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Abandoned farmland in Quebec

– status and development options

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Abstract

The purpose of this exploratory study is to provide land managers and stakeholders with the knowledge they need to determine the feasibility of pursuing development options for abandoned farmland in Quebec. The study is based chiefly on a review of the literature, supplemented with interviews with agroforestry specialists, stakeholders and planners.

Abandoned farmland is farmland that has been allowed to lie fallow and that the owner has no intention of cultivating. According to the data collected, over 100,000 ha of farmland have been abandoned in Quebec, with the greatest amounts found in the Lower St. Lawrence (45,000 ha), western and eastern Montérégie (23,500 ha) and Eastern Townships (17,600 ha). Few data are available for the Outaouais and Abitibi-Témiscamingue regions, where large areas of abandoned land may also occur. The causes of land abandonment vary depending on the region and the landowner's situation: lack of potential for conventional agriculture, loss of interest in cultivating it or, particularly in the case of non-farming landowners, speculation. Abandoned farmland is often perceived as a blot on the landscape or as a waste of resources. Developing such land will likely generate economic, environmental, social and ecological benefits.

Currently, reforestation (or afforestation) is the most common method of developing abandoned farmland, but it has its drawbacks, including modifying the land use and not generating income for several decades. Other approaches preserve agricultural land use while providing economic potential: intensive silviculture, fruit production and agroforestry. Putting abandoned farmland back into cultivation can also be encouraged with taxation and sharecropping (long-term leasing). A comprehensive development approach can combine these measures following an analysis of the territory's potential. Agroforestry, with its numerous combinations of systems and types of production, is one possible solution that can be useful in developing abandoned farmland, but it is also advantageous to rural communities that benefit from the resulting agricultural revitalization. Since there are multiple solutions, objectives must be harmonized to ensure consistency in implementing them. Particular attention must be paid to ensuring co-operation among stakeholders in the entire area in question.

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The study involved interviewing many stakeholders, including in particular land use planning and agroforestry specialists. Many not only answered our questions but also provided documents essential to this exploratory study. Their interest in our work was a source of motivation for us. The authors would like to sincerely thank all these individuals for their generous co-operation.

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Introduction

A drive along Quebec's roads and highways reveals many parcels of abandoned farmland, prompting numerous questions. Why is such abandoned farmland found in both rural and periurban environments? What is the extent of this phenomenon? Is it possible to return this land to agricultural use? Is agroforestry a possibility here? This abandoned farmland appears to pose a real problem, but it goes largely unrecognized due to the lack of information on the subject. This issue is at the root of our study.

Statement of problem

Thousands of hectares of farmland have been abandoned in Quebec, representing a not insignificant portion of the territory (Benjamin et al. 2006b). This abandoned land is unproductive land, often perceived as a landscape nuisance (Baumgartner 2006; CMQ 2004) and a form of squandering of resources (GéoKam 2004). Once developed, such land would be likely to generate economic, ecological, social and environmental benefits.

Since land managers and stakeholders are concerned by the presence of abandoned land, the emerging field of agroforestry is eliciting increasing interest due to the potential of its multiple systems: shelterbelts, riparian agroforestry systems, alley cropping, silvopastoral systems and understorey crops. This makes it feasible to develop abandoned farmland with various agroforestry practices.

The aim of this exploratory study is to provide land managers and stakeholders with the elements of knowledge they need to determine the feasibility of devising approaches and projects for developing abandoned farmland in Quebec. The study will determine the status of such farmland, identify possible development options—in particular, the use of agroforestry systems—and propose potential solutions. It is based mainly on a literature review and interviews with various stakeholders.

1. Methodology

The purpose of this chapter is to give the reader an overview of the methodology used in the study. The term "abandoned farmland" is defined and then the type of study undertaken, an exploratory study, is explained, followed by a statement of the hypothesis on which the study is based. Finally, the objectives of the study are described.

1.1 Definition of abandoned farmland

For a variety of reasons, many parcels of farmland in Quebec have been abandoned, allowing uncontrolled natural vegetation to become established. Without management, natural succession occurs on this land that is in [trans.] "an unstable transitional state between two stable states, agriculture and forest" (Girard 1990, cited in Benjamin et al. 2006). Unlike fallow land, which is intentionally taken out of cultivation for a short period in order to prepare the soil for farming practices, abandoned farmland is abandoned for an undetermined period (Benjamin et al. 2006; GéoKam 2004):

> [trans.] Abandoned farmland bears witness to a decrease in, and even a voluntary abandonment of, agricultural activity. It is therefore distinct from fallow land, which has been intentionally allowed to rest by the agricultural producer.

For the purposes of this study, abandoned farmland refers to land that the owner has no intention of cultivating (contrary to fallow land).

1.2 Exploratory study

The approach used in this report is the exploratory study, which involves verifying the benefits to land managers and stakeholders of using an agroforestry-based approach to develop abandoned farmland in Quebec.

In a guide describing the stages in an investment project, the Forest Products Industry Development Directorate (Direction du développement de l'industrie des produits forestiers) of the Quebec Department of Natural Resources (MRN) (1999)

defines an exploratory study as [trans.] "a document written to explain the broad outlines of a project in order to get decision makers in the company interested and eventually to free up the budgets required to move the project forward." In other words, an exploratory study involves demonstrating the validity of an idea to prove that a project is worthwhile. According to Valette (2006), an exploratory study [trans.] "is also called a qualitative study; it is based on field observations that in turn result in a strategy to test hypotheses and theories." In terms of the issue of abandoned farmland, the hypothesis that this study seeks to validate or invalidate is as follows.

Hypothesis

In Quebec, there is a significant amount of abandoned farmland and this land's potential justifies that the parties concerned focus their efforts on developing it using agroforestry production.

1.3 Study objectives

The objectives of this study are as follows.

1. Find and assemble existing information allowing the current status of abandoned farmland in Quebec to be described, including:
    - Inventories of the size and geographical location of abandoned farmland;
    - Categories used;
    - Vegetation cover;
    - Physical characteristics of the land;
    - Types of landowners;
    - Reasons for, and disadvantages of, the abandonment of this land;
    - Development approaches used.
2. Assess the area of abandoned farmland in the entire province and carry out a critical analysis of the results obtained.
3. Identify causes of farmland abandonment and associated consequences.
4. Explore development approaches with potential for abandoned farmland, and agroforestry systems in greater detail.
5. Determine the validity of the hypothesis and, if appropriate, propose avenues for action in the form of recommendations.

2. Categorization of abandoned farmland

The interviews with stakeholders revealed that there is no uniform and accurate classification system for abandoned farmland and, in regions where such land has been characterized, a characterization methodology and categories had to be developed individually. In general, abandoned farmland is usually classified based on the existing vegetation cover or the category of land use that can be assigned to it.

2.1 Categorization by vegetation cover

The vegetation cover found on abandoned farmland varies from parcel to parcel based on several factors, including how long the land has lain fallow, former land uses, soil quality (structure and texture), topography, hydric conditions, geology and climate. A succession of plants take over the parcel which, left alone, eventually reverts to forest. The vegetation cover that is observed will occupy the land at a given point in time only.

