussed.

In 1998, SEPA in collaboration with the Biotechnology Advisory Center, Stockholm Environment Institute of Sweden, held a workshop focused on regulation and practice in the field of biosafety. Officials and scientific experts from Germany, Japan, the Netherlands, Sweden, the United Kingdom (UK) and the US, as well as Chinese representatives from the concerned departments, attended the workshop and made presentations on biosafety legislation and its implementation, risk assessment and environmental monitoring of GMOs, and capacity building in biosafety-related fields.

In 2001, SEPA and the Canadian Food Inspection Agency jointly implemented the Capacity Building on Legislation and Technical Guidelines in China project. During implementation, Canadian officials and scientists in the field of biotechnology were invited to make presentations on risk assessment and risk management concerning GM plants for the benefit of trainees from provincial environmental protection agencies and researchers from national scientific institutes and universities. In addition to SEPA, MOA, MOST, the Ministry of Education and other departments also held workshops and training seminars on GMOs and GM food.

To improve understanding of biotechnology and raise awareness about biosafety, the media including television, radio and the press introduced and reported on developments in biotechnology both at home and abroad, highlighting.
Meeting the Challenge of Invasive Alien Species

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Biological invasion is the process by which species enter a new environment from their native habitat via natural or man-made routes, causing economic losses or ecological disasters in the invaded region and affecting local biological diversity, agriculture, forestry, animal husbandry and fisheries production as well as human health. The term “invasive alien species” (IAS) refers to alien species that pose a threat to ecosystems, habitats, species and human health. With the growth in China’s international trade and the development of the tourism industry, the country now experiences worsening biological invasion problems. In fact, biological invasion has become one of the key threats to the country’s biological diversity and ecological environment. The ecological price of invasive alien species has been the loss of local biological diversity and extinction of species. The economic cost includes serious productivity and quality losses in agriculture, forestry, animal husbandry and fisheries as well as heavy expenditure on prevention and control.

The comprehensive and systematic study of invasive alien species is now a major research field in China. This research is important for ecological and environmental protection as well as agricultural production and sustainable economic development. To meet the challenges of invasive alien species, China now needs to develop a priority action plan based on national conditions and urgent issues. Currently, a number of topics require immediate research including (i) basic ecological research on specific alien species; (ii) critical evaluation of and research on the current status of invasive species and their impact on particular ecosystems or geographical regions; (iii) research on systems to evaluate particular invasive alien species’ ecological and environmental impacts and risks, and models to describe the resulting economic losses; and (iv) research on environmentally sound techniques and measures to control harmful alien species, and techniques and measures to rehabilitate ecosystems and habitats where invasive alien species have been brought under control.

1. Harmful alien species and sustainable economic development

The invasion of harmful alien species has seriously undermined China’s economic and ecological security, with impacts on social stability and the country’s national interest. This invasion affects agriculture, forestry, animal husbandry, fisheries and the breeding industry, and has caused significant economic losses to the country. Agricultural, forest and other ecosystems including grasslands, pasture, wetlands, oceans, rivers, islands and natural reserves have been damaged, posing the prospect of ecological disasters, endangerment of wildlife resources and grave public health hazards. As it is, the situation in China today is serious: Bemisia tabaci (Gennadius) and Liriomyza sativae (Blanchard) plague farmland, while Leptinotarsa decemlineata (Say) is making inroads into central China from the north-west. Pine wood nematode and Dendroctonus valens LeConte now run rampant, killing forest, while Hyphantria cunea (Drury) is eating away at shelter forest in many areas. Eupatorium adenopho-
rum, Mikania micrantha and Spartina spp are mushrooming in the south-west and eastern regions of the country, Alternanthera philoxeroides (Mart.) Griseb. and Eichhornia crassipes are invading water bodies, termites and Procambarus clarkii are destroying river dykes, Ambrosia artemisiifolia L is a pest common to the north-east and Periplaneta americana and Blattella germanica is encroaching on public areas. These invasive alien species have seriously affected the ecological, productive and livelihood functions of agriculture in China and significantly slowed the progress the country is making towards building a prosperous society.

