Access to Forest Genetic Resources and Benefit Sharing

Potential Opportunities and Challenges for Governments and Forest Stakeholders

WORKSHOP REPORT

Workshop sponsored by:
the Government of Canada
and the Government of
New-Brunswick

February 2006

Government of Canada / Gouvernement du Canada

Natural Resources / New Nouveau Brunswick Canada / Ressources naturelles

Canada

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February 21 & 22, 2006,.Fredericton, New Brunswick

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Library and Archives Canada Cataloguing in Publication

Access to forest genetic resources and benefit sharing : potential opportunities and challenges for governments and forest stakeholders.

Text in English and French on inverted pages.
Title on added t.p.: Accès aux ressources génétiques forestière et partage des avantages, opportunités et défis potentiels pour les gouvernements et les parties concernées du milieu forestier.
Report of a workshop held Feb. 21 and 22, 2006 in Fredericton, New Brunswick.
Cf. Summary
Available also on the Internet.
ISBN 978-0-662-05864-9
Cat. no.: En4-90/2008

1. Forest genetic resources conservation--Canada--Congresses. 2. Forest biodiversity conservation--Canada--Congresses. 3. Forest genetics--Canada --Congresses. 4. Forests and forestry--Canada--Congresses. I. Canada. Environment Canada II. Title: Accès aux ressources génétiques forestière et partage des avantages, opportunités et défis potentiels pour les gouvernements et les parties concernées du milieu forestier.

SD399.7.A22 2008 333.95'34160971 C2008-980248-9E

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Cover Photos: Corel Corporation

Printed on recycled paper.

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Acknowledgements

Environment Canada and Natural Resources Canada would like to thank all the participants, the speakers, facilitators, and members of the organizing committee for the time they devoted to preparing for this workshop. The views they shared over the two days of this event were critical to its success.

The organizers would also like to thank the Government of New Brunswick for its involvement in this project and for offering to host the workshop and contribute to its financing. Special thanks go to the Canadian Biotechnology Strategy for providing financial support to this workshop and ongoing support to the development process of an Access and Benefit-sharing (ABS) policy in Canada.

This workshop is part of a broader initiative to elaborate a position on ABS from a forest sector's perspective that feeds into the Canadian ABS policy-development process. The views of the participants and other forest stakeholders will again be sought as the policy-development process evolves. All comments and suggestions are welcome and should be directed to the workshop organizers at Environment Canada (sophie.bernier@ec.gc.ca) or the Canadian Forest Service of Natural Resources Canada (sylvie.m.gauthier@nrcan.gc.ca).

Acronyms

ABS	Access and Benefit-sharing
CBD	Convention on Biological Diversity
FGR	Forest Genetic Resources
GR	Genetic Resources
IPR	Intellectual Property Rights
NTFP	Non-timber Forest Products

Introduction

Essential for the adaptation to environmental changes, the diversity of genetic resources (GR) has been over the past several years a source of potential economic value for the biotechnology sector in industrialized countries. Bioprospecting activities are therefore increasingly conducted nowadays in all regions of the world where ecosystems are abundant in biodiversity, and in regions sheltering atypical species, such as small islands, or extreme environments close to the poles. For all provider countries of GR, unfair bioprospecting activities could result in a loss of unique genetic specimens, and also missed opportunities for generating potential benefits associated with their use.

The Convention on Biological Diversity (CBD) recognizes that States have the sovereign right to exploit their own natural resources. In order to better define parameters around how bioprospecting activities should happen, the CBD encourages both users and providers of GR to follow the *Bonn guidelines* when entering into bioprospecting partnerships. The voluntary nature of the *Bonn guidelines*, however, is viewed by biodiversity-rich countries as an insufficient incentive. As an alternate solution, the CBD third objective – Access and Benefit-sharing (ABS) – has become an area of intensive policy discussion in which political momentum exists for the elaboration and negotiation of an international regime.

Under the CBD, Canada has a stake in participating in international negotiations for an ABS regime. Bioprospecting activities are already taking place in Canada, with GR being accessed by both Canadian and foreign entities. Since research is key to the well-being of our society, it is important to understand how our GR are being used, including in specific cases the traditional knowledge associated with, and how benefits derived from their use can be maximized for the well-being of all Canadians. Such an exercise should enable Canada to define its own interests and policies in preparation for international negotiations.

To help achieve this objective, Environment Canada is leading a domestic ABS policy-development process in collaboration with other federal departments and the provinces/territories. Its main goals are to raise awareness amongst a wide range of Canadian stakeholders and garner their point of view for better defining and eventually protecting our domestic interests. While challenging, engaging all jurisdictions, economic sectors, Aboriginal Peoples, research institutions, and other relevant stakeholders in this process is central to properly identifying the drivers that will shape ABS policies for Canada.

With forests known as the single most important repositories of terrestrial biodiversity and forest genetic resources (FGR) a significant component of the bio-based economy, the engagement of the forest sector in this discussion is crucial to defining Canadian interests. The interface between forests and ABS must, therefore, be explored in order to identify opportunities, challenges, and key considerations related to FGR that policy-makers should take into account in developing ABS policies for Canada.

As a first step in this process, the Government of Canada, in collaboration with the Government of New Brunswick, held the workshop "Access to Forest Genetic Resources and Benefit-sharing: Potential Opportunities and Challenges for Governments and Forest Stakeholders" in Fredericton, New Brunswick, on February 21 and 22, 2006. This report presents the outcomes of the workshop and highlights key considerations identified by the participants.

Workshop Overview

The main goal of the workshop was to bring together a representative group of Canadian forest stakeholders in order to build a network of interested parties, providing them with an opportunity to share information on ABS, and integrating the results of their discussions.

Objectives

The objectives of the workshop were to

- raise awareness of ABS and its domestic/international policy development process,
- identify the challenges and opportunities raised by ABS in the context of FGR, and
- garner forest stakeholders' views on the practical legal, economical, social, and environmental considerations surrounding ABS policies in Canada.

Participants and Venue

The workshop drew 46 participants from across Canada, including representatives from the federal and provincial governments, aboriginal organizations, academia, associations, research institutions, and private sector companies. Their professional profile varied from scientists, lawyers and managers, to policy-makers and aboriginal experts. The organizing committee chose Fredericton as the location for the event because of the many public and private organizations in the region that are involved in FGR research. A visit to the Seed Bank and Cryogenic Centre of the Canadian Forest Service was also held as a side event.

