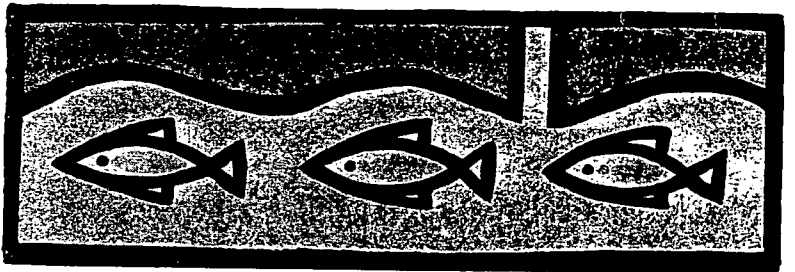
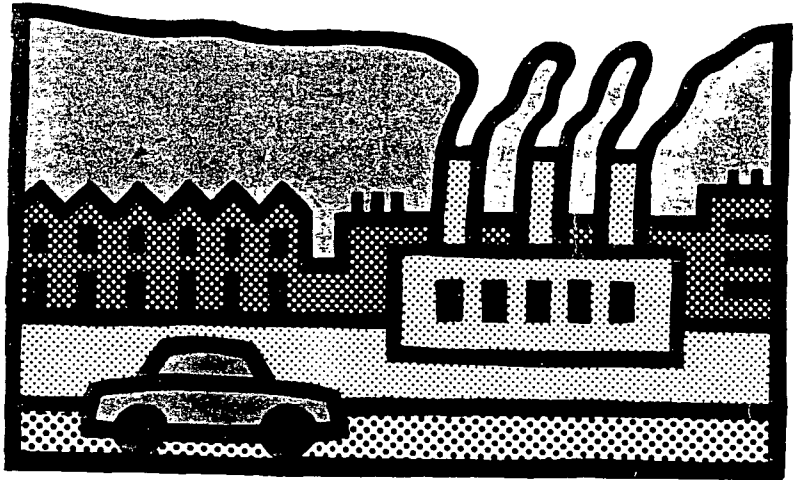
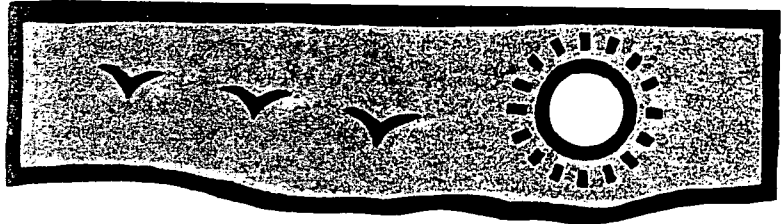


E/E WORKSHOP II
December 6-8, 1989
NCR



Sustainable Development >>>
Making the Environment - Economy
Partnership Work for Water Management

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E/E WORKSHOP II - DECEMBER 6-8, 1989 - NATIONAL CAPITAL REGION

Agenda

<u>Day One</u>	<u>Activity</u>	<u>Responsibility</u>
9	Introductions/Roles/Objectives/ Expected Output.	H. Foerstel (IWD-NCR)
9:30	10 Minute Presentations on economic instruments, factors and policies for sustainable water development (10 minute presentation, with indication of priorities).	IWD - ATLANTIC EP - NCR IWD - QUEBEC CWS - NCR IWD - ONTARIO PARKS - NCR IWD - W&N AES - NCR IWD - P&Y CPG - NCR C&P - P&Y
13:30	Work group devolvement to examine economic issues: 1. Cross-purpose policies and existing fiscal policy constraints 2. Impacts of appropriate resource pricing 3. Adequate application of the "tools" of government in the environment 4. Institutions and processes for E/E integration	
14:00	Analysis of these issues to identify the impediments to effective E/E integration and a prescription for solutions. Work groups as set up above.	
16:00	Presentation by each workgroup. Consolidation of the above in plenary session.	
	<u>Day Two</u>	
9:00	Review of previous day's consolidation of workshop issue reports.	
10:00	Preparation for dialogue with the Deputy <i>Minister</i>	
13:00	Dialogue on environment economy integration with the Deputy Minister.	

Day Three

- 9:00 Refinement of consolidated environment economy integration for sustainable development document based on discussion of previous day. Write-up of workshop report.
- 13:00 IWD regional issue review. Where do we go from here? The environmental agenda? Implementation? Resources?
- 15:00 Workshop summary and closing.

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tel.

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Client: Contact: **Place Vincent Massey - 6. floor boardroom** Date: **6-8.12.89** Start: Début: End: fin:
 Location: Adresse: **Place Vincent Massey - 6. floor boardroom** Leader: **H. Foerstel ET AL.** Recorder: Secrétaire:

Documents & Eq/Mat: **Binder: Sustainable Development > Making the Environment-Economy Partnership Work for Water Management**

Participants:
 absent
 present
 R.S.F.P.
 Inform Informer: **RLP/D.A. Davis**

Importance: Time Agenda - Programme Conclusions - Décisions Budget Follow-up - Suivi
 Sequence Temps Plan, questions, options, information Deadline Echéance Resp. Inform Informer

A	1	Introductions			
B		Roles: presenters			
C		discussion leads			
D		work groups			
E		Objectives:			
F		• explore pts. of view			
G		• "angles of attack"			
H		• get agendas out in open			
J		• agree on "vocabulary"			
K		• explore context (timing, Env. Agenda)			
L		• meet Deputy Minister / dialogue			
M		• cross-service links			
N		Expected Output:			
P		- good draft of a short "position"			
Q		statement on topic			
R		- workshop report			
S		- steps to take / action items			
T		to pursue (for each person)			
V					
W					
X					
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A'					
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Recorder:
Secrétaire:

Documents
& Eq/Mat.:

Participants:

absent

present

R.S.V.P.

Inform
Informer



Agenda - Programme

Plan, questions, options, information

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Introduction

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10. H. Naik / D. Bjornback

SUSTAINABLE DEVELOPMENT

MAKING THE ENVIRONMENT-ECONOMY PARTNERSHIP

WORK FOR WATER MANAGEMENT

E/E WORKSHOP II - SPECIFICATION OF ACTIONS

December 6-8, 1989 - National Capital Region

Introduction

Last year, 1988, the Heads of Planning of Water Planning and Management Branches of Inland Waters Directorates, the largest group of socio-economic expertise in the Department held a workshop to examine how environment-economy integration could be approached within Conservation and Protection Service (C&P). This meeting culminated in a workshop report with the above title and a recommendation that a follow-up workshop be held, the following year, to translate the three objectives of that workshop into specific water management action plans for C&P.

At a recent meeting, in Halifax, June 1989, the Chiefs of Water Planning and Management Branches encouraged the idea of a follow-up to promote the implementation of (resource) economic considerations for sustainable development within C&P. The output of this meeting would include a set of specific actions that could be turned into workplans for incorporation at the regional and national level for the 1990/91 and subsequent years.

The rationale for this meeting rests on the need for the Department to be involved, and to be seen as being involved, in the economic side of the environment-economy integration, one of the most important components in the implementation of sustainable development. Although the existing socio-economic resource base within the Department rests largely within the Planning Divisions, there are other economists within C&P and the other services, more recently in Corporate Policy Group. Representation will be sought from these resources and an invitation for participation has been extended to and accepted by the Deputy Minister.

The attached agenda lays out a framework of several components that will facilitate the attainment of the workshop objective - ~~To identify the~~ activities that need to be taken, by the Department, to implement environment-economy integration for sustainable development in the water (related) sector of the environment.

- Each participating organization (IWD-NCR, EP-NCR, etc.) will prepare a short 5-10 page (10 minute paper) for pre-distribution to all participants and presentation and discussion on the first day of the workshop. This paper is not to be an outline of what is currently being done, but rather, a discussion paper for actions by government to facilitate/enhance/promote economic

solutions to environmental problems in the context of sustainable development.
These papers are to "faxed" out to all participants on the workshop distribution list by November 30, 1989 at the latest.

- On the first day, after opening remarks by H. Foerstel and others, we will move into presentation and discussion of the papers. The general themes will likely fall into one of the categories identified in the agenda for work group activity. Pacific and Yukon Region will facilitate this session.

- Following lunch, the work groups will be assigned their tasks and reconvene later for discussion and consolidation of their results. This will continue into the next morning in preparation for the dialogue with the Deputy. The purpose of the dialogue is to exchange views about the significance, feasibility and desirability of each of the proposed economic actions, identified by the work groups, on the policies of the Department and the federal government. The general focus will be with respect to water related resources. Ontario Region will facilitate these sessions in co-operation with Atlantic and Quebec.

- The results of this dialogue and the workshop will be summarized and drafted in preparation for a workshop report. IWD representatives will remain on the final day to prepare the report and all participants will participate in the review of the final workshop report document before it is released as an internal departmental document. Western and Northern Region will facilitate this activity.

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R. McNeill

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DRAFT

POTENTIAL ENVIRONMENT CANADA (CONSERVATION AND PROTECTION) PROGRAM
ACTIVITIES TO PROMOTE SUSTAINABLE DEVELOPMENT FOR WATER AND RELATED
RESOURCES IN THE PACIFIC AND YUKON REGION

Planning Division
Inland Waters
Pacific and Yukon Region

November 28, 1989

Introduction

A reliable supply of good quality water is a prerequisite for achieving sustainable development in a regional or national economy. Environment Canada must take the lead role in promoting Environment/Economy integration by developing knowledge and techniques that promote efficient use of natural resources.

This paper presents an outline of areas where Environment Canada should develop program activities to promote sustainable development. Emphasis is placed on the use of economic instruments and on institutional arrangements necessary for sustainable development. This list of items is based on perceived problems in the Pacific and Yukon Region. Many of these problems are related to global or national environmental concerns and can only be addressed through national programs. The action items are therefore classified as either regionally based or nationally based.

Regionally Based Programs

1. Umbrella Water Management Agreement with British Columbia

Problem

Water management problems are too large and jurisdictionally complex, particularly in large Basins such as the Fraser River, to be handled unilaterally. Environmental, economic and social factors must be considered simultaneously when making decisions on water and related resource use in order to move towards sustainable development. Therefore, there is a need for a coordinated effort by all levels of government before remedial and preventative actions can be implemented to achieve sustainable development.

Action

An umbrella agreement with British Columbia similar to the Prince Edward Island Water Management agreement is required. This type of agreement would cut across jurisdictional boundaries and provide the administrative vehicle to take both remedial (reactive) and preventative (proactive) actions. Activities under this type of agreement would aim to identify, prioritize and remedy water and related resource management problems and would promote integrated management of water and related resources. The actions proposed in subsequent sections to deal with water management problems could take place under the mandate of an umbrella agreement.

2. Renewal / Expansion of Fraser River Estuary Management Program (FREMP)

Problem

FREMP's mandate is limited to the estuary but does not have responsibility for the Upper Fraser River, which may be the source of some of the downstream problems. Furthermore, the Agreement covers many water use problems but has no direct say in land use issues that effect the water resource. Land use zoning and regulation is under the jurisdiction of municipal and local governments whose decisions are not subject to FREMP.

Environmental problems in the Fraser River Basin have resulted because the present resource management system has not been able to deal with numerous and diversified economic activities and non-point source pollution. In order to achieve sustainable development, a suitable institutional arrangement must be established that is able to manage and regulate all activities that affect the water resource.

Action

The federal and provincial governments must develop a cooperative action plan to manage activities that affect the sustainability of the water resource in major river basins. The plan should involve both the users of water and related resources and all levels of governments that have jurisdiction over zoning and land use. Strategies for the integrated management water and land resources could then be developed. Planning and management activities under the Action Plan should be done for the entire river basin. FREMP, which deals only with the estuary, should become a sub-agreement under a broader Fraser River Basin Action Plan.

3. Review of the Okanagan River Basin Implementation Agreement

Problem

Under the terms of the Agreement, which expired in 1982, a five year review of the framework water management plan was to take place to see if the plan was meeting the needs of the Basin's population. This review has not yet taken place. The opportunity exists to use the proposed review to examine current management of water and related resources in the Basin from a sustainable development perspective.

The Okanagan River Basin is an example of how environmental capital has been lost during economic expansion. Continuing degradation of water quality could have long term impacts on the economy of the region. Supply management techniques to resolve water shortages cannot be sustained in this region.

Action

A federal provincial review of the water management plan should take place within the context of sustainable development. Particular emphasis should be placed on demand management tools, including water pricing and agricultural water conservation, that were not examined during the implementation phase of the agreement.

4. Promotion of Efficient Water Pricing for Municipalities

Problem

Water pricing policies in British Columbia are inefficient and only 50 percent of municipalities have universal residential metering. The largest metropolitan area, as well as interior dry belt areas do not have universal metering. As a result, flat rate schemes, which encourage over use of water are often the norm.

Resistance to metering and efficient pricing is based on three factors:

1. Lack of knowledge of the benefits of efficient pricing,
2. Cost of meter installation and reading,
3. Lack of guidelines for setting volume-based pricing.
4. Public resistance to an increase in water prices.

Action

Promotion of water pricing by senior management in the regions is necessary. A program to provide financial assistance for meter installation may be required to obtain universal metering. The preparation of guidelines to assist municipalities in establishing water pricing is underway. This work should be expanded to include agricultural water use. DOE has funded work on instructional material and software for utilities to determine the benefits of water metering. Development of similar material to aid in water pricing should be continued. A communications plan should be developed and implemented to promote the need and value of water pricing to the public.

5. Control of Pulp Mill Effluents

Problem

The pulp and paper industry is exceptional in the amount of water required for operations and in its production of organochlorines. New pulp mills are proposed on the Peace River in British Columbia, which connects with the Athabasca and MacKenzie systems in Alberta, where major new pulp mill developments are also proposed. The effect of this development is unknown.

