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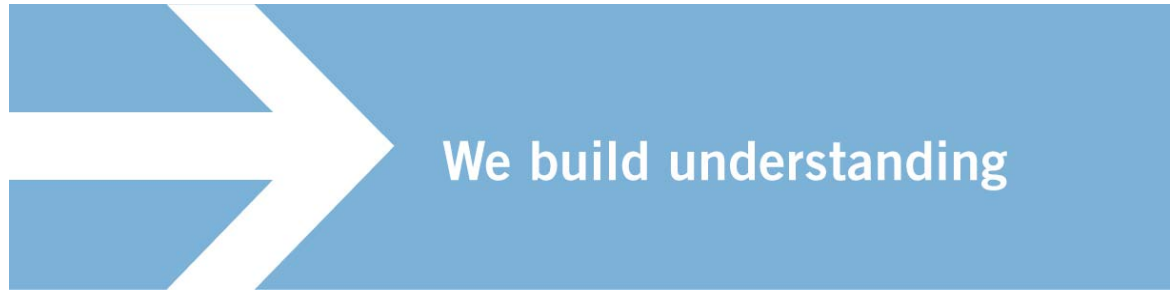
Conseil de recherches en
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Canada



National Round Table on the
Environment and the Economy

Table ronde nationale sur
l'environnement et l'économie



We build understanding

Nature and Society: Environment and Sustainability Research Program

Advice on Capacity and Knowledge
Needs, Research Agenda,

Executive Committee National Round Table on the
Environment and the Economy to the Social Sciences and
Humanities Research Council

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EXECUTIVE SUMMARY

In March 2002, the President of the Social Sciences and Humanities Research Council (SSHRC) invited the National Round Table on the Environment and the Economy (NRTEE) to organize “a high-level expert advisory process to advise on the design of a large-scale research program focused on the social, economic, legal and cultural aspects of environment and sustainability issues.” SSHRC requested advice on the knowledge needs of key stakeholders, the scope and foci of a research agenda, and the most appropriate research approaches for the program.

In collaboration with SSHRC and Environment Canada,¹ the NRTEE convened two advisory meetings in the summer of 2002, gathering knowledge users from several levels of government, industry and civil society along with sustainability research leaders from academe.²

1.1 Advice from the NRTEE: The Need to Invest in Human Capital for Sustainability

The NRTEE has carried out multi-sectoral work in a broad range of applied environment and economy programs for many years. It is thus acutely aware of the need to improve Canadian capacity and knowledge transfer in the fields of environment and sustainable development, in order to better support awareness, decision making, management and governance in these areas.

Influential social, economic and ecological trends present fundamental new questions for Canadians. These trends are challenging our understanding of how best to manage human impacts on nature and how best to govern and make decisions. For example, we must now simultaneously accommodate:

- escalating signals that human activity has outstripped ecological carrying capacity and the resulting need for profound changes such as the de-carbonization of the economy;
- a disconnect between the economic signals offered by our fiscal and national accounting systems and the accumulating, but uncounted, ecological deficit;
- continuing uncertainties in ecological knowledge and understanding, requiring adaptive management approaches and the application of the precautionary principle;
- rapid technological evolution that sometimes creates new hopes and sometimes new problems;
- a growing gap in environmental values between Europe and North America, and ongoing North/South divisions; and
- competing and sometimes differing centres of power for taking action on sustainability within the Canadian federation.

Is Canadian society equipped to meet this immense challenge? And are we confident that we have the knowledge needed to emerge as a winner? Our frank response to this question must be no—we have

1 Environment Canada co-funded the NRTEE-led consultations with external stakeholders, and conducted a parallel interdepartmental consultation with federal government departments, which will be reported on separately.

2 See Appendix A for meeting participants.

more knowledge to gain and much more work to do. We simply do not have clear and widely accepted answers to very basic sustainability questions, including many that lie in the social sciences realm. Supported by major public investments in recent budgets,³ significant advances have been made in our knowledge of the biophysical underpinnings of sustainability, and innovative new technologies are emerging to reduce our environmental footprint. However, to date, no similar strategic investment has been made in building the social knowledge and capacity that is just as essential to success. An investment in human capital will be a key element in building Canada's capacity to meet the sustainability challenge. As a result, the NRTEE supports the launch of a SSHRC program focusing on nature and society.