Format

The workshop participatory sessions were designed to encourage discussion and feedback on key issues. Table groups were composed of participants from different backgrounds and affiliations. A professional facilitator animated the sessions, introducing presentations and guiding the question periods, and managed an open forum in which participants shared questions and comments with their table-mates. A summary of key findings and participant workbooks were used to keep track of collected ideas. There were 10 presentations on the current state of knowledge on science and policy issues pertaining to ABS and FGR in Canada. In addition, three forest stakeholders panels on the themes of science, aboriginal and rural communities, and industry, allowed participants to describe ongoing projects and highlight opportunities and challenges that could support the development of ABS policies. Presentation summaries are available in the appendices.

Outcomes

The outcomes of the workshop built on the document *Questions of Interest*, which was sent to participants in advance of the event. In this report, they are presented in two categories:

- *Opportunities and challenges* which were identified by participants on Day 1, after the concept of ABS had been introduced and linkages with the context of FGR had been made,
- *Environmental, legal, economical, and socio-political considerations* for forest-based ABS policies in Canada reflecting key findings identified by participants on Day 2.

Presentations and Thematic Panels Overview

Tuesday, February 21

Setting the Stage: Introduction to ABS

- Tim Hodges, Director, Access and Benefit-Sharing Secretariat, Environment Canada
  What Is ABS?
- Christian Malouin, Scientist, Canadian Forest Service
  Overview of FGR in Canada
- Dale Simpson, Manager, National Forest Genetics Research Centre
  The Status of FGR in Canada
- Sophie Bernier, Policy Analyst, Access and Benefit-Sharing Secretariat, Environment Canada
  Domestic and International ABS Legislation

Forest Resource Management and ABS

Mechanisms to Interface with ABS: Provincial Policies and Co-Management Practices

- Cathy MacLaggan, Policy Analyst, Government of New Brunswick
  Overview of New Brunswick's Policies and Legal Mechanisms Related to ABS and FGR
- Nathalie Lafontaine, Policy Analyst, Government of Quebec
  Overview of the Forestry Context and Regulations for the Canadian Yew in Quebec

Other Mechanisms: Forest Certification

- Douglas Prosser, Policy Analyst, Wood Products Group
  Forest Certification in Canada

Wednesday, February 22

ABS and Research in FGR

- Sophie Bernier, Policy Analyst, Access and Benefit-Sharing Secretariat, Environment Canada
  ABS and Biotechnology: Intellectual Property Rights (IPR) Issues
- Dr. Irene Hay, Canadian Forest Service
  A Forest Sector Approach to Bio-Products
- Dr. Ron Smith, Chief Executive Officer, VarFor Limited
  Forest Genetic Resources: Research, Product Development, Commercialization, and Regulations
- Dr. Stewart Cameron, Canadian Forest Service
  Opportunities for Diversified Use of Non-timber Forest Products (NTFP): Taxus Canadensis *Case*

Stakeholder Panel 1: Scientists and FGR – Interface with ABS

- Facilitator: Glenn Kendall, Director, Canadian Biotechnology Secretariat
- Dr. Judy Loo, Scientist, Canadian Forest Service
  Presentation of Two Projects Dealing with FGR
- Dr. Chris Lucarotti, Scientist, Canadian Forest Service
  Forest Genetic Technologies to Address Disease Issues
- Dr. Jean Bousquet, Leader of the Canada Research Chair in Forest and Environmental Genomics, Laval University
  Benefit of ABS Policy for FGR in Support of Academic Research

Stakeholder Panel 2: FGR – Their Importance for Aboriginal and Rural Communities

- Facilitator: Harry Bombay, Director, National Aboriginal Forestry Association
- Jim Webb, Senior Policy Advisor, Little Red River Cree Nation
  Treaty-Based Approach to Forest Management as Established by Treaty No. 8
- Doug Belanger, Environment Coordinator, Batchewana First Nation
  ABS and First Nations: Critical Needs for Capacity Building
- Keith Williams, Instructor, Faculty of Math and Science, North Island College
  The Role of Communities in ABS Policies in Canada
- Nadine Roach, Forestry Coordinator, Union of Ontario Indians
  First Nations: Needs for Involvement in Policy Discussions in Canada
- Dr. Marc Stevenson, Sustainable Forest Management Network, University of Edmonton
  Examples of Worst Practices in Accessing Traditional Knowledge

Stakeholder Panel 3: Industry and ABS in the Context of FGR

- Greg Adams, Environmental Coordinator, JD Irving Ltd.
  Public Private Partnership on FGR Projects: Successful Examples of ABS and IPR
- Eric Smith, Chief Executive Officer, Chatham Biotec Ltd.
  Secured Access to FGR for Ensuring Market Competitiveness for Industry

Opportunities and Challenges for ABS Policies in the Forest Sector

Opportunities

- Canada's interests can be promoted internationally if Canadian policy-makers develop ABS policies that build on forest-related and other domestic policies and legislations.
- While developing ABS policies at both, domestic and international levels, policy-makers can draw on lessons learned from forest-related policies and market mechanisms.
- ABS provides an opportunity to broaden the focus beyond trees and consider the importance of FGR found in NTFP.
- ABS processes should increase the sharing of databases containing FGR information.
- ABS will promote research partnerships on FGR and build on ABS successful examples.
- ABS can support the development of the bioproducts industry based on FGR research.
- The Model Forest Network could be used as a vehicle to begin implementing ABS.

Challenges

- Domestic ABS policies should include mechanisms that will enable jurisdictions in Canada to assess the level of bioprospecting activities being conducted in the forest.
- To be efficient, ABS policies require an accurate inventory of FGR and adequate monitoring activities.
- The debate around ABS should focus less on the economic value of the GR but rather prioritize the environmental protection through the achievement of the first and second objectives of the CBD: the "conservation" and "sustainable use" of biodiversity.
- Ownership, authority, jurisdictions and power are key issues for consideration among federal, provincial, municipal and aboriginal responsibilities, in the context of ABS. Who will ultimately make decisions regarding the ABS of FGR?
- Legislative differences domestically (federal/provincial/self-government) and internationally, as well as potential gaps, have to be assessed and addressed.
- Common definitions of FGR, traditional knowledge, benefit-sharing, derivatives, etc. must be developed that are acceptable to all stakeholders.
- In the context of traditional knowledge associated to the use of FGR in Canada, it can be difficult to define investments in research and when they begin and end.
- Under ABS policies, new guidelines might have to be defined and implemented – e.g. the Province of Quebec developed sustainable harvest guidelines for the Canadian yew.
- Achieving industry buy-in of ABS will be a challenge. Industry will need to balance the need for high quality standards, while maintaining its competitiveness internationally.

Key Considerations for Developing ABS Policies in the context of FGR

Environmental

- ABS policies must ensure the genetic variability and sustainability of our FGR biodiversity and respect criteria and indicators for sustainable forest management.
- As part of a larger biodiversity context, ABS policies must integrate environmental methodologies such as the ecosystem approach (including ecosystems interacting with forest), as well as global environmental issues such as climate change.

