

Reconciling Farm Support and Environmental Protection: Trends and Prospects

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List of acronyms

Acronyms	Description	English translation
AAFC	Agriculture and Agri-Food Canada	
AVOP	Adjusted Value of Production	
BAPE	<i>Bureau d'audiences publiques sur l'environnement</i>	Office of Public Hearings on the Environment
CAIS	Canadian Agricultural Income Stabilization	
CDAQ	<i>Conseil pour le développement de l'agriculture du Québec</i>	Council for the Development of Québec Agriculture
CPTAQ	<i>Commission de protection du territoire agricole du Québec</i>	Agricultural Land Protection Commission
EC	Environment Canada	
FADQ	<i>Financière agricole du Québec</i>	Québec Agricultural Financing Agency
FISA	Farm Income Stabilization Account	
FISI	Farm Income Stabilization Insurance	
FPPQ	<i>Fédération des producteurs de porcs du Québec</i>	Québec Federation of Pork Producers
IRDA	<i>Institut de recherche et développement en agro-environnement</i>	Research and Development Institute for the Agri-environment
MAMR	<i>Ministère des Affaires municipales et des Régions</i>	Department of Municipal Affairs and Regions
MAPAQ	<i>Ministère de l'Agriculture, des Pêcheries et de l'Alimentation du Québec</i>	Department of Agriculture, Fisheries and Food
MDDEP	<i>Ministère du Développement durable, de l'Environnement et des Parcs</i>	Department of Sustainable Development, Environment and Parks
MSSS	<i>Ministère de la Santé et des Services sociaux</i>	Department of Health and Social Services
NAFTA	North American Free Trade Agreement	
NISA	Net Income Stabilization Account	
OECD	Organization for Economic Co-operation and Development	
PAAGF	<i>Programme d'aide à l'amélioration de la gestion des fumiers</i>	Support Program for the Improvement of Manure Management
PAIA	<i>Programme d'aide en agroenvironnement</i>	Agri-environment Investment Support Program
PSE	Producer Support Estimate	
RPPEEPA	Regulation respecting the prevention of water pollution in livestock operations	
RRAO	Regulation respecting agricultural operations	
RRPOA	Regulation respecting the reduction of pollution from agricultural sources	
UPA	<i>Union des producteurs agricoles</i>	Farmers' Union in Québec
WTO	World Trade Organization	

1. Introduction

The challenge of developing agricultural policy consistent with the principles of sustainable development raises numerous questions, notably with regard to environmental balance and social equity. This paper will attempt to identify some of these key issues. It begins by describing trends in the evolution of agri-environmental policies in the industrialized countries, then broadens its focus to reflect on the integration of environmental considerations into the design of farm policies and programs. On one hand, this approach allows us to assess farm support measures in terms of their environmental impact, and on the other, to position the principal Canadian and Québec support programs with respect to their role in environmental protection and the development of sustainable agriculture.

2. Agri-environmental policy: evolution and trends

2.1 An evolutionary perspectives on Québec agri-environmental policy

The intensification of Québec agriculture over the past several decades has been marked by the concentration of production, an increase in farm size and specialization, technological progress, and massive use of off-farm inputs, resulting in a significant increase in agricultural productivity. This “modernization” of farming has been extensively encouraged and supported by agricultural programs and policies, which have helped ensure a certain degree of stability for farm businesses in the face of risks engendered by market imperfections and weather (Debailleul, 1998). However, the intensification of agriculture has also significantly increased pressure on resources over the years, seriously affecting the environment in the process, notably through water contamination, soil degradation, and habitat and biodiversity deterioration (MENV, 2003).

To counteract the environmental impacts of agriculture, government authorities have put in place a whole series of measures aimed at controlling agricultural pollution and reducing its effect on the environment and human health. Table 1 provides an overview of the main initiatives taken by governments and industry stakeholders over the past 25 years in response to agri-environmental challenges. By taking a closer look at these measures, we can make a number of observations about key trends in the evolution of agri-environmental policy.

First, regulation has traditionally been the approach of choice for the government in matters of environmental protection. Three successive provincial agricultural regulations specific to the agricultural sector have been adopted since 1981, primarily to protect water and control animal waste management. Regulatory measures have also been used to impose restrictions on development ranging all the way to moratoriums, as well as to introduce a land management approach (municipalities with a manure surplus, carrying capacity). And additional legislative measures have been adopted with respect to farmland protection, planning, and development; pesticide management; and the inclusion of cross-compliance in the management framework for future farm support programs.

“Accompanying measures” are another type of intervention widely used in Québec agri-environmental policies and include numerous ways of increasing environmental awareness among producers and supporting them in their agri-environmental efforts. These measures include knowledge enhancement initiatives (soil degradation inventories, environmental monitoring, agri-environmental portraits); education, training, and technology transfer activities that encourage sound environmental practices (agri-environmental advisory clubs, pest management strategy), including some at the agricultural watershed level (St. Lawrence Vision 2000); and financial assistance programs for farms (*PAAGF*, *PAIA*, *Prime-Vert*) to help them achieve regulatory compliance, especially for liquid manure storage structures. Various R&D initiatives are also supported by a number of agri-environmental programs.

Moreover, provincial and federal agricultural strategies and policies—which are often developed in collaboration with farm industry stakeholders—have integrated orientations to foster environmental protection and promote sustainable agriculture. Recent measures have also introduced new methods into the government’s agri-environmental policy toolbox. The release of the Québec Water Policy in 2002 highlighted the importance the government is now placing on integrated watershed management to better protect this resource. More recently still, the Québec government has decided to implement a number of BAPE commission recommendations on hog production (public consultations, introduction of cross-compliance).