In a study on the effects of ecological, historical and spatial factors on vegetation succession and composition in abandoned farmland (Haut-Saint-Laurent MRC, Montérégie region), Benjamin et al. (2005) state that the main factors that potentially explain the status of a parcel of abandoned farmland are abiotic ecological variables such as slope, presence of rocks on the surface, canopy and soil pH, as well as the history of land use and the age of the parcel in question. Cultural practices used, such as pasture and intensive agriculture, also leave traces differentiating soil structure and vegetation. For example, thorny shrubs usually colonize former pastures. In addition, the vegetation cover found on abandoned farmland varies by age, with older plots tending to be dominated by shrubs and more recent plots by herbaceous vegetation.

Although most of these parameters are easily identified, classifying abandoned farmland on the basis of the existing vegetation cover may present certain challenges since there do not appear to be any standards for such classification. In the literature, there are often three cover classes for abandoned farmland: herbaceous cover, shrub cover and tree cover. The distinction between classes is rarely defined. However, in the project to develop rural land in the regional county

municipality (MRC) of Rocher-Percé, these three categories (herbaceous, shrub and tree) were clearly defined, with dominant and other species identified in a list provided along with other characteristics, such as mean height and percentages of hardwoods and softwoods (Anel 2006).

In an inventory of abandoned farmland in the Basques MRC (Lower St. Lawrence region), four categories of abandoned land were established and precisely described, with photographs accompanying the definition of each category. The categories, which together provide a useful model, are described as follows (CEPAF 2006):

1) Low herbaceous vegetation: grassy meadow, two thirds of which consists of herbaceous plants (by area), mixed with a few very small shrubs (photograph 1);

2) Tall herbaceous vegetation: less than a third occupied by herbaceous plants, scattered with a few small shrubs over small areas (photograph 2);

3) Low shrubland: small and large shrubs (no greater than 1.5–2.0 m tall), possibly mixed with a few taller shrubs or small trees (photograph 3);

4) Tall shrubland: many trees, with the tallest reaching around 10 m high (photograph 4) (Langlais 2006).

Photo 1: Low herbaceous vegetation

Photo 2: Tall herbaceous vegetation

Photo 3: Low shrubland

Photo 4: Tall shrubland

Source: CEPAF 2006 (document provided by Guy Langlais)

FIGURE 1: FOUR CATEGORIES OF ABANDONED FARMLAND (BASQUES MRC)

2.2 Categorization by potential land use

Abandoned farmland is often classified according to its use: agricultural, timber or mixed in the case of plots that can be put back into cultivation or developed. A number of factors can be taken into account in assessing plots' potential and determining their use:

- size;
- zoning;
- land use according to development plan (MRC);
- accessibility, presence of access roads;
- location: proximity of urban and periurban areas;
- activities, demand;
- agricultural potential of soil;
- type and nature of soil;
- abutting soil use;
- hydric conditions (drainage);
- topography (slope);
- climate (CHU, winds, precipitation, etc.);
- successional stage of vegetation;
- mean vegetation height;
- percent cover (herbaceous vegetation, shrubs, trees);
- percentage of hardwoods and softwoods;
- dominant and other species.

These factors were taken from the characterization methodologies developed for abandoned farmland in the Islet, Basques and Rocher-Percé regional county municipalities and in the Lower St. Lawrence region. Depending on the characterization objectives, additional parameters such as landowners' degree of interest in developing their land can be added.

3. Size and geographic location of abandoned farmland

The subject of this chapter is the extent and location of abandoned farmland in Quebec. To compensate for the lack of data, various methods to quantify the area of abandoned farmland are examined. The method used, based in particular on interviews with rural planning and development advisers, allows the extent of such farmland to be partially evaluated and a few findings to be obtained.

3.1 Data in literature on area of abandoned farmland

It is difficult to accurately determine the area of what is currently considered abandoned farmland in Quebec since there are no aggregated data on the subject. In addition, this type of land use is dynamic, since abandoned farmland can be reclaimed for various uses such as afforestation for timber production. This subject will be discussed in greater depth in section 5, *Development approaches.* The data in this section are from existing documentation.

According to the Quebec Department of Agriculture, Fisheries and Food (MAPAQ), in the mid 1990s, roughly 300 km^2 of farmland was abandoned every year in the province (Stanton 1995, cited in Benjamin et al. 2006). According to Benjamin et al., in 1995, the area of abandoned farmland in Quebec was estimated at 8,000 km^2 (Labrecque 1999) with the greatest densities probably occurring in the Gaspé, Lower St. Lawrence and Abitibi regions. In a report from the same era, Hamel (1994) claimed that close to 8%, or roughly 175,000 ha, of Quebec's agricultural land was abandoned.

Figures on the loss of cultivated land also provide an indication of the increase in abandoned farmland. The following map (Figure 1) shows losses and gains in cultivated land in 100-ha increments for the 1981–1991 period. It shows that, during the 1980s alone, much more cultivated land was lost than was gained. According to Bouchard and Domon (1996), between 1961 and 1996, Quebec's agricultural land base decreased from 3.2 million ha to 1.74 million ha.

In addition, there is little information on the most common categories of abandoned farmland (by vegetation cover). A recent study by Benjamin et al. (2006) on

landowners' perceptions shows that abandoned farmland was divided almost equally between herbaceous and shrubby parcels among the landowners surveyed. The purpose of this study, which was carried out in the Acton MRC (Montérégie region), was to determine the potential for, and constraints associated with, redeveloping abandoned farmland. It provided a profile of the 25 landowners surveyed and their abandoned parcels. The succession stage of the 25 parcels studied was divided almost equally between shrubs (13) and herbaceous vegetation (12). Most of the parcels were less than 100 acres. Although the study did not provide any information on the age of the abandoned parcels, it did obtain their year of purchase: 10 were acquired less than 10 years ago and 9, between 10 and 19 years ago. Most of the plots studied fell into the two previous groups, although 5 others were acquired between 20 and 39 years ago and one, more than 50 years ago. The age of abandoned farmland seems to vary a great deal, ranging frequently between 2 and 35 years (Tremblay 2004; Labrecque 1999 cited in Benjamin 2006) or even older, depending on the region.