Legal

- ABS policies must respect environmental and forest-related regulations and policies in Canada.
- In the Canadian jurisdictional context, ABS policies must clarify who holds the rights related to FGR.
- In the context of forest communities, ABS policies must clarify who holds the IPR for common knowledge related the use of FGR.

Economic

- ABS policies must ensure that long term economic benefits are provided in a fair and equitable manner through the sustainability of Canada's FGR diversity.
- ABS policies should contribute to and facilitate value-added development at the forest community level as well as promote innovation.

Social and political

- The contribution of ABS policies to the public good should provide fair and equitable benefits to forest stakeholders, while ensuring that benefits accrue at the local level.
- ABS policies should help to preserve the viability and the culture of aboriginal and rural communities in the forest.

Aboriginal

Although a discussion on issues related to Aboriginal Peoples in the context of ABS and FGR was not a specific objective of this workshop, references were made to this subject.

For Aboriginal Peoples living in the forest, ABS was seen as an opportunity to

- retain the integrity of the forest ecosystem and, in consequence, protect their livelihoods;
- lead to community development in the forest and contribute to the social, economic, political, and natural capital of First Nations; and
- receive returns for FGR and traditional knowledge, thereby validating the value of traditional knowledge and renewing interest in its benefits.

Specific considerations for Aboriginal Peoples related to ABS included

- how to balance the need to identify traditional knowledge owners with the recognition of collective rights;
- how ABS policies will define "equitable" and "fair" compensation, and reflect aboriginal treaty rights in the benefits arising from FGR;
- the need to respect the spiritual context of traditional knowledge surrounding FGR when defining ABS parameters;
- the ethical obligation to ensure that benefits accrue to Aboriginal Peoples who provide the knowledge associated with the use of FGR;
- the need for an ABS policy to acknowledge two distinct realities—aboriginal and other—and the possible need for multiple frameworks to deal with distinctive legal, cultural, and economic implications; and
- the need for Canada to take, at the very beginning of its ABS policy-development process, a different approach for Aboriginal Peoples (e.g., when considering to develop benefit-sharing policies in the context of the owner of traditional knowledge), including a recommendation to establish an aboriginal working group in Canada, which would take into consideration lessons learned through past aboriginal experience.

Key Findings

Participants closed the workshop by identifying key findings based on the considerations listed above. They agreed that the field of research and development with FGR, sometimes leading to the commercialization of products, is a growing international industry and that Canada must move forward in this area, as other countries are taking a proactive approach. In their opinion, ABS policies should aim to achieve the conservation and sustainable use of FGR, while promoting economic growth and maximizing benefits for Canadians. Forest stakeholders indicated that care must be taken in ensuring continued exports of Canada's natural resources.

Conclusion

ABS is a complex subject that encompasses many issues. This workshop was a good opportunity for participants to discuss the notions of "access" and "benefit-sharing" according to their own views as well as in the context of aboriginal and rural communities in Canada.

Although good ideas emerged from the discussions, some views missing from the outcomes are paramount for adequately determining the driving forces surrounding ABS policies in the forest sector. In addition, other core elements and dimensions of ABS—both within the context of FGR and even more broadly—were not discussed extensively during the workshop, including the following:

- IPR (ownership, patent, traditional knowledge)
- prior informed consent and mutually agreed terms (negotiation process)
- certificate of origin
- economic development and competitiveness (domestic and international)
- ethics and the socio-political well-being of Canadians

In addition, certain stakeholder groups within the industry (e.g., scientists, economists, corporate representatives) and legal advisors from industry, government, and aboriginal groups were underrepresented or absent from the workshop. Therefore, not all possible interests within the forest sector were brought to the table during the event.

Although organizers concluded that the workshop's objectives were only partially met, they believe that the event was a respectable starting point for broader national discussions surrounding ABS in the context of FGR.

Appendix A: Presentations and Panels Summary

Day 1 AM: What Is ABS?; Overview of FGR in Canada; Status of FGR in Canada; Domestic and International ABS Legislation

The first session of the workshop was aimed primarily at introducing participants to the main terms and definitions surrounding ABS. What are the various elements covered by ABS and how are they addressed at the national and international levels? What is happening in Canada in the context of ABS? This general overview of this multifaceted issue served as a foundation for the remaining workshop sessions. This session also took a more in-depth look at FGR through an examination of definitions, the sharing of views on the interface between ABS and existing forest-related national policies such as the National Forest Strategy, and an overview presentation on the status of FGR.

Timothy Hodges, Environment Canada, spoke about the emergence of this novel policy area at both the domestic and international levels and its ramifications for other policy areas. He discussed some of the complexities related to the development of ABS policies in Canada and the opportunities and challenges raised by this horizontal and innovative issue. He explained the ongoing policy-development processes taking place at the national and international levels and informed participants that a federal-provincial-territorial working group on ABS has been established in Canada to develop a nationally coherent approach and to implement an ABS engagement strategy to raise awareness among stakeholders. He also provided information on key international meetings that will address ABS-related issues and advance the international debate on ABS.

The presentation by **Christian Malouin, Canadian Forest Service,** provided an overview of FGR in Canada and statistics on forest biodiversity and its importance to socio-economic systems. Aspects related to the definition of FGR and its interpretation—both narrow and broad—were discussed. Major drivers for the conservation of FGR were highlighted, such as the CBD Programme of Work on Forest Biological Diversity, the National Forest and Canadian Biodiversity strategies, and the Canadian Council of Forest Ministers Criteria and Indicators reporting framework. The Model Forest was identified as a platform through which FGR are being shared among various stakeholder groups and a potential building block for future efforts toward the ABS of FGR. *In situ* and *ex situ* sites where sufficient knowledge is present to monitor access to FGR were identified. The importance of conserving the genetic diversity of forests, including the need for monitoring, reporting, and protecting elements of the landscape, was stressed as a key element of future national ABS policies in Canada.

Dale Simpson, Canadian Forest Service, focused on the status of FGR in Canada by providing information on the results of a survey of tree and shrub species of concern. The purpose of the survey was to identify priority tree and shrub species that may be in need of gene conservation, to help identify areas where more work can be done, and to assist the Canadian Forest Service's National Forest Genetic Resources Centre in targeting species for *ex situ* gene conservation collections. Survey participants identified a species of concern (i.e., one needing gene conservation measures) based on a set of criteria. Based on the survey results, 50 tree species required *ex situ* gene conservation measures, 16 required *in situ* conservation, and 9 required more information before a determination could be made. Many of the species identified are under pressure in only a portion of their range, and species identified as requiring gene conservation throughout their range included those experiencing high mortality due to an

exotic pest. The survey results will continue to be used to identify species in need of conservation and to assist in prioritizing work.