The number and capacity of pulp mills in British Columbia has increased dramatically in the last twenty years. Regulation by the provincial government is not well coordinated with Federal Fisheries. Enforcement of current regulations is insufficient as witnessed by the recent shutdown of the shellfish fishery in Howe Sound and a number of other locations on the British Columbia coast due to high concentrations of dioxins and furans originating from pulp mills.

Action

Coordinated government programs are required to monitor, control and remedy environmental effects of effluents from pulp mills. The feasibility of using pollution charges should be examined as part of this program. Pollution charges could stimulate the development of new technology (environmental industries) and the modernization of pulp mills. Immediate remedial actions, modeled on the Ontario Remedial Action Programs, may be required to deal with environmental damage that has already occurred.

Programs Requiring National Participation

1. Federal Programs for Recycling

Problem

Solid waste disposal is becoming a critical problem in the populated areas of British Columbia. Existing disposal sights in the Lower Mainland are approaching maximum capacity. High precipitation and proximity of landfill areas to the Fraser Estuary and Burrard Inlet result in leaching of pollutants to both ground and surface water.

Action

A national program for environmental industries should be developed that includes significant funding for recycling facilities. In particular, incentives are required for establishment of de-inking and processing facilities for recycled paper as Canadian facilities are very limited. The demand for recycled paper is expected to grow with legislation in 14 American states, including California, that requires all newspapers to use a significant percentage of recycled paper for newsprint by the early 1990's. Expansion of current facilities for metal and glass recycling should also be encouraged through financial incentives.

Funding programs should be included as part of federal activities directed towards economic expansion and diversification. For example, they could fit in under the Western Economic Diversification or Industry Science and

Technology programs. Liaison with Department of Environment would be necessary at the senior management and technical levels.

2. Federal Programs for Alternative Fuels

Problem

The production and impact of greenhouse gasses is a global concern. The local effects on climate and hydrology are not well known but have potentially serious consequences in British Columbia where there is significant coastal zone development.

Action

Direct federal involvement is required for widespread adoption of cleaner fuels for automobiles. Actions would include legislation for production of alternative fueled vehicles (eg. natural gas, hydrogen), funding of fueling networks and conversion grants. Interdepartmental coordination at the cabinet and deputy-minister level would be required.

Such a program is of regional interest because of the abundant supply of natural gas in Western Canada. The prevalence of hydroelectric facilities in British Columbia would also prove to be an advantage in hydrogen production, which is the cleanest burning fuel. There is significant potential to use the excess hydro-electric capacity in non-peak periods for cost efficient production of hydrogen by electrolysis of water.

3. Environment Canada Participation in Population And Immigration Policy

Problem

Population targets and immigration quotas are based on economic requirements without consultation of Environment Canada. Economic benefits of population increases are achieved at some environmental cost (increased pollution and depletion of limited natural resources). Immigration and population increases occur mainly in large urban areas of Toronto, Montreal and Vancouver where the ability of the environment to sustain development is already limited. Major urban areas already suffer from traffic congestion, poor air quality, limited supplies of water and difficulties in solid and liquid waste disposal. Increased population will place further strains on the environment, especially in major urban areas.

Action

Population and immigration policy should take into account both environmental and economic factors. Environment Canada should be consulted in setting population and immigration targets. Participation at deputy minister and cabinet level would be required.

3

W. Sinclair

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Sustainable Development

Formulating a Perspective

by

William F Sinclair
C&P, P&YR

To date the sustainable development efforts within DOE and C&P have focused on generating greater understanding of what are conceived as the concepts advocated by the Brundtland Commission and recommended by the National Task Force on the Environment and the Economy. Although not denying the importance of developing a program which everyone appreciates and understands, the main thrust of these activities fall well short of the policy directions and institutional reforms recommended by the Commission (Our Common Future:11-23). In fact, when the principles advocated by the Brundtland Commission are examined in light of the sustainable development initiatives now underway within the DOE and C&P, it becomes clear that the current program is less than complete. Except for the one activity of "developing and integration of national data bases as well as scientific and technical research", it could be argued that all of C&P's sustainable development activities are mainly passive and cosmetic (Conservation and Protection Sustainable Development Progress and Plans:4).

Even a very cursory examination of the Brundtland Commission report undeniably confirms the concern the Commission has for having government environmental agencies throughout the world establish policies and programs, which encourage changes to "produce trade, capital, and technology flows that are more equitable and better synchronized to environmental imperatives" (Our Common Future:41). The emphasize is to initiate a reward system based on economic incentive (not necessarily subsidy) so that industry and the public consider it to be in their own best interests to behave environmentally responsible. It is not enough to simply meet with industry and the public and suggest that sustainable development is in everyone's best interest. Government environmental agencies

grams and delivery mechanisms so that the concept of sustainable development becomes meaningful and realistic. The Brundland Commission Report states:

The role of public policy is to ensure, through incentives and disincentives, that commercial organizations find it worthwhile to take fuller account of environmental factors in the technologies they develop (Our Common Future:60).

Throughout the report examples are given where government policies reward rather than penalize those who act environmentally irresponsible. In this regard, the Commission draws attention to the perils associated with subsidies that encourage the overexploitation of fish, the excessive use of agriculture land, the overuse of chemicals, and the destruction of forests (Our Common Future:30,57). According to the Brundtland Commission, there is "no single blueprint of sustainability and each nation will have to work out its own concrete policy implications" (Our Common Future:40). Nonetheless, the Commission's report makes it is clear that government environmental agencies are not performing in a manner consistent with the principles of sustainable development, unless the policies and programs of these agencies are such that they encourage (even force) polluters to take responsibility for the environmental degradation they are causing at no cost to then remainder of society.

As the agencies with primary responsibility for the environment within the Canadian Federal Government, DOE and C&P are in a position to help Canada maintain a leadership role in sustainable development. However, this will not endure over the long term unless the current sustainable development initiative within DOE and C&P is focused on those activities that were envisioned by the Brundtland Commission and structured in a manner consistent with the C&P Task Force on Environment-Economy Integration. In this regard, it should be noted that sustainable development as practiced within C&P includes some part of have to demonstrate their commitment to sustainable development by altering pro-

practically every mainstream program activity. For example, a recent statement on strategic directions indicates that a sustainable development approach involves:

- react and cure existing environmental problems
- anticipate and prevent: environment into economic decisions
- the wise use of natural resources
- preservation of genetic diversity: a holistic ecosystem approach to planning
- the four "Rs": reduce, recover, recycle, re-use
- an international response.

It even includes a Conservation Strategy, the justification of which I suppose is based on a reference to a National Conservation Strategy on p. 157 of the Commission Report. In this reference the Commission suggests that a Conservation Strategy is a useful tool for helping to anticipate and prevent species depletion and damage to ecosystems. The Commission does not suggest or recommend a Conservation Strategy as part and parcel of sustainable development, nor should it be considered necessarily consistent with sustainable development.

The responsibility placed on governments by the Brundtland Commission is substantial. In fact, the challenge for both governments and their environmental agencies could be considered onerous. If taken literally it includes a concern for population control, the distribution of wealth internationally, and even job creation and growth. However, the main focus for these concerns as they can be interpreted to pertain to C&P initiatives is on:

- (1) establishing pricing mechanisms that require industry and the public to take into account the environment

and resources in their economic decisions, and

- (2) restructuring policy and programs to avoid the unintended consequences of regulations and enforcement procedures which detract from environmental protection by rewarding those causing pollution.

If we look at (1) above, there is no question that current C&P sustainable development initiatives give recognition to this need. IW is making a large contribution in this area on water pricing. Nonetheless, as suggested above, it can be argued that C&P is not adequately focusing sufficiently on putting in place the necessary mechanisms to ensure that environmental concerns are incorporated into economic decisions. What we appear to be depending on is moral suasion. There is the misconception that industry and individuals are going to voluntarily invest on environmental controls or alter behavioural patterns that are destructive to the environment simply because government asks them. As everyone who is involved in socio-economic issues related to water pricing issues knows, neither industry or individuals will include environmental considerations in economic decisions unless there are incentives for doing so. The Brundtland Commission recognised this, and if we are to be successful, we in C&P must recognise this reality.

The main message here, however, is not to advocate resource pricing or or simply force polluters to pay. This obviously is very important, but I certainly don't have to convince economists from IW about this importance. What you may require convincing about, is the important role IW economists can play with respect to (2) above. Namely, the contribution that IW economists can make - as the only economic group in the regions and involved in operational matters - in

helping to foster program delivery mechanisms that do not result in the unintended negative impacts on either the environment or the nation's resources.

The federal government's ability to influence the price paid for the use of publicly owned resources is limited. The provinces own the resources and are responsible for most of the instruments that can be used to directly reward or penalize industry or even consumers for their environmental behaviour (municipal recycling, stumage fees, water-use pricing, sewage treatment). The DOE and C&P can encourage the provinces and municipalities to adopt marginal cost pricing, but DOE and C&P has limited direct responsibility for delivery in this area. What we can do, and what I am arguing we should be doing, is examining DOE and C&P programs to ensure that in every instance the initiatives of the federal government are consistent with sustainable development. The need for industry and the public to take incorporate environmental considerations into economic decision making is well understood by C&P, but as government agencies making decisions on the environment we do not appear to adequately understand the need to take economic considerations into account when making environmental decisions. Some will argue that we take economic considerations into account because we undertake cost-benefit analyses; that we do Regulatory Impact Analysis statements on both new legislation and amendments to existing legislation. However, no matter how necessary or well-founded these efforts do not necessarily guarantee regulatory and enforcement patterns conforming to sustainable development.

The Brundtland Commission cited several examples where governments have adopted what are supposed to be environmental initiatives which are at cross-purposes with protecting the environment or conserving resources. The Brundt-

land Commission noted that governments throughout the world:

- have laws to reduce overexploitation of fish stocks only to provide subsidies through tax benefits that encourage over-capitalization and overfishing
- pay farmers to continue to grow crops on land that can no longer sustain production, which at the same time contributes to soil erosion, nutrient depletion, and the over-use of pesticides
- maintain stumpage fees so low that it pays the forest industry adopt practices that lead to the inefficient use of resources, discourages paper recycling, and contributes to the need for governments to make public funds available for reforestation
- charging electrical fees which encourage over-use of power and hydro-electric developments, which indirectly leads to waste and deterioration of water quality, the destruction of fish habitat and upsets the sometimes critical ecological balances.

There are hundreds, perhaps thousands of these examples that can be cited, and most are indicative of practices in Canada.

Examples that directly pertain to our circumstances are:

- (1) Toxicity tests which are based on water concentrations. The less water used in manufacturing operations, the higher the concentration of toxic substances in plant and mill effluents, and the more likely these operations are to fail our acute toxicity tests.

Our department is urging water pricing to conserve water, while at the

same time we are discouraging water use reductions by administering water toxicity tests based on effluent concentration.

- (2) Another example is where we do not set time limits whereby manufacturing operations have to achieve a specified standard at a give point in time. We negotiate, thereby making it profitable for a manufacturing operation to delay adopting the controls necessary as long as they possible (cost of installing a \$20 million effluent control equipment).
- (3) Still another example of failing to take into account adequately economic considerations is where we treat companies or individual operations as if they are unable to meet government control standards because of a perceived threat to economic viability due to fluctuations in the business cyclical (seasonal worker example).
- (4) The federal government helps to subsidize the drainage of wetlands, which encourages farmers to use marginal lands for growing crops and reduces the wetlands availabe for bird populations.
- (5) Crop quotas are given to farmers on the basis of the total amount of land used for farm production. This further encourages the use marginal lands to the disadvantage of wildlife populations.

At ther risk of being in direct contradiction to the views of some of those working within C&P on sustainable development, these are not new or philosophical ideas which need to be proven effective to gain public support. Some education is needed, but there are many influential people who are knowledgeable in this area and do not need convincing. Dr. Dewees of the faculty law in the University of Toronto in a recent speech stated that " efficiency

standards without higher energy prices will not achieve substantial energy savings" (Proceedings Environmental Research: 1989 Technology Transfer Conference in Toronto). It is Dr. Dewees's view that there is not yet exist enough knowledge to identify all of the human activities causing depletion of the ozone. However, we do know that CO₂ is a major contributor to the problem. By acknowledging that we do not at present have fossil fuel alternatives, and we are not likely to have any within the foreseeable future, Dr. Dewees comes to the conclusion that the most practically solution is to establish a tax for those using fossil fuels to both encourage the development of new technologies and reduce CO₂ consumption. As recorded in the Globe and Mail on the 24th of November, 1989, a French agronomist - Mr. Dumont - recommended a similar approach for dealing with this problem at a recent sustainable development conference in Montreal.

Murray Rankin a law professor at the University in a recent speech to the British Columbia Water and Waste association inedicated, that in his opinion after studying pollution enforcement in B.C., the only to overcome what he felt was the lack of will to enforce pollution control regulations, was through the use of economic incentives and disincentives. According to Dr. Rankin, environmental agencies must eliminate the economic incentives for manufacturers to delay or avoid adopting pollution controls, if governments are to be successful in reducing the pollution caused by industry. Regulations and enforcement will not of themselves bring the problem under control (imagine, this from lawyers??).

Recently the Austrialian Government established a pricing scheme for farmers in New South Wales to conserve the use of water. Farmers are allowed to buy and sell their allocations in open market. The pricing system for water to-

gether with the establishment of a free market system serves as an incentive to conserve water, but also helps to ensure that water is used most efficiently by those employing it in its most productive use.