Table 1: Highlights of Québec agri-environmental policy (1978-2005)

Year	Measure(s)	Main area(s) of intervention	Dept./Org. in charge
1978	Act to Preserve Agricultural Land	Preservation of agricultural land	CPTAQ
1981	Regulation respecting the prevention of water pollution from livestock operations (<i>RPPEEPA</i>)	- Protection of water - Leak-tightness of manure storage facilities	MDDEP
1986	National Agricultural Strategy	Soil conservation	AAFC
1987	Moratorium on hog production in Lanaudière area	Restrictions on development	MDDEP
	Pesticides Act (Regulation for the sale and use)	Pesticide management	MDDEP
	Canada-Québec Subsidiary Agreement on "Soil and Water Conservation"	Degraded soil inventory	AAFC/MAPAQ
1988	Support to organic agriculture	- Technical support - Integrated intervention plan (1989)	MAPAQ
	Support Program for the Improvement of Manure Management (<i>PAAGF</i>)	Financial assistance for manure storage facility construction	MDDEP (88-94) MAPAQ (94-97)
1989	Federal-Provincial Committee on Sustainable Agriculture	Concept of sustainable agriculture	AAFC/MAPAQ
	Agri-Food Policy "Partners in Growth"	One of the 4 pillars: Environmental protection	AAFC
1992	Pest management strategy	50% target reduction in pesticide use	MAPAQ
1993	Agriculture component of the St. Lawrence Vision 2000 Action Plan	Raising awareness of agri-environmental problems in various agricultural watersheds	MDDEP, EC and local organizations
	Canada-Québec Subsidiary Agreement on Environmental Sustainability in Agriculture	Support for agri-environmental advisory clubs	AAFC/MAPAQ
1994	Forum on sustainable development in agriculture	Building consensus on sustainable development	MAPAQ and stakeholders
1995	Sustainable Development Policy	- Integrated resource management - Overhaul of policies and programs for promoting sustainable development	MAPAQ
1996	Introduction of the concept of "municipalities with manure surplus" in <i>RPPEEPA</i>	Territorial management approach	MDDEP
1997	Regulation respecting the reduction of pollution from agricultural sources (<i>RRPOA</i>)	Agri-environmental fertilization plan (nitrogen/phosphate)	MDDEP
	Bill 23: Act respecting the preservation of agricultural land and agricultural activities	- Priorization of agricultural land use in agricultural zones - Minimum distances for odor mitigation and management	MAMR MAPAQ
	Environment program	Support for agri-environmental advisory clubs	CDAQ (AAFC)
	Agri-environment investment support program (<i>PAIA</i>)	- Financial assistance for manure storage facility construction - Support for agri-environmental advisory clubs	MAPAQ
	Agri-environmental plan for hog production	- Sectoral agri-environmental portrait - Technical support club - Development of an environmental certification	FPPQ
1998	Québec Conference on agriculture and agrifood	Doubling the value of Québec agrifood exports	MAPAQ and stakeholders
	Founding of the Institute for research and development in agri-environment (<i>IRDA</i>)	Research and technology transfer for improving farming practices	MAPAQ and stakeholders

Year	Measure(s)	Main area(s) of intervention	Dept./Org. in charge
1998 (cont.)	Agri-environmental strategy	- Agri-environmental portrait - Network of advisory clubs - Development of an environmental certification	UPA
1999	<i>Prime-Vert</i> program	- Financial assistance for manure storage facility construction - Support for agri-environmental advisory clubs	MAPAQ
	“Un environnement à valoriser” Action Plan (an environment to promote)	- Knowledge enhancement - Implementation of sound practices - Development of an environmental certification	MAPAQ and stakeholders
2001	Bill 184	- Adoption of cross-compliance - Adjustments to land-use planning orientations	MAPAQ
2002	Regulation respecting agricultural operations (RRAO)	- Farm-by-farm approach - Phosphorous balance - Reinforcement of controls	MDDEP
	Administrative requirements for hog production	Restrictions on pig farm development	MDDEP
	Commission on sustainable development of hog production in Québec	Drafting of a framework for sustainable hog farming	BAPE
	Québec Water Policy	Integrated water management at the watershed level	MDDEP
2003	Agricultural Policy Framework	Environment: one of five key components → Support for implementation of agri-environmental farm plans	AAFC
	Report of the BAPE Commission on hog production	Integration of sustainable development principles in pig production	BAPE
2004	Government orientations for the sustainable development of hog production	- Public consultation on pig farm projects - Production zoning and quotas - Requirement that new livestock operations possess 50% of land required for manure disposal	MAPAQ/MDDEP/ MAMR
	Introduction of the concept of “carrying capacity” in RRAO	Deforestation for agricultural purposes prohibited in degraded watershed	MDDEP
2005	Introduction of the first cross-compliance measure	Phosphorus balance required for farms in order to access support programs	FADQ/MAPAQ

Sources: Gouvernement du Québec, 2005 and 2004; MENV *et al.*, 2004; AAC, 2003; MENV, 2003; Debailleul, 1999; Fournier and Henning, 1990.

2.2 Agri-environmental policy in the industrialized countries

Most industrialized countries have also put in place various measures to improve the environmental performance of their farming sectors. As in Québec, the most common approaches combine regulatory measures—which have grown progressively stricter over time—and the introduction of agri-environmental payments to help farms cover the cost of converting infrastructures and equipment to make them more environmentally friendly. In addition, financial support is provided for initiatives in technical assistance, education, and R&D.

A number of European countries have also set up agri-environmental programs which offer payments to encourage less intensive farming practices (i.e., extensification of crops and livestock raising, integrated production); support farming systems with better environmental performance (e.g., organic farming); promote biodiversity-related objectives (i.e., preservation of rare cultivars and breeds, species and habitat protection); and encourage ecological services (e.g., protection of sensitive environments, landscape preservation) that extend beyond the environmental benefits of “sound management practices”. In addition, the United States and many European countries have developed resource retirement programs that compensate farmers who remove land or livestock from production. Although agri-environmental payments to farmers are increasing, they still only represent an estimated 3% of total farm subsidies in the OECD countries (OECD, 2003a.)