Question Period: see Q&As 1 and 2

Sophie Bernier, Environment Canada, reviewed pertinent national and international legislation governing natural resources in Canada and explained the extent to which each of the existing federal legal frameworks can or cannot, from a federal standpoint, apply to ABS. Her review of domestic legislation included the *Canadian Wildlife Act*, the *Canada National Parks Act*, and the *Forestry Act* as well as three federal conservation acts (*Migratory Bird Conservation Act, Oceans Act, Fisheries Act*). While no specific legal framework at the federal level covers ABS entirely, research shows that some ABS elements are covered under existing legislation at this level. More legal research is needed at the provincial and territorial levels to assess whether ABS would be complementary to existing legal and policy frameworks or would require new legal mechanisms. Ms. Bernier also briefly reviewed some of the existing ABS legislation in other countries—namely Costa Rica, the United States, and Australia. While their implementation is still ongoing, these frameworks are examples of how countries have decided to legally manage their GR and associated traditional knowledge. Some of the elements contained in the Australian model could help guide the policy-development process in Canada.

Question Period: see Q&As 3 and 4

Day 1 PM: Mechanisms to Interface with ABS: Provincial Policies and Co-Management Practices; Other Mechanisms: Forest Certification

Provinces and territories regulate the natural resources within their boundaries and have exclusive powers to legislate the enhancement, conservation, and management of forest resources. Exploring existing management policies and regulations at the provincial and territorial levels would help legislators understand the degree to which these already include ABS principles. Given that ABS policies should build on existing practices, it is key for all groups involved to explore the level of consistency between existing mechanisms and potential new ABS measures. How is traditional knowledge being addressed under existing practices and regulations? Are there guidelines for forest management at the sub-national level that meet the ABS principles and objectives?

Cathy MacLaggan, Department of Natural Resources of New Brunswick, provided an overview of New Brunswick's policy and legal mechanisms related to the ABS of FGR. The historical context for ABS and background information on land ownership, provincial jurisdiction, and the aboriginal and treaty rights of First Nations, were presented. New Brunswick's natural resources legislation was summarized, including legislation related to provincial Crown land and forests, protected natural areas, provincial parks, fish and wildlife, endangered species, and conservation easements. The forest-management planning process and the development of strategies for the conservation of biological diversity were also highlighted. A question was raised about the integration of ABS issues within the forest-management framework. Environmental, agricultural, and fisheries legislation and economic development strategies were examined. National and international agreements and working groups were discussed along with selected federal legislation. The regulatory and management framework for mineral exploration and mining was presented as a possible model for approaching ABS issues, and the environmental impact assessment approach was suggested to address planning issues related to ABS.

Nathalie Lafontaine, Natural Resources and Wildlife, Government of Quebec, provided an overview of forestry in the province of Quebec, where public forests represent 89 percent of the total forest cover (the remainder is privately owned). Quebec's legal framework for forests aims to protect all forest resources and uses, take into account public concerns (with a special emphasis on First Nations), ensures that sylviculture is well adapted to various forest ecosystems, maintains biodiversity, and produces wood fibre in a sustainable fashion. The preamble to Quebec's *Forest Act* promotes respect for the six sustainable forest-management criteria developed by the Canadian Council of Forest Ministers. The Act was developed around a set of general principles, including the expansion of the forest industry and improvement of forest productivity, the ensured conservation and protection of ecological processes, and fostered multiple-use of the forest environment. The Act is also based on the principle that the right to harvest wood entails the obligation to practice sound forest management. More generally, Quebec's legal framework on forests includes the *Forest Act*, the *Natural Heritage Conservation Act*, the *Act Respecting the Conservation and Development of Wildlife*, the *Parks Act*, the *Environment Quality Act*, and the *Act Respecting the Lands in the Domain of the State*. In 2004, the Coulombe Commission was established by the provincial government to assess the management of Quebec's forests. The conclusions and recommendations of the Commission will lead to a series of modifications in approaches and practices and to amendments to the *Forest Act*, including the future implementation of an ecosystem and adaptive management approach and a more regionalized and integrated multi-resource management system. In Quebec's public forests, specific regulations and guidelines are set to protect landscapes, water quality, essential wildlife habitats, advanced growth in cutting areas, and biodiversity. The government's policy also encourages and participates in the development of forest certification systems. Ms. Lafontaine also presented some useful information on the yew in Quebec and new amendments to the *Forest Act* governing the harvesting of shrubs and parts thereof.

Question Period: see Q&As 5

Douglas Prosser, Wood Products Group, provided information on forest certification mechanisms designed to ensure that forest practices are environmentally and socially responsible. The three forest certification schemes available in Canada are the Forest Stewardship Council, the Canadian Standards Association, and the Sustainable Forestry Initiative. All are voluntary, but some have prerequisites for membership in industry associations or access to public timber. They have document standards and procedures and require an independent third-party certifier to verify practices. Each scheme has its own governance structure and specific standards. For example, the Canadian Standards Association standards (which are approved by the Canadian Council of Forest Ministers) include biodiversity, maintenance and enhancement of forest ecosystems, conservation of soil and water resources, the contribution of forests to global ecological cycles, multiple benefits to society, and society's responsibility for sustainable development. The Forest Stewardship Council's principles and criteria for forest management encompass legal aspects, indigenous rights, labor rights, multiple benefits, and environmental impacts on forest management. The relationship between ABS and all the certification criteria requires further exploration.

Question Period: see Q&As 6

Day 2 AM: ABS and Biotechnology: IPR Issues; A Forest Sector Approach to Bioproducts; FGR: Research, Product Development, Commercialization, and Regulation; Opportunities for Diversified Use of NTFP: *Taxus Canadensis* Case

Sophie Bernier, Environment Canada, gave a presentation on FGR, ABS, and biotechnology. She provided an overview of biodiversity in Canada and worldwide and the biotechnology sector in Canada. One of the highlights of her presentation was a discussion of the regional distribution of biotech firms in Canada, with Quebec and Ontario having the most research, revenue, and employment in this field. An examination of the key sectors in which biotech investments are made indicates that forest biotechnology and environment are low priorities, with the majority of biotech-related spending devoted to human health, followed closely by agriculture. Emerging policy areas and changing social needs and objectives have led to increased biotech research needs in a wide range of sectors. How can we ensure that there is a concerted approach to biotechnology in Canada and a strategy behind the use of GR for research and commercial purposes? Creating partnerships and maximizing the use of Canadian research infrastructures (i.e., universities, national research centre, regional biotechnology institutes) and developing a set of key strategies—including a marketing strategy for biobased products, an information/network strategy, a strategy for IPR, and strategies for the conservation and preservation of GR—would help increase the contribution GR make to the Canadian economy and the long-term genetic diversity of Canadian ecosystems. There is a need to discuss a national FGR strategy among and within different GR-related sectors and to consider elements of a national strategy in an integrated way.