Michel Potier of OECD has argued for the need to remove what he refers to as contradictions between environmental and economic sectorial policies. As Dr. Potier puts it governments must first "identify those interventions which prove detrimental to the environment", then they must adopt "policy reforms in order to eliminate them" (Proceedings Environmental Research: 1989 Technology Transfer Conference, in Toronto).

The nations making most use of economic incentives and disincentives, and those who have done most in terms of reformulating regulatory and enforcement strategies to avoid rewarding polluters for polluting are the Europeans. In fact, the OECD has published a book listing the economic programs and reforms that have been established within OECD member nations. It is my understanding that the number of programs being established is increasing so fast, that a up-dated version is being prepared.

It is obvious from the foregoing examples that DOE, and as part of DOE, C&P is going to have to move rapidly if we are to maintain what many feel is a leadership role for Canada in sustainable development. The DOE and C&P will have to provide greater focus for sustainable development within ongoing operational and regional program activities. The incentives for polluters to continue pollute or over-utilize the nation's resources have to be eliminated, if we are to make progress in adopting sustainable development as a concept that results in better overall progress in protecting and preserving the environment for the benefit of present and future generations. As economists working within

an environmental agency for a government committed to sustainable development, we must be prepared to examine and recommend adjustments to both sides of policy issues. It is not enough to encourage the provinces and municipalities to price resources and establish penalties for pollution. It is not enough for DOE and the C&P to establish such mechanisms, we have a responsibility to ensure that those causing environmental damage are not inadvertently rewarded for environmental excesses. We must work to eliminate contradictions between environmental and economic sectoral government initiatives. This requires strengthening of economic capability not only at the policy level (a direction the Department appears to have moved), but also in developing and formulating regulations, enforcement procedures, and program delivery mechanisms - both at headquarters and within the regions.

I have been a member of the DOE since it was established. I am aware that some within the C&P may find this revolutionary or threatening to "their bureaucratic or professional turf". However, it is only a matter of time now until other professionals or government lobby groups recognise what some already have (as noted above). The environment is not the exclusive domain of any profession, organisation, or group within our society. The environment belongs to the world and all GOD's creatures. Our department is on the leading edge of a concept which could dominate environmental thinking over the next decade. IW economists, as the critical mass of economic talent within C&P, and the only source of economic input for C&P programs in most regions, have a responsibility to work with operational managers and headquarters personnel to help make sustainable development a meaningful reality within the department and government by helping to fill what appears to be a very substantial void in our current understanding of environment and the economy.

4

R. Rivers

E/E WORKSHOP II
DECEMBER 6-8, 1989
NCR

**PERSPECTIVES ON ACHIEVING SUSTAINABLE DEVELOPMENT
THROUGH ENVIRONMENT AND ECONOMY INTEGRATION**

PREPARED FOR
MAKING THE ENVIRONMENT-ECONOMY PARTNERSHIP
WORK FOR WATER MANAGEMENT
E/E WORKSHOP II - SPECIFICATIONS OF ACTIONS

BY

INLAND WATERS DIRECTORATE - ONTARIO REGION

December 6-8, 1989 - National Capital Region

INTRODUCTION

Last year the Planning Divisions of Inland Waters Directorates met to examine conceptual approaches to achieving environment-economy integration for sustainable development in the context of water management. Much has happened since that time in regards to the expectations of the public (and the discovery of the expectations of the public) on environmental management issues. In light of these expectations, there is, currently, an opportunity to demonstrate federal leadership in environment-economy integration. This is certainly true for water management, but it is in many ways more important that we extend our grasp, as environmental socio-economics professionals, beyond a strict interpretation of role as water managers into other elements of the ecosystem including man.

PROBLEMS AND SOLUTIONS

There are an almost infinite set of environmental problems that pose a barrier to the achievement of sustainable development in Canada. Almost all of these are a result of human activities; ie, socio-economic. Many of these are the direct or indirect result of federal activities with respect to existing or the lack of existing policies (legislation, regulation, fiscal). Most of these federally induced problems arise from the activities of federal agencies other than Environment Canada. However, as DOE assumes a greater role for policy in all environmental matters (EARP), we will become, more and more, part of the solution or the problem. The purpose of this paper is to discuss possible solutions to a partial set of this myriad of problems.

1. Leadership

If anybody is to believe that the federal government is serious about sustainable development, we have to demonstrate our commitment. The provinces and municipalities have jurisdictional authority for many of the development

activities that conflict with sustainable development and they may not accept our direction in these areas unless we are seen as having our own house in order. As a consequence, we should take immediate steps to:

- make all federal facilities/activities water efficient (conservation)
- purchase only recycled and unbleached paper products
- make all federal facilities energy efficient (use of windows and stairways)
- make all federal activities energy efficient (small cars, military exercises)
- replace hard copy with electronic media (reports, flyers, cheques)
- fully embrace the three R's (especially reduction)
- permit professional and project employees to work at home via electronic media to save trips to office.
- relocating government offices closer to the employees

ACTION: Announce a proposed designation of all federal facilities and activities as environmentally sustainable and set up a process involving the public interests to facilitate this activity within a given time period.

2. Research

There is a great need for substance to accommodate the philosophy of sustainable development. In particular, major efforts are needed to:

- predict/anticipate the degree to which current economic activities, in part and together can affect (need to be modified for) sustainable development
- develop indicative (providing sustainable performance targets) economic plans for key environmental impacting sectors (energy, immigration, urban development)
- modify national accounts to reflect environmental concerns (measuring the stock/inventory of resources as well as the flow of income and expenditures)
- support development of "end of pipe technologies" and "source reduction" approaches (environmental industries)
- provide incentives and subsidies for private sector programs leading to sustainable development where appropriate.

ACTION: Strike a task force of TBS, Finance, DOE, PCO, Economic Council, academics to develop a revised set of economic productivity and health indicators (Gross Domestic Well-being) that would address the inadequacies of the current national accounts system.

ACTION: Request the E.C.C. to dust off previous indicative planning models to assess the appropriateness of these for targeting and managing sustainable development.

3. Regulatory Policies

Environmental legislation and regulation need to be substantially broadened and strengthened. In addition, all federal legislation/regulation and policies should be reviewed to identify and eliminate those that are unsustainable.

ACTION: Set up a task force (representatives of regional staff) to review all federal policies that might be at cross-purpose to sustainability (including reg's and leg's).

ACTION: Review the need for regulation of activities that may not be easily influenced through economic (dis)incentives.

4. Fiscal Policies

Taxation, subsidy, procurement, appropriate resource pricing, and enhancing the economic climate are approaches to moving towards a less regulated/policed society. The advantages include a more efficient goods and services producing sector. A prerequisite to effecting these kinds of policies is an understanding of the long term sustainability of the resource sector, including air, water, wetlands, etc.. The jobs-or-environment tradeoff paradigm needs to be put to rest. Attention should be paid to distributional as well as allocative issues if these policies are to be broadly accepted by society.

ACTION: As a consequence of 2 above, develop sustainable resource utilization planning. Increase all resource royalty charges within the control of the federal government, as soon as possible, based on domestic and international experiences in these markets. Commence negotiation and provide support for the these types of market activities at the provincial and municipal levels.

ACTION: Terminate, immediately all unsustainable program incentives (farm drainage grants/loans, etc.).

ACTION: In cooperation with Finance, modify the tax system (direct and indirect) to remove unsustainable activity exemptions and to increase/apply taxation on these activities.

5. Awareness and Education

Many believe that the best necessary approach to sustainable development is to change society's attitudes towards resource use and waste. The "frontier mentality" that was characteristic of a developing nation has largely stayed with us and tends to restrict our inclination to resolve problems ecosystemically. Our society typically looks outwards, and not inwards to find solutions to the problems; eg. contaminated ground water, water shortages, etc.. This approach is in conflict with the ecosystem approach. There is a need for stimulating awareness of this issue by modifying curricula and providing basic instruction at academic institutions, by demonstrating alternatives to traditional solutions in communities and by informing the public on the issues (thereby affecting demand?).

ACTION: Set up a national education task force to identify and debate changes to curricula to include environmentally sustainability and refocus studies leading to unsustainable practices (storm water engineering, benefit cost analysis, etc.) and reform the educational process in these regards. Particular focus should be given to engineering and economics faculties (Paul Ehrlick)

ACTION: Expand the notion of consumer choice to include a wide range of services, intermediate products and processes and involving public participation in choice assessments.

6. Others

There are a host of areas where federal policy needs to be strengthened to send clear messages to society:

- zero discharge of persistent toxic chemicals requires an implementation timetable for effluent levels, production processes and products and services.
- the concept of effluent mixing zones for all contaminants is incompatible with ecosystem management and should not be allowed in the natural environment
- best available technology (BAT) should be a task left to industry to develop and this is particularly true for economic achievability (BAT-EA)
- federal environmental assessment has not worked through self-enforcement and all projects should be screened and evaluated by DOE
- since there is a great need to avoid complicity with industry on the one hand (BAT-EA) but also a need to establish close working relationships on the other (target loading ceilings and allocations) forums beyond the roundtables need to be established for government-industry interaction.
- population management through immigration must account for the limited sustainable capacity that exists in Canada and net migration, in the absence of better information should be reduced to a steady state level at or near zero. A continuation of current fertility levels would ultimately lead to a decline in overall population for a more sustainable society.
- northern development should be discouraged since it is highly energy inefficient.

ANOTHER ELEMENT

Society in its present form is inherently unsustainable, mainly because its continued development is based on a reliance on a non-renewable source of energy, fossil fuels and also because of a lifestyle that is energy intensive and waste abundant. The apparent success in the application of economic disincentives to reduce wasteful energy use in the seventies seems to have vaporized as we move into the nineties. This could be blamed partly on the lack of a consistent energy conservation policy, on poor economic oversight in forecasting energy supply and demand, or in the limited ability of economic incentives alone to effect long term change in a market economy. There may be a need to examine other approaches than regulation, economic incentives and resource pricing.

Clearly there are infrastructural realities that will make deep change difficult to achieve, and it is deep change that is needed to move society towards sustainability. Suburban developments, for example, which do not favour alternative transportation, predominate the urban landscape and will be with us a long time. The efficiencies of high density housing and self sufficient neighborhoods are only just beginning to be discussed, let alone accepted, by society. Thus, there are going to have to be ways to make this sector, currently so dependent on the automobile, more sustainable in its daily existence. Thus there is a need to consider ways of encouraging major change that will have to transcend our somewhat fixed notions of urban lifestyle, high mobility and uninhibited trade.

Waste management provides an example of one area where society has/is acting in the absence of regulation or direct economic incentives. Notwithstanding the fact that no direct economic incentives were offered, this urban household sector embraced the practice of waste recycling. Many would argue that even more recycling would be occurring but for the lack of municipal programs. Whatever motivated society to embrace solid waste reduction may also be a potent factor to stimulating society to changing the way that it regards the environment and its place in the ecosystem.

Thus, while it is accepted that there will always be a role for the regulation of environmentally damaging societal activities and a need for utilizing more direct economic instruments to motivate sustainable behavior by affecting the bottom line of industries and individuals, there is also a place for recognizing the potential that exists in a motivated society. All three elements are important.

END...

5

F. Filion

E/E WORKSHOP II
DECEMBER 6-8, 1989
NCR

CONSERVATION AND PROTECTION

CONSERVATION ET PROTECTION

MEMORANDUM

NOTE DE SERVICE

TO/À

AUTEUR/E

+-	B. Smith	D. Burich	M. Gosselin	--+	+-----+
!	S. D'Aquino	R. Rivers	B. Emmet	!	!Security-Class.-Sécurité !
!	R. McNeill	T. Muir	J. Keefe	!	!
!	D. Bjonback	A. Sudar	H. Foerstel	!	+-----+
!	L. Good	J. Hammerli	D. Tate	!	!Our file -N / Référence !
+-	J.Y. Cayen	N. Beaudoin		--+	!
					!
					!
+-				--+	+-----+
!	Chief			!	!Your file -V /Référence !
!	Socio-Economic Division			!	!
!	Program Analysis & Coordination			!	+-----+
!	Canadian Wildlife Service			!	!Date November 30, 1989 !
+-				--+	+-----+

SUJET/SUBJECT: IWD Workshop on E/E Partnership December 6-8, 1989

I will be unable to attend the above workshop because of meetings related to E/E considerations pertaining to the \$1.5 billion North American Waterfowl Management Plan. Nevertheless, I felt it might be helpful to share with you the speaking notes (attached) used in my briefing of Wildlife Ministers a few days ago. The key ideas that I would invite you to consider during the workshop are the messages contained in part 5, "Sustaining the Benefits", of those speaking notes and the operational definition of Sustainable Development.

Wildlife which depends on water, is an important socio-economic and political resource. As you know, direct and indirect socio-economic benefits related to our environmental resources are often poorly documented. This lack of strategic socio-economic insights often results in lower program funding and lower political clout than are required for successful conservation and protection policies or programs. I encourage you to examine part 5 of the attached notes with the above in mind.

In closing, I recommend that the workshop members allocate some time to discuss the merits of quantifying and consolidating the contributions that water, and other environmental resources which depend on water such as wildlife, make to the economy, and to the well-being of society. I believe this would be a highly useful activity to encourage in the workplans. The National and Provincial Round Tables on E/E would provide excellent outlets for these socio-economic results. The results would also be vital in developing and justifying much needed socio-economic incentives to conserve biological diversity as recommended by IUCN.

Good luck in this important meeting!


F.L. Filion

Att.

Sports

Wildlife-related activities are in demand

It takes a while to digest all the facts and figures released last week in the report The Importance of Wildlife to Canadians in 1987, but the overall message for our policy makers is clear. The demand for wildlife-related activities is immense and continues to grow across the country.