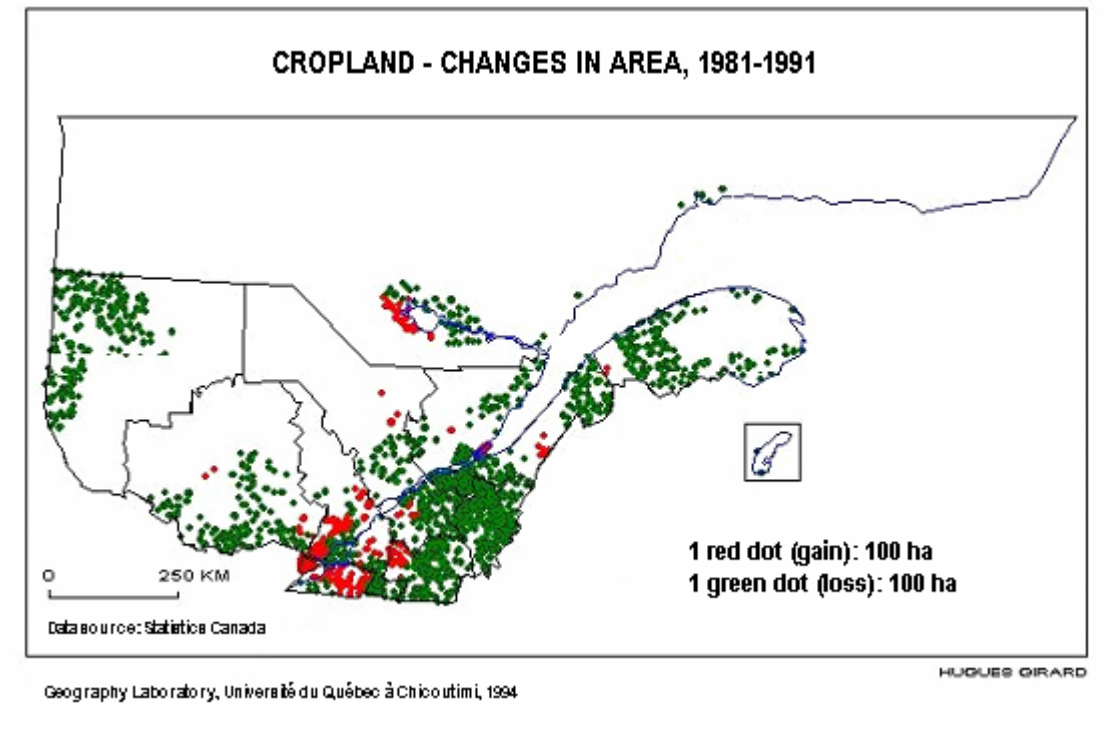


FIGURE 2: CHANGES IN AREA OF TILLED LAND BETWEEN 1981 AND 1991 (TAKEN FROM UQAC 1994)

3.2 Definition of an approach for assessing abandoned farmland

No comprehensive inventory of abandoned farmland covering all of Quebec has been carried out on a regular basis. Given this, two alternative solutions could be used to obtain this information, but would be less accurate (Charles Savoie, personal communication, 2007).

First, the land use map produced by MAPAQ from satellite images acquired between 1996 and 2002 could be used. It allows annual crops to be distinguished from perennial ones, but does not differentiate among perennial crops consisting of pasture, hay, and abandoned or fallow land. Since the map is not based on recent images or precise data, this solution was not retained.

A second option would be to sign an agreement and gain access to the data from MAPAQ's registration files for agricultural producers to obtain statistics on abandoned farmland by municipality. However, there are two problems with this alternative. First, the data have not been validated and the area of abandoned farmland indicated by farmers on the form has not been verified. Secondly, such data come from registered producers only and do not include figures from unregistered owners of abandoned farmland and owners that are not farm producers. Since, in some regions, the majority of the owners of abandoned farmland are not agricultural producers (this subject will be discussed further in Section **4.2),** a great deal of accuracy is lost.

Consequently, to determine the amount of abandoned farmland in the province, a third approach is required, which involves conducting interviews by region and even regional county municipality, since some regions do not have this information. In addition, not all regions and MRCs have an inventory of abandoned farmland on their territory. Nevertheless, conducting telephone interviews and e-mailing stakeholders provided a better overview of the extent of abandoned farmland in each of the province's agricultural regions. In this study, we contacted all MAPAQ rural planning and development advisers, since most of them have information on abandoned farmland in their region.

3.3 Results of evaluation of area of abandoned farmland

Table 1 provides a synthesis of the information available on the area of abandoned farmland in each region of Quebec. It should be noted that the total shown includes all abandoned farmland according to known data from the 10-year period of 1997 to 2007 (total of numbers shown in bold in Table 1). The actual total is undoubtedly higher since a great deal of abandoned farmland is not included: data was not available from a number of regions, including Outaouais and Abitibi-Témiscamingue, which have significant areas of abandoned farmland, as well as several MRCs. On the other hand, it is possible that the area of abandoned farmland has decreased in some regions, since up-to-date data are not available (for example, the data used for the Eastern Townships present the picture as it was 10 years ago). However, the table does provide a good overall idea of the situation.

Out of all the regions, the Lower St. Lawrence has the greatest area of abandoned farmland, over 45,000 ha. Surprisingly, the eastern Montérégie, western Montérégie and Central Quebec regions also had sizeable areas of abandoned farmland, some 25,000 ha in each case, around the year 2000. In Central Quebec, there appears to be very little of this type of land use anymore; the same situation is probably true in the Montérégie regions, given the strong demand for farmland. The Saguenay–Lac-Saint-Jean and Quebec City (Capitale nationale) regions come next, with roughly 6,000 ha, followed by Chaudière-Appalaches, with around 3,000 ha.

3.4 Findings on abandoned farmland area

Methods, including evaluation criteria and the age of the most recent data, used to characterize and inventory abandoned farmland differ from region to region or MRC to MRC. In addition, abandoned farmland, forest land and urban land are not always differentiated. For these reasons, it is difficult to compare data although the information gathered does allow some findings to be obtained.

Relative extent of abandoned farmland

Based on the information obtained, abandoned farmland covers at least 100,000 ha in all of Quebec's administrative regions. This appears relatively small compared to

Table 1: Abandoned Farmland Area by Region

	Region	Year	Abandoned Farmland Area	Comments	Other Information
1	**Bas-Saint-Laurent (Lower St. Lawrence)**	1997	**45,035 ha**	6,863 ha of abandoned farmland per se and 1,871 ha in so-called agroforestry wildlands (agricultural and timber production).	Data for each MRC available from the Agence de mise en valeur des forêts privées du Bas-Saint-Laurent (www.agence-bsl.qc.ca).
2	**Saguenay–Lac-Saint-Jean**	2004–05	**6,724 ha**	Cleared but uncultivated land.	Data for each MRC available in *Profil 2005 de la production agricole du Saguenay–Lac-Saint-Jean* (MAPAQ).
3	**Capitale-Nationale (Quebec City)**	2006	**6,000 ha**	Conservative estimate.	Area of abandoned farmland known for each MRC (MAPAQ).
4	**Mauricie**	2007	Rare	Abandoned farmland is a rare and prized commodity.	Almost all land with agricultural potential is already under cultivation or has been reforested; due to the high agricultural potential of the land, it is used for intensive agriculture.
5	**Estrie (Eastern Townships)**	1999	**17,567 ha**	2% (264 ha) has agricultural potential and 25% (4371 ha) has mixed potential (farming and timber production).	Abandoned farmland area available by MRC in the *Rapport de l'étude sur la mise en valeur des friches en Estrie* (Chalifour 2000).
6	**Montreal**	2007	Low	A number of parcels of abandoned farmland, but small in size.	Small agricultural area; very few farmers (one on Île Bizard).
7	**Outaouais**	2007	Large	Many parcels of abandoned farmland in certain MRCs.	Urbanite landowners who do not intend to farm land.
8	**Abitibi-Témiscamingue**	2007	Possibly large	No recent inventory. A decrease in cultivated land over the last 15 years.	Several plots of abandoned farmland with good development potential.
9	**Côte-Nord (North Shore)**	2000	**1,350 ha**	In 2 MRCs (La-Haute-Côte-Nord and Manicouagan).	Sept-Rivières MRC not inventoried because of small area involved.
10	**Nord-du-Québec (Northern Quebec)**	2007	Little		Little agriculture in this region.
11	**Gaspésie–Îles-de-la-Madeleine (Gaspé–Magdalen Islands)**	2007	Known for two MRCs (**5,400 ha**)	Last inventory carried out in the 1990s, now out of date.	Area evaluated in two of the six MRCs (Bertrand Anel, personal communication, 2008): Rocher-Percé (1400 ha) and La Haute-Gaspésie (4000 ha).
12	**Chaudière-Appalaches**	2007	Known for one MRC (**2,885 ha**)	Abandoned farmland not characterized in entire region.	Characterized in Islet MRC: 2,885 ha in 2000 (Islet CLD).
13	**Laval**	2007	Unknown	Area of abandoned farmland is unknown but appears to be stable.	Most of the abandoned farmland is the target of land speculation.
14	**Lanaudière**	1997	**252 ha**		Very little abandoned farmland in the St. Lawrence plain; concentrated around Terrebonne and Mascouche.
15	**Laurentides (Laurentians)**	2007	Little	No inventory of abandoned farmland has been carried out. Not much abandoned farmland.	Most of the small amount of abandoned farmland in the region is owned by land speculators.
16 18	**Montérégie Est et Ouest (Eastern and Western Montérégie)**	2000	235 km^2, or 23,500 ha	Source: CERFO 2000 cited in Benjamin et al., 2006.	Coverage of the entire region (eastern Montérégie) with orthophotos dating from April 2006 allows advanced herbaceous and/or shrubby plots to be quickly and accurately identified.
17	**Centre-du-Québec (Central Quebec)**	1991–92 2007	25,000 ha Now, very little	7,000–8,000 ha with agricultural potential that have been ploughed and 16,000–17,000 ha set aside for reforestation (in 1991–-92).	Abandoned farmland can be found along ravines, where the steep slopes limit cultivation. Some of these plots were previously used as pasture.
	Total		**108,713 ha**		