Dr. Irene Hay, Canadian Forest Service, addressed the forest sector approach to bioproducts. The main issues covered were the definition of bioproducts, the types of research underway in forestry bioproducts, and issues arising from ABS in forestry bioproducts. According to Dr. Hay, "bioproducts are products made from biomass—any type of plant or organic material (both new and waste) that is available on a renewable or recurring basis." Bioproducts from forestry fall into several categories: Non-timber forest products (NTFP, e.g., yew, salal, mushrooms, berries), green chemistry (e.g., resins, lubricants, plastics) and bioenergy (e.g., bio-oil, biodiesel, ethanol). There are currently up to 500 types of forest bioproducts in commercial use in Canada that collectively contribute nearly $1 billion annually to Canada's economy. The bioproducts industry in Canada has the potential to diversify the Canadian economy and forestry industry and help Canada meet a range of economic and environmental goals (e.g., to reduce carbon dioxide emissions, achieve leadership in biotechnology, capture the value of Canada's FGR, and stimulate development in remote/First Nations communities). Dr. Hay explained how NTFP are a central component of the bioproduct strategy and that the commercial harvesting of many NTFP species contributes significantly to the Canadian economy (e.g., salal sales are $45 million in Canada annually and the current market for decorative and aesthetic products is $175 million). Estimates show that 25 percent of prescription drugs in the United States contain plant extracts or active ingredients derived from forest plants. In the context of green chemistry, this sector has the potential to contribute to the development of *de novo* pharmaceuticals and new biocontrol agents (e.g., fungi, leaf extracts from resistant species). The world demand for functional foods and nutraceuticals is estimated at $56 billion and increasing rapidly, with Canadian demand estimated at $1-2 billion. Dr. Hay also provided information on the emerging bio-economy. In her view, many heretofore underutilized species could become sources of raw material for various industries, provide supplemental incomes, or become part of major export businesses. Canada has both the forest resources and the research capacity to develop this industry. During the last part of her

presentation, Dr. Hay explored the relationship between ABS and the emergence of the bioproduct industry. She raised a number of questions related to Canada's multi-jurisdictional complexity, ownership issues, benefits derived from the use of GR, relationship to the IPR system, applicability of ABS in different contexts (i.e., commercialization vs. research), and scientific issues.

Dr. Ron Smith, VarFor Limited, provided an overview and examples of research, product development, commercialization, regulations, and emerging issues related to FGR and benefit-sharing. He explained that one of the main problems with FGR is that our knowledge about its potential benefits is weak and unstructured, therefore its economic potential is significantly underutilized. He emphasized the need to think creatively in order to effectively explore and capitalize on the opportunities raised by ABS. He cited research on butternuts, conducted at the Atlantic Forestry Centre of the Canadian Forest Service, as an example of how a research program (launched because the species was endangered by an introduced disease) led to the development of new methods of propagation. While it was deemed important to protect these GR for economic reasons (wood) and as food for wildlife, less obvious opportunities were missed, including a number of medicinal uses cited in the Natural Medicines Database. Developing FGR research programs that will identify economic opportunities (including value-added processing) for new forest species and innovative uses for existing or currently used ones will require a multi-disciplinary partnership approach. Other challenges related to commercialization, patentability, and clarity around the scope and definition of NTFP (i.e., are they forest resources or agricultural resources?) were amongst those raised by Dr. Smith. The need to obtain economic benefits yet avoid the "get-rich-quick" mentality that has led to the over-harvesting of many species was also discussed. Improving working relationships with First Nations by ensuring the fair distribution of benefits and the protection of traditional knowledge was also identified as a key element of ABS that should be integrated into future research programs. Ensuring that forest research benefits the economic development of First Nations and rural communities, fostering education around the positive impacts of sustainable management, and improving monitoring mechanisms were all identified as areas requiring significant improvement.

Dr. Stewart Cameron, Canadian Forest Service, concluded the session on opportunities for diversified uses of NTFP by sharing a case study on the Canadian yew, *Taxus canadensis*. After introducing participants to the species and its distribution, he summarized the stages involved in the production of taxanes: from the clipping of foliage to the packaging of the final product. His presentation included a value-added calculation of the paclitaxel (a cancer drug) chain, showing biomass at the low end of the chain. Dr. Cameron explained that the main benefit-sharing issue for this woodland resource is the negative impact of unsustainable over-harvesting to capture market share. Large pharmaceutical companies look for a reliable supply and high quality, not just low cost. In the late 1990s, Canada's reputation has been mediocre due to substandard harvesting methods, poor biomass quality, and theft by individuals. Without major customers, there is less employment (largely rural). The solution facilitated by the Canadian Forest Service was to develop sustainable harvest guidelines and create the Canada Yew Association, based on an assumption that partnering is critical to promoting common industry and multi-jurisdictional goals. This has led to increased Canadian biomass sales to international customers. A sustainable harvesting study by the Canadian Forest Service on behalf of the Canada Yew Association has shown that frequent light harvesting provides a better return to the local community (including harvesters and landowners). It may also increase long-term product yield and decrease the harvest contractor's operating costs. Two domestication

initiatives are currently underway to provide low-cost high-quality biomass and help strengthen the industry by lessening dependence on wild harvesting: the Atlantic Canada-based *Taxus* domestication project and the Ontario *Taxus* project. The operational goal of nursery crop cultivation projects is to maximize the production of taxanes per hectare in order to lower the cost per kilogram. The net result would be a modest indirect benefit to all, if cultivation stabilizes the taxane industry. Dr. Cameron concluded by showing the effect that the commodification of resources has had on paclitaxel, whose price per kilogram is declining as the industry shifts to lower-cost semi-synthetic versions of the drug, and the market is increasingly dominated by a smaller number of large pharmaceutical clients. These clients are seeking lower biomass prices for processing offshore, and unless Canadian value-added processors find ways to compete, they may become unprofitable. If biomass prices decrease, woodland harvesting will likely continue but will be less important. Nevertheless, Canadian biomass/extract from combined nursery and woodland sources will continue to be exported. The question is how to support the taxane industry. For the woodland resource, there is a need to impose mandatory sustainability guidelines as a prerequisite for wild harvesting on Crown land and to allow the export of sustainably sourced materials only from both Crown and private land. For cultivated biomass, assistance should focus on bridge funding for the upscaling period between research and full commercial production as well as ongoing market assessments of competition and opportunities for collaboration.