1.2 Advice from the Consultations: Program Objectives, Research Agenda and Design Needs

Two advisory meetings convened knowledge users from several levels of government, industry and civil society along with sustainability researchers from academe. Their views form the basis for the following observations and advice on the focus and design of the proposed Nature and Society: Environment and Sustainability Research program.

Recommended Objectives for the Nature and Society Program

The consultation identified two categories of human capital requiring development and investment: *capacity building* to generate a cadre of highly educated professionals, managers and researchers for deployment into all sectors of society (in universities and beyond); and *knowledge development* to build the basis for sound, evidence-based decision making.

- **Capacity building:** the transition to sustainability requires a professional workforce—lawyers, administrators, economists and planners, educators, marketers and researchers—with a sophisticated grasp of issues, exposure to interdisciplinary scholarship, talent for social innovation and training in change management. New and expanded financial support and academic resources are required for graduate students focusing on the social science aspects of environment and sustainability issues. The goal would be to make graduate work in this field financially competitive with graduate work focusing on the natural science aspects of environment and sustainability, and to meet current demand for graduate admissions.
- **Knowledge development:** Social science research is needed to better inform decision making and to explore best practices (in the public and private sectors and in civil society) in linking the environmental, economic and social aspects of sustainability. In particular, expanded knowledge is needed to address the sustainable development “implementation gap” evident within all sectors and at all levels of society. This research should emphasize innovation and real world application.

The recommended objectives for the Nature and Society: Environment and Sustainability Research program can be summarized as follows: the program should be designed to address the growing needs of the public, private and civil society sectors for more and better social science and humanities-oriented

³ For example, the Sustainable Development Technology Fund, the Canadian Foundation for Climate and Atmospheric Sciences, and the Climate Change Action Fund.

capacity and knowledge on environment and sustainability issues. Specifically, the program should inform decision making and best practices in the public and private sectors, as well as in civil society, by:

- deepening understanding of social, legal, economic, managerial, ethical and cultural aspects of environment and sustainability;
- supporting the formation of highly trained professionals, managers and researchers for deployment across society;
- supporting high-quality issue-based research that emphasizes innovation and real world application, and the fundamental and theoretical research to underpin this applied work;
- promoting the transfer of this knowledge among researchers, research partners, policy makers and other stakeholders within Canadian society; and
- where appropriate, extending and developing research partnerships involving the public, private and not-for-profit sectors.

Recommended Research Focus and Agenda

SSHRC funds four categories of programs: investigator-driven research, targeted research, advanced research training, and research communication and knowledge transfer. The following advice assumes that investigator-driven research and other funds will continue to be available to researchers in the environment and sustainability fields whose research interests do not fit within the targeted research agenda proposed below.

Sustainability is an issue of global concern—the world knows no ecological boundaries, and political and economic boundaries are fading. Implementing sustainability presents all sectors of society with similar questions, issues and challenges. The Nature and Society program should therefore fund both domestic research and international research, the latter especially where international agreements, institutions or directions are influencing domestic policy, or where comparative analysis can reveal best practices. The research themes should be relevant and applicable to all actors in society—individuals, community groups, Aboriginal peoples, public policy decision makers and private sector managers; individual research projects could use any one or more of these actors as subject or audience. The research scope should include both evidence-based research to support and inform more effective governance and decision making, and fundamental and theoretical research, where this is connected to the long-term needs of research and policy development at the practical level.

Three clusters of issues emerged as research priorities for the Nature and Society program. These themes were considered to be relevant for governments of all levels (local to international), for private sector firms in various sectors and stages of sustainability leadership, and for civil society organizations, community-based initiatives and individuals:

- **Living in nature:** What is the interdependence between human and natural systems? How would human society need to change in order to live in balance with nature, and what are the relative roles of technology, institutions, cultural values and individual behaviour in achieving this balance?
- **Integrated governance:** What are the elements of good governance as seen through the lens of environmental sustainability? and

- **Stewardship and innovation in the public and private sectors:** What tools can society use to ensure high levels of stewardship while encouraging and rewarding innovation?