The latest Stats Canada survey confirms the significance of wildlife as an important social and economic asset for every province. Since a similar 1981 study, total expenditures on wildlife related activities have increased by 21 per cent to \$5.1 billion, the total time spent has increased by 157 million days, and the "average" participant is a little older and better educated.

The recent survey was sponsored by the federal government and 10 provincial wildlife agencies. More than 55,000 people over age 15, including 16,000 from Ontario, responded to a question-



GRANT HOPKINS
Citizen staff

OUTDOORS

naire on their wildlife pastimes.

The attitudes of Canadians towards wildlife was one of the key questions. Over 83 per cent said that maintaining abundant wildlife was important for the country. The disturbing factor is that the remaining 17 per cent of Canadians feel wildlife is of no or little value, or didn't know enough to reply.

The report indicates that 91 per cent of Canadians (18.3 million) participated in one or more wildlife-related activity. That doesn't

mean the majority of Canadians are fanatical stompers in the woods and marshes because watching wildlife programs on TV and reading wildlife books on a January weekend also counted.

An interesting profile is provided of the hunting fraternity. Although the number of people who hunt is down slightly from 1981, 8.4 per cent of the Canadian population (1.7 million) participated in 1987. The majority hunted big game followed in popularity by upland birds, small game and waterfowl.

Hunting is predominantly a male sport (90.4 per cent), equally divided between urban and rural residents, with over half between the ages of 15 and 34.

Hunters accounted for 20 per cent of the total wildlife expenditures nationally, or just over a billion dollars. Ontario hunters spent an estimated \$314 million or an average of \$630 each. The

report notes they also engage in other wildlife activities, which contributes a similar amount to the provincial economy.

For the first time, the 1987 survey included questions on recreational fishing and trapping. An estimated 5.6 million Canadians (28.1 per cent) fish with a 70-30 split between males and females. On a population basis, Newfoundland leads the field, followed by B.C. and the prairie provinces. Nearly 28 per cent of Ontario residents spend an average of 17 days with a rod and reel.

About 400,000 Canadians evenly divided between urban and rural residents, trap small mammals.

In summary, the wildlife report is ammunition to push for strong conservation policies, programs, and legislation at all levels of government. A copy is available from Fern Filion, Canadian Wildlife Service, Ottawa, K1A 0H3.

Les Canadiens ont la passion des activités fauniques

 Louis-Gilles Francoeur

LA PASSION des Canadiens pour la faune de leur pays constitue un véritable trait sociologique si l'on se fie aux constatations de la dernière enquête nationale menée par Statistique Canada.

Cette enquête, menée en 1987 auprès de 80,000 personnes, révèle que :

- un Canadien sur trois, soit 6 millions (30,8 %) sur 20 millions à l'époque, ont pratiqué cette année-là la chasse, la pêche ou le piégeage en même temps que d'autres activités dites « non consommatrices » de la faune. Même si le rapport ne le précise pas, il s'agit probablement pour une société dite industrielle d'un taux exceptionnel qui frise le trait culturel : plus précisément, un Canadien sur trois a pêché à la ligne cette année-là et un sur dix s'est déclaré chasseur actif (le double voudrait en faire autant);

- toujours en 1987, 91,3 % des Canadiens ont participé à une activité reliée à la faune : ils ont consacré ensemble 1,2 milliards de jours à des activités à la faune et dépensé à cette fin 5,1 milliards \$;

- pas moins de 70 % des Canadiens ont en 1987 pratiqué diverses activités non consommatrices de la faune, dans lesquelles ils ont investi 2,7 milliards \$, soit plus de la moitié des dépenses totales consacrées à la faune. Parmi les principales activités non consommatrices de la faune on note particulièrement le fait d'observer, de nourrir, d'étudier et de photographier les animaux.

La chasse ne doit pas être opposée à ces pratiques dites non consommatrices de la faune, notent les auteurs de l'étude. Les chasseurs (8,2 %) sont en réalité responsables de 14 % du total des journées consacrées à la faune et de 40 % de toutes les dépenses de 5,1 milliards \$. Les chasseurs ont aussi consacré, selon Statistique Canada, autant d'argent à la récolte de la faune qu'aux activités non consommatrices. Et l'étude précise que ces mêmes chasseurs forment en réalité le tiers (29,3 %) de tous les militants et membres des groupes et organisations voués à la conservation et à la protection de la faune au Canada.

La première enquête nationale sur la faune s'est déroulée en 1981. Statistique Canada a décidé d'élargir en 1987 l'horizon de ses questions à la pêche et au trappage. La pêche comptait en 87 pas moins de 6 millions d'adeptes (30,8 %). Cette activité est plus populaire auprès des hommes (69 %) que des femmes (30,2 %) et attire davantage les plus jeunes (53,4 % des pêcheurs ont entre 15 et 34 ans), tout comme la chasse. La proportion homme-femmes est toutefois plus accentuée dans le cas de la chasse (90 % vs 10 %).

THE IMPORTANCE OF WILDLIFE TO CANADIANS IN 1987

Speaking notes for Fern Filion's presentation to the
WILDLIFE MINISTERS COUNCIL MEETING
in Quebec City on November 15, 1989.

1) Introduction

Merci M. Bouchard/M. Blackburn

Ma présentation comportera trois volets principaux:

- un bref historique de ce travail coopératif sur l'importance de la faune pour les Canadiens
- les faits saillants du sondage et de son analyse
- quelques conséquences pour la gestion de la ressource faunique dans le contexte du développement durable

Avant d'aller plus loin je demanderais que l'on distribue les copies du rapport que je vous présente aujourd'hui.

2) Background

As the briefing material is being distributed let me give you a bit of background about this cooperative F/P socio-economic initiative on The Importance of Wildlife to Canadians (TIOBTC).

This national survey on TIOBTC has the endorsement of the annual F/P Wildlife Conference and is jointly funded by all Federal and Provincial Governments.

It was conducted by Statistics Canada using the most advanced and reliable statistical methods available in Canada today.

In February 1988, nearly 80,000 Canadians were randomly selected from all walks of life to tell us how they related to wildlife during the 12 months period of 1987.

The multi-level stratified sample yielded a highly representative cross-section of all Canadians above 14 years of age.

Although 98% of Canada's population was covered by this sample, the Yukon and NWT could not be included because a sufficiently reliable and cost effective method has not yet been established for that part of Canada.

Answers to the questions were tabulated by Statistics Canada and analyzed by a Federal-Provincial Task Force which I have the privilege to chair.

3) Highlights of the National Survey on The Importance of Wildlife to Canadians (TIOWTC)

The Briefing Kit that is before you contains a report on TIOWTC.

This is the 1st in a series of reports on the subject. It deals with the diversity and popularity of wildlife-related activities and how people feel about wildlife conservation.

It also contains sheets which highlight some of the key socio-economic findings. It is filled with results which I hope you will find fascinating. My role here today is to focus on a few of the most relevant ones.

Because of the time limit, I will focus my presentation on the **summary sheets for Canada**, with references to a few selected findings from the report.

One of the sheets in your kit is entitled "**Highlights for Canada**". It summarizes **three major groups of findings** for 1987 in terms of peoples' behavior, commitment and attitudes towards wildlife.

The 1st major group of findings deals with **actual behavior** - the magnitude of the popularity of wildlife-related activities in Canada (the figure at the bottom of page 11 of the report illustrates this finding).

In total, 18.3 million people (that's **91% of adult Canadians**) participated in wildlife-related activities in 1987.

Activities such as hunting, trips to observe study and photograph wildlife, feeding birds around home, enjoying wildlife programs, reading wildlife magazines, purchasing wildlife art... among others.

The 2nd major group of findings deals with the significant **commitment of time and money** that people make to these activities.

In terms of **time commitments** - participants enjoyed wildlife during 1.2 billion days in 1987. That's a lot of time to commit to any activity.

In terms of **monetary commitment** - the figure on page 24 of the report shows that participants spent \$5.1 on those wildlife activities.

The 3rd major group of findings deals with **attitudes** - strong public support for wildlife conservation in all provinces.

For example, **83%** of Canadians state that **maintaining abundant wildlife populations is important**.

85% of Canadians state that it is important to **preserve endangered wildlife species**.

Associated with this is the level of interest in participating in wildlife activities. A level of interest which is significantly higher than actual participation rates (this is shown in the figure on page 30 of the report).

For example, compared to the nearly 2 million who did hunt in 1987, almost 4 million Canadians would have liked to hunt that year.

This difference, this latent demand, occurs all across Canada but is highest in Que, Ont, Man, Sask, Alta, and BC.

Initiatives such as those proposed under the North American Waterfowl Management Plan (NAWMP) are expected to help in allowing this latent demand to express itself.

There is also good news for NGO'S. For example, there were almost six times more people who were interested in contributing to a wildlife organization than actually did so in 1987.

This difference, this latent demand, occurs all across Canada and is highest in Que, NB, NS, PEI, and NFLD. The provinces provide fertile ground for new marketing strategies.

4) Trends

There is another sheet in your briefing kit which is entitled "Trends Across Canada Since 1981".

There are three observations which should be pointed out.

The first deals with popularity.

The popularity of wildlife-related activities as a whole has grown - there were almost 2 million more participants in 1987 than in 1981. These gains have occurred primarily in non-hunting activities. Although participation in big game hunting remained stable, other types, such as waterfowl hunting have declined a little.

The 2nd observation deals with commitment.

The commitment of time and money to these wildlife-related activities has grown. Canadians spent 157 million more days and about 1 billion more dollars in 1987 than in 1981.

The 3rd observation deals with public support.

The number of people expressing public support for wildlife conservation programs have increased by 2 million since 1981. The numbers of Canadians who state that maintaining abundant wildlife populations or that preserving endangered species is important to them are now at 15 million and 17 million people respectively.

5) Sustaining the Benefits

The next sheet in your briefing kit is entitled "Sustaining the Benefits of Wildlife Across Canada".

As you can see the above socio-economic results have implications which are numerous and far ranging. What are the key messages that emerge from these findings? There are two of them:

The 1st message is that Wildlife is an important economic resource and an excellent example of Sustainable Development (SD).

Let me define Sustainable Development, as it pertains to wildlife.

SD as it pertains to wildlife is the utilisation of wildlife and habitat to optimize economic and other societal benefits today while not damaging prospects for their use by future generations.

Results from the national survey show that wildlife resources provide direct benefits valued at one billion dollars annually. They also show that the monies spent by 18 million participants each year contribute billions to Canada's G.D.P. and sustain between 150,000-200,000 jobs annually.

The economic spin-offs from these activities return about \$2 billion in tax revenues to Federal and Provincial Governments, each year. As it turns out, that's more than the combined annual total of all government expenditures on wildlife management programs.

Because wildlife is a renewable resource these substantial benefits to people and to the economy can be sustained in perpetuity. In this context, government expenditures on wildlife management should not be viewed as a cost to the taxpayer but as wise investment in environmental conservation with a good rate of return. This is a message that we should all be attempting to convey to our National and Provincial Round Tables on the Environment and the Economy.

A final note on wildlife as an economic resource. Socio-economic results such as these may play an essential role in establishing fair and defensible estimates of the importance of wildlife resources in the event that compensation may be required for damages by environmental pollution and mishaps. Ex: Nestucca oil spill claim being contemplated by DOE and BC as mentioned by the Honourable Lucien Bouchard yesterday.

There is also a 2nd notable message in the findings. The message that wildlife is an important political resource.

Wildlife is a political resource inasmuch as the vast majority of the Canadian electorate enjoys wildlife and expresses strong support for wildlife conservation initiatives.

True, moose and waterfowl don't vote. But the millions constituents who enjoy them and care deeply about them do.

The above survey results suggest that political leaders are likely to enjoy greater public support when they are perceived to favor concrete conservation actions. Actions to protect essential ecological processes; Actions to preserve genetic diversity; And actions to ensure the sustainable use of wildlife and habitat resources - many of the very actions that you have been discussing at this meeting: (e.g., wildlife policy for Canada, RENEW, Eastern Habitat Joint Venture, N.A.W.M.P., among others...).

6) Closing Remarks

As I conclude, I wish to note that DOE is most grateful to the provinces for their excellent cooperation and contributions to the success of this joint initiative.

This cooperation was expressed in 2 important ways:

1st, through vital financial support from all provinces (the sponsors are identified on page 8 of the report).

2nd, through professional support to the Federal-Provincial Task Force Membership.

Provincial Task Force members include:

Paul Gray from Ontario
Peter Boxall from Alberta
Roger Reid from BC
Pierre Bouchard du Québec

Environment Canada members include:

Elaine DuWors and
André Jacquemot

The Federal-Provincial Task Force jointly authored the first report on TIOWTC.

Three additional reports will be prepared over the next 18 months.

The next one will focus specifically on the contribution of wildlife resources to the economy and to SD in Canada and the provinces.

Some of you have already approached me in order to obtain copies of this report to circulate among members of your respective legislatures. Environment Canada will be happy to make sufficient copies of the reports available to you should you wish to do this.

Au nom de tous les membres du groupe de travail fédéral-provincial chargé de l'enquête nationale sur l'importance de la faune pour les canadiens, je vous remercie de l'attention particulière que vous m'avez accordée.

Si vous avez des questions sur la présentation ou sur le rapport qui vient d'être rendu publique, je me ferai un plaisir d'y répondre.