With fast-growing international trade and expanding exchanges with the outside world, the risk to China from harmful invasive alien species is growing. Outbreaks of new pest epidemics are surfacing from time to time. Since 2000, more than 10 new plant diseases and insect pests that harm agriculture and forestry have been found in places like Beijing, Fujian, Guangdong, Guangxi, Hainan and Xinjiang. Brontispa longissima (Gestro), Fusarium oxysporum f. sp. cubense, Verticillium albo-atrum Reinke & Berth, Rhynchophorus ferrugineus, Rhabdoscelus lineaticollis and Frankliniella occidentalis (Pergande). In addition, there are frequent reports of entry into China of certain extremely dangerous alien species such as Tilletia controversa Kuhn. At the country’s entry ports, Chinese quarantine authorities in 2002 intercepted a total of 22,448 movements of some 1,310 types of pests, a respective increase of 3.4 and 1.5 times over the previous year.

With China’s accession to the World Trade Organisation (WTO), the issue of harmful alien species invasion will become more complicated politically, socially and economically. China will face the daunting tasks of preventing invasion and minimising the attendant risks. The country needs to control the spread and damaging impact of harmful invasive alien species, ensure sound agriculture and national ecological security, and safeguard its national interests and social stability. China must strengthen the infrastructural position of agriculture and promote the sustainable development of its agricultural and rural economies.

II. International efforts to prevent, control and manage invasive alien species

1. International conventions and action plans

Currently, over 40 international conventions, agreements and guidelines address in one way or another the hot spots and focal problems of harmful invasive alien species. These include the Agreement on Sanitary and Phytosanitary Measures (SPS), Convention on Biological Diversity (CBD), Cartagena Protocol on Biosafety, Global Invasive Alien Species Programme and South Pacific Regional Environment Programme.

In 1996, IUCN-The World Conservation Union, the Commonwealth Agricultural Bureau International (CABI) and the Scientific Committee on Problems of the Environment (SCOPE) jointly implemented the Global Invasive Alien Species Programme. Over 80 information and data banks and web sites have now been set up around the world in connection with invasive alien species. These include 30 web sites on topics such as control, management, early warning and risk assessment. These databases provide a great deal of information and technical guidance for related research work. In February 2000, IUCN released a guide for preventing biological diversity losses caused by alien species invasion, which provides principles for prevention and management work.

2. National prevention and administration systems

To address alien species invasion challenges, both developed and developing countries have strengthened their national capacity-building efforts by formulating special laws and regulations and establishing
inter-agency coordination systems and administrative mechanisms. Many countries have set up national committees charged with the task of developing medium- and long-term invasive alien species research programmes, examining and approving import and export permit applications, developing systems for managing potential biological invasion risks and developing invasive species control and management projects.

In 1996, the United States (US) adopted the Invasive Species Act. In 1999, President Clinton signed an Executive Order on Invasive Species (No. 13112), authorising the establishment of an Invasive Species Council and a non-federal Invasive Species Advisory Committee (ISAC). Led by the US Department of Agriculture and represented by the departments of Treasury, Defence, Interior, Commerce and Transport, and the US Environmental Protection Agency (EPA), the Council is responsible for the unified administration of invasive species issues in the US. So far, it has developed a national programme for invasive alien species management and drawn up specific action plans covering leadership coordination, prevention, early detection and fast response, control and management, ecological rebuilding, international cooperation, research, information management, and education and publicity. Among the action plans are the Cooperative Agricultural Pest Survey Program (CAPS) and the National Agricultural Pest Information System Program (NAPIS). The establishment of fast response systems, monitoring of epidemics, risk analysis and pest removal are some of the activities undertaken by the Council. The US has also established alien species databases at various levels and achieved information resources sharing between agencies and between upper and lower administrative departments.