The Canadian Institutes of Health Research (CIHR) are developing a National Research Agenda on the Environmental Influences on Health that will spell out national priorities for environmental health research in Canada over the next 10 to 15 years. For this reason, health and environmental issues are not addressed as a theme area for the Nature and Society program.

Advice on Program Needs

SSHRC has developed a wide array of program mechanisms, each designed to support activities at various stages of the training, research, interaction and knowledge transfer process. The design of mechanisms for the Nature and Society program will be influenced by current capacity in the community, the types of issues being addressed, and the needs of stakeholders (knowledge producers and knowledge users) in this field.

The following key needs should be considered in the design of the program:

- **financial support** in the form of graduate fellowships and top-up awards to attract the best and brightest students to the social sciences and keep them there;
- **encouragement of strong collaboration between disciplines.** There is a need for both research within core disciplines and interdisciplinary research; however, interdisciplinary research faces distinct barriers within the university system. The Nature and Society program should signal the value of interdisciplinary research, by being open to all disciplines, but giving preference to applications with a strong interdisciplinary focus;
- **development of individual knowledge leaders and champions.** Research chairs offer a strong mechanism for developing knowledge leaders and champions; they also enable senior people to provide leadership and catalyze research groups. These chairs should have a defined field of expertise—much like the Industrial Research chairs funded by the Natural Sciences and Engineering Research Council (NSERC). Knowledge users in the business sphere liked this model because it offers one-window entry into specific fields of knowledge;
- **small research teams** that are able to meet often can provide a more conducive environment for true interdisciplinarity than can major collaborative research initiatives;
- **creative and aggressive approaches to outreach and knowledge transfer** are needed to make the knowledge acquired under this program accessible to users. Program design, funding and assessment criteria should make this a priority. One way to achieve this is to encourage very porous boundaries between academic and other constituencies, through mechanisms such as virtual scholars in residence. Another option is to offer a single electronic gateway to research findings. Consideration should also be given to how to better transfer the large body of research and knowledge generated outside Canada;
- **flexibility around partnership models.** The program should seek “partnerships where desirable and necessary, but not necessarily partnerships.” There exists a diversity of types of research needs, and partnership requirements should be driven by these needs. In theoretical research such as

environmental ethics, partnerships may not be required. In practical research, early and active involvement of partners can be beneficial. Partnership involvement could take the form of funding, data sharing and/or hosting graduate researchers. SSHRC's Community-University Research Alliance (CURA) program and NSERC's Industrial Research Chair program represent successful partnership models that meet different research needs.

A strategic objective of the Nature and Society program should be to bring the human and biophysical sciences together. The separation of the human and natural sciences has long impeded the structured and systematic production of knowledge on environmental issues. While tri-council research is not the objective of the Nature and Society program, it would be highly desirable for SSHRC, NSERC and CIHR to outline how research linking the social, health and/or natural sciences will be supported.

1. Background

In March 2002, the President of the Social Sciences and Humanities Research Council (SSHRC) invited the National Round Table on the Environment and the Economy (NRTEE) to organize “a high-level expert advisory process to advise on the design of a large-scale research program focused on the social, economic, legal and cultural aspects of environment and sustainability issues.” Past attempts to plan a social sciences research program on sustainable development had revealed the need to improve the clarity and specificity of research objectives for any future proposals, and to include knowledge users as well as researchers in establishing these objectives. Hence, SSHRC requested advice on the knowledge needs of key stakeholders, the scope and foci of a research agenda, and the most appropriate research approaches for the program.

In collaboration with SSHRC and Environment Canada,⁴ the NRTEE convened two advisory meetings, gathering knowledge users from several levels of government, industry and civil society along with sustainability research leaders from academe.⁵ The preliminary consultation meeting, held in June 2002, investigated society’s priority knowledge needs in the fields of environment and sustainability. This conversation shaped the research agenda recommendations proposed for the Nature and Society program. The second meeting, held in September 2002, refined this agenda. It explored the needs for training, research, interaction and knowledge transfer in this field, and how best to support these needs in the design of the program’s mechanisms.