6

D. Bjorback / H. Naik

E/E WORKSHOP II
DECEMBER 6-8, 1989
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Sustainable Development in the Prairie Context

R. D. Bjonback and H. Naik
November 30, 1989

1. Sustainable development and the environment are issues very high on the public agenda in the Prairie Provinces, and have received national and international media attention. These issues can be summarized as follows:
 - a. water shortages - water availability of sufficient quality to support the economy and future growth (three droughts in the 1980s),
 - b. water developments - Rafferty-Alameda and Oldman projects as the lightning rods for public concerns about environmental impact,
 - c. resource extraction and industrial development - symbolized by world scale pulp mill developments and environmental concerns in the Peace-Athabasca systems,
 - d. agricultural sustainability - long term soil health and impacts of practices on the environment.
2. To address these issues, governments must integrate and jointly evaluate the economic and environmental factors. A number of important obstacles prevent such an integrated approach as follows:
 - a. organization of governments of sectoral lines, agriculture, industry, environment,
 - b. tax and fiscal systems do not recognize "environmental capital",
 - c. market failures - commons issues, and mismatching of sectors who pay and who benefit from environmental effects,
 - d. lack of information on values of environmental capital, both to the consumer and in the production process.
3. To address the constraints, to achieve sustainable development in a Prairie context, the following strategies are proposed:
 - a. DOE as a central agency - chairing the Cabinet Committee on the Environment, leverage other federal agencies to achieve sustainable development, through environmental considerations in Cabinet and T.B. submissions, audits of federal programs, new federal EARP legislation,
 - b. Federal Tax and Fiscal System Reform - incorporate idea of environmental capital in the tax system; fiscal and regional development policy reform to consider sustainable development as a goal along with job creation, etc.; remove incentives that have environmental harm (eg. Wheat Board quota system and wetlands),

- c. Market Failures - need to develop economic incentives within the market system that lead to positive environmental outcomes eg. encourage provinces to enact agricultural land tax systems, that do not lead to cultivation of marginal lands; effluent fees to reflect environmental damage,
- d. Research and Demonstration - use existing science, data, and research programs and sustainable development agreements with the provinces to demonstrate economic and ecologic value of water and renewable resources in alternate uses, and protecting resources to support long term growth.

4. The Necessity for Change

The incorporation of sustainable development principles in economic decision making will require fundamental change in the federal system, both in terms of fiscal system and the role of Environment Canada. The federal government has the most pervasive impact on economic structure and associated environmental effects in Canada. The federal government controls perhaps 45 percent of GNP. Federal fiscal, social, and economic policy is not neutral among social classes, regions, or sectors, and must be shaped to consider environmental aspects. How can this be done, when Environment Canada has not had the experience of a major player in the Ottawa budget and policy scene?

The promotion of economic development has been an important pre-occupation of the federal government, especially since the time of Macdonald's "National Policy" and the opening up of the Canadian West. The National Policy was successful in settling and establishing the Western economy, and capturing the manufacturing and service supply spin-offs within central Canada through coordinated tariff and transportation policies. The consequence of these policies, and international economic developments, has resulted in the concentration of economic power, wealth and the development of a broadly-based manufacturing and service economy in central Canada. Resource-based economies subject to swings in economic fortunes within international markets, dominate the peripheral regional economies to the east, west, and north of Central Canada.

? Economic performance between Central Canada and the peripheral regional economies is often "out of sync", and poses a significant problem in terms of the national co-ordination of federal fiscal and monetary policy. A prominent example is the recent, 1980s boom, which has been a central Canada phenomenon. Low (natural resource) commodity prices internationally, higher input costs and climatic factors such as drought, have in large part kept the peripheral regional economies out of participating in this growth phase.

Substantial federal investments in regional development, coordinated with provincial governments through a variety of programs, the most recent being the Atlantic Opportunity Agency and Western Economic

Diversification program, have attempted to improve the economic prospects of these peripheral regional economies. Provincial governments have placed emphasis upon resource development and management policies as the principal tool of "province-building", which in most part, emphasize the pursuit of external (international) markets. Limestone and Conawapa hydro developments in Manitoba, the Rafferty-Alameda dams project in the southeast Saskatchewan, and irrigation development in southern Alberta (Oldman Dam) and Saskatchewan, and oil sands, pulp mill development in northern Alberta and Saskatchewan are prominent examples in the Prairie context.

The result has been, in many cases, to increase the stress on the environment, both by individual resource users and governments. The imperative to gain the benefits of short-term, immediate development of natural resources outweigh long term conservation considerations. To make matters worse, as events in external markets turn against these regions, governments attempt to counteract these effects by increasing levels of subsidies to producers. These policies then tend to further accelerate resource depletion, and further entrench resource extraction as subsidies become perceived as long term commitments.

Why is there such an orientation towards resource extraction as a "province-building" tool? The peripheral regional economies have few other options to stimulate the economy, regional development programming nationally has not been able to stimulate wider-based economic growth outside central Canada. Federal fiscal and monetary policy have also been a constraint to economic diversification. For example, the recent overheating of the central Canadian economy has resulted in tight monetary policy, higher interest rates, which further worsen depressed economic conditions, higher resource depletion rates and pose greater environmental risks in the resource-based peripheral regions of Canada.

Economic activities (and households) have traditionally enjoyed the use of air, water, (and to some extent) land as "free goods" for the purpose of extraction and waste disposal. The economist's solution is to set an appropriate resource price, reflecting externalities and user costs to encourage long term sustainable use. This would result in more consideration being given to efficient use, and environmental values in economic decision-making. Reform of the federal fiscal system to incorporate this concept would be an important prerequisite to sustainable development.

Within this highly simplified analysis, the regional structural of Canadian economy still must be addressed if success is to be achieved. In the peripheral regions of Canada, the most serious polluters and destructive resource extractive activities are based on natural resources. There often are no other alternatives to maintain the economic base, and these sectors therefore have a powerful bargaining advantage in resisting the internalization of costs or resource conservation strategies.

The traditional response has been for public subsidy for pollution control (eg pulp and paper) and resource conservation (eg. soil conservation initiatives). These subsidies however fail to address the issue that the economic incentives (through internalization of costs) must be built with future decision-making as well. With realistic prices for resources, the move toward materials recycling, water conservation, and other productivity enhancements would be encouraged.

The central conflict between environmental protection and resource conservation; and industrial competitiveness of the region, still remains. This particularly applies to those regions with well established, old resource extractive activities and industries, for which such pricing schemes would accelerate long term structural decline of the industry. The natural response by the industry and the region is a quest for a subsidy, resistance to environmental improvement, or to accelerate other resource extraction activities.

The region facing this issue often has few alternatives but to stick with the status quo. Canadian industrial policy has not been particularly effective in managing economic change on an industry sector or regional basis. An industrial and regional development strategy is required to allow of the resource-based peripheral regions of Canada to participate in economic diversification, and opportunities for environmentally-sensitive resource-based development. This would perhaps require the de-centralization of the new, non resource owned economic activity now occurring in Central Canada, investments in education and technology development, use of fiscal and tax policy to encourage sustainable development.

To encourage such an environmentally - responsive economic policy will require Environment Canada to become much more active, influential, and a major player in the formulation of policy in Cabinet with line agencies and the Department of Finance, and through the development of management and program review practices through such mechanisms such as Treasury Board and the Auditor General. The creation of the Cabinet Committee on the Environment is a step in this direction.

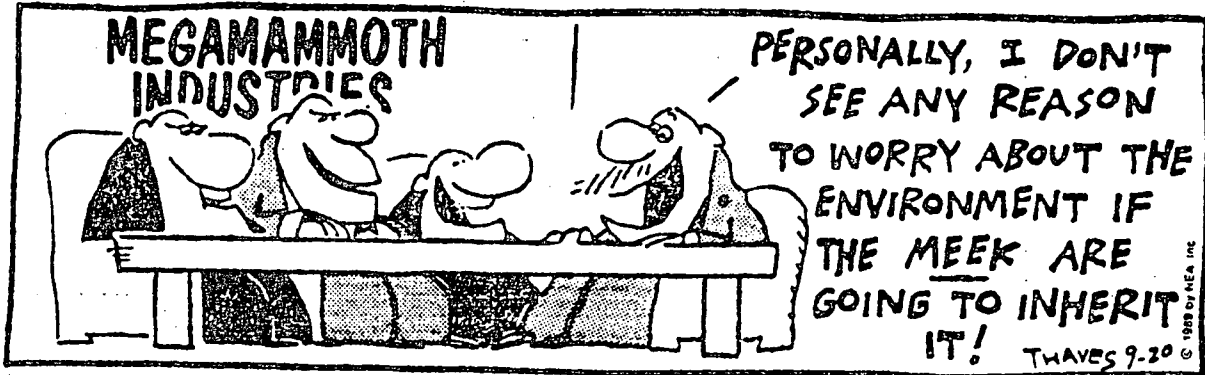
The traditional science and data base of the Department ~~is a~~ source of strength. Good science is necessary to develop and influence policy, and this needs to be maintained and strengthened. However, policy choices include not only biophysical factors, but also the examination of economic, social and political evidence, within a framework of balancing of benefits and costs. On this front, Environment Canada needs to bolster its capability in policy analysis, combining hard science and economics, to seek environmental objectives through the economic and social policy process.

7

Z. Davar

E/E WORKSHOP II
DECEMBER 6-8, 1989
NCR

FRANK AND ERNEST



ENVIRONMENT - ECONOMY INTEGRATION:

"In the Long Run, We Are All Meek"

(John Maynard Keynes revisited?)

Presented at: 1989 DOE Workshop on
Environment-Economy Integration
December 6-8, NCR
Zal Davar, C&P Atlantic

Introduction

The cartoon on the cover page and my adaptation of Keynes' often-quoted observation that "in the long run we are all dead", illustrate the main dilemma we face in attempting to implement environment-economy integration: short term versus long term attitudes and institutions.

Political agendas, boardroom agendas, annual financial statements, are all concerned with "now"; with revenue and profit "today". In the long run, however, the exploitation of natural resources at a rate which exceeds the capability of renewable resources to be replenished, will deplete the available resource base; similarly, the use of non-renewable resources at a rate which exceeds the search for substitutes or alternate processes.

The emphasis on "today" will of course diminish as symptoms of over-exploitation increase. And this is not just doom-and-gloom pie-in-the-sky pontification. The oil crisis of a few years ago and the present east coast fishery problems are stark examples of scarce natural resources which were once thought to be cheap and abundant.

This is not a new message for the participants at this Workshop. We are "the converted". But it does leave begging the questions: What can we do about it? Is there a radical change required in the way we go about our business? Are our tools obsolete? Are we capable of making ourselves sufficiently relevant to decision-makers? That is the focus of my discussion here today.

What is Expected of Us?

How often have we been handed a proposal for a flood control structure or a municipal sewage treatment plant or a new park or offshore oil development; and been asked for the benefit-cost ratio of the proposed project?

After choking down a mouthful of half-swallowed coffee, we valiantly compose ourselves and patiently attempt to explain to the blank faces in front of us, such things as varying discount rates, incomplete information, uncertainty, indirect effects, intangibles, sensitivity analysis and so on.

We are not decision-makers; we are analysts. And as long as we are dealing with human effects, public goods, etc. it is our job to say "on the other hand." It is our job to make assumptions clear, state consequences on the basis of those assumptions, and demonstrate the results of varying the assumptions.

In undertaking this job, I feel we should temper our enthusiasm about "new" methods and tools. Benefit-cost analysis has served us well for many years and should not be abandoned. It does have its problems; particularly information problems. But I feel it would be more productive to direct our efforts at attempting to solve those problems first, rather than rushing off into other directions which may simply present a new set of problems. New tools and methods are required, but they are required to help us refine benefit-cost assessments, not replace them.

Information Problems and Possible Solutions

There is no question that one of the most common and legitimate criticisms of benefit-cost analysis is our inability (ie. insufficient information) to translate environmental consequences into dollar terms.

I recently attended one of the regional workshops put on by Informetrica, at which Carl Sonnen presented a model of environment-economy linkages. He did a good job of addressing some of the benefits to be derived from increased expenditures on environmental equipment. But he regards these expenditures as "diverted from otherwise productive application." He admits that reducing environmental stress will produce direct benefits, but he says "we assume these compensating benefits to the economy are negligible." He then briefly cites what he refers to as some "anecdotally obvious" rewards to reducing environmental stress.

Does Carl Sonnen (who is regarded with considerable respect by the economic community, by decision-makers, by government) have an attitude problem? No, as we see a little later in his presentation, he has an information problem:

"As far as we know, an organized base of information about the extent of the economic "damage" outlined above is not available.

Indeed, even partial information is poorly developed. For example, while there are scientific programs designed to study damage to crops, no effort has been made to translate this into terms that express this in measures that are useful for an economic evaluation. And, of course, some environmental stress has ambiguous, direct

economic effects. A warmer Canada may hurt ski slope operators; golfers would benefit. Given this information limitation, we have developed this case solely as a representation of the direction of effects. That is, there is no solid empirical basis to our assumptions at all."

It is difficult to argue with these observations. Which makes it difficult to present a substantiated case for policy reform. How, for example, can we credibly push for fiscal incentives, when we cannot (or at least have not attempted to) demonstrate that public savings from reduced remediation requirements would be greater than tax revenue foregone to encourage increased preventative efforts?

This all sounds quite negative, but there are a few efforts which I have come across, which may start to provide a glimmer of light at the end of the tunnel:

One of those efforts is the area of economic-environmental accounting. There has been a fair bit of work and dialogue on this subject at the international level, which has been summarized in a Rawson Academy report prepared under a contract for our Department. The gist of the approach being discussed is:

"In the same way that macro-economic analysts use different definitions of the money supply according to the policy matter they wish to address (M1, M1-B, M2, etc.), there will now be recommendations on the construction of alternative measures of aggregate product: GDP being gross domestic product; NDP1 is the conventional net domestic product which accounts for depreciation of

purchased assets; NDP2 further subtracts depletion of resource stocks; and, NDP3 subtracts environmental expenditures, treating them as goods and services used up in the process of production."