In 2001, Canada began developing a national plan to cope with the alien species invasion threat within its borders. New Zealand began implementing its biosafety programme in April 2003. Australia has formulated a National Strategy for Protecting Biological Diversity, detailing guidelines for alien species management, impact assessment, control measures, technical specifications, and risk analysis and management. The Japanese Ministry of Agriculture, Forestry and Fisheries has dawn up a list of 316 harmful weeds and issued pre-warnings against their possible invasion of that country. Developing countries such as India, Malaysia, South Africa and Thailand have also established special agencies led by their respective national agricultural committees and councils to undertake unified administration of invasive species issues.

(3) Prevention and control, research and system building
Many countries have attempted to address the biological invasion issue more effectively by setting up new research institutions, participating in international cooperation and sharing information with other nations. The US will establish a National Research Center for Invasive Aquatic Species, with six regional branches planned. The Canadian government is planning to set up research institutions and has expressed its intention to cooperate with the US. North America and South Africa are now cooperating to establish a joint information centre on invasive species.

Internationally, research efforts have focused on routes of biological invasion and their prevention, early detection and fast response, and control and management. Attention has also been paid to basic research on biological invasion and cataclysm, ecological adaptation and regional expansion, system resistance and control systems. These efforts include:

- basic work on establishing information banks on invasive alien species and data sharing;
- research on the relationship between biological characteristics and the successful invasion of invasive alien species, as well as the genetic background of ecological evolution and ecological adaptation;
establishing risk assessment indicator systems and early warning models;
• developing rapid detection and long-term monitoring techniques and methods with the use of molecular biotechnology;
• formulating monitoring models for invasive species with use of Geographic Information System (GIS), Global Positioning System (GPS) and remote sensing (RS) technologies; and
• establishing effective, sustainable control technology systems.

III. Countermeasures against biological invasion
(1) Databases and information systems regarding invasive alien species
This effort involves the establishment of national data banks on invasive alien species covering genera, origin and distribution; biological and ecological characteristics; risk analysis and management; and effective control technology. It also includes developing measures to identify places of origin and routes of invasion.

(2) Early warning and risk forecast systems for alien species invasion
Possible invasive species are evaluated and pre-warnings are issued to strengthen preventive measures and develop emergency control measures. Forecasting also involves the evaluation of, pre-warning against and strengthened monitoring of the damage, distribution and spread of invading species. In-depth systematic research needs to be conducted on linkages between climatic restrictions, phylogensis, geographical constraints and the ecological adaptability of invasive alien species. This may form the basis for developing the capability to identify, record and monitor the dynamics of invasive species, providing up-to-date data and releasing information about areas at risk.

(3) Rapid detection, contingency and fast response techniques and systems
This work involves the development of effective techniques for quickly detecting potential invasive species, particularly plant diseases and acute animal plagues as well as techniques to eliminate all types of carried invasion (for instance, via traded products and packaging materials).

(4) Epidemiology of dangerous plant diseases and acute animal epidemics
With research on the interactions between pathogens, hosts and their environment, epidemiologic models are established for different conditions. The idea is to set up technological systems that can stop the spread of plant and animal epidemics.

(5) Effective and continuous biological invasion control technology systems
Effective, acceptable techniques and measures with particular targets are developed to remove or control harmful alien species. The focus is on developing comprehensive technological systems that can remove or control invasive alien species and formulating optimum solutions and technology mixes. In-depth research needs to be conducted on the biological basis of techniques and measures for controlling invasive alien species. Timely research is also needed to evaluate the benefits and risks of introduced benign species which may become invasive species.

(6) Ecological and economic impact assessment systems
This involves the development of systems for assessing the ecological and economic impacts of alien species, including species that have been knowingly introduced. Research is needed on impact assessment models that can predict the ecological and economic costs of given species in given regions. Predictive indicator systems for invasive alien species should also be developed, so that predictive models can be applied to assess the ecological and economic impacts of invasive alien species on regions other
than their native habitat, and on other species.