Source: Personal communications with MAPAQ regional rural planning and development advisers and land managers from several MRCs (Appendix 1)

the decrease in rural land that occurred from 1961 to 1996 of roughly 1.5 million hectares. However, if one considers that the average tilled area of a farm in Quebec is 63 ha, the area of abandoned farmland corresponds to the tilled area of roughly 1,600 farms.

Lack of recent inventories of abandoned farmland

Most regions do not have recent inventories of the abandoned farmland in their territory; according to our research, only a few MRCs and the Quebec City and Saguenay–Lac-Saint-Jean regions have up-to-date data on this phenomenon.

In the Saguenay–Lac-Saint-Jean region, a technician has been visiting the entire region every five years to characterize abandoned farmland and update the inventory. The data collected are grouped by MRC. According to MAPAQ's rural planning and development adviser in Saguenay–Lac-Saint-Jean, Jean Tremblay, this inventory is an indispensable tool that fulfills several objectives: characterizing the rural environment, integrating this portrait into the region's agricultural profile and facilitating the processing of reforestation applications. The last objective is particularly important given the many applications received, which range between 200 and 300 a year but may sometimes exceed 500 (Jean Tremblay, personal communication, 2007).

The management of abandoned farmland warrants inventories being carried out in several other regions or MRCs. However, the trend is to use orthophotos[1] to quickly identify and characterize land for which a reforestation application has been submitted. Camille Desmarais, MAPAQ's rural planning and development adviser for the Central Quebec region, says that if an inventory must be taken, orthophotos would be the tool he prefers since very high-resolution digital photos allow accurate results to be quickly obtained. In addition, this technology allows data linking, for example, information on abandoned parcels to be linked with soil maps. In Central Quebec, some vehicles are equipped with a GPS to quickly and efficiently find plots of abandoned farmland when validation in the field is required (Camille Desmarais, personal communication, 2007).

[1] Orthophotos (also called orthophotograhs or orthoimages) are aerial photographs or satellite images of the Earth's surface that are geometrically corrected or radiometrically equalized to remove distortion (Wikipedia 2007).

Difference between regions

The information on abandoned farmland shows significant differences between regions. Regions blessed with soils that have good agricultural potential generally have few of these parcels; any abandoned land is quickly put back into cultivation, whether it is purchased by a neighbour or leased. In the Mauricie region, for example, abandoned farmland is a rare commodity since the rate of usage of agricultural land is high, which can be attributed to the high soil quality (Camille Caron, personal communication, 2007). Inversely, regions with soils or a climate with less potential for high-yield agriculture have more abandoned farmland.

Residents' interest in development

The interest in finding out about and developing plots of abandoned farmland seems to be much greater in remote regions like the Lower St. Lawrence, Saguenay–Lac-Saint-Jean and the Gaspé. In these regions, the large number of abandoned parcels is associated with a decrease in landscape value and agricultural heritage, as well as the disappearance of local products that people were proud of. To stem this decline, land inventories and development projects are under way.

In periurban areas, the situation is quite different since abandoned fields are often owned by people who are not farmers, including land speculators, and returning them to production is not an important concern for many of these stakeholders. In fact, particularly in the case of land that is the target of speculation, people want this land to be dezoned as agricultural land. In short, the dynamics of stakeholders and their interest in developing abandoned farmland vary a great deal depending on the context.

4. Reasons for abandonment of farmland and associated disadvantages

Why is agricultural land abandoned? What are the downsides to this phenomenon that justify a search for solutions? This chapter provides a few answers to these questions by presenting the causes and disadvantages identified during the research. Among the causes of land abandonment identified, one problem seems to be getting worse, and is the subject of a specific subsection on owners of abandoned farmland.

4.1 Causes of farmland abandonment

Among the reasons cited for the abandonment of farmland, **the industrialization of agriculture** is one of the most significant. In an article in *L'Agroalimentaire,*[2] Tremblay (2004) maintains that the intensive consolidation brought about by the industrialization of milk production results in the underutilization of some land with less agricultural potential. In addition, he contends that the investments required to restructure some farming operations are so great that small producers sometimes choose to abandon their land instead.

Former pastures often have **very stony, poor-quality soil**. This limits their potential to be put back into cultivation given the intensive use of farm machinery in modern cultivation methods. In some cases, **steep slopes** or **plots that are too small or fragmented** make farming nearly impossible (Tremblay 2004). However, according to Benjamin et al. (2005), spatial factors such as the remoteness or the small area of the land in question had very little influence on the process of farmland abandonment by landowners from the Montérégie region interviewed.

According to Tremblay (2004), **improved yields** in many crops, including forage crops, have likely reduced the area of tilled land required, another possible cause of the abandonment of farmland. Conversely, the existence of **land unsuitable for farming** or **not offering sufficient profitability**, were reasons invoked by a number of landowners in the Quebec City region in the *Portrait de l'agriculture*

[2] *L'Agroalimentaire* is a supplement published by the newspaper *Progrès-Dimanche* in collaboration with the Table agroalimentaire du Saguenay–Lac-Saint-Jean. All the regional stakeholders in the biofood sector, including MAPAQ staff in the Saguenay–Lac-Saint-Jean region, are invited to contribute content.

périurbaine de la région de Québec produced by the Quebec City agricultural and agri-food regional development council, the Conseil de l'Agriculture et de l'Agroalimentaire pour le Développement de la Région de Québec (CAADRQ 2005).