West Germany has in fact announced that it intends to adopt such an approach in its national accounts by the mid-90s.

In another related area, I came across a 1986 Sunday Star article by Arthur Donner entitled "Economists' input valuable in environmental debate." The title itself was sufficient to draw my attention, but of more specific interest, Donner notes that Ontario Hydro, which is regulated by the Ontario Energy Board, is required to account for environmental degradation in the prices it charges on electricity exports to the U.S. There were no further details in the article, but it would be interesting to confirm this and to find out how they go about calculating environmental degradation.

The third area of effort which I would like to draw our attention to is the notion of cumulative assessment and regional carrying capacity. Professor Rees of UBC recently published an article promoting this notion, the role of environmental assessment and the context of sustainability. He defines regional carrying capacity as,

"the maximum rate of resource consumption and waste discharge that can be sustained indefinitely in a defined planning region without progressively impairing bio-productivity and ecological integrity..."

Under this approach, land use and development would be controlled according to sustainability criteria, and each region would have to undertake

complete inventories of ecological resources and implement an ambient environmental quality monitoring program.

To provide the economic context, Rees suggests the development of ecological accounts for each region, which would monitor total consumption (demand) and production of ecological goods and services within each region.

All three efforts which I raised for discussion are obviously still in development, but they do offer promise in our quest to translate environmental consequences into dollar terms. The objectives, of course, are improved benefit-cost assessments and, more generally, making the results of our analyses more "tangibly" relevant to decision-makers, policy-makers and in fact, the informed public.

Positive Time Preference Equals Depletion

The last point I would like to discuss is one that has been a puzzle to me for many years: one of the key assumptions of any economic evaluation which encompasses revenues and/or costs distributed over multiple years, is a positive rate of time preference for money. That is, a dollar today is more valuable than a dollar a year from now, and more so than two years from now, and so on, and so on. That of course is why we employ present value analysis and discount rates in our evaluations.

The rationale for this assumption focuses on the notions that 1) time presents risks, increasingly so the longer the duration and 2) delayed revenues postpone re-investment and therefore result in foregone interest accumulation.

These are admittedly reasonable notions. What bothers me about them though, is that the premise that "now is better" is the absolutely diametric antithesis of sustainability and conservation. Present value discounting dictates that now is better, which of course encourages shorter return periods, which of course translates into accelerated resource exploitation and therefore, depletion. After all, what right-minded business-person will concern themselves with revenues or benefits which, for example, 15 years from now are discounted by 75 percent of their current value; or 30 years from now by 95 percent of their current value ($i = 10\%$)? Such values become virtually irrelevant.

But are the right questions being asked? For example, how does the risk of uncertain future returns compare with the risk of species extinction or irreversible damage to ecosystems? Do they cancel each other out, resulting in a zero net discount rate? Or how does the amount of foregone interest compare with the increased social costs of remediation or more expensive substitutes once resources are depleted or damaged? Should we even be so bold as to suggest a negative rate of time preference whenever ecological resources are involved?

I do not have the answers to these questions. And I do not have the answers to most of the questions I have raised here today. But I think they are valid concerns; concerns which, to this point, have constrained the contributions we have been able to make. I am interested in your reactions, comments, and any suggestions you may have as to how they may be resolved.

8

D. Tate

E/E WORKSHOP II
DECEMBER 6-8, 1989
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Economic Studies at IWD Headquarters

Notes for an Environment Economy Workshop¹

D.M. Tate

This paper presents a short outline of projects in support of the environment:economy and sustainable development themes. Being a Headquarters component, IWD's Economic Analysis section has devoted substantial work to developing the philosophy of using economic principles to support water management. This type of work is covered in the first section. The second section outlines current projects that support these economic principles. Finally, the third section examines tasks that should be carried out over the next one to two year period.

Economic Principles Applied to Water Management

In dealing with the application of economics to water management, a large range of options arise. To organize this material, we have set up a number of general principles into which various actions can be classified. They follow, to some degree, some of the points that Professor Pearse outlined in a recent appearance before the House of Commons Standing Committee on the Environment.

1 Modifying the Federal Government Economic System

ISSUE: The federal government plays a pivotal role in shaping the Canadian economy, as noted above. To begin incorporating sustainable development will require many modifications to the existing federal economic system, as illustrated by the following examples.

EXAMPLES: The availability of water resource of adequate quality and quantity comprises a significant benefit to water users. The role of water in permitting and supporting economic activity is similar to that of financial capital, except for one basic distinction: the inability to measure "environmental capital". The result is a subtle, but nevertheless real view of economic actions related to the environment as "taxes" and "licences to pollute", with resultant negative connotations. The alternative view, based upon the concept of environmental capital, is that these resources provide a valuable and essential service, requiring economic payments to ensure future viability. In other words, this capital can be consumed, thereby requiring payment. In other resource areas, such consumption is often paid for through the collection of economic rent.

¹This document is in draft form only, and will be changed as appropriate following further review.

Under current practice, government revenues flow into consolidated revenue funds. These funds are then dispersed in accordance with the government currently holding power. The common perception is that revenues collected and dispersed in this manner are taxes. This prevalent and well-founded procedure may have a negative impact on attempts to raise money for environmental programs, which have shown a remarkable persistence near the top of public opinion polls. Conditions would be more favourable if assurance could be guaranteed that funds generated environmentally would be spent environmentally.

- Regional development
- DOE with central agency functions

2 Modifying Federal Programs and Practices to Enhance Water Management

ISSUE: Many federal government programs and practices have had the inadvertent effect of encouraging or even subsidizing water management and related actions harmful to the environment. A few examples will demonstrate this point.

EXAMPLES: Benefit-cost procedures incorporated in Treasury Board guidelines mandate the use of discount rates to adjust future benefits and costs for comparative purposes to present values. In effect such procedures "discount" the future in such a way that future resource uses are less valuable than to-day's uses. B/C procedures also permit the inclusion of secondary project benefits in calculating overall ratios. These benefits have frequently been overestimated in the past, thereby generating unrealistically high B/C ratios.

In attempting to control pollution by setting regulations, governments invariably negotiate "compliance schedules" and the like with industry. Past experience shows that the schedules have then been delayed using a variety of rationales, with resulting increased profits for the industries concerned. Also, regulations are frequently stated in terms of effluent concentrations, not total loadings, thus encouraging overusage of the country's (free) water. Finally, some resource management actions actually conflict with water management objectives, such as the drainage of wildlife supporting wetlands to improve agriculture.

REQUIRED ACTION: Embracing the sustainable development concept requires a review of the federal benefit-cost guidelines. This review should assure that a modified set of guidelines are consistent with new management concepts. Within its own jurisdiction, the federal government should modify its approach to pollution control by (1) framing regulations, where required, in terms of pollutant loadings; (2) refusing to renegotiate compliance schedules; and (3) placing charges on the discharge of wastes above negotiated rates after compliance deadlines have passed. Finally, the Finance Department and Treasury Board, supported by Environment Canada, should review all of the federal

government's resource development programs to assure compatibility with sound water and environmental management, thus assuring cross-compliance between federal funding and environmental objectives.

3 Water as a Provider of Essential Services

ISSUE: Throughout most of Canadian history, water has been viewed as "free" The principle university undergraduate economics textbook for an entire generation, Samuelson's Economics, viewed water, and air, in exactly these terms. This was important, since, in economic terms, "free" means unlimited. More will be written about the underpricing problem below, but the point here is that, until recently, the role of water as a provider of essential services and the concept of charging an economically rational price for those services have rarely been connected. Too often, suggestions concerning water charges have been viewed as taxes, penalties and licences to pollute, all concepts so negative that they have been shunned by Canadian governments. It is essential that this perception be converted to one which views water in a service provision context, and establishes charges on the basis of this service.

EXAMPLES: Municipal water prices to retail consumers average \$0.50 per cubic meter on a Canada-wide basis. Users frequently view increased water prices as initiatives by individual municipalities to raise taxes. Governments across Canada are also reluctant to establish policies and mechanisms that may lead to higher water prices. Suggestions that effluent discharge fees be levied to provide an incentive to industries to cut back waste discharges are often viewed as licences to pollute, even though any type of regulation is equally a licence to pollute - a cost-free one in the regulatory case.

REQUIRED ACTION:

4 Establishing Economic Incentives in Water Management

ISSUE: Economic and technologic history in developed economies basically consists of a gradual improvement in living standards, productivity and social welfare. Living standards today in a Western economy are several orders of magnitude better than they were in the eighteenth century, due principally to the role of improved technology. Technological change is largely a response to economic conditions. Simply stated, when the prices paid for any good or service reflect the value of resources used in their production, incentives exist for innovation. When they are too low, the forces for change do not exist and progress is limited.

In the water resource field, generally low water prices and, in some cases, zero prices, have meant that these incentive mechanisms in general do not exist. Technologies are traditional ones, resource usage is unrealistically high, and water pollution problems abound. One of the central benefits of using economic

instruments rests in the establishment of incentive systems to promote better water management.

EXAMPLES: Across Canada, the price of water per cubic meter (the approximate daily use by a typical family) averaged about \$0.50, including delivery and waste removal. By comparison with other liquids in common use (e.g. milk at \$800 per m³) this average price is extremely low. The price of water to self-supplied industry is often zero, and when positive, is economically irrelevant. The price set for the discharge of waste from industry is likewise normally zero.

In a static situation low water prices mean overusage of the resource. For example, domestic water use rates are among the highest in the world. Likewise, water recirculation rates in industry are generally lower than in other nations. The existence of "no cost" industrial waste sinks has led to substantial water pollution problems, as industries seek to minimize costs. In a dynamic situation, these problems are compounded. Water use forecasts that fail to account for price are invariably high, and, when used as design criteria, produce systems larger than necessary, a resultant wastage of scarce capital and an incentive to keep prices low to assure the usage of these over-sized systems. Pollution problems continue and are even exacerbated as new processes and products result in new types of waste. In the absence of correct economic incentive systems, the problems exemplified here and many other related ones are not only predictable, but also inevitable.

REQUIRED ACTION: Assuring long term environmental health and sustainable development requires the establishment of suitable and well-designed economic incentive systems. For example, the Federal Water Policy calls for realistic water pricing. In the municipal case, this means marginal cost pricing based upon the full (capital and operating) cost of system operation. It also means the adoption of universal water metering. The federal government should establish, in cooperation with provinces and municipalities, a set of guidelines for municipal water pricing. It should also make any future financial assistance to municipalities contingent upon the adoption of universal metering and the pricing guidelines. The federal government could also offer to cost share the installation of meters, preferably ones that can be read from central locations.

In the industrial case, the federal government should place a price on water withdrawal and waste discharge on water bodies over which it has jurisdiction. It should encourage the provinces to do likewise in areas of provincial jurisdiction. Withdrawal charges could be based on recovering a portion of the economic rent from water resources, which currently accrues to the industrial sector. Effluent charges could be based on the costs required to resolve the pollution problems created by industrial waste discharge.

Each of these measures fall within the competence of the federal government either to implement or to show leadership. The establishment of economic incentive systems for environmentally compatible activities will form a critical component of future water and environmental management. Incentives will lead to rational water resource use and to significant technological change.

5 The Reform of Property Rights Systems

The study of Canadian economic history reveals the story of natural resource use and development, beginning with the fishery, and proceeding on to the fur trade, forestry, minerals and so forth. More than many nations, Canada's development has focused upon natural resources, and to a major extent still does. The sole purpose here in alluding to this history is to note that each resource in turn has been perceived at the outset of development as freely available, with jurisdiction vested in the public sector. As scarcities arose, or as exploitative opportunities exceeded government management capabilities, portions of the property rights have been assigned to the private sector. The most extreme form of private property rights over what once were totally public resources has occurred with respect to land, where they are almost total. But in other sectors as well, privatization has occurred to various degrees, often in exchange for the payment of royalties, or other means of collecting economic rent. This has allowed the allocative and change-inducing forces of the economic market to operate, with considerable success.

With respect to water resources, public ownership is still almost completely intact. This has had the effects outlined earlier in the paper of resources over-use and abuse. Viewed in this light, it may be opportune for governments to consider the possibility of assigning increasing rights to water to the private sector. Limited attempts at doing so, such as the establishment of private fishing clubs, suggest that the resulting effects on the resource are beneficial in terms of quality improvements. This is not to suggest rapid movement toward privatization in the water sector, but to put forth the idea that beneficial results for water management might accrue from modifying the current system of property rights to water resources.

EXAMPLES: In the current international literature, frequent discussions focus on the privatization of municipal water systems. In the case of France, private water companies, working under public regulation, have become major purveyors of water as well as major innovators of water technology. The United Kingdom is currently in the midst of privatizing their river basin authorities, which, until recently, have provided water servicing. Benefits claimed for privatization of water utilities include: project financing independent of funding, thereby

freeing up public funds for more pressing demands; low construction and operating costs; the ability of the public to retain regulatory authority; the expected impetus to innovation and additional sources of tax revenue. Disadvantages include: varying degrees of loss of public control over water management; possible adverse effects on labour; and questionable cost savings due to the addition of a profitability factor to total costs. The application of privatization in the Canadian water utility field is neither supported nor rejected here. However, it requires a thorough and unbiased investigation as one possible means of modifying property rights to water resources, providing water servicing at lower costs and incorporating economic incentives into the water utility industry.

The issue of water pollution has already been raised earlier in the paper, in illustrating the possibilities of invoking economic incentives for industrial pollution control. It is clear that incentives will work for controlling environmentally degradable wastes, where society can (and should) rely on the assimilative services of the environment. Such an approach will probably not work for toxic materials, which must be kept out of the environment, probably through regulation. What follows applies only to biodegradable wastes.

