

Science Council launches study on sustainable agriculture

Canada's national advisory agency on science and technology policy, the Science Council of Canada, announced that it has initiated a comprehensive study of agricultural sustainability in Canada. The study, which will be concluded in two years, will look into the conflicts between agriculture and the environment and recommend appropriate policy approaches for the future.

As we move towards the end of the present century many forces, both national and international, are bringing about major changes in Canada's agriculture and food system. These forces include a substantial global population growth, international trade conflicts, economic and political reforms in the USSR, China, and eastern Europe, and Third World debt. But perhaps no factor will be as important or as pervasive in its consequences as the growing global preoccupation with environmental issues--issues that result from the collision between accelerating demand for products and the earth's fragile ecosystem. Agriculture cannot remain isolated from the general call for the development of a sustainable society.

The transition to environmentally sustainable agriculture will mean substantial changes, not just for farmers, but throughout the entire food system, including processors, retailers, and consumers. It will challenge our production, processing, and food consumption practices, our agricultural policies, even our basic values.

Necessary changes

Why are major changes necessary in a system that has for so long provided so much to agricultural producers and food consumers? After all, technological advances in Canadian agriculture since World War II have provided the basis for:

- a) a prodigious increase in agricultural productivity;
- b) an abundant, highly nutritious, relatively low-cost food supply for Canadian consumers;
- c) an increasing volume and variety of highly competitive agricultural exports. But it is also a system that must now confront some basic questions relating to its sustainability from an environmental and food safety point of view.

The economic and industrial changes that have resulted from technological advances in agriculture have led to the development of a complex, integrated agriculture and food system, which includes:

- a) approximately 300,000 producers, largely family farms, which vary greatly in size, tenure, and capital investment;
- b) an extensive agricultural supply and service sector, which provides inputs to farm producers in the form of pesticides, chemical fertilizers, credit services, machinery, and equipment;
- c) a major processing, transportation, and distribution sector, which moves an enormous range of agricultural products from the farm gate to consumers in both national and international markets;
- d) extensive government participation in the form of regulatory activities, taxation and expenditure policies, commercial initiatives, research, market development, and involvement in matters of international trade and commerce.

Big business

The agriculture and food system, as it has evolved over the past four decades, is big business. Although there are only 300,000 farmers in Canada, the system as a whole provides the basis for substantial employment and investment. In 1989 Canadian farmers spent \$15.5 billion on inputs such as fuel, chemical fertilizers, pesticides, machinery, and debt service charges and another \$2.6 billion on depreciation charges. Equally significant economically are the activities associated with the processing, transportation and distribution of farm products. In addition to providing a wide variety of food products to 26 million Canadians each year, farmers export nearly \$10 billion worth of goods (about 10 per cent of Canada's total commercial export trade). The agricultural system has an important role in the general economy, and the consequences of rapid growth or recession in the system are quickly transmitted to other sectors.

But farmers and others in the agricultural and food system are struggling with economic viability. Canadian farm debt increased from \$10.3 billion in 1977 to an estimated \$21 billion 11 years later. Between 1979 and 1988, 3,681 farmers went bankrupt in Canada--about one a day. At the same time, the sustainability of farming is threatened by serious environmental problems. For example, five major droughts in the prairie region of Canada during the 1980s have underscored the vulnerability of the farm economy to climatic change. Drastically reduced crop yields, widespread soil erosion, acute shortages of water, and the damaging impact on livestock operations illustrate the fragile relationship that exists between farmers and their natural resources, soil and water.

Sustainable development

Other issues of direct concern to agricultural producers include the contamination of ground and surface water by fertilizers, pesticides, and waste disposal; the effect of pesticide residues, chemical preservatives, irradiation, and animal hormones on food safety; aerial spraying, air pollution, and land use conflicts; waste management; environmental regulations; and a variety of other technological and management issues.

Farmers and others associated with agriculture and food production need to know what "sustainable development" means for them, and how the requirements for sustainability can be reconciled with the economic viability of their operations. If Canadian agriculture is to deal effectively with the new challenge emerging globally and nationally, a much broader and more systematic approach to managing technological change and policy development is required. The adoption of new technologies and the wise use of those already available are critical if Canada is to maintain its ability to compete on world markets. Equally important is the ability to manage science and technology in a manner appropriate to existing natural and human resources. We as Canadians not only must clarify our goals, but we must also assess the impact of technological change on the structure and character of our agricultural system, on the associated natural and human resource base, and we must identify policies that will shape the course of that system towards a more sustainable foundation.

Project objectives

The Science Council believes that there is an urgent need to use the collective expertise of the scientific community in Canada to assess, insofar as possible, the potential of technological developments to promote sustainable agriculture. This knowledge must be expressed in a way that lay persons can understand. To achieve this the Council aims to:

1. Examine the capacity of technology to shape and define the Canadian agriculture and food system to the year 2000 and beyond.
2. Assess the adequacy of existing institutional arrangements to exploit technological developments for a sustainable Canadian agriculture and food system.
3. Identify the policies needed to ensure an agricultural system that is economically viable and environmentally sustainable.

These objectives raise a series of fundamental questions. How adequate are existing technologies to meet future environmental and economic needs? Is our present research infrastructure able to generate the S&T necessary to satisfy future requirements? Are existing arrangements to develop and apply technologies for sustainable agriculture adequate? What new policies are needed to promote agriculture that is both economically and environmentally sustainable? Who is responsible for initiating action? And what initiatives are required?

Ultimately, securing these objectives requires a clear vision of the kind of agriculture Canadians want to emerge in the 21st century. The goal of sustainable agriculture is now

broadly accepted at both the federal and provincial levels. The Science Council plans to establish a road map for reaching that goal.

The role of the Science Council

The Science Council's involvement in Canadian agricultural issues dates back to the early 1970s. Since then a number of Council publications have examined specific aspects of agriculture, but none has attempted to tie together the changes under way in the agriculture and food system or to develop long-term policies for this sector.

The Science Council will bring together disparate stakeholders to build consensus on courses of action. The Council will draw on the expertise of scientists, academics, agricultural producers, consumers, business people, government officials, and other interested parties to develop the policies necessary to apply science and technology to promote sustainable agriculture. To this end, the Council will solicit submissions and hold national workshops, leading to the publication of a final report in December 1991.

The committee directing the study will be chaired by Dr. Clay Gilson of the Department of Agricultural Economics at the University of Manitoba and the Council will solicit submissions and hold national workshops, leading to the publication of a final report in December 1991.

Written submissions can be made to Dr. William Smith, Science Advisor, Science Council of Canada, 100 Metcalfe St. Ottawa, ON, K1P 5M1, (613)992-7850

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