A report on the situation in the farming sector in the Islet MRC (GéoKam 2004) maintains that producers are abandoning their farms due to such things as the **lack of younger farmers to take over, economic problems** and sometimes **difficulty obtaining authorization to subdivide their land** from Quebec's agricultural land protection commission, the Commission de protection du territoire agricole du Québec (CPTAQ).

In a study on perceptions of abandoned land by 25 landowners around Acton in the Montérégie region (Benjamin et al. 2006), the **desire to conserve their land in its current state** was the reason most often given by landowners in response to the question [trans.] "For what reasons is this portion of your land not being or no longer being used?" Most of these respondents were older and retired. Although **time and money constraints** were also mentioned, the authors concluded that [trans.] "abandoned land was not the troublesome part of the property that it could have been" (Benjamin et al. 2006).

4.2 Influence of type of landowner

In both periurban and rural areas, abandoned farmland is owned not only by farmers but also by other types of landowners, each with his or her own set of interests and intentions for the use of this land. Such interests may be a cause of farmland abandonment. In periurban areas in particular, speculators may allow their land to go uncultivated in the expectation of a zoning change.

In 1994, Hamel noted in a report on the potential of reforesting abandoned farmland with large deciduous forest tree species that most abandoned farmland did not belong to farmers, which is increasing the land's potential for timber production. Hamel also observed that planting hardwoods was particularly suited to small landowners, who had the time, motivation and money to succeed.

Today, it is difficult to know whether most owners of abandoned farmland are farm producers. In agricultural regions, it is mainly farmers who voluntarily abandon the cultivation of part of their land for one or more of the reasons cited above.

Nearer towns and cities, the situation is different. In periurban areas, many of these landowners are not farmers. Many are speculators waiting for their land to be rezoned. Others are city people looking for a place in the country.

A report produced by the Communauté métropolitaine de Québec (CMQ) [Quebec City metropolitain community] in 2004 revealed that there were several thousand hectares of abandoned farmland in the agricultural portion of the region, a large percentage of this on good-quality agricultural land. A sizeable portion of this land belonged to developers who wanted to see their land become urbanized (CMQ 2004). In other words, these non-producers allowed their land to deteriorate in the expectation that it would be removed from the agricultural zone. This is also true in the Montreal and Laval regions and in part of the Outaouais region.

In Laval, most of the abandoned farmland is probably the target of speculation (Pierre-Olivier Quesnel 2007, personal communication). According to MAPAQ's registration data in 2004, 2,630 ha of farmland was leased by registered agricultural operations, or 73% of the land farmed in the agricultural zone. Based on an examination of land titles, MAPAQ identified 1,720 ha that were not owned by agricultural enterprises, their shareholders or close family. In other words, roughly 55% of tilled area is not in the hands of agricultural enterprises.

The result is that in periurban areas it is difficult to preserve agricultural land use on abandoned farmland that does not belong to farm producers. Future efforts to develop abandoned land in these areas could be made more difficult by landowners' lack of motivation to get involved in farming or forestry activities.

The study conducted by Benjamin et al. (2006) on the perceptions of owners of abandoned farmland in the Acton MRC provided a portrait of the 25 landowners interviewed. A majority (8) were between 40 and 50 years old and their origins were 17 rural, 6 urban and 2 neo-rural. Land use was mainly non-agricultural (13), with land acquisition being relatively recent, mostly dating back 19 years or less. A total

of 8 landowners were in the primary sector (farming). This example illustrates well the diversity that exists among owners of abandoned land in rural regions—in this case, the Montérégie region—not far from a major urban centre such as Montreal.

In short, reasons for abandoning farmland vary from region to region depending on the context and the various interests involved. In the end, such reasons—whether poor agricultural yields, the cost of reforestation, or monetary expectations associated with future rezoning for residential or commercial development—often boil down to economics.

4.3 **Disadvantages of abandoned farmland**

The presence of abandoned farmland in the rural and periurban landscape has a number of disadvantages and consequences for society as a whole.

First of all, with barely 2% of the territory of Quebec used for agriculture, any new abandonment of potential cropland represents **a loss of long-term potential** to society. The longer the loss of agricultural potential due to the change in land use—either over a long period (for example, after reforestation with softwoods) or irremediably (urbanization)—the greater the value of this loss.

In the short and medium term, abandoned farmland represents the **economic underutilization** of agricultural land. According to GéoKam (2004), [trans.] "abandoned farmland is unproductive land, thus representing the squandering of capital that otherwise would be likely to generate agricultural or forestry activities and revenues." Such underutilization deprives not only landowners of potential income but also local communities of potential economic spinoffs.

However, according to GéoKam (2004), the presence of large amounts of abandoned farmland in a municipality is an indication of the state of the market for agricultural land, which could **hamper the municipality's development**. Furthermore, the negative visual impact of abandoned farmland may contribute to the **devaluation of adjacent properties** as well as harm the municipality's image. In a periurban context, abandoned farmland, particularly when overgrown with lo**w herbaceous**

vegetation, can be a **nuisance** to neighbours (CMQ 2004), leading to such things as the **propagation of weeds** like ragweed.

On a larger scale, **decreased landscape value** has become an increasingly important issue, particularly in tourist regions. For example, in a report on the status of the agricultural sector in the Islet MRC, aesthetic considerations were one of the issues cited with respect to abandoned farmland, in terms of the effect on tourism development and the quality of life (GéoKam 2004). Benjamin et al. (2006) report that abandoned farmland is one of the most poorly viewed types of land use. Tessier (2007) delved further into the question of the impact of agricultural activities on rural landscapes and studied the benefits of agroforestry development to model it and provide added value.

Despite the preceding, it must be emphasized that abandoned farmland does have benefits. It helps to protect fauna and flora that get established there. In addition, there are no pesticides or chemical fertilizers applied on this land and thus no pollutants. Abandoned land therefore can act as a buffer zone between cultivated land and the natural environment. Though unintentionally, abandoned farmland can play a role in preserving biodiversity and the environment.

5. Development approaches

Although some abandoned farmland is put back into cultivation by farming operations, thus regaining its agricultural value (MAPAQ 2002), the most common solution currently for developing these plots is reforestation (afforestation). There are other solutions[3] for dealing with abandoned farmland, such as various agroforestry systems, intensive silviculture and the planting of fruit trees and shrubs.

5.1 Reforestation

Abandoned farmland is often well suited to such options as reforestation, because this type of land is often easy to access and free of large rocks and stumps (Benjamin et al. 2006). In addition, forest development programs[4] in some regions encourage such initiatives. Although the main objective of afforestation is timber production, trees' capacity for atmospheric carbon sequestration is another significant benefit often mentioned in these programs. This issue has been studied and it would be interesting to follow the emerging carbon market since additional revenues could be generated from tree planting through carbon credits. In addition, agricultural soils—even marginal ones—often have potential for forestry.