2. Advice from the NRTEE: The Need to Invest in Human Capital for Sustainability

The NRTEE has been engaged in multi-sectoral work in a broad range of applied environment and economy programs for many years. This experience has made the NRTEE acutely aware of the need to improve Canadian capacity and knowledge transfer in the fields of environment and sustainable development, in order to better support awareness, decision making, management and governance in these areas. Accordingly, the NRTEE welcomed the opportunity to work with SSHRC and Environment Canada in planning a program to increase Canadian capacity in these fields.

Influential social, economic and ecological trends present fundamental new questions for Canadians. These trends are challenging our understanding of how to manage human impacts on nature and how best to govern and make decisions. For example, we must now simultaneously accommodate:

- **complexity in many dimensions:** competing ecological and socio-economic demands; rapidly evolving technology that sometimes creates new hopes and sometimes new problems; and unexpected ecological, economic and social indirect causalities, feedback loops and interdependencies;

⁴ Environment Canada co-funded the NRTEE-led consultations with external stakeholders, and conducted a parallel interdepartmental consultation with federal government departments, which will be reported on separately.

⁵ See Appendix A for meeting participants.

- **continuing uncertainties in ecological knowledge and understanding**, suggesting for example, the need for adaptive management approaches and the application of the precautionary principle;
- **multiple temporal and spatial scales of ecological effects**, and the ensuing need for governance mechanisms and management responses to operate simultaneously across international, national, regional and local levels, and across generations; and
- **redistribution of roles and responsibilities**, as public sector governance becomes more collaborative and cooperative or is shifted between levels of governments, and as private sector and civil society actors assume new partnership and self-governance roles.

Is Canadian society equipped to meet the immense challenge of sustainability, and are we confident that we have the knowledge needed to succeed? Our frank response to this question must be no—we have more knowledge to gain and much more work to do. In Canada today, we simply do not have clear and widely accepted answers to very basic sustainability questions, including many that lie in the social sciences realm, such as:

- What are the systemic managerial, economic and cultural barriers underlying the so-called implementation gap on sustainability (the gap between stated commitments and realization of more integrated environment–economy decision making), and how can these be overcome?
- How can we balance international environmental obligations with local interests and rights, and how do we manage this tension within the confederation’s division of powers?
- How can we value natural capital in national and corporate accounting and decision-making systems?
- What are the links between environmental security and quality of life, and how do these relate to traditional measures of standard of living?
- How can public sector, private sector and individual decision making grapple with environmental and social impacts for which cause and effect occur generations apart?
- How do and how should financial markets assess and value environmental/sustainability performance (strong and weak)?
- What comparative advantages do Canadian industries have, how can these be applied to give the country an edge in new environmental technologies, and what policy instruments can help to incubate these inventions?
- How can resource-dependent rural communities best be supported as environmental pressures and/or market transitions threaten traditional livelihoods?
- What influences individual consumption choices, and how do environmental values fit within this demand? What approaches can move society toward a culture of sustainability?

All of our knowledge and creativity will be needed to answer such questions. Supported by major public investments in recent budgets,⁶ we have made significant advances in understanding the biophysical underpinnings of sustainability. At the same time, we are making steady progress in creating innovative

⁶ For example, the Sustainable Development Technology Fund, the Canadian Foundation for Climate and Atmospheric Sciences, and the Climate Change Action Fund.

new technologies to reduce our environmental footprint. However, to date, no similar strategic investment has been made in building the social knowledge and capacity that is just as essential for success. Large hurdles remain on the path to a more environmentally sustainable society: these lie in our social institutions, policies and values, and in the large knowledge gaps in the social sciences (e.g. economics and finance, political science, management, law, sociology, psychology and ethics). An investment in human capital will be a key element in building Canada's capacity to meet the sustainability challenge. As a result, the NRTEE supports the launch of a SSHRC program targeting nature and society.

3. Advice From The Consultations: Program Objectives, Research Agenda and Design Needs

Two advisory meetings convened knowledge users from several levels of government, industry and civil society along with sustainability researchers from academe. Their views form the basis for the following observations and advice on the focus and design of the proposed Nature and Society: Environment and Sustainability Research program.