In addition to agri-environmental payments, several other economic instruments play an important role in certain countries. Several European nations and U.S. states levy taxes on inputs (pesticides and inorganic fertilizers). Charges are also paid on nutrient surpluses in a few European countries, and a system of tradable permits has been put in place in the Netherlands.

Cross-compliance is another approach increasingly popular with government authorities. Cross-compliance measures linking agricultural support programs to respect for minimal environmental standards are currently employed in the United States and some European countries. Depending on the type and source of major agri-environmental problems, they make assistance payments conditional upon compliance with environmental standards governing crops (U.S., Netherlands, France), livestock production (Ireland, Catalonia), or both (United Kingdom, Switzerland, Denmark, Finland, Norway, Italy, Greece).¹ The European Union Common Agricultural Policy (CAP) of 2003 stipulates that such measures will be in use in all EU member states by 2005 (OECD, 2003a). The advent of this approach highlights the extent to which past agricultural support programs have been designed independently of environmental objectives. Integration of these measures is one of the first concrete indications that agricultural policy must now be designed to take both economic and environmental dimensions into account.

¹ For the sake of clarity, it is important to note that according to the OECD (2003e), supplementary payments made to farmers for adopting environmentally friendly practices are not considered measures of cross-compliance, but are rather “agri-environmental payments.” The cross-compliance mechanisms in effect in the U.S. and the provisions for cross-compliance in the CAP are clear in this regard: eligibility for regular agricultural assistance is subject to meeting cross-compliance requirements.

Finally, two other types of agri-environmental measures have emerged in recent years. First, several countries have, over the past ten years, shown an interest in developing new “eco-labeling”, notably a certification process designed to provide consumers with information on the environmental characteristics of the farming systems (environmental management system). Second, some countries have also begun promoting community-oriented approaches that draw on local know-how to resolve environmental problems, including watershed rehabilitation (OECD, 2003a).

This brief overview of agri-environmental policies shows that numerous institutional initiatives have been developed to mitigate the environmental impacts resulting from the intensification of agricultural production, particularly over the past four decades. Moreover, in response to the growing environmental pressures from farming, agri-environmental measures have come to play an increasingly central role in the agricultural policies of most industrialized countries (Debailleul and Boutin, 2004 ; OCDE, 2003a).

2.3 Reflections on agri-environmental policies in Québec and abroad

A comparison of measures used in Québec and in other regions of the globe reveals that Québec essentially relies on regulation, agri-environmental payments linked to farm investments, and other conventional support measures (extension and training, technology transfers, research, etc.). More recently, new tools have been added to complement these existing measures, including environmental certification for farms (Agriso), cross-compliance in support programs and, most recently, the watershed management approach. Since 2002, farm assistance has also been made available for certain environmental services (shelter belt plantations, riparian zone revegetation and stabilization, etc.)

Other types of measures, however, have not been retained for Québec’s agri-environmental policies. For example, agri-environmental payments have primarily been directed into investments and equipment upgrades to farms help meet regulatory requirements and have so far not been used to support lower-intensity or organic farming systems. Furthermore, there has been little effort to promote resource retirement measures in intensive production areas. And aside from agri-environmental payments, no other economic instruments have been deployed to help promote agri-environmental objectives in the province.

Like most jurisdictions of industrialized countries, Québec has stepped up environmental measures regulating agricultural activity and multiplied the number of agri-environmental initiatives, which are in turn playing an increasingly important role in agricultural policy. Given growing public awareness of environmental issues and the proliferation of information, the OECD (2003a) estimates that this trend is here to stay and will generate even stronger demand for improved environmental performance in the agricultural sector. Indeed, many of Québec's important agri-environmental policy measures have been adopted in the wake of heightened media coverage of agriculture-related environmental problems (see Table 1). The period 1996–1997 was marked by the Québec Auditor-General's report and the complaint to the NAFTA Environmental Cooperation Commission. The 2000–2001 period was also marked by media events (the tainted water tragedy in Walkerton, the release of *Bacon, the Movie*, etc.) and the publication of several reports (the water management commission report, a new Auditor General's report, the Public Health Department report on the health risks associated with livestock production, the Brière report on the link between environmental issues and social cohabitation, etc.).

To better appreciate the measures in effect in Québec and get a sense of emerging trends in agri-environmental policy, it is worth taking a more specific look at environmental measures that target pork production in countries and states where, like in some regions of Québec, pig farming is practiced on an intensive basis. First, from a regulatory perspective, a recent comparative analysis of environmental regulations governing livestock production shows that the regulatory dynamic in Québec is relatively similar to that in other countries, even though Québec has displayed more leadership in the area of nutrient management plans (Debailleul and Boutin, 2004). As for non-regulatory measures, Table 2 compares the main agri-environmental policy instruments in effect in 2003 in certain countries and regions with areas of intensive hog production.

Closer study of this table shows that more restrictive control measures have been adopted for pig farmers in these areas (e.g., cross-compliance, taxes/charges, etc.), complemented by measures to limit production, such as livestock buyout programs aimed at reducing hog populations (Netherlands, Catalonia, Brittany) and limits on pig density per hectare (Denmark).