Under the *Act Respecting the Preservation of Agricultural Land and Agricultural Activities* (R.S.Q., chapter P-41.1), land in an agricultural zone can be used either for conventional crops or silviculture. Agricultural producers therefore have the right to plant trees on their land at their own expense. In addition, a framework agreement reached in the 1980s between the Quebec Department of Natural Resources and Wildlife **(**MRNF) and MAPAQ allows landowners with land less suitable for agriculture

[3] The development options described in this chapter were chosen because of their popularity and potential. Other activities are feasible on some abandoned farmland, such as Christmas tree production and community pasture. Abandoned farmland that has not been treated with fertilizers or pesticides also has potential for organic farming.

[4] Quebec's forest resources development program, Programme de mise en valeur des ressources du milieu forestier, is a financial assistance program for work carried out in forest environments administered by Quebec's Department of Natural Resources and Wildlife: www.mrnf.gouv.qc.ca/forets/amenagement/amenagement-programme.jsp (in French only).

to obtain free seedlings from the MRNF. Reforestation applications can be submitted through a forestry adviser or by applying to MAPAQ's regional offices.

If the area set aside for timber production is a single parcel of 4 ha or more, the landowner may benefit by obtaining a forest producer certificate (Certificat de producteur forestier). Four funding programs are available to recognized forest producers, including a private forest development assistance program (*Programme d'aide à la mise en valeur des forêts privées)*, which reimburses producers for up to 80% of the work done. Producers wishing to obtain a certificate must apply to a registration bureau mandated by the MRNF. Some MRCs or municipalities may adopt bylaws to more closely regulate activities and uses on their territory. Under the *Act Respecting Land Use Planning and Development* (articles 79.1 and 113), an MRC has the power to enact bylaws to govern or limit for all or part of its territory the planting or felling of trees to ensure protection of the forest cover and promote the sustainable development of private forests.

Some regional forestry agencies have signed agreements with MRNF and MAPAQ on this issue. For example, Appendix 2 contains a copy of the policy on reforesting abandoned land adopted by Quebec's private forest agency (AFPQ 03). This policy gives landowners the right to reforest land that complies with the specified criteria without obtaining MAPAQ authorization.

In Quebec, the MRNF is responsible for producing tree seedlings at the request of the regional private forest development agencies (Agences de mise en valeur des forêts privées régionales). The main species produced are shown in Table 2 (André Bégin, personal communication, 2007), although other species can be produced.

Table 2: Main Tree Species Produced by the MRNF

Softwoods	Hardwoods
White spruce	Sugar maple
Black spruce	Red maple
Red spruce	Yellow birch
Norway spruce	White birch
Jack pine	Red oak
Red pine	Bur oak
White pine	White ash
Eastern larch	Red ash
European larch	American elm
Japanese larch	Basswood
Eastern white cedar	Bitternut hickory
Balsam fir	Black cherry
	Black walnut
	Hybrid poplar

Source: André Bégin, MRNF forestry technician, personal communication, 2007

Roughly 130 million seedlings are produced every year in Quebec for public and private forests. Out of this number, roughly one million are hardwoods other than hybrid poplar. The popularity of hybrid poplars, of which two million seedlings are produced annually, is due to their very vigorous growth. However, this tree requires good soil preparation (tilling and harrowing) and limited competition in the first few years after planting. In general, hardwoods require more tending than softwoods and are more difficult to grow. Plantations must be planned several years in advance since seedlings require two to four years to produce before they are ready to use. The species most often used for reforestation are white spruce, black spruce and jack pine.

Although reforestation has a number of benefits, it also has certain constraints, such as the investments required and, particularly in regions with intensive farming, the strong pressure exerted by agriculture (Benjamin et al. 2006). Reforestation is not necessarily the best solution for agricultural landowners. A certain amount of resistance to silvicultural operations was found among farmers during a study on the perceptions of the owners of abandoned farmland: [trans.] "These people tend to be

opposed to the reforestation of abandoned farmland and do not want plantations to be increased in the region" (Benjamin et al. 2006). Therefore, it would be worthwhile to evaluate the possibility of developing abandoned land in another way, to benefit farm producers. According to Benjamin et al. (2006), mixing hybrid poplars and longer-lived hardwoods and alternating softwoods and hardwoods are the types of plantations that owners of this land most often envisage (see discussion in subsection 5.3 *Intensive silviculture)*.

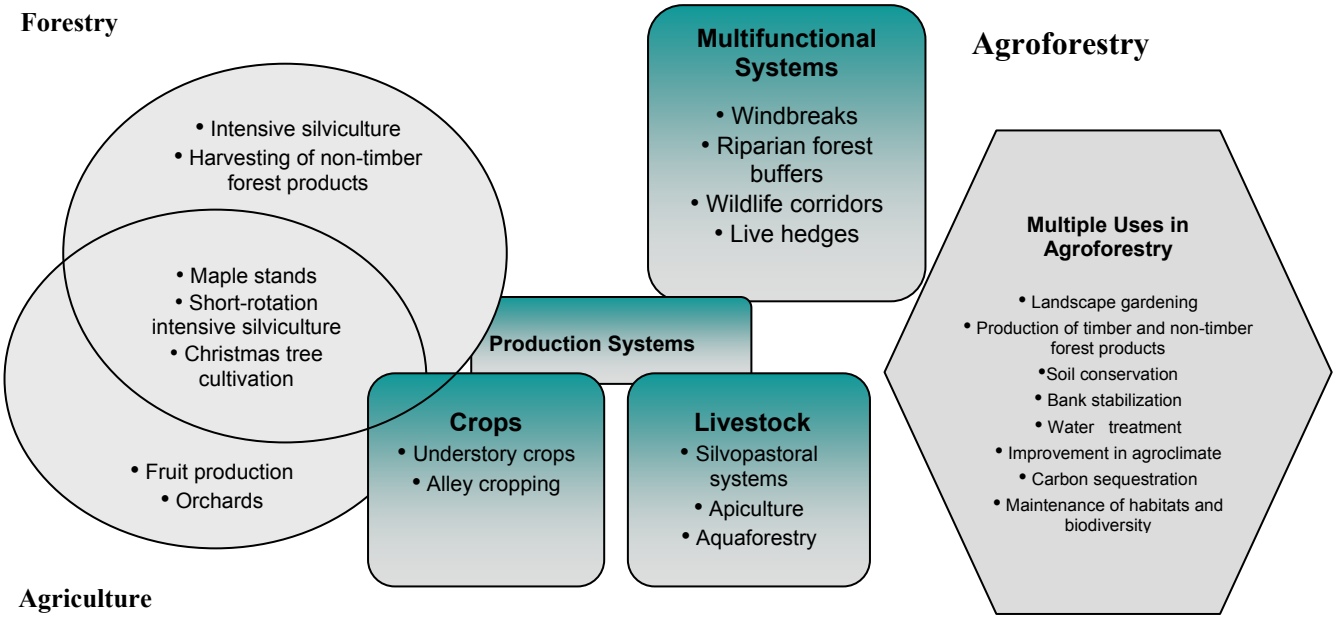
Rural communities are also concerned with the issue of the systematic reforestation of abandoned farmland. The reforestation and timber production processes are associated with minimal human activity and people in these communities prefer to see activity in the fields, producing a living landscape (Bertrand Anel, personal communication, 2007). While reforestation with a diversity of species that is well integrated with the rural environment may help to improve the landscape, a forest monoculture can create a rather bland and boring landscape and even lead to the loss of landscape through the creation of visual barriers.