3.1 Recommended Nature and Society Program Objectives: Focus on Capacity and Knowledge

The consultation identified two categories of human capital requiring development and investment: *capacity building* to generate a cadre of highly educated professionals, managers and researchers for deployment into all sectors of society (in universities and beyond); and *knowledge development* to build the basis for sound, evidence-based decision making.

- **Capacity building:** The transition to sustainability requires a knowledgeable workforce—lawyers, administrators, economists and planners, educators, marketers and researchers—with a sophisticated grasp of the issues, exposure to interdisciplinary scholarship, a talent for social innovation and training in change management. As we begin to operationalize sustainability, the demand for such individuals can be expected to grow. At the same time, the ageing of the Canadian population means that in the coming decade large numbers of experienced workers in all sectors will retire. In academe, for instance, an inventory of social science and humanities researchers who focus on environmental issues in Canadian universities found that over 50% are 55 years of age or older.⁷ The public and private sectors face similar issues. Consultation participants pointed to the need for succession planning in the environmental management field. They also identified this renewal as an unprecedented opportunity to expand the range of employees with exposure to and expertise in sustainability issues.

Currently, there is little incentive, support or access for individuals wishing to specialize in the social science aspects of environment and sustainability within the higher education system. Graduate students and post-doctoral fellows with an interest in environment and sustainability issues face

⁷ *Inventory of Canadian Social Science and Humanities Researchers Working on Environmental Issues*, Professor Philippe Crabbé, University of Ottawa, 2002. This prognosis is similar to that in many other academic disciplines.

financial disincentives to adopting a social science rather than a natural sciences focus: whereas NSERC offers targeted and comparatively generous financial assistance to recruit individuals into the natural sciences as early as the senior undergraduate level, SSHRC has no scholarships available for any studies at the masters' level⁸ and no doctoral or post-doctoral scholarships targeted specifically to environment and sustainability. Moreover, graduate environmental programs with a social science and humanities orientation⁹ are heavily oversubscribed. As an example, applications to graduate studies outstrip available positions by a factor of 7:1 in York's doctoral program,¹⁰ pointing to a need for expanded academic resources to host capacity building.

- **Knowledge development:** Consultation participants energetically confirmed the need for a focused program to support social science research on practical sustainability issues—particularly on the linkages between the environmental, economic and social aspects of sustainability. A recurring theme was the need for research to address the sustainable development “implementation gap” evident within all sectors and at all levels of society. Such research would explore best practices in the public and private sectors and in civil society, and would be used to better inform decision making. This research was seen to entail three elements:
 - i. a deepened understanding of social, legal, economic, managerial, ethical and cultural aspects of environment and sustainability;
 - ii. evidence-based research to support and inform more effective governance and decision making; and
 - iii. fundamental and theoretical research, where this is connected to long-term needs of research and policy development at the practical level.

Participants agreed that the research should emphasize innovation and real world application. They underlined that interdisciplinary projects and scholars face significant barriers within the academic community, and they emphasized the value of interdisciplinarity and collaboration in sustainability research.

Accordingly, the recommended objectives for the program are: *to address the growing needs of the public, private and civil society sectors for greater and improved social science and humanities-oriented capacity and knowledge on environment and sustainability issues. Specifically, the program should inform decision making and best practices in the public and private sectors, as well as in civil society, by:*

- *deepening understanding of social, legal, economic, managerial, ethical and cultural aspects of environment and sustainability;*
- *supporting the formation of highly trained professionals, managers and researchers for deployment across society;*
- *supporting high-quality issue-based research that emphasizes innovation and real world application, and the fundamental and theoretical investigations to underpin this applied work;*

⁸ This is true for all social science and humanities fields, not only the environment and sustainability field.

⁹ There are 22 Canadian universities offering a master's program with a specific environmental focus; 7 of these also offer a doctoral program. Crabbé, op. cit.

¹⁰ Personal communication, Dr. Peter Victor, former Dean, Faculty of Environmental Studies, York University. Nature and Society Program Experts Advisory Committee Meeting, Ottawa, September 9, 2002.