(7) Ecosystem rehabilitation techniques
Demonstration areas are set up for invasive alien species management based on the characteristics of invaded ecosystems. The idea is to demonstrate through examples systems for monitoring, managing and controlling invasive alien species.
Working Groups

Issues raised in the presentations and plenary discussions were further debated in working groups on the following themes:

• Access to Genetic Resources and Benefit Sharing
• Biosafety
• Intellectual Property Rights and Traditional Knowledge
• Sustainable Trade

The working groups' discussions were focused on five key questions:

1. What are the most relevant issues for China at the intersection of trade, biodiversity and sustainable development and what should be the priorities for addressing them?

2. What issues need to be added to the research agenda in China to provide input into the national debate on trade, biodiversity and sustainable development?

3. What legal measures are required to implement the priorities identified?

4. What changes, if any, need to be made in institutional coordination mechanisms in order to effectively coordinate action on trade, biodiversity and sustainable development?

5. What are important issues for China's position in the WTO's Doha Round?
Access to Genetic Resources and Benefit Sharing

1. Relevance and priority of issues
Participants felt that the issues being addressed in the four separate working groups are all priorities for China and that they are all inter-related. Issues of traditional knowledge and intellectual property rights are particularly related to access and benefit sharing (A/BS). Because of the inter-relationships, all of these issues must be addressed concurrently. They are too urgent and too inter-related to be addressed one at a time.

Crosscutting priorities include:
- Building awareness of the issues involved in A/BS among policy makers and the urban and rural public;
- Building capacity;
- Allocating financial resources, particularly at provincial and local levels.

2. Research Agenda
The research agenda is dependent on awareness of the issues. Research needs to be inter-disciplinary, and needs to focus on economic and social aspects as well as biology and genetics. Participants identified four types of issues on which research should focus:
- Economic issues - how to link ecological compensation with benefit sharing policy at macro and micro level;
- Conservation issues - research on genetic resources must be carried out in cooperation with in situ research on biological resources;
- Social issues - particularly traditional knowledge, and taking into account long-term interests of local farmers and resource users;
- Development issues - policy should require strategic assessment of development plans for underdeveloped areas that are rich in genetic resources and traditional knowledge.

3. Legal measures
The CBD Conference of the Parties adopted the Bonn Guidelines on A/BS. The Guidelines are voluntary and give guidance on how to implement the CBD provisions on A/BS. SEPA is already in the preliminary phases of drafting legislation on A/BS. When the draft is ready, it will be subject to consultations.

4. Institutional coordination
Coordination needs to be strengthened both horizontally - within the central government - and vertically - between the central and provincial governments.
With regard to horizontal coordination:
- It is important to set up a mechanism for trade decision-makers and A/BS decision-makers to work together;
- Inter-sectoral processes for planning research and development need to be strengthened;
- There is already an intersectoral consultative group on CBD implementation that can address A/BS issues.

With regard to vertical coordination, there need to be processes put in place for central government authorities, provincial government authorities, and municipal/local officials to work together.
5. China's position in the Doha Round
China has a leadership position among developing countries in the WTO Doha Round and can use its internal experience with research, legal measures and institutional coordination to influence the international debate on A/BS issues.
Biosafety

Participants emphasized the overarching need to build national capacity, raise awareness, and enhance knowledge in both the public and private sectors about issues related to sustainable trade and biosafety. They noted that managing invasive alien species (IAS) and genetically modified organisms (GMOs) should be handled similarly; that will require innovative domestic coordination mechanisms. Managing IAS in protected areas and educating the public about the potential impacts of IAS and GMOs on forests was another significant point raised. Information is needed on GMOs and their potential impacts on biodiversity and the environment. Biodiversity impact assessment procedures are also needed to identify and effectively manage potential impacts of GMOs and their trade on biodiversity and the environment.

1. Relevance and priority of issues
   - Economic considerations make trade the priority, but biosafety issues are important for environmental protection and biodiversity conservation and need to always be taken into account in making trade-related decisions.
   - Deal with capacity building concurrently at all levels.