5.2 Agroforestry

Agroforestry, with its systems combining agriculture and forestry, offers a number of potential solutions for developing abandoned farmland while maintaining agricultural land use. In Quebec, agroforestry is an emerging, though still largely unknown, field. Several stakeholders are currently working to develop agroforestry and get it recognized in the province. A paper entitled *Portrait of Agroforestry in Quebec*—the result of co-operation between Agriculture and Agri-Food Canada (AAFC), the Canadian Forest Service (Natural Resources Canada) and the Centre d'expertise sur les produits agroforestiers (CEPAF) (De Baets et al. 2007)—provides a good overview of the issue. Here is its proposed definition of agroforestry, which has been adapted to the Quebec context:

> Agroforestry is an integrated system of rural land resource management based on combining shrubs and trees with crops and/or livestock, whose interactions generate economic, environmental and social benefits.

Agroforestry is practised not only in many tropical countries but also in temperate ones. Agroforestry practices are numerous and varied. The following diagram, taken from *Portrait of Agroforestry in Quebec,* shows the field in Quebec (Figure 3).



Source: ***Portrait of Agroforestry in Quebec***, De Baets et al. 2007

FIGURE 3: THE AGROFORESTRY SECTOR IN QUEBEC

Agroforestry practices that could contribute directly or indirectly to resolving the problem of abandoned farmland in Quebec include shelterbelts, riparian agroforestry systems, silvopastoral systems (combining livestock and trees or forests), apiculture (putting hives in blueberry fields), understorey crops and alley cropping (planting crops between rows of trees). Intensive silviculture is also very promising, but since it is related to—although is not necessarily included in—recognized agroforestry practices, it is discussed in a separate subsection (5.3 *Intensive silviculture*).

In the *Portrait of Agroforestry in Quebec* (De Baets et al. 2007), abandoned farmland is repeatedly described as land that could be developed with agroforestry systems. According to De Baets et al., practices such as intensive silviculture, alley cropping,

and plantations of common elderberry, serviceberry and beaked hazelnut have a great deal of potential, particularly in developing abandoned farmland (De Baets et al. 2007). Trials of alley cropping (crops grown in between rows of trees) are currently under way in the Mauricie and Gaspé regions. Since agroforestry is still in its early stages in Quebec, very few agroforestry practices seem to have been implemented on abandoned farmland at the current time. Despite this, the ecological and economic functions associated with agroforestry practices and the wide range of systems that can be implemented make agroforestry an attractive alternative for developing abandoned farmland.

5.3 Intensive silviculture

According to the literature consulted, the interest in intensive silviculture for developing abandoned farmland seems to be on the rise, since, among other things, it is a useful alternative for dealing with the anticipated shortfall in fibre. Quebec's intensive silviculture network, the Réseau Ligniculture Québec (2007), defines intensive silviculture as [trans.]: "the intensive cultivation of plantations of trees in short rotation in order to obtain maximum fibre yields." Favoured crops include hybrid poplars, hybrid larches, Norway spruce, white spruce and willows (Réseau Ligniculture Québec 2007, De Baets 2007). According to the *Portrait of Agroforestry in Quebec* (De Baets et al. 2007), short-rotation intensive silviculture has definite potential, particularly for the reclamation of abandoned farmland. The newspaper *Les Affaires* states that [trans.] "the (forestry) industry is targeting such things as abandoned farmland to reforest Quebec." (Les Affaires 2006).

In Quebec, the MRNQ's forest research directorate is working with several companies interested in planting fast-growing species, chief among them Domtar (Windsor), Fraser (Outaouais), Tembec-Malette (Mauricie) and Louisiana-Pacific (Chambord) (Réseau Ligniculture Québec 2007). Hybrid poplar is already supplying 17% of Fraser Papers' fibre requirements and an even greater percentage for Domtar, the biggest planter of hybrid poplars in Quebec (Les Affaires 2006). Around the world, a number of countries are exploiting rapid-growth plantations commercially (Réseau Ligniculture Québec 2007), including New Zealand, the United States and France.

Intensive silviculture reduces harvesting pressures on natural forests (Réseau Ligniculture Québec 2007) and certainly has potential in developing abandoned farmland. In a study on the perceptions of owners of this type of land, Benjamin *et* al. (2006) found that planting hybrid poplars, a practice that was relatively unknown and uncommon in the study area (Montérégie), was viewed fairly favourably by landowners. Compared with reforestation, intensive silviculture involves a more sustained level of human activity and potentially greater species diversity. Depending on production conditions, however, intensive silviculture can take the form of monocultures, which pose potential risks for the environment.

Hybrid poplar plantations are a promising avenue for developing abandoned farmland and restoring degraded shorelines of watercourses; in the latter case, longer-lived deciduous forest tree species can be planted to succeed the hybrid poplars over the longer term (Benoît Truax, personal communication, 2007). According to Paquette and Cogliastro (2003), [trans.] "in southern Quebec, on private land, the primary opportunities for practising poplar culture[5] are in the agricultural environment (riparian buffer strips, shelterbelts, forest corridors), particularly in marginal agricultural situations." The fact that there are a number of hybrid poplar cultivars with specific technical characteristics that can be planted on various types of abandoned land makes this practice particularly promising for taking advantage of the opportunities arising out of farm abandonment (Paquette and Cogliastro 2003). In addition, cultivars can be selected that are suitable for more marginal soils (Paquette and Cogliastro 2003).

The advantage of growing poplars and longer-lived deciduous forest tree species in conjunction stems from the succession of the two species, which has many benefits. According to Paquette and Cogliastro (2003), hybrid poplars' rapid growth quickly creates protective conditions for the growth of longer-lived deciduous forest tree species. In addition, silvicultural treatments for the two species are similar but, for poplars, are done on a short rotation, which allows stakeholders to get involved and learn the ropes early on, and maintains their motivation to take care of the longer-lived species. The resulting stand structure draws the larger deciduous forest tree species towards the light, limiting the growth of lateral branches in favour of improved wood quality. Lastly, even after the poplars are harvested (after 15 to 20

[5] Cultivation of poplars.

years), the landscape is preserved because the long-lived deciduous forest tree species are still present. According to Hamel (1994), the regions most suitable for the production of deciduous forest tree species are Montérégie, Chaudière-Appalaches, Eastern Townships and Mauricie.

Intensive silviculture, since it involves relatively short rotations (15 to 20 years) and is somewhat akin to agriculture, is a promising option for developing abandoned farmland. The affinities between intensive silviculture (e.g., cultivation of hybrid poplars) and agroforestry, which uses the same species for riparian agroforestry systems and shelterbelts, suggest the need for joint coordinated planning in implementing intensive silviculture and agroforestry practices.

5.4 Fruit production

Fruit production has a great deal of potential in the development of some types of abandoned farmland. In an article entitled *De petits fruits au secours de grandes régions*, Croisetière and Richer (2003) comment that most native fruit trees and shrubs adapt well to abandoned farm fields. Fruit can be field grown or incorporated in an agroforestry system such as alley cropping, riparian system or shelterbelt.