Day 2 PM

The following presentations were made by practitioners or representatives of key groups and provided an opportunity for all interested stakeholders to provide their views on ABS and its interface with their work, values, and institutional objectives.

Stakeholder Panel #1: Presentation of Two Projects Dealing with FGR; Forest Genetic Technologies to Address Disease Issues; Benefits of ABS Policy for FGR in Support of Academic Research

Many forest research sectors—including the flower, nursery pharmaceuticals/nutraceuticals/chemicals, and food (e.g., mushrooms, berries, herbals) sectors—are routinely manipulating FGR as part of their experimental procedures. Why are FGR important to your research? What rules do researchers follow before accessing GR? Are there any benefit-sharing requirements included in research institution procedures? Are there guidelines for harvesting and using FGR in your industry, and do they meet key ABS objectives and principles?

Glenn Kendall, Canadian Biotechnology Secretariat, facilitated the first panel discussion, which was composed of scientists conducting research using FGR.

Dr. Judy Loo, Canadian Forest Service, presented two examples of projects from her research with FGR. The first project is aimed at understanding and breeding for resistance to invasive alien species, specifically woolly beech scale. The research focuses on maintaining genetic diversity in wild populations, testing for durable resistance, determining resistance mechanisms and modes of inheritance, and collecting from as many disease-free individuals as possible to maintain genetic diversity in breeding populations. The second project is related to collaborative research on an endangered pine species in Mexico that is potentially valuable for its pine nuts, drought resistance, aesthetic form, and urban planting potential. Dr. Loo concluded her presentation with a few thoughts about ABS. In her work, she accesses GR for scientific purposes but recognizes that a useful product may result. GR are often accessed on

private land, however her team always receives advance permission from the landowner. Her group has also used local knowledge to find sources of material. In her view, benefits may include publicly available information or material available for the public good. At her institution there is no policy in place for sharing the benefits derived from research. The question of how benefits should be shared if either project results in tangible value remains to be answered.

Dr. Chris Lucarotti, Canadian Forest Service, focused on insect-specific viruses and their role in suppressing forest insect pests. His work in this area has led to the development, registration and commercialization of a biological control product called Abietiv™, which is used for the balsam fir sawfly. Dr. Lucarotti also spoke about the opportunity for New Brunswick to become a world leader in forest genetic and resource-management practices by building on existing facilities and technology. In conjunction with this opportunity, he emphasized the need to develop education and awareness mechanisms for aboriginal groups.

Dr. Jean Bousquet, Leader of the Canada Research Chair in Forest and Environmental Genomics, spoke about the benefits of an ABS policy for FGR to support ongoing work at Laval University. He reviewed two large-scale projects: 1) the Phylogeographical Atlas of Canadian Conifers, which is being undertaken in partnership with the Canadian Forest Service and focuses on the genetic structure of Canadian conifers; and 2) ARBOREA, which is being carried out with the Canadian Forest Service and other organizations and focuses on the genomics of softwood trees for developing molecular breeding applications. The need to share information with the research community and stakeholders was noted, as was the need for researchers at the university to access FGR to adequately support ongoing research. Benefit-sharing is in line with the policies of the granting agencies (e.g., Natural Sciences and Engineering Research Council of Canada, Canadian Forest Service, Canadian Biotechnology Secretariat, Genome Canada, Genome Quebec) that are funding these projects.

Question Period: see Q&As 7

Stakeholder Panel #2: Treaty-Based Approach to Forest Management as Established by Treaty No. 8; ABS and First Nations: Critical Needs for Capacity Building; The Role of Communities in ABS Policies in Canada; First Nations: Needs for Involvement in Policy Discussions in Canada; Examples of Worst Practices in Accessing Traditional Knowledge

Close to 80 percent of Canadian aboriginal communities are located in forested regions; therefore, an ABS policy will undoubtedly affect their ways of life. Aboriginal and local communities are increasingly aware that their traditional knowledge is being used in modern research on FGR. They wish to regain control over this knowledge and to share it in keeping with their values and traditions. How can aboriginal communities remain involved in decision-making processes related to access to traditional knowledge and benefit-sharing? What exists and what is needed in terms of capacity building to increase the appropriate involvement of communities in forest resource management? What role could an ABS policy play in the context of forest traditional knowledge? What are the roles of aboriginal groups, researchers, and governments in the context of accessing traditional knowledge and ensuring fair benefit-sharing for the commercialization of traditional knowledge-based products?

Harry Bombay, National Aboriginal Forestry Association led the second panel, which was devoted to hearing views on ABS from representatives of aboriginal communities and groups, stakeholders (including local communities and academia), and professionals working on specific

projects with forest stakeholders. He shared the view that treaties are ABS agreements but that their institutional nature does not allow for the proper involvement of Aboriginal Peoples. Mr. Bombay stressed the importance of having a process in place for broad discussions with Aboriginal Peoples and the need to change existing structures to better treat them as partners.

Jim Webb, Senior Policy Advisor for the Little Red River Cree Nation, described the Nation's treaty-based approach to sustainable forest management planning within a 10 000 km^2 provincial forest tenure. He explained how the Nation has developed a sustainable management framework on the basis of research undertaken with the Sustainable Forest Management Network.[1] The framework's main features include: 1) the use of the Little Red River Cree Nation's cultural and economic values to determine what sustainability means and how it is related to maintaining the community's cultural identity and re-establishing its economic self-reliance; 2) the proactive engagement of the Nation with third-party corporations and Crown governments in order to secure Crown forest tenures in support of their existence as a forest peoples within a sustainably managed boreal forest; and 3) engagement with the Sustainable Forest Management Network to develop and use community-based research findings to inform the Nation's cooperative planning approach to management for ecological, cultural, and economic sustainability. Mr. Webb noted that Treaty No. 8 (1899) reserved a "significant bundle" of First Nations proprietary interests in lands and resources. He explained that contemporary treaty implementation negotiations focus on the use of historically identified "hunting, trapping, and fishing preserves" (1927) as a basis for negotiations on the need for the equitable re-allocation and use of natural resources by First Nations peoples in order to support their cultural and economic survival. He further explained that the treaty implementation negotiations between Alberta's Treaty No. 8 First Nations, the Province of Alberta and Canada reflect both the economic and cultural values of these First Nations and the relationship between "forest ecological integrity" and their ability to maintain their culture and identity as people of the boreal forest. Mr. Webb asserted that bioprospectors interested in exploiting GR within these identified lands should be prepared to enter into an impact-benefit agreement with the Little Red River Cree Nation that reflects the following principles of cultural and economic accommodation:

- exploitative activities may not threaten or diminish the ecological integrity of the identified lands;
- impacts may not infringe, without justification, the ability of the Little Red River Cree Nation people to utilize the identified lands to sustain their identity and culture;
- the Little Red River Cree Nation people will receive equitable economic benefit from the corporate exploitation of FGR within the identified lands; and
- bioprospecting proponents must commit to work with the Little Red River Cree Nation to re-establish community economic self-reliance and to identify and develop mutually acceptable means of accommodating each other's interests.