- *promoting the transfer of this knowledge among researchers, research partners, policy makers and other stakeholders within Canadian society; and*
- *where appropriate, extending and developing research partnerships involving the public, private and not-for-profit sectors.*

3.2 Advice on Nature and Society Research Focus and Agenda

3.2.1 Context

SSHRC provides funding for four categories of programs: investigator-driven research, targeted research, advanced research training, and research communication and knowledge transfer. The following advice assumes that investigator-driven research and other funds will continue to be available to researchers in the environment and sustainability fields whose research interests do not fit within the targeted research agenda proposed below.

SSHRC's experience has been that the most effective targeted research programs lay out overall thematic areas or clusters of research issues. They do not attempt to define specific research questions. Accordingly, the following discussion maps out proposed thematic areas that respond to the needs of knowledge users, but avoids being overly directive.

3.2.2 Research focus

Sustainability is an issue of global concern—the world knows no ecological boundaries, and political and economic boundaries are fading. Significant initiatives, issues and challenges can be found at all scales of activity and social/political organization—from the individual and community levels to the national and international levels. The Nature and Society program, then, should fund both domestic and international research. Funding for international research is especially important where international agreements, institutions or directions are influencing domestic policy, or where comparative analysis can reveal best practices.

Consultation participants agreed that implementing sustainability presents all sectors of society with similar questions, issues and challenges. They proposed that the research agenda concentrate on fundamental themes that would be relevant and applicable to all actors in society—individuals, community groups, Aboriginal peoples, public policy decision makers, and private sector managers. Any one or more of these actors could serve as the subject and audience for the Nature and Society program research.

Consultation participants also recommended that the program embrace the broadest scope of research. Evidence-based research is needed to support and inform more effective governance and decision making. Fundamental and theoretical research is also needed, but only where this is connected to the long-term needs of research and policy development at the practical level. Included in this latter category would be the development of new methodologies such as the accounting for natural capital, dealing with intergenerational equity, or ways of studying, generating and visualizing alternative futures.

3.2.3 Proposed Nature and Society: Environment and Sustainability Research Agenda

Based on consultation with users of sustainability knowledge within government, industry, civil society and academe, three research themes are proposed for the Nature and Society program. These are considered to be relevant for governments of all levels (local to international), for private sector companies in various sectors and stages of sustainability leadership, and for civil society organizations, community-based initiatives and individuals:

- **Living in nature:** What is the interdependence between human and natural systems? How would human society need to change in order to live in balance with nature, and what are the relative roles of technology, institutions, cultural values and individual behaviour in achieving this balance?
- **Integrated governance:** What are the elements of good governance seen through the lens of environmental sustainability? and
- **Stewardship and innovation in the public and private sectors:** What tools can society use to ensure high levels of stewardship while encouraging and rewarding innovation?

The Canadian Institutes for Health Research (CIHR) are developing a National Research Agenda on the Environmental Influences on Health that will spell out national priorities for environmental health research in Canada over the next 10 to 15 years. For this reason, health and environmental issues are not addressed as a theme area for the Nature and Society program.

3.2.3.1 Living in Nature

What is the interdependence between human and natural systems? How would human society need to change to live in balance with nature, and what are the relative roles of technology, institutions, cultural values and individual behaviour in achieving this balance?

Human systems are subsystems of the surrounding environment, and as such are deeply reliant on its ecological integrity. The character of these human systems (economic, technological, social and cultural) in turn determines their impact on nature. This is equally true for urban issues, Aboriginal or rural communities, natural resource extraction and manufacturing systems, or protected area management.

Increasingly, sustainability practitioners are grappling with how to manage on an ecosystem basis, how to accommodate widely ranging spatial and temporal scales of impacts, and how to design and manage the economic and lifestyle changes required to live more sustainably. Human and social sciences bring many dimensions to the understanding of these issues. Examples of their contribution include:

- economic valuation of ecosystem services or of ecological debts;
- socio-economic assessment of the environmental impacts of alternative economic development options;
- planning of urban transportation demand-management opportunities;
- historical and anthropological research into traditional use of the land and traditional knowledge;
- exploration of social and cultural influences on the formation of environmental values; and

- philosophical investigation of environmental justice or of how to reconcile intergenerational objectives with short-term wants and needs.

In addition to the above examples, the living in nature theme would explore how social learning and change management can be promoted. It would look at how technology shapes our relationship with nature, and explore cultural notions of welfare and well-being and how these influence consumption patterns. It would develop methodologies for the study of alternative futures.