Public agencies could establish marketable permits to discharge wastes based upon the capacity of the ambient water resources to assimilate these wastes naturally. Firms would purchase such permits on the open market, which would allow the discharge of specified wastes up to the limits of the permits. Beyond those limits, and in the absence of permits by any firm, pollution abatement and zero-discharge would be required. Such a system would require monitoring, but monitoring is required for any attempt to control pollution. This system presents one method of altering property rights systems to allow economic forces to play a role in water management.

2. HEADQUARTERS PROJECTS

The Headquarters economic component of IWD has taken on a number of projects which will support the principles outlined in the first section. For the most part, these relate to principles c (economic instruments) and d (property rights). A very large amount of work remains to be done.

a. Water Use Surveys, Analyses and Database

Water use is the principle way in which humans interact with the environment. The water use program aims at building statistical records documenting this interaction. Work recently completed includes: the 1986 industrial water use survey, a summary report on this survey, a municipal water use survey for 1989 and a municipal water pricing survey also for 1989.

A large and complex model has been completed to analyze water supply:demand balances at the river sub-basin level. The final users' manual will document the complete model, along with

an example of how to adapt the model to a hypothetical area.

A national water use database is in the experimental stage. This database will ultimately hold all of IWD's water use data (from 1972 to the present), and will be accessible from remote locations.

b. Pricing Studies

Studies aimed toward support of the water pricing strategy of the Federal Water Policy for an important component of Headquarters economic work. The municipal pricing brochure issued in 1988 has proven very successful, and is currently being updated on the basis of 1989 data. A preliminary study of industrial water pricing was recently completed for Ontario, based partially on the theory of economic rent. It showed that water pricing in this sector would be an effective means of encouraging water conservation.

Analysis has begun on analyzing industrial water price data from the 1986 industrial water use survey. Preliminary indications are that fairly strong price:quantity relationships exist in the data, suggesting that pricing strategies have considerable potential for influencing industrial water demand.

c. Demand Management

Work continues on the application of demand management to water resources. An extended paper on this subject will be published early in 1990. A paper has also been prepared on DM in the agricultural sector. An application of the demand management approach is underway for the South Saskatchewan River Basin. This project will examine the practicalities of applying the approach to a basin in a semi-arid area.

d. Privatization

Privatizing water utilities has been suggested as one means of lowering the costs of water servicing. For public agencies, one of the chief benefits claimed is the freeing up of development capital now required for water systems, and also more realistic water pricing. We have a study of privatization underway to assess the advantages and disadvantages of such an approach. This will be completed by March 31, 1990.

e. Economic Instruments and Environmental Agenda

We were asked to contribute a brief on economic instruments applied to water management to a technical paper in support of the environmental agenda. This paper is still in preparation; the approach taken is similar to that outlined in section one of these notes.

3. Future Work

There is a need to examine the ways in which economic instruments can be fit into the federal government system. This will form a major initiative for next year. As well be expect to complete a systematic study of economic instruments for environmental management. Third we shall continue our survey work, with preliminary work to begin soon on the 1991 industrial water use survey. Several pieces of research on the water use data (time trends, demand functions, linear programming, etc. will be undertaken as well.

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H. Foerstel

E/E WORKSHOP II
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**Welcome...
to this "first" for DOE?**

**We have come a long way since the
witchhunt in the late 70s.**

**Feeling of confidence and relevance...
new openness exemplified by DM willing
to meet us "just like that".**

**What a challenge...but finally society is getting
mobilized. However, there is a huge job ahead
in making the economic system work for
instead of against the environment.**

**That's exactly what the House of Commons
Environment Committee has been hearing, and
what we have been "flogging" in the Federal Water
Policy for at least two years(and contributed to
most recently in the Environmental Agenda.
Don Tate will brief us on that in a few moments.**

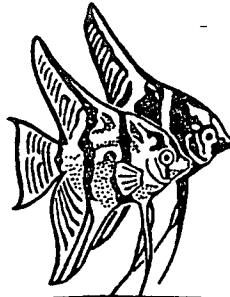
The environmental economics debate is well along in several countries, e.g. the FRG. Parties are competing with one another with political programs and the press reflects this .

There is an amazing convergence taking place, regardless of how dedicated or reluctant this or that country has been. Should this surprise? No:

- » coincidence of env. startup around 1970
(UN, EEC, OECD, Canada, US, FRG, etc)**
- » conventional environmental strategies are at the end of their tether, everywhere. Mild reforms, env. mgt. by goodwill, and soft guidelines, standards and procedures just have not worked or been that relevant..**
- » economic system still the most pervasive/efficient/socially neutral and accepted means for promoting good environmental behaviour...although not alone either!**

SOME PET PEEVES AND USEFUL CHECKS:

- Sustainable** > needs to be down-to-earth
> just start by projecting the Egyptian period forward...
> compound interest
- Env. Policy** > coordination vs. integration
> state's limitations
- Env. Science** > coexistence of specializations vs. ecological synthesis
- Smokescreens** > true and tried tactics
> public shift of mood, values
> the economic dimension:
our jumping-off point.

Workshop Goals

H. Nauk / D. Bjonback

E/E WORKSHOP II
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CROSS PURPOSE POLICIES AND SUSTAINABLE DEVELOPMENT

Hasu Naik and Derek Bjonback

Water Planning and Management, Western and Northern Region, Regina

This paper illustrates the impacts of selected, federal, cross-purpose policies and programs that may have ramifications on developing sustainable development strategies. As its scope is extensive, the focus is limited to land use policies. Without going into the complexities of defining "land" and "land use planning", this essay treats "land" as a resource in the ecosystem context, the natural order which embraces water, air and living things.

The agricultural industry epitomizes the complexity of resource use, particularly land and water, from a sustainable development perspective. Land is used as a primary input in the production process. However, "soil at risk" has been described as "Canada's Eroding Future" (Report of the Senate Committee on Agriculture, 1984). Land degradation is estimated to cost Canadian farmers \$1 billion annually. Water is another primary input in agriculture. Associated land-water problems affecting total economic performance include droughts and floods, animal waste contamination, nutrient pollution and pesticide seepage and runoff. These soil and water problems not only affect agriculture but also wildlife, fisheries, recreation and the environmental sustainability in general. Some of the problems could become exacerbated if predictions of climate change are realized.

There is another dimension to these land-water issues. The following quote from the Working Group Report to Agricultural Ministers on Soil and Water Conservation and development (1986) illustrates its significance.

"There are a wide variety of policies in federal, provincial and local governments that are perceived to adversely affect implementation of soil and water conservation and development measures. These include land use policies, quota systems, crop insurance, transportation policies, chemical regulation and pricing systems, and taxation among others."

This paper has a limited objective to examine some of these policies with a view to illustrate the need for defining an action plan for intergrating environmental and agricultural policies at least at the federal level. As evidenced from the discussion of this paper, it appears that the leaders within the agricultural industry are aware of these possibilities. It is up to us as Environment Canada's planners to transform the integration of environmental and agricultural policies into a program delivery framework.

In Canada, the federal government shares responsibilities for environment with the provincial governments. Within the federal system, Environment

Canada has the overall lead on environmental matters, and shares responsibilities for environmental management with other federal departments including Agriculture, External Affairs, Health and Welfare, Fisheries and Oceans, Indian and Northern Affairs, Transport, and Energy, Mines and Resources. Each of these departments assumes some measure of responsibility for the environmental impacts of activities in their respective sector. This approach forms a basis for the integration of environmental and sectoral interests. For example, Transport Canada is accountable for the safe movement of dangerous goods, Agriculture Canada for the safety and efficacy testing of pesticides and fertilizers, etc.

Although provincial jurisdiction for land and most resources permits the federal government to act only within narrow limits, several policy and program areas have recently emerged, which have imparted powerful and influential leadership roles to the federal government. These include regional economic development, environmental impact assessment, conservation strategies and the North. A new trend is emerging to weave the hitherto separate strands of land use planning, economic development, and conservation into an integrated, sustainable ecosystem framework. In this process the identification of cross purpose policies and programs provides useful insight into developing corrective measures for promoting sustainable development.

Governments have a variety of tools at their disposal for resource management. These include education, regulation, taxation, subsidies, legislation and expropriation. Governments faced with divided jurisdictions view legislation as an easy solution, because legislation gives the public a perception that governments are prepared to act. Often, a short-term sectoral approach leads to quick fixes. Without intensive monitoring and enforcement, the reliance of conventional environmental policy on legislation is prone to evasion. Such sectoral approaches lead to inter-sectoral conflicts. The situation is exemplified by the abundance of conflicting legislation and programs that affect soil and water conservation. Bond *et al* (1986) noted that there are over 100 federal programs that have the potential to significantly affect Canada's landscape, many of which are in direct conflict.

The linkage between agricultural programs and environmental factors have not been well recognized until recently. Conceptually, sustainable agriculture is a subset of sustainable development. Recent literature on conservation strategies have highlighted the scope for using the market-based system of economic incentives and disincentives in promoting sustainable development. According to the Draft Second World Conservation Strategy, "Economic instruments are more effective and efficient in promoting sustainable development; they allow resource users flexibility in achieving the environmental goals set by society; and they harness market forces to the achievement of those goals. More fundamentally, they rectify the bias of the economic system caused by the underpricing of natural assets. When a great variety of applications are involved, the combination of regulations and incentives is the most effective and manageable option of achieving environmental protection."

STABILIZATION POLICIES IN AGRICULTURE

The Report of the Working Group on Agricultural Soil and Water Policy (1989) noted that Agriculture Canada has a wide range of programs relating to regional development, regulation and stabilization. These programs can have a significant impact on the conservation and development of soil and water resources. It is important to see that such programs do not lead to degradation of the resource and, where possible, contribute to their enhancement.

The Sixth Annual Western Provinces Conference (November 1988) has documented policies and institutions with an impact on soil and water conservation. It has recommended the need for one net farm income stabilization plan that would cover all commodities. The rationale for this recommendation follows:

"Building networks of commodity specific support programs, overlain with climatic adversity programs and transportation assistance, provides an environment of subsidy gamesmanship rather than land stewardship. The current framework is often conservation unfriendly and induces producers to follow the stabilization schemes rather than sound land management practices."

In the Canadian context, agricultural stabilization policies consist of two parts: the yield component and the price component. The stabilization of returns to yield was introduced in the form of crop insurance in 1959. The Agricultural Stabilization Act (ASA) was introduced in 1958.

Crop Insurance

The federal Crop Insurance Act has undergone several changes since it was first introduced. The main objective of the program is to stabilize farm income by minimizing losses from crop failures resulting from weather and other natural hazards.

Federal involvement in crop insurance consists of contributions to provincial crop insurance programs. Currently, the federal government contributes 50 percent of the administration costs and 25 percent of the required premium costs in Quebec and Newfoundland, and 50 percent of the required premium costs in other provinces where the provincial government pays for all of the administration costs. In 1988, a total of \$393 million, including \$197 million in federal contributions, were paid in premium charges. Farmers received \$850 million in indemnities. Administration costs totaled \$53 million. This is a measure of government transfer.

The Report of the Federal-Provincial Crop Insurance Review (1989) noted that crop insurance may mask environmental signals in some areas and postpone necessary decisions by farmers to adjust to changing economic, agronomic or climatic conditions. In some instances this program may

actually work against the adoption of better soil conservation practices by supporting crop production on marginal land. Further, the report points out, government subsidization of crop insurance premiums is an important factor to consider in the context of the Canada-United States Free Trade Agreement and the General Agreement on Trade and Tariffs.

Professor Furton (1988) explains the economic argument as follows. The cost of insurance should be equivalent to the expected benefits from the reduced yield risk. The cost of the program to farmers as an individual, at the margin, should be equal to the anticipated benefits from reduced risks. However, because part of the costs are being covered by a transfer from public sector, farmers will incur larger risks than they would under private insurance. Land is then brought into production that has a high variance of yields because part of the costs of purchasing that insurance is carried by the public sector.

Professor Furton also notes that in many parts of Saskatchewan, crop insurance encourages farmers to bring land into production that would otherwise be left to pasture by providing the protection of guaranteed yields for the marginal lands. Much of this dry land is susceptible to wind and water erosion. Also, the practice of summerfallowing is encouraged by crop insurance programs. Although summerfallow fields are susceptible to soil erosion, farmers are able to obtain crop insurance on seeded summerfallow.

The homogeneity of crop risk areas and soil productivity ratings are crucial in calculating the premium rate structure. The risk area concept is conservation positive because it facilitates coverage consistent with accurate soil and crop potential. It could become conservation negative when risk area boundaries are not accurate or are too large. This would lead to inflated coverage or too low of a premium rate, disturbing optimum land use. Similarly, the soil productivity indices are conservation positive only when yields are scientifically and statistically determined.

In Alberta, a high risk subsidy is offered to make crop insurance affordable in higher risk situations. However, this subsidy tends to encourage farmers to seed crops on land which is not suitable for that particular crop. Also, many of the low productivity rated soils will be in a subsidy position with respect to all crops. While the original intent of the subsidy is commendable, as it is operated now, it has become one of the most conservation-negative features.

Western Grain Transportation Act (WGTA)

The literature on the economic impacts of the Western Grain Transportation Act (WGTA) and the Western Grain Stabilization Act (WGSA) is voluminous. Only the issues with respect to their impacts on land use are relevant here.

The intent of the WGTA is to encourage producers to export their grain to international markets. Between 1897 and 1983, the cost of transferring prairie grain to export terminal was fixed at a rate of one half cent per tonne per mile. By 1983, legislation was passed to bring rail revenues for shipping grain into line with actual costs. Since then, the federal government has committed to paying an annual \$658 million revenue shortfall ("Crow Benefit").