2. Research Agenda
   - Testing and management of LMOs should be standardized and capacities, including training, for government agencies and private sector enterprises should be enhanced.
   - New testing facilities should be established as required and the capacities of existing ones enhanced.
   - Develop methods for assessing impacts of biotechnology on agriculture.
   - Develop methods for assessing impacts of GMOs on biodiversity
   - Standardize procedures for testing living modified organisms (LMOs).
   - Establish effective screening methods and procedures for IAS.
   - Undertake a socio-economic survey of impacts of GMOs and trade on local livelihoods.

3. Legal measures
   - Develop implementation of the precautionary principle in China.
   - Review existing laws and regulations dealing with biosafety, trade and IPR.
   - Develop a national law on biosafety that addresses issues of trade and its impacts on environment and biodiversity. Among other things, the law should:
     - Address import and export of GMOs;
     - Empower SEPA to make decisions on imports of LMOs and other GMOs;
     - Address issues of liability and responsibility are important for effective implementation of Biosafety protocol/regulations
     - Provide for using available labeling guidelines effectively.
   - Review and consider whether to revise the 1993 law and 2001 regulations on management of GMOs.
   - Review the Ministry of Agriculture regulations on evaluation and management of biosafety and on management of import safety of agricultural transgenics. Implementation of these regulations should be done in a coordinated manner and be more effective.
   - Review IPR law and available protection for GMO-based inventions.
   - Harmonize quarantine, phytosanitary, and biosafety regulations.
   - Harmonise IPR laws, biosafety regulations and trade laws.
   - Involve principal actors in the development and implementation of regulations on biosafety and trade.

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• National implementation initiatives should identify ways of linking trade into existing biosafety laws and regulations and should focus on linkages to the WTO through a specific working group or specialist group.
• Develop capacity to enforce laws and regulations related to biosafety.

4. Institutional coordination
• Interagency cooperation is needed and is essential to effectively implement the Cartagena Protocol and national biosafety laws and regulations.
• Establish information systems along the lines of the Biosafety Clearing-house at provincial and/or sector levels to address issues of trade and biosafety.

5. China's position in the Doha Round
• Development of biotechnology should take into account issues of national and regional security.
• The WTO Committee on Trade and Environment (CTE) should cooperate in implementing the Cartagena Protocol.
• The CBD Secretariat can establish an open-ended working group to identify implications of the Cartagena Protocol and its relationship to the international trade regime.
• China can develop a national policy paper for the CBD and WTO on GMOs, trade and environment.
• Bilateral and regional trade agreements should consider the biosafety and environmental impacts of trade in GMOs more specifically.
• China can take a lead at the CBD Conference of the Parties/Cartagena Protocol Meeting of the Parties in providing guidelines on how the above can be achieved.
Intellectual Property Rights and Traditional Knowledge

The working group called attention to the large uncertainties that local and indigenous people face as they strive to use, nurture and sustain traditional knowledge, practices and innovations. They are often marginalized in the globalization and decision-making processes.

1. Relevance and priority of issues
The Working Group discussed various issues at the intersection between genetic resources, traditional knowledge (TK) and intellectual property rights (IPRs). Participants identified four main principles to be taken into account at both international and national levels:

- Exante and expost impact and benefit assessments of any policy or legal action related to genetic resources, traditional knowledge and IPRs;
- Use of a holistic approach to address the various issues at stake;
- Creation of prior informed consent and consultative processes with relevant stakeholders;
- Benefit sharing with the holders of traditional knowledge and with other groups in national society.

Participants identified various relevant issues for China:

- Insufficiency of the IPR system to address and resolve concerns about protection of traditional knowledge;
- Existence of political difficulties of revising the TRIPs Agreement to incorporate CBD principles;
- Lack of capacity in China to understand these issues and find adequate solutions and the subsequent need for technical assistance from both developed and developing countries;
- Lack of coordination among different sectors (forestry, agriculture, civil affair, nationalitity commission, culture) to actively participate in the international discussion and national implementation;
- Poor opportunities for voices from civil society, NGOs and ethnic groups to be heard on the issues;
- Need for double strategy at the international and national level to promote the protection of TK;
- Need to design and implement a national action plan for the protection of TK that would include technical, legal and policy aspects.