3.2.3.2 Integrated Governance

What are the elements of good governance as seen through the lens of environmental sustainability?

There is an increasing need to reconcile governance institutions and models with emerging sustainability principles and perspectives. Current institutions and models face mounting pressures posed by:

- the need to manage global public goods;
- a growing gap in values between Europe and North America, and ongoing North/South divisions;
- tension between international obligations (trade and environmental) and local ecological and economic interests and rights;
- competing within the Canadian federation;
- an erosion of trust in institutions of all types, and withdrawal of the social licence to govern and operate;
- demands for increased transparency, accessibility and accountability to a wider range of stakeholders; and
- continued barriers to integrating environmental and social concerns with traditional economic priorities.

These stresses challenge governance in the broadest sense—from the roles of nation states, supra- and sub-national governments, to the organizational design and mandates of public and private sector institutions, and to the values, ethics and historical rights that underpin current structures.

We need to learn more about best models and practices for responding to these pressures. At the local community level, for instance, some citizen groups are working with local businesses and all levels of governments to manage airsheds and watersheds on an integrated and collaborative basis. Co-management boards, established under Aboriginal land claims, offer models for the management of migratory species. In the private sector, selected corporations are evolving from a model of governance focused on shareholders to one with a broader focus on stakeholders, and increasing numbers of companies are producing corporate sustainability reports. Municipal governments are pressing for changes in their powers to enable better governance of urban sustainability issues. And some provincial governments have delegated certain environmental responsibilities to the municipal level or to the private sector, unleashing a debate about the appropriate roles of the public and private sectors. Major reforms to the governance of environmental issues took place in Canada with the 1998 Canada-wide Accord on Environmental Harmonization. In the international sphere, the North American Free Trade Agreement (NAFTA)'s Commission for Environmental Cooperation represents a unique attempt to address

environmental concerns within the context of a trade agreement, and structures such as the Arctic Council and the International Joint Commission manage cross-border regional issues.

To date, we know surprisingly little about how these changes in governance are affecting Canada's economy, society and the environment in which we all live.

3.2.3.3 Stewardship and Innovation in the Public and Private Sectors

What tools can society use to ensure high levels of stewardship while encouraging and rewarding innovation? What methods and techniques would lead to more sustainable outcomes?

Traditional command-and-control instruments and compliance-based environmental management are proving inadequate, on their own, for achieving more complex and multi-dimensional sustainability objectives. The last decade has seen an explosion in experimentation with new approaches for balancing stewardship and innovation, but the ideal tool kit for change management remains elusive. In the public policy realm, traditional legislation and regulation are being complemented by tax incentives, subsidy removal, emissions trading, green procurement, public reporting requirements, awareness programs and various forms of voluntary initiatives. Philosophies of resource management and planning have evolved, and new forms of resource valuation and sustainability indicators are being introduced. In the private sector, environmental management systems are spreading, and tools such as life-cycle assessment, design for the environment, supply-chain management and environmental indicators are helping firms to operationalize sustainability objectives. Non-governmental organizations (NGOs) for their part have led civil-society initiatives to establish market standards for sustainability practices, e.g. through the Forest Stewardship Council certification program, and are leading programs in making information about local emissions and releases readily available to the public.

Exploration of the stewardship and innovation theme begins with an investigation of what influences current behavioural choices and management philosophies. It would incorporate how natural science knowledge is communicated and translated into public policy, and how ecological and health risks are perceived and balanced against political and economic risks. There would also be a need to assess the effectiveness of the current instruments used for sustainability management, to design models for choosing instruments, to draw lessons about the optimum combinations and design of tools, and to devise new instruments for creating a positive innovation environment for sustainability. This theme includes the tricky question of how to operationalize intergenerational equity considerations into decision making.

Another crucial aspect of this theme is how to compare and benchmark Canadian approaches against those of major international competitors. How do the characteristics of nation states (political, economic, ecological, social) influence their approaches to managing environment and sustainability?