The question whether the freight subsidies should be paid to the railways or the farmers is not relevant to the important outcome. The freight subsidy still results in a substantial transfer to those who export their grain. Other things remaining unchanged and Canada being the price taker in the international grain markets, a removal of freight subsidy would result in a drop in the price received by grain farmers. Under standard economic analysis, farmers will bring land into production at the margin when returns from production would be equated to operating costs on a per acre basis. The freight subsidy disturbs this normal market adjustment. There are many regions in the Prairies where a drop in the grain prices would make acreage that is currently used for the production of grain, unproductive and unprofitable. Land that may be better suited for wildlife habitat or other uses is being brought into grain production simply because of this government policy. Even in the more productive southern part, farmers are more inclined to use their land for grain production rather than cattle production for the same reason.

Western Grain Stabilization Act (WGSA)

The WGSA, passed in 1976, was conceived as a measure to stabilize the incomes of grain farmers, during the periods of low returns. Funded by both producers and the federal government, the program covers seven major grains and pays producers when aggregate income falls behind the preceding five year average. In 1986-87, close to \$1.4 billion in total WGSA payments were made, which represents a yield of \$13.60 in benefits for each one dollar paid by farmers in the preceding three years.

Under this act, farmers are induced to produce and market grain to maximize their contribution and thus capture the government contribution. The Act permits transfers to only grain producers and thereby discourages other forms of land use such as livestock production, wildlife habitat, or conservation.

The Special Canadian Grains Program was introduced as a temporary measure to assist farmers to face current market disturbances caused by export subsidies (paid by U.S.A. and EEC countries) and depressed prices. Payments of \$1.0 billion each were announced for 1987 and 1988. Payments are calculated on the basis of seeded acreage of eligible grains and representative regional yields derived from the crop insurance data. The land use impact is similar to what is described above for the WGSA.

Waterfowl Crop Damage Compensation Program

The crop damage compensation costs are equally shared between Canada and each province in Western Canada. Although not a formal part of the Crop Insurance Program, payments are calculated by the Crop Insurance staff. Farmers are compensated on a spot loss based on the percent crop damage multiplied by the commercial value of the crop destroyed or \$54 per acre, whichever is less. Often this formula results in farmers paying for 50 percent of the loss. This program is conservation negative from the standpoint of waterfowl, soil and water conservation. The benefits of waterfowl and wetlands accrue to the province and the country as a whole. Farmers should not be asked to accept losses resulting from waterfowl. The Sixth Annual Western Provinces Conference (1988) recommended to revamp the current Waterfowl Crop Depredation Program to adequately compensate farmers for crop losses.

Many of the alternative uses of land in their natural state produce public goods. Currently, sloughs and small water bodies on prairie farms are not excluded in the local tax assessment. Perhaps property assessment methods should be changed so as not to penalize farmers for maintaining sloughs on their land that help raise waterfowl.

The Canadian Wheat Board Quota System

Divergent opinions prevail regarding how the Canadian Wheat Board (CWB) Quota System (QS) affects the land resource. The consensus prevails that the QS plays a major role in land management decisions. Basically, it limits grain delivery opportunities based on farmer-registered crop specific acreage allotments and neglects the role of productivity arising from the use of other agricultural inputs. Environmentalists argue that the QS promotes cultivation of marginal lands and encourages summerfallowing. While the CWB does not accept any of the above criticisms, the Western Canadian Wheat Growers (WCWG), Saskatchewan Wheat Pool and PFRA experts (those who were interviewed) support the above opinions (Hellene Bruneau, 1987; Hildebrand, 1983).

Before we examine the above arguments, it would be unfair not to recognize the historical changes that have been made in the QS. The CWB has undertaken several reviews of the QS. The 1970-71 review recognized that quotas could be used to pull the right kind and quality of grain to the appropriate terminal at the correct time. Quotas were set by grain and grade to meet export requirements. The 1978-79 review established a mechanism to ensure a more efficient use of available space and to provide some equity between Board and non-Board crops. The review also recognized an increase in the over-delivery privilege for seed and an increased ability of producers to reassign quota acres. The 1986-87 review introduced two new programs: contracting and bonus acres.

With this background about the evolution of quota, let us briefly examine the controversy. First, the CWB argues that bonus acres were introduced

specifically to recognize productivity differences. Opponents argue that irrigation-generated productivity differences are ignored. The QS does not take into account any production inputs other than land. Although farmers may want to produce more and to diversify, they are limited in their deliverable volume and, therefore, have no incentive to increase productivity. The WCWG recommended that equity of access to delivery opportunities should be based on something other than area.

Secondly, statistical evidence indicates that the QS has encouraged additional land clearing. Farmers want to increase production by breaking marginal land because they want to maximize their delivery opportunities which is based on acreage. This not only enhances soil degradation but also removes land suited for other purposes, e.g. wildlife habitat and wetlands. For the same reason, the amount of land in forage also gets disturbed because farmers will tend to cultivate as many acres for grain as possible to maximize their delivery opportunities. The QS is therefore considered conservation-negative.

Thirdly, it is maintained that the QS encourages land-damaging summer-fallow practices. Historically, summerfallowing has been promoted based on its perceived utility for weed control, moisture retention, soil aeration and seedbed preparation. Recent findings however recognize summerfallowing as a leading factor contributing to soil degradation.

Components of soil degradation associated with summerfallowing include soil erosion by wind and water, organic matter loss and associated nutrient decreases and soil salinization. Summerfallowing breaks down soil aggregates which in turn reduces water infiltration and leads to water erosion. The lack of vegetative cover during the fallow year and the above noted breakdown of soil aggregates leaves soils very vulnerable to wind and water erosion. Conventional summerfallowing practices also reduce soil organic matter and increase salinity. Man-induced saline soils are caused by agricultural practices (for example, irrigation) or by changing surface water runoff. This so called secondary salinity is a result of addition, redistribution or concentration of soluble salt that is carried by ground water or surface water with summerfallow as the major contributing factor.

The CWB maintains that the QS has no influence on a producer's decision to summerfallow. The decision to include summerfallow acreage in quota assignment was made basically in order not to penalize those farmers who summerfallow for moisture conservation and weed control. Opponents argue that the QS has significant impact on land use including summerfallow, since it affects decision-making at the farm level by determining the delivery opportunities. Producers are more inclined to summerfallow than to seed other crops such as speciality crops because there are more costs and risks involved in growing these crops than there are in summerfallowing.

Finally, the WCWG noted that other policies and programs also influence producer's land use decisions including crop insurance and the method of payment of the "Crow Benefit". The QS therefore should be examined in the context of all the elements of agricultural policy, including transportation subsidies, crop insurance, stabilization payments, feed freight assistance, etc.

Recognizing the above criticisms, the 1987-88 review committee has recommended several changes to the QS, which if accepted, would hopefully make adequate corrections to conservation - unfriendly outcomes of the QS. These included a new definition of equity, a productivity - recognizing supply agreement which will untie acreage-based deliverable quotas, and minimum call. Equity is defined as an equal percentage of the total market for the grade and grain each member makes available for sale to the CWB. The supply agreement shall include all grain that the producer is willing to commit to the CWB. Finally, each producer will be allowed to deliver a minimum of 25 tonnes of grain. The purpose is to allow small producers to deliver their entire crop.

MANAGING WETLANDS FOR SUSTAINABLE DEVELOPMENT

Approximately 1.2 million ha of wetland habitat have been converted to agricultural uses on the Prairies. Bardecki (1989) estimated that 85 percent of wetland losses in southern Ontario are as a result of drainage for agriculture.

In Canada and the United States, wetland losses have been primarily due to agricultural drainage encouraged by legislation, support programs and subsidies. Drainage subsidies can have the effect of expanding the agricultural output already in oversupply, for which the senior governments may be granting other subsidies to discourage this condition. For example, the eastern Ontario Subsidiary Agreement was a joint federal-provincial initiative which provided up to two-thirds of the subsidy for agricultural drainage in the early 1980s (Bardecki, 1988). Simultaneously, farmers are able to capture the benefits of any increased production and any increase in property value (Since 1980, Ontario has taken positive steps towards a comprehensive wetlands management program).

On the Prairies, many wetlands are drained and cultivated because they impede efficient use of large equipment for field operations. Cultivation, harrowing, discing and ploughing directly destroy wildlife habitats. According to one estimate, approximately 40 percent of the original wetlands habitat on the Canadian Prairies has been lost and the rate of loss is increasing.

Historically, intensive development pressures have facilitated the destruction of wetland. This has happened without any opposition because people have a poor understanding of the natural value of a wetland ecosystem. Many of the benefits attributed to wetlands in their natural

state reflect their diverse capability in providing public goods: a mix of terrestrial and aquatic habitat, attenuation of flood peaks and storm flows, amelioration of water quality problems, protection from erosion, climatic, atmospheric, recreational, aesthetic and educational values, etc. These non-market public goods are primarily external to the usual property rights. In the presence of such externalities it is unlikely that any equilibrium that might be approached by the market system will be in the position of maximizing societal efficiency. Social costs and/or benefits will not equal private costs and/or benefits. In the absence of any effective course of public action by which society at large may exhibit its preference for wetland conservation, it is likely that these wetlands will continue to disappear.

Marginal land retirement and/or the establishment of a conservation reserve and land leasing have been suggested for wetlands and habitat retention, reducing soil degradation and addressing environmental concerns. Examples of land easement and leasing programs in the Canadian Prairies are the North American Waterfowl Management Plan, Habitat programs in Manitoba and Alberta and the Prairie Pothole Project in Saskatchewan.

Conservation easement have been successfully used in the United States. They commit land owners to maintain designated areas without the substantial cost of outright land purchase. This may however require changes in property laws in some provinces. Payment for easement generally depends on the lost income to the land owner as a result of the restrictions imposed on the land. Leasing provides more control over land use but generally costs more than easement.

Restrictive covenants have also been examined as a means for long-term protection of wetland and upland habitat. The concept entails acquiring lands, delineating habitat to be retained, registering a caveat against the title which would prevent disturbance such as drainage or clearing and then reselling the lands to the private sector. This may entail costs of monitoring and enforcement.

The Prairie Farm Rehabilitation Administration recommended the conversion of about 10 percent of Prairie crop land from annual cropping to permanent vegetation cover. This conversion of targeted land (7.2 million acres) would reduce annual Canadian grain production by about 2-3 million tonnes.

In addition to removing contradictions in agricultural policy in general and conservation policies in particular, the efficiency of fiscal measures as a policy tool at municipal, provincial and federal levels is worth exploring. Measures relevant to wetlands and marginal lands include a preferential tax rate for wetlands and other marginal lands, a surcharge on off-site beneficiaries (recreationists, hunters) to compensate for revenue loss in the municipal tax base, modifications to tax assessment notices to change landowners perceptions of differential tax base, creation of tax credits for not draining wetlands, not cultivating

marginal lands and delayed haying/grazing, removal of tax deduction claims for income tax purposes for drainage and clearing costs, tax credits for the promotion of conservation easements, etc.

Concluding Comments

The previous discussion indicates that the scope for integrating environmental policies with agricultural policies exists in several important areas.

1. Crop insurance
2. Transportation and freight subsidies
3. Grain price/income stabilization policies. Policy intervention should not take the form of long-term subsidies which create dependency on governments, distort market signals, undermine long-term competitiveness, or slow down structural adjustments within the sector.
4. The Canadian Wheat Board Quota System
5. Wetland and marginal lands. The beneficiaries of conservation investments should help pay the costs.
6. Fiscal policies and credit policies
7. In cases where several categories of externalities prevail, the principal affected parties of present investments may be the future generations. Traditional economic analysis heavily discounts uncertain future benefits. This should be modified to make consumption preferences more neutral with respect to time.
8. Real policy integration may require a broadening of sectoral mandates to include responsibilities for environmental objectives, compliance and enforcement. Further, environmental standards imposed on a sector without consultation or agreement may result in evasion.

Despite the significant steps now being considered to reduce the conflicts between agriculture and the environment, substantial challenges remain. There are few areas where Environment Canada in particular can greatly contribute in coordinating land-water policies to encourage sustainable development. The list is not exhaustive.

1. The federal government is one of the participants in the planning activities under the Northern Land Use Planning Policy. Such activities should be marketed as demonstration projects for sustainable development.
2. More specific recognition of the ecosystem approach and land use planning principle (only implicitly recognized currently) in the federal Environmental Assessment and Review Process.
3. Under the Canada Water Act and other legislation such as Canadian Environmental Protection Act, an active participation in the management of water use (river basin planning), water quality and in water-related land-use planning.

4. More effective direction for land use planning and zoning under the National Flood Damage Reduction Program, in collaboration with federal agencies such as Canada Mortgage and Housing Corporation and provincial governments (Quebec Model).
5. More vigorous implementation of Federal Policy on Land Use, Federal Water Policy and Federal Policy on Wetlands.
6. Agriculture Canada and Department of Regional Industrial Expansion sponsored ERDA Agreements and the Soil and Water Conservation Agreements in particular.
7. Implementation of the North American Waterfowl Management plan with a specific emphasis on the removal of cross-purpose policies/programs and an active encouragement for cross-compliance.
8. More vigorous marketing of sustainable development and the emerging Environmental Agenda through events such as National Environment Week, Soil and Conservation Week, Forestry Week, etc.

The future Environment Canada strategy must emphasize creation of a supportive policy environment with other sectoral departments, geographic targetting, industry and public consultations, and cooperation among different levels of government and the private sector for building a consensus on methods of integrating environmental concerns into other sectoral planning.

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