2. Research Agenda
A new research agenda should address many specific aspect of traditional knowledge. These include:

- What should be considered TK in China?
- What type of knowledge exists and which are the main features? Focus should be given to traditional medicines, agricultural knowledge, and folklore expressions;
- Which are the barriers to protecting TK in the current IPR system and how they should be overcome?
- What has been the experience in other countries and how they have regulated TK?
- Which are the most relevant cases of protection of TK (good practices) in China, and what lessons can we learn from them?
- What are the main options to protect TK?
- How can TK and genetic resources that have already been misappropriated without consent be recuperated?
- What could be the minimum principles and rules that should addressed at the international level?

3. Legal measures
An eight-step process was proposed to initiate a national action plan for the protection of TK in China:
• National survey of types of TK, experiences, stakeholder mapping and any other relevant information;
• Evaluation of functions, impacts, potentialities, options for protection and future commercialization of TK and derivative products and processes;
• Consultation process with relevant actors;
• Exchange and coordinate with other developing countries, such as India, for sharing information, knowledge, experiences and understanding;
• Draft national legislation to protect, promote and preserve TK;
• Establish National Policy Support Initiative Consultative Group with participants from NGOs, enterprises, and academics institutions as well as representatives from ethnic groups;
• Promoting public awareness and mainstreaming traditional knowledge, to lead to benefit sharing in the future;
• Find ways to implement any future national legislation.

4. Institutional coordination
Internal consultation and coordination mechanisms should be improved. The establishment of a national network or consultative group could be considered as a possible means for enhancing transparency, exchanging information and coordination. In any action plan, technical assistance and capacity building initiatives should be emphasized. Cooperation from international organizations, other developed or developing countries and NGOs should be welcome and encouraged.

5. China’s position in the Doha Round
At the international level, participants emphasized the need to closely follow negotiations in the WTO, WIPO, the CBD and FAO. A unanimous call was made to review the TRIPs Agreement and the WIPO Agreement to incorporate CBD principles and defensive measures for disclosing the origin of biological resources and proving prior informed consent and mutually agreed terms. WIPO should be looked at carefully. Active participation and interaction is needed to achieve some minimum principles and rules to protect traditional knowledge, both positively and defensively.
Sustainable Trade

The Working Group on Sustainable Trade chose not to follow the question format and instead made the following recommendations:

1) China must develop its capacity to distinguish between those standards, regulations and labels that are based on legitimate environmental objectives and those that serve a protectionist purpose. In this context, China is encouraged, through MOFCOM, to develop an “early warning system” for new and emerging standards, regulations and labels, based on information from diplomatic representations and formal notifications under the WTO Agreement on Technical Barriers to Trade (TBT);

2) China should participate fully in relevant international standards bodies such as ISO and the Codex Alimentarius Commission, and should take full advantage of the provisions in the TBT, the WTO Agreement on the Application of Sanitary and Phytosanitary Measures (SPS), and the WTO generally for technical assistance, right to consultation, etc.;

3) China should request the European Union, the United States, and other key trading partners to consult them at an early stage when developing standards, regulations or labels that may affect China’s trading interests;

4) China should fully develop approaches based on technical equivalence and mutual recognition so that, to the extent possible, its trade might be based on its own environmental standards rather than standards set elsewhere and not always appropriate for China;

5) China should strengthen its participation in multilateral environmental agreements where trade-related issues linked to standards, regulations and labels are discussed, negotiated and agreed;

6) China should ensure that its trading policy community and its WTO negotiators are in a position to benefit from the strongest possible environmental backing, from SEPA and from other sources of environmental experts in China.
## Participants List

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