In the realm of business management, what is the evidence for and what are the elements of the business case for sustainability? Why do some firms choose to maximize their competitive advantage through sustainability leadership, while others lag behind compliance? Further business dimensions that could be explored are the response of capital markets to sustainability initiatives and the ways in which new environmental technologies and practices are developed, diffused and adopted.

3.3 Advice on Program Needs

SSHRC has developed an array of program mechanisms, each designed to support activities at various stages of the training, research, interaction and knowledge transfer process. The design of mechanisms for the Nature and Society program will be influenced by current community capacity, the types of issues being addressed, and the needs of stakeholders (knowledge producers and knowledge users) in this field.

Consultation participants outlined various key needs that should be considered in the design of the program:

- financial support to attract the best and brightest students to the social sciences and keep them there;
- encouragement of strong collaboration between disciplines;
- development of individual knowledge leaders and champions;
- support for small research teams as opposed to major collaborative research initiatives;
- creative and aggressive approaches to outreach and knowledge transfer; and
- flexibility around partnership models.

3.3.1 Capacity Building

One objective of the Nature and Society program should be to generate a cadre of highly educated professionals, managers and researchers for deployment into all sectors of society. Such capacity building requires a new investment in graduate fellowships and top-up awards for social science studies on environment and sustainability.

3.3.2 Knowledge Development

Another objective of the Nature and Society program should be to bring the human and biophysical sciences together. The separation of the human and natural sciences has long impeded the structured and systematic production of knowledge on environmental issues. While tri-council research is not an objective of the Nature and Society program, it would be highly desirable for SSHRC, NSERC and CIHR to outline how research linking the social, health and/or natural sciences will be supported.

There is a need for both disciplinary and interdisciplinary research. Consultation participants spoke time and again of the difficulties interdisciplinary scholars face within the university system, arguing the Nature and Society program should include a strong signal regarding the value of interdisciplinary research. The program should be open to applications from all disciplines, with preference given to those with a strong interdisciplinary focus.

Participants also noted that true interdisciplinarity develops best within small groups that are able to meet often. They expressed support for a small-team approach to research funding as opposed to the major collaborative research initiative model.

There was consensus that research chairs offer a strong mechanism for developing knowledge leaders and champions, and that they enable senior people to provide leadership and catalyze research groups. As evidence, participants pointed to the Eco-Research Chair program funded under the Green Plan;

although this program was never subject to formal evaluation, individuals funded through it have continued to be leaders and ambassadors for sustainability issues within the academic community. Chairs created under the Nature and Society program should have a defined field of expertise, much like the Industrial Research chairs funded by NSERC. Knowledge users in the business sphere liked this model because it offers one-window entry into specific fields of knowledge. SSHRC's allocation under the Canada Research Chair program would need to be complemented to provide for chairs under the Nature and Society program.

3.3.3 Research Communication and Knowledge Transfer

The Nature and Society program design and funding criteria must give priority to a non-traditional and aggressive approach to research communication and knowledge transfer.

This could be achieved by encouraging very porous boundaries between academics and other constituencies, through mechanisms such as virtual scholars in residence. This approach also facilitates multiple-perspective research, by providing academics with exposure to different approaches and points of view. Other non-traditional forms of knowledge transfer should be rewarded in proposal assessments and project evaluations.

Consideration should also be given to how to better transfer the large body of research and knowledge being generated outside Canada.

Knowledge users asked that the program's outputs be made readily available, suggesting, for example, a single electronic gateway to research findings.

3.3.4 Partnerships

Consultation participants argued for "partnerships where desirable and necessary, but not necessarily partnerships." They asked for openness to a diversity of types of needs and associated partnerships. Theoretical research in fields such as environmental ethics, for example, may not require partnerships; conversely, practical research can benefit from early involvement of partners, whose contribution can take the form of funding, data sharing and/or hosting graduate researchers.

Community-based research benefits tremendously from a partnership approach. Participants supported the Community-University Research Alliance (CURA) model, which requires researchers and knowledge users to work together at all stages of the research process, from identification of research questions to application of research-generated knowledge. Some NGOs may be able to take on a more engaged role in managing such community-based programs.

Similarly, business-focused research profits from partnerships such as those under the NSERC Industrial Research Chair model.

APPENDIX A: PARTICIPANTS

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