Another aspect of agri-environmental policy worth discussing is the level of public assistance to farmers. An examination of Québec's agri-environmental assistance programs shows that in

2002–2003, the government incurred over \$70 million (CAN) in spending through the Prime-Vert program, an amount representing some two-thirds of Canada’s total agri-environmental spending for this same period (MAPAQ, 2003; AAFC 2003). Provincial assistance programs to help livestock producers achieve regulatory compliance are another illustration of the level of Québec agri-environmental support. Subsidies available under these programs cover between 70% and 90% of the cost of building manure storage structures—a level of support equivalent or superior to those in the European Union (30% of costs in Denmark, 65% in France) and the United States (up to 75%) (OECD, 2003b). Finally, in a last example, public spending for agri-environmental interventions averaged nearly \$30 (CAN) per hectare for the 1999–2001 period, on par with U.S. figures and several times greater than amounts in the other Canadian provinces (Tremblay *et al*, 2004). However, it should be remembered that these agri-environmental investments also reflect the fact that Québec has more high-intensity agriculture than any other provinces—and probably more serious environmental problems as a result.

Table 2: Emerging trends in agri-environmental policies governing pig farming (2003*)

Country/Region	Specific Components	Production limitations
Denmark	Cross-compliance Taxes/charges	Harmony clause (max. 1.4 animal units/ha)
Catalonia	Cross-compliance	Livestock buyout
Brittany	Mandatory treatment	Moratorium (2000) Livestock buyout
Netherlands	Taxes/charges Certification Tradable permits	Livestock buyout
North Carolina	Legal agreements with promoters	Moratorium (1997)
Iowa	Master matrix	None
Québec	None	Administrative requirements (2002)

* Measures already in place in 2003

Source: Adapted from Debailleul and Boutin, 2004; Debailleul, 2004

Although agri-environmental requirements are an increasingly important component of agricultural policy, they are a negligible factor in farm competitiveness. In the pork industry, for example, the OECD (2003b) reports that regulatory costs imposed by environmental policies average 1% to 2% of total production costs, and are therefore relatively limited in comparison to other charges. In fact, the main factors affecting international competitiveness and farm

profitability in the pork industry are capital and labor costs, exchange rate fluctuations, and the business management decisions made by farmers. These considerations have led the OECD to conclude that the “potential competitiveness impact of environmental regulations imposed on pig farming remains an adjunct to the overall debate on the relative competitiveness of pigmeat production in various countries” (2003b; pp 132-133).

In concluding this section, our analysis of the evolution of agri-environmental policies shows a clear trend toward the densification and reinforcement of government agri-environmental measures. Governments are seeking to exercise greater control over agricultural activities, which have grown increasingly intensive over the years. Although these measures may have helped limit the negative impact of increased agricultural pressure on natural resources, the OECD (2003a) believes that their effects so far have been rather limited, and that results remain to be further investigated.

Parallel to our reflection on agri-environmental policy, the challenge of integrating environmental concerns into agricultural policy also raises the question of “policy consistency” and compatibility between agricultural policy and agri-environmental measures. The same agricultural support policies that have contributed to increased productivity and production are also cited for their negative effects on the environment (OECD, 2003a). In the case of Québec, the relationship between agricultural policy and environmental problems and the role of certain support programs in fostering environmentally harmful practices have been raised on several occasions in the past (Nolet, 1998; Debailleul, 1998; Auditor General of Québec, 1996; Debailleul and Ménard, 1990; Fournier and Henning, 1990). For example, Québec’s auditor general (1996) has deplored the fact that farm income stabilization insurance plan (FISI) is entirely based on models that maximize production and includes no environmental criteria.

Situations like these have led the OCDE (2003b, p. 19) to ask “to which extent agri-environmental policies are fixing problems created amongst other reasons by agricultural support policies?” We will explore this question in greater depth in the next section by taking a closer look at OECD research into the environmental impact of the main types of farm support. We will also examine the potential role support programs can play in developing a consistent body of agricultural policy that can help meet the environmental and sustainable development challenges of agriculture in the 21st century.

3. Agricultural support measures and their impact on sustainable development

3.1 Sustainable development and agriculture

In agriculture, sustainable development implies production that is not only economically profitable, but also preserves the integrity of the environment and respects social equity. Figure 1 illustrates the challenge of applying the concept of sustainable development to agriculture. The point where the three circles intersect represents the zone of sustainability. The present situation, illustrated by three circles of different sizes, reflects the importance currently placed on the three different dimensions of sustainable development. In the case of agricultural policy, this has translated into a predominant emphasis on economic measures. Agri-environmental measures have been developed more recently, and initiatives to address social concerns remain relatively marginal. This situation has not favor bringing more farms into the sustainable development zone. However, the evolution of agricultural policy toward a better balance between the three circles would encourage a stronger focus on environmental and social measures, thereby expanding the zone of sustainability and allowing the inclusion of a greater number of farms into that zone.

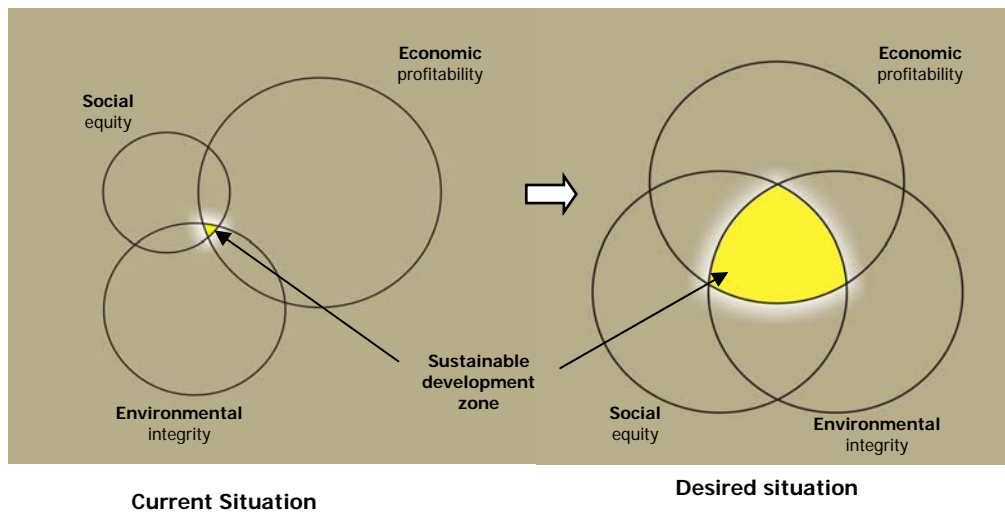


Figure 1: The challenge of sustainable agriculture

Source: Adapted from Jacob, P. and B. Sadler, 1990 and MENV, 2004.