Doug Bélanger, environmental coordinator for the Batchewana First Nation, explained that First Nations lack the capacity to establish structures to deal with emerging issues. In the context of ABS, there is also a need to consider what is being discussed under Article 8(j) of the Convention on Biological Diversity. In his view, the linkages between ABS and 8(j) are a good opportunity to discuss the integrity of biodiversity. There is a need to further discuss with First

[1] The Sustainable Forest Management Network is a national centre of excellence for research on sustainable forest management that is funded by the Natural Sciences and Engineering Research Council of Canada and the Social Sciences and Humanities Research Council's research grants and member contributions. The Little Red River Cree Nation is a mentoring partner of the Sustainable Forest Management Network.

Nations issues around traditional knowledge. He explained that some First Nations may not be comfortable with the idea of sharing their knowledge, and made a reference to one in Ontario that was offended by the commercial sale of forest medicines whose uses were based on traditional knowledge. Mr. Bélanger emphasized the rights that First Nations people have over forest medicines and how these rights must be considered in the development of an ABS policy for FGR.

Keith Williams, Instructor in the Faculty of Math and Science at North Island College, shared some of his thoughts on ABS and its relationship with rural and aboriginal community development. He opened by saying that "communities will realize social and economic benefits from strategies that empower them as partners with government and industry in the research and development of plant GR." In his view, "appropriate benefit-sharing could represent a fair and just approach to economic development where FGR are concerned, particularly when a community has a history of use and a deep understanding of a given resource." He highlighted some of the challenges that rural and aboriginal communities are facing. The demographic shift is a huge challenge, as many young people are moving to urban or semi-urban areas to find education and employment. This has many implications for rural communities, including lack of skilled labour, lack of youth representation in leadership positions, and lack of sufficient enrollment to keep schools open. Many rural communities also lack adequate processing and transport facilities to support local business development. The more natural resources are processed at the local level, the better. Overall, rural communities are challenged by low capacity, in terms of both people and supportive infrastructure. According to Mr. Williams, some of these problems could be tackled through the development of an ABS policy that requires industry or government to evaluate and address the capacity-building needs of a given community to act as partners or collaborators in the development of a particular plant GR. Sustainable employment (e.g., through the creation of entrepreneurship strategies to build supporting industries, such as those involved in harvesting, processing, packaging, and transporting a given resource) and support to education in the form of relevant development programs with local post-secondary institutions (especially in sectors that have the potential to attract students from across Canada and beyond) may contribute to an ABS-based sustainable community development strategy. Mr. Williams concluded his presentation by stating that an effective ABS strategy must be founded on principles that promote sustainable community development.

Nadine Roach, Forestry Coordinator for the Union of Ontario Indians, also highlighted the lack of capacity in First Nations to develop appropriate mechanisms and engage effectively in policy discussions on many natural resource-related issues such as GR and traditional knowledge. In her view, the consideration of values and cultural aspects related to land and traditional knowledge should be increased. FGR and traditional knowledge are intrinsic to the way of life in First Nations. Given the ancient nature of traditional knowledge and its contribution to the social, cultural, and environmental survival of communities, its monetary value is difficult to determine. Ms. Roach also noted the challenge of determining appropriate parameters for both the protection of traditional knowledge and the sharing of benefits. She concluded by reiterating the need to involve First Nations early on in the policy-development process so that issues relating to aboriginal land and knowledge are dealt with in a manner that is consistent with the values and management systems of First Nations.

Dr. Marc Stevenson, Sustainable Forest Management Network, talked about best practices in accessing traditional knowledge by discussing the commonalities of worst practices.

He divided his presentation into three parts. The first introduced a number of commonalities related to accessing traditional knowledge: research issues, questions, agendas, units of analysis, concepts, terms, and the language of discourse are all determined by non-aboriginals: 1) there is a general lack of consultation on who accesses traditional knowledge and how they go about it, resulting in a loss of social capital (i.e., increased internal tension and confusion about control over IPR and monetary compensation); 2) aboriginal elders and other traditional-knowledge holders are interviewed using western techniques and language that is inappropriate to aboriginal comprehension (i.e., this ignores the richness, complexity, and context of aboriginal narratives); 3) local interpreters are often used to translate difficult concepts and understandings from one language to another; 4) interviews are often recorded on audiotape or videotape and then transcribed, in whole or in part, into text or onto maps; and 5) specific factual or geographical information is singled out for its contribution to existing scientific data. The second part of the presentation explained the consequences of these practices: 1) a progressive loss of information, knowledge, and context each step of the way; 2) an incremental separation of knowledge holders from the knowledge they created and once controlled; 3) the inculcation of the belief in Aboriginal Peoples of the rationality and objectivity of western science and the conviction that aboriginal ways of knowing are inferior, of little value in the modern world, and in need of significant reform (i.e., loss of cultural capital); and 4) the undermining of traditional values, knowledge, and management practices that are vital to sustaining cultural and biological diversity and exercising aboriginal rights. The third part of Dr. Stevenson's presentation focused on solutions: that is, what can be done to avoid these practices and create mechanisms for proper access to and incorporation of traditional knowledge. Solutions proposed included: 1) developing a fair negotiating process (everything must be negotiated, including the language of negotiation, in order to avoid problems and create space for Aboriginal Peoples in managing biodiversity); 2) developing a professional literacy that sees how existing institutions, practices, and decisions privilege the state and disadvantage Aboriginal Peoples; and 3) developing an appreciation of the value of aboriginal approaches to biodiversity creation and retention, including the recognition of aboriginal management practices. Dr. Stevenson concluded by emphasizing the need to develop innovative institutions for ABS that will ensure effective negotiation and fair implementation of ABS agreements among all parties. Both aboriginals and non-aboriginals have a responsibility for restructuring institutions.

Stakeholder Panel #3: Public-Private Partnerships in FGR Projects: Example of ABS and IPR Success; Secured Access to FGR for Ensuring Market Competitiveness for Industry

The total contribution of forest products to Canada's gross domestic product was $35.9 billion in 2004. In the case of the timber and NTFP industries, how does the use of GR contribute to the competitiveness of your industry? To what extent would ABS apply to your sector of activities? Are there existing mechanisms in place to regulate the use of GR, the use of traditional knowledge, and benefit-sharing in your sector of activity? How could ABS and the existing licensing process be mutually supportive? What would the opportunities and the challenges be for industry in the context of ABS? Do you see ABS as being compatible with your social corporate responsibility strategy?