In Québec, the BAPE (Office of Public Hearings on the Environment) Commission (2003) on the sustainable development of hog farming highlighted the important role all three dimensions of sustainability have in ensuring the long-term viability of the pork industry. The Commission's report contained numerous concrete suggestions intended to help policymakers ensure the sustainable development of hog farming and agriculture in general. Inevitably, this integrated vision represents a challenge to many existing agricultural policies. It is within this perspective that the following sections will attempt to appraise the main farm support mechanisms on the basis of their potential contribution to sustainable development. We will begin by reviewing the environmental impact of the main farm support measures, followed by a brief assessment of agricultural support from a social equity perspective.

3.2 Environmental impacts of agricultural supports

Before beginning our analysis of the linkages between agricultural support measures and the environment, it is worth reviewing a few notions to facilitate comprehension. Table 3 presents the various main types of farm support using a dual classification based on World Trade Organization (WTO) and OECD categories.

The WTO classification is based on production and trade distortion effects and comprises support measures categorized either in the amber, blue or green boxes². Measures listed in the amber box have the greatest distortion effect and are therefore among the categories of support targeted for reduction during the new round of WTO negotiations. Measures in the blue box are considered to cause less distortion because they put certain limits on production. Finally, the mechanisms in the green box generate limited distortion, and are therefore not targeted for reduction (Unisféra, 2003). In addition to the types of subsidies listed in Table 3, the green box also includes other policy instruments such as agri-environmental payments (e.g., Prime-Vert program), support for general-interest services (research, training, extension, etc.), and food aid programs.

The OECD classification distinguishes between the different types of support that make up the producer support estimate (PSE), a measure used to assess total farm support allocated and conduct comparisons between countries. This classification divides types of support into six

² According the terminology of WTO Agriculture Agreement, subsidies are classified by boxes which are given a colour depending on how support measures are considered to distort production and trade.

different categories: market price support, payments based on output, payments based on input use, payments based on cropped surface and/or animal numbers, payments based on historical entitlements or overall farming income, and payments based on input/resource constraints (Portugal, 2002). A brief description of each of these categories is presented in table 3—along with examples of various Canadian and Québec measures to illustrate the classification—based on compiled OECD data (2003d).

Table 3: Classification of main farm support measures

	Forms of PSE support	Description	Exemples in Québec
Amber box	Market price support	Increases price paid to producers through tariff barriers, export subsidies, etc.	Supply management (import controls and a pricing policy covering production costs)
	Payments based on output	Increases price paid to producers through transfer payments based on current output of a specific agricultural commodity	Farm Income Stabilization Insurance (FISI)
	Payments based on input use	Reduces cost of specific inputs (fertilizer, pesticide, gas, etc.) through tax discounts and subsidies	Fuel tax discounts Property tax refund program (input = land)
Blue box	Payments based on cropped areas / animal numbers	Based on cultivated area or number of animals for a specific agricultural commodity, regardless of output	Crop insurance programs
Green box	Payments based on historical entitlements / overall farming income	Based on area, number of animals, or previous production of a specific product, or on total farming income, but not conditional on production of specific products (support decoupled from production)	Canadian Agricultural Income Stabilization (CAIS) program Net Income Stabilization Account (NISA) Farm Income Stabilization Account (FISA)
	Payments based on input/resource constraints	Based on reduction or withdrawal of production factors (livestock buyouts, cropland retirement, etc.)	None

Sources: AAFC, 2003; OECD, 2003d; Unisféra, 2003; Portugal, 2002.

Assessment of the impact of farm support measures on the environment is based on a number of premises and considerations. First, in situations where there are no limits on production, guaranteed prices that are higher than world prices tend to encourage increased production, and even overproduction. This can harm the environment due to increased use of inputs and environmental pressures that exceed the carrying capacity of the land. Conversely, decreases in price support measures tend to encourage less intensive agriculture. Support that varies directly with production volumes is considered amongst the most environmentally harmful, since it

couples maximum support to maximum output. This contrasts with decoupled support mechanisms—i.e., measures that do not link payment to output—which eliminate this incentive to maximize production and are less environmentally harmful (OECD, 2003c). Finally, support mechanisms that have a “lock-in” effect that favors particular crops, inputs, or technologies are also considered more harmful to the environment. On the one hand, the lock-in effect tends to limit the crop and livestock options available to farmers by encouraging specialization, monoculture, and inadequate crop rotation; on the other, it tends to hinder the adoption of more environmentally beneficial farming practices and production methods (Unisféra, 2003).

Together, these considerations allow us to establish an initial ranking of PSE-category support measures according to environmental impact. As we can see, market price support mechanisms and payments based on output and use of inputs are the most harmful for the environment. These three types of support represent close to 77% of all farm subsidies in the OECD countries and a somewhat lesser portion—62%—in Canada. Payments based on cropped surface and/or animal numbers, and those based on historical entitlements or overall farming income are considered more neutral in terms of environmental impact; in the first case, they place limits on production, and in the second, they constitute a form of decoupled support. In Canada, these types of assistance represent nearly 40% of support available to farmers, twice the level found in OECD countries. Finally, payments based on input/resource constraints are presumed to be beneficial because they help reduce agricultural pressures on the environment. However, this type of measure is not used in Canada.