Greg Adams, JD Irving Ltd., began his presentation by talking about his company's work in the areas of forest regeneration and tree-improvement programs. Many of these programs are cooperative in nature and are the result of partnerships among industry, provinces, and universities. The research Mr. Adams described in his presentation involves the use of FGR, which, he said, contributes absolutely to his company's competitiveness. He described some of

the measures in place to regulate access to GR, explaining that measures are in place at different levels and vary according to type of material being accessed (i.e., seeds vs. categorized breeding material). He also noted that access protocols are negotiated on a case-by-case basis. His company uses internal controls and best practices to regulate access to and use of FGR. In his view, the usefulness of ABS as a tool to help his company meet its environmental and social objectives would depend greatly on the nature of the measures put in place. He said that the current regional cooperative system is functional, but he recognizes that there could be circumstances in which an ABS framework could play a role. Mr. Adams concluded by discussing how environmental factors such as climate change will likely require reconsideration of adaptive variation knowledge and the use of FGR.

Eric Smith, Chatham Biotec Ltd., also provided an overview of the use of FGR by his company. According to Mr. Smith, approximately 100 different medicinal plants are being used in research to develop low-cost drugs. These plants can be found in Canada and abroad. Mr. Smith noted that securing rights to access FGR is a way of guaranteeing the long-term capacity of companies to compete in the market. FGR are key to increasing production output while decreasing the costs of production and harvesting. He explained that the production of Taxus (a cancer treatment drug) involves the use of eight different yew species and has resulted in the creation of species with a high degree of taxanes. A joint project with the Canadian Forest Service, for example, resulted in taxane-intensive species and thereby contributed to the company's market competitiveness. He emphasized the importance of preserving IPR for research results. When looking at the interface between Chatham Biotec's research activities and the ABS objectives and components, Mr. Smith referred to various sets of guidelines, including the harvesting guidelines developed by the Canadian Yew Association and the Smart Wood Guidelines for the sustainable harvesting of resources. He also emphasized the role of joint ventures and partnerships, which are the main mechanisms used by his company to ensure benefit-sharing with resource providers.

Appendix B: Questions and Answers

Q1: In relation to prior informed consent and the sharing of traditional knowledge, have you considered that Aboriginal Peoples in Canada may not want to share or provide their knowledge? What if they don't want to share it? How can this be respected? How can trust be built between providers of knowledge and users?

A1: Yes, this is a reality that needs to be taken into account. An ABS system would have to address all scenarios. As a first step, all groups (knowledge holders and users) have to be informed of their respective rights and responsibilities when accessing traditional knowledge associated with GR. Some mechanisms are in place in the Yukon, for example, for establishing parameters around access to traditional knowledge. One key thing will be to find ways of ensuring the transparency, equity, and certainty of this system.

Q2: Could a party tell another party how to manage its resources? Could a party decide to share its GR with one party as opposed to another and discriminate on the basis of management practices?

A2: No, in the context of an international regime on ABS, this is an international agreement under which reciprocity is needed. The inclusion of a national treatment clause would secure reciprocity and maintain equal treatment to all parties.

Q3: Indigenous peoples in Canada have rights and interests that interplay with the issue of ABS. Why was there no reference made to the Acts under the responsibility of the Minister of Northern and Indian Affairs during the presentation?

A3: The presentation focused on the acts relating to natural resources and under the responsibility of the Minister of the Environment and the Minister of Natural Resources. Notwithstanding that aboriginal issues are very important in this debate, the purpose of the presentation was to provide an overview of the federal acts covering the use and management of resources.

Q4: When listening to the summary of the Yellowstone National Park case, it is obvious that there were no benefits shared in relation to traditional knowledge. The aboriginal interests and rights must be ensured in this kind of context.

A4: To the best of our knowledge, there was no traditional knowledge shared by any aboriginal group with the scientists who used the genetic material discovered at Yellowstone National Park. Yes, aboriginal rights and interests must be protected and knowledge holders must derive benefits for sharing their knowledge; however, not all GR have traditional knowledge associated with them. That is why the international debate addresses the sharing of benefits for traditional knowledge associated with GR.

Q5: Does the Quebec *Forest Act* legislate the harvesting of the Canadian yew on private property, therefore putting restrictions on property?

A5: The Act legislates harvesting activities done only on Crown lands. There seems to be no legislation for harvesting activities done on private lands in Quebec; however, if the Ministry is providing grants to private forest companies to harvest on private land, there is a strong

probability of sustainable harvesting practices being part of the conditions under the agreement. Any questions related to the Canadian yew should be forwarded to Gil Lambany, Ministry of Natural Resources and Wildlife (Forêt Québec).

Q6: How can you decide that one scheme is better than another for the certification of a forest area? Why would one scheme better address specific needs than another?

A6: (Comments from participants)
A6.1 Discrimination between the different systems will depend on the goals you want to achieve and the extent to which you consider sustainable forest management to be inclusive of or aimed at encompassing a range of elements and values. For example, the Canadian Standard Association system does not provide certification standards related to indigenous rights and international law. The Forest Stewardship Council system, however, addresses Aboriginal Peoples' issues, including traditional knowledge issues. Moreover, in the participant's opinion, the Forest Stewardship Council system maintains a higher level of consistency with the provisions of the CBD. Certification systems do not include issues around access, and benefit-sharing with indigenous communities can happen only if indigenous issues are part of it. If not properly designed, certification systems could limit access to FGR and diminish derived benefits.

A6.2 Certification applies to all FGR and encompasses all aspects of forest (i.e., biodiversity, multiple uses). Herbs can be certified under existing systems.

A6.3 Some existing models, such as the Laval University Model Forest, include criteria aimed at maintaining biodiversity at the gene level as well as the tree level by assessing, for example, the impacts of genetically modified organisms on forest preservation.

A6.4 The concept of "chain of custody" applies from the bag to the identification number, to the tracking system. The system is driven by companies, including the pharmaceutical industry, that require all of the relevant information on the forest products they use, across the production chain. Even if all certification requirements are followed, however, sound certification may not be achieved if the entity that sets up the criteria and guidelines for certification does not factor in all the elements (e.g., social, environmental, legal, cultural) that are key to ensuring sustainable forest management. In most certification schemes, both the land base and the products are subject to certification.

Q7: (Comments from participants) Many of the presentations stressed the fact that research results are a clear contribution to public good and that the discoveries made through research are a form of benefit shared with the public. This is true, but there are different degrees of public good. While research may be a public good in some cases, it should nevertheless consider some sort of compensation for direct public good to key communities.