Table 4: Ranking of PSE supports according to their environmental impact

Environmental impact	Support measure	% of support (PSE)*	
		OECD	Canada
Most harmful	Market price support	69.1	53.6
	Payments based on output		
	Payments based on input use	8.5	8.5
More neutral	Payments based on cropped area / number of animals	12.6	10.5
	Payments based on historical entitlements / overall farming income	6.8	27.4
Beneficial	Payments based on input/resource constraints	2.9	0

* Based on 2001 data.

Sources: AAFC, 2003; Unisféra, 2003; Portugal, 2002.

It should be mentioned that the Canadian figures shown in the table are based on aggregate data and do not reflect regional variations in support programs in effect in the different provinces. For example, market price support mechanisms are much more common in Québec because the province produces a greater share of supply managed commodities, notably on account of its more than 45% share of national milk quotas (UPA, 1999). Moreover, in 2001, Québec's Farm Income Stabilization Insurance (FISI) programs accounted for some 85% of Canadian payments based on production. As for programs based on historic entitlements and overall farming income, they are more common in Western Canada, but less developed in Québec (OCDE, 2003d).

Another regional particularity worth mentioning is the level of support Québec farmers enjoy. Given the relative importance of supply managed commodity production in Québec and the payments made under the FISI programs, we can easily deduce that the level of farm support (i.e., PSE level) in Québec would be significantly higher than the Canadian average. Although available data does not allow for precise calculations, certain indications support this conclusion. First, although Québec agriculture generates only 16% of farm cash receipts in Canada, Québec farming enterprises accounted, on average between 1997 and 2001, for 24% of all payments made under Canadian support programs. Second, total public expenditures in support of the Québec agrifood sector represented 18.5% of the Canadian total for the 1999–2002 period (data from AAFC, 2003). Lastly, the adjusted value of production (AVOP) of government transfers to Québec farmers for the period 1997–1999 was almost twice as high as the AVOP for Canada as a whole (AAFC, 2000). Together, these data tend to confirm a higher overall level of support for Québec farms.

But the classification presented in Table 4 is only the first step in assessing the environmental impacts of the various forms of farm support. To refine the analysis further, a certain degree of “filtering” is required. This involves assessing support measures in conjunction with the other elements of agricultural policy. For example, market price support mechanisms in Canada are accompanied by measures restricting production (supply management). As a result, they are more like support measures based on the number of animals. This, in turn, leads us to conclude that these mechanisms will tend to have a more neutral effect on the environment. It is also important to verify whether support measures engender a “lock-in” effect—i.e., favor certain products or use of specific inputs or technologies. If so, they are considered more harmful for the environment. Farm income stabilization insurance programs and, to a lesser extent, crop

insurance programs can cause a lock-in effect. Moreover, initial classification of certain programs in PSE support categories may be less appropriate when assessing environmental impact. This is the case for the property tax refund program, which was ranked in the “payments based on inputs” category when, in terms of environmental impact, it belongs more in the “payments based on cropped area” category of the PSE classification system. These examples clearly illustrate the importance of completing this policy “filtering” step before attempting to evaluate the environmental impact of support measures. Drawing on these considerations, we have developed a classification scale in Figure 2 to rate Québec support programs according to their environmental impact. Although agri-environmental support payments are not included in PSE support measures, they have been included in this figure.

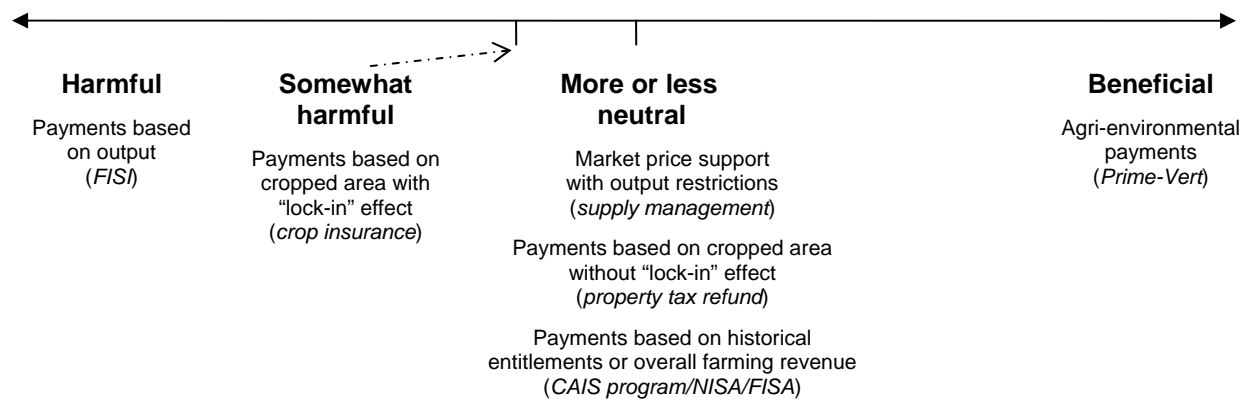


Figure 2: Classification scale of agricultural support measures available in Québec according to their environmental impact

As the above illustration shows, farm income stabilization insurance programs (FISI) are the Québec support measures considered most harmful for the environment. They encourage overproduction by linking support payments to production levels and also provoke a lock-in effect that leads to specialization and inadequate crop rotation. Crop insurance programs, even though they allow for considerable flexibility in farm practice management, can also engender a lock-in effect in some cases by favoring certain inputs. They may also be unsuited to certain more environmentally friendly forms of production (e.g., organic farming). As a result, their effects, although limited, may run counter to goals for improved environmental performance. The remaining support measures are considered relatively neutral in their environmental impact. This brief examination of the relationship between agricultural support measures and the environment

allows us to better appreciate the significance and scope of one of the recommendations made by the BAPE commission on pig farming in Québec with respect to the FISl program:

The Committee recommends that the current farm income-stabilization insurance (FISl) program for the pork industry be replaced by an overall farming income protection plan for farmers, that a maximum net income be protected, and that this protection apply regardless of the output, type of commodity, or cost of production.
(translation)

BAPE, 2003; p. 154, Recommendation 25.

3.3 The distribution of farm support

Although the main purpose of examining farm support measures is to assess their environmental impact, we cannot pursue a goal of sustainable development—and take into account the three components comprising it—without also considering the issue of social equity. Agricultural policy has primarily been developed to support farm household incomes, both for reasons of equity within the agricultural sector and with the rest of society, and to enhance stability in managing risk related to market failure and weather conditions. Although farm support measures in Canada, like those in most industrialized countries, have helped reduce variability in farm income and bring average farm household income levels in line with those of other households, significant income disparities between farm households still persist.

In analyzing agricultural policy from a sustainable development perspective, we must therefore take a closer look at the issue of social equity in the distribution of farm assistance. OECD research (2002) on farm household income has found that farm support measures have failed to achieve equity in farm income distribution and tend to benefit larger—and often more prosperous—operations that generally do not need support.

In Canada, for example, the average net farm income of the largest farm enterprises—25% of total farms—is three times higher than the overall average. Another example of the problematic relationship between farm size and the concentration of farm assistance, this time in Québec, is

shown by the Lorenz curve³ in Figure 3, which illustrates the distribution of Farm Income Stabilization Insurance (FISI) aid to hog feedlots. The Lorenz curve shows the cumulative percentage of FISI-insured hogs based on the proportion of these farms. The distance between the Lorenz curve and the curve of “absolute equality” reflects the degree of inequality in distribution. The greater the distance between the two curves, the more pronounced the concentration of aid and the more unequal its distribution. The curve reveals that 23% and 44% of FISI payments to hog feedlots went to 0.8% and 6.4% of hog raising farms, respectively.

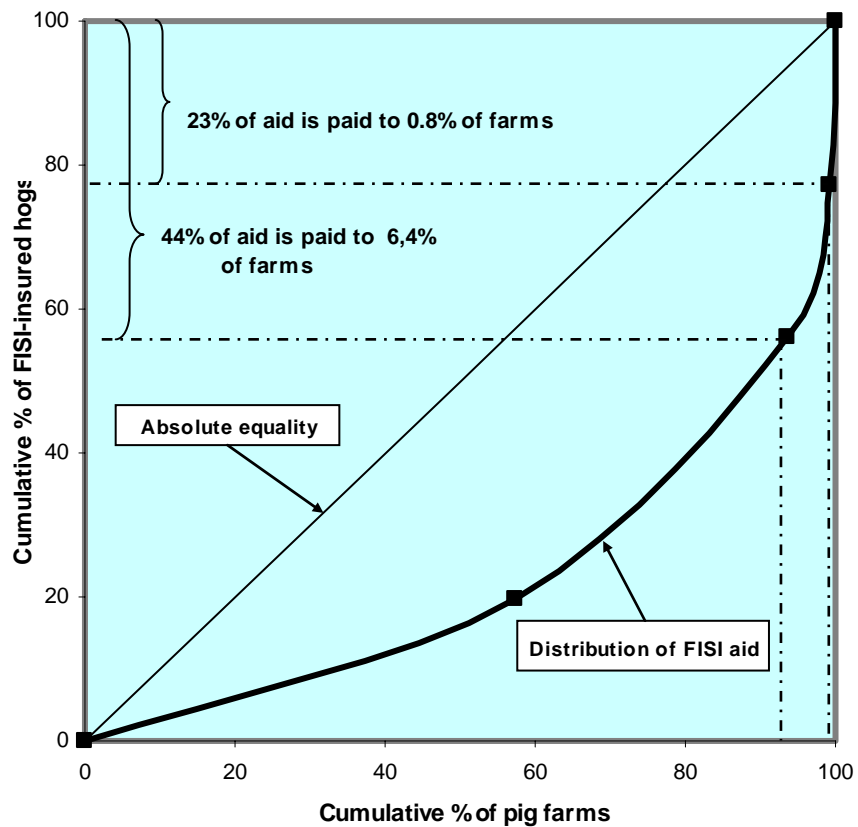


Figure 3: Distribution of payments to hog feedlots under the Farm Income Stabilization Insurance (FISI) program for the pork industry – finishing (2002–2003)

Source: Based on data from Financière agricole du Québec (FADQ), 2003.

In addition to size-related variations, average farm income also varies according to farm type. Canadian dairy farms earn nearly three times the farm sector average, whereas crop farm

³ The Lorenz curve is used in economy theory to graphically represent scales of inequality in wealth or income distribution; it can also be used to represent other distributions (Encyclopédie économique, 1984, pp. 164–165).

incomes are average and cattle operations two times lower than average. In short, distribution of support tends to be unequal and there are significant income disparities that also vary with farm type. Moreover, agricultural policy instruments also generate “wastage” of aid measures—in other words, a significant share of support is transferred to beneficiaries not initially targeted by the measures. Some of these funds end going to economic agents upstream and downstream from production (input suppliers, resource holders, etc.) or being used for purposes other than those originally intended, for example, capitalization into farm assets (increased value of property, quotas, etc.) (OECD, 2002).

Together, the elements presented in this section led the OECD (2002, p. 32) to conclude that “current agricultural policies are not sufficiently well-targeted [...] to meet the specific needs of farm households with income problems” (translation). Generic measures such as market price support and support measures based on output levels and input use are incapable of significantly altering farm income distribution patterns. Yet as we have seen, these measures accounted for nearly 78% of producer support estimates (PSE) in the OECD zone in 2001.

To rectify inequities in the distribution of agricultural support, OECD suggests that farm payments be decoupled and targeted specifically on the basis of farm revenue. In Québec, the BAPE commission on sustainable pig production made a similar recommendation, as we saw earlier. But the commission also made some precise suggestions about how to ensure that agricultural support measures would also guarantee greater equity between agricultural beneficiaries.

The Commission recommends that all agricultural income support programs...
... target people who work on family farms or farms of human dimensions, i.e.,
requiring the work of no more than four people;
... be available only to individuals, even for people who exercise farming activities
through the intermediary of a corporate entity. (translation)

BAPE, 2003; p. 154, Recommendations 26 and 27.

4. The challenge of integrating sustainable development considerations into agricultural policy

Québec agricultural policies have been designed to meet the objectives that Québec society has collectively set for itself over the years. In the 1960s and 1970s, the goal was to improve the socioeconomic standing of farm households and develop agriculture. The 1980s were marked by an agricultural policy—*Nourrir le Québec* (feeding Québec)— whose goal was to increase Québec's level of food self-sufficiency. And in the past decade, policy has focused on the development of new markets by encouraging the agricultural sector to increase agrifood exports. The farm support programs put in place during these periods have been designed to support these different agricultural policy goals.

As the 21st century begins, however, the main challenge facing Québec agriculture is to integrate the principles of sustainable development—a challenge Québec farmers themselves identified in the early 1990s, and which led them to demand a redefinition of agricultural policy on the basis of the principles of sustainable development (UPA, 2004). However, this transition to sustainability cannot be readily achieved without first undertaking a genuine review of the tools developed under previous “productivist” policies. The BAPE commission on sustainable pig production has helped foster reflection and debate on this issue and identified a number of prospective ways to bring hog farming and agriculture in general on a course toward sustainability, on the one hand, and to a type of development consistent with societal expectations on the other—a condition essential to legitimizing ongoing agricultural aid and maintaining levels of farm support.

Among the conditions required to bring agricultural policy in line with the imperatives of sustainable development, several key prerequisites stand out. First, it is vital to develop a comprehensive vision of all agriculture-related policies to ensure that the policy components do not generate impacts that may run counter to any of the three dimensions of sustainable development. And, as the BAPE commission demonstrated with the 58 recommendations in its report (BAPE, 2003), a sustainable agriculture strategy must propose a diverse array of initiatives and measures that address a wide range of economic, environmental, and social concerns. Finally, strong public and institutional leadership prioritizing sustainable development is another important factor in mobilizing stakeholders and bringing them to make the changes necessary to meet this new challenge.

In this paper, we have sought to highlight some of the main issues involved in developing a sustainable agricultural policy. Using an evolutionary perspective, we have shown that a panoply of agri-environmental measures have been put in place in Québec, as well as in the rest of the industrialized world, to address the environmental problems and pressures engendered by the intensification of agriculture. Despite the growing importance of these measures in agricultural policy and the increasingly severe restrictions they impose, their effect to date has been limited. Integrating environmental issues into agricultural policy requires more than just a series of agri-environmental measures, it demands a thorough assessment of how farm support policies exacerbate environmental problems. If we are to pursue a goal of sustainability in agriculture, we should make the environmental dimension part of agricultural policy and program design.

It is in this perspective that the OECD recently undertook studies to better understand the relationship between the environment and farm support policies. Although research is still underway, analysis to date has generated a number of findings. For example, market price support and support payments based on production levels and input use are environmentally harmful measures that are in contradiction with agri-environmental measures in a number of countries. Support measures engendering a “lock-in” effect favorable to specific inputs or technologies have also been found to be harmful for the environment. The pervasiveness of these various types of support makes it harder and more expensive to achieve environmental objectives. Conversely, environmental pressures have been eased in cases where support has been decoupled from production, or is accompanied by restrictions on production. As for the social equity issue, other OECD studies have shown that generic support measures like market price support and payments based on output levels and input use also lead to inequalities in the distribution of farm support. The situation is no different in Québec and the rest of Canada. In this area, too, the decoupling of aid measures is viewed as one way to alleviate the problem.

By applying this analysis to the various aid measures available in Québec, we have shown that Farm Income Stabilization Insurance (FISI) programs may cause environmentally harmful effects, whereas crop insurance programs have limited environmental impact, and other support measures are considered to be relatively neutral. Furthermore, certain Québec farm support programs tend to introduce inequities into the distribution of aid.

These observations raise several points worth considering if we are to change our approach to agricultural policy and introduce a sustainable development perspective. First, reconciling farm

support and environmental protection requires a better understand of the relationship between farm support policies and the environment. Use of tools developed for environmental assessment purposes could make a significant contribution in this regard and facilitate analysis of farm support programs. Efforts begun by Québec's Department of Agriculture in the 1990 to review agricultural policies and programs with a view to making them more sustainable (MAPAQ, 1997) is worth pursuing and should be expanded to all available programs, as called for in its departmental sustainable development policy adopted in 1995.

Furthermore, we can expect that a "greening" of farm support programs will result in a gradual shift away from more harmful support measures toward less harmful measures and/or agri-environmental payments, as has been the case with the reforms introduced in the European Union. Anticipated benefits of this "greening" of agricultural aid programs include an increase in the effectiveness of environmental regulations due to a decrease in the environmental impact of farm support, as well as a reduction in the cost of achieving environmental objectives. These adjustments would enhance the productivity of our agri-environmental investments and make farm support measures more effective vehicles for meeting our goals for sustainability. In addition, these benefits should be particularly significant in a context like the one in Québec, where the overall level of support for farms is higher than the Canadian average. However, despite the fact farm support reform is a necessary step toward improving environmental performance in the agricultural sector, correcting the harmful impacts of these measures is not enough on its own to resolve these environmental problems. Reforms in this area must be part of a series of initiatives to develop a new agricultural policy architecture built on a strong foundation of sustainable development principles.

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