According to Croisetière and Richer (2003), berries are well known for their nutritional (and sometimes even medicinal) properties and can be used for a range of commercial purposes (for example, elderberries can be used as a food colouring agent). Cultivating these native trees and shrubs can provide both environmental and economic benefits. Native species adapt more easily and require less fertilizer and fewer pesticides. Economically, according to the Centre de recherche Les Buissons (cited in Croisetière and Richer 2003), the growing of native berries can revitalize regions' economies.

According to Croisetière and Richer (2003) again, a study on the potential of berry production on the North Shore shows that cloudberries and alpine cranberries have exceptional potential. Other species of berries studied include lowbush blueberry, serviceberry, red and black chokecherry, wild plum, beaked hazelnut and highbush cranberry, all in the Saguenay–Lac-Saint-Jean region at the Jardins Maria-Chapdelaine inc. The Research and Development Institute for the Agri-Environment

(IRDA), in association with MAPAQ and farm producers, is also studying native crops (Rousseau 2006); they found that the most promising commercial species are the mulberry, serviceberry, highbush cranberry and black chokecherry.

5.5 A project combining agroforestry and abandoned land

This section describes a concrete example of agroforestry development carried out on abandoned farmland. The project, coordinated by Bertrand Anel of the Rocher-Percé CLD [local development centre], involves developing rural land in the Rocher-Percé MRC. It recognizes the multifunctionality[6] of agriculture in the area. The two-year project began in 2005 and draws on a group of 12 partners[7] that are studying options for developing abandoned farmland in the Rocher-Percé MRC, in the Gaspé region. The proposed agroforestry system combines on the same parcels deciduous forest tree silviculture, crops and livestock raising (Anel et al. 2007).

Currently, agriculture in the Rocher-Percé MRC is at a turning point—it can either be renewed or disappear (Baumgartner 2006). The region is renowned for its tourist attractions, including the beauty of its landscape. Issues motivating the launching of the project include redevelopment of abandoned farmland, loss of natural and built heritage and the loss of links between producers and consumers (Baumgartner 2006).

The purpose of the project is to validate the interest in silvopastoral systems in the Rocher-Percé MRC. The project's objectives, listed on the Web page of Laval University's Chaire multifacultaire de recherche et d'intervention sur la Gaspésie et les Îles-de-la-Madeleine,[8] are to

- Carry out a biophysical characterization of the MRC territory;

[6] Multifunctionality is the idea that agriculture has many functions in addition to producing food and fibre, such as environmental protection, landscape preservation, rural employment, security of supply, etc. (OECD 2007).

[7] Partners are the Rocher-Percé MRC, Laval University's Chaire multifacultaire de recherche et d'intervention sur la Gaspésie et les Îles-de-la-Madeleine, the Rocher-Percé CLD and CLE [local job centre], the Consortium pour le développement durable de la forêt gaspésienne, the Conférence régionale des élus de Gaspésie–Les-Îles, the Union des producteurs agricoles de la Gaspésie-Les-Îles, MAPAQ, the Rocher-Percé Community Futures Development Corporation, the Fondation communautaire Gaspésie-les-Îles, the town of Percé and the Coopérative de solidarité du Rocher-Percé.

[8] Web site of Laval University's Chaire multifacultaire de recherche et d'intervention sur la Gaspésie et les Îles-de-la-Madeleine: www.gaspesie-les-iles.chaire.ulaval.ca/accueil (in French only).

- Carry out a socio-economic characterization to determine conditions for the project;
- Draft a project plan to test and disseminate the concept of agriculture and agroforestry multifunctionality;
- Allow local and regional stakeholders to acquire expertise and appropriate concepts.

The ultimate aim of the project is the development of the multifunctionality of rural land through a combination of agriculture and forestry to maintain welcoming landscapes and an active rural dynamic (Bertrand Anel, personal communication, 2007). It has three main stages:

1) Characterization of abandoned land (completed)

- Inventory of abandoned parcels larger than 1 ha using orthophotos;
- Site visits to characterize parcels (vegetation type and percent cover);
- Contacting landowners to determine interest and motivation in developing their land;
- Creation of a geographic information system.

2) Search for solutions (under way)

- Trials of agroforestry plantations combining long-lived deciduous forest tree species with crops in plots already cultivated in 2006;
- Trials planned of implementation of systems on abandoned farmland in 2007.

3) Reconciliation of programs (forthcoming)

- Contact with, and proposals for co-operation mechanisms between, farming and forestry organizations to obtain the financial and technical means required to establish widely spaced plantations including crops.

Appendix 3 shows the form used to characterized abandoned land. The systems established included species like red oak (*Quercus rubra*), Eastern white pine (*Pinus strobus*), red ash (*Fraxinus pennsylvanica*) and American elm (*Ulmus americana*).

Producers were closely involved in the process and participated in the selection of tree species. Selection criteria included potential timber value, compatibility with intensive silviculture in an open habitat and whether species were native to the

Gaspé region (Anel et al. 2007). In parcels with alley cropping, common elderberry, wild plum and basswood were chosen. Producers' receptiveness to the project increased as the project progressed and they are now very proud of the trees that they are growing on their land (Bertand Anel, personal communication, 2007). Photographs of some of the plots can be seen on the following Web page:

http://www.sbf.ulaval.ca/agroforesterie/gallerie.html

According to Anel et al. (2007), the project is producing positive results overall. Farmers' interest in the project is growing and they are satisfied with it. Implementing the systems has proven to be relatively easy and implementation costs, relatively modest.

6. Other solutions promoting development

Other solutions, either commercial or administrative in nature, could also be envisaged to encourage the development of abandoned farmland, such as sharecropping and a surtax on abandoned farmland. Experience elsewhere in the world with the management of abandoned farmland may also inspire new approaches.

6.1 Sharecropping

As explained earlier, some owners of abandoned land may be reluctant to develop it for all sorts of reasons: lack of interest, time, money or knowledge, for example. It would be useful to explore the possibility of helping landowners who would like to develop their land themselves or to provide them with the option of leasing their land out to an individual or a specialized group that would use the land.

Leasing land for cultivation or livestock raising is called sharecropping. Sharecropping can be defined as a type of rural lease in which the landowner, or lessor, allows a lessee to cultivate the land in return for a share of the crop (Wikipedia 2007). In Quebec, this type of farming arrangement has been tried on an experimental basis since 1994 at the Bas-Saint-Laurent Model Forest (La Semaine verte 2002). However, the land in question was not abandoned farmland but rather forest land.

The Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) has produced a fact sheet on crop share lease agreements, available at the OMAFRA Web site (http://www.omafra.gov.on.ca/english/busdev/facts/01-067.htm). The advantages and disadvantages of this approach, taken from the fact sheet, are shown in Table 3.

Table 3: Advantages and Disadvantages of Crop Share Leases

Advantages	Disadvantages
Compared to cash rents, less operating capital is "tied up" by the tenant because the landlord is sharing costs.	Landlord's incomes vary with yield and price variation and changes in shared production input costs. This may be a particularly important concern for retired landlords.
Management may be shared between an experienced landlord and tenant, resulting in more effective decisions.	Accounting for shared expenses must be maintained.
Sales of crops may be timed for tax management. Likewise, purchased inputs may be timed to shift expenses for tax purposes.	The need for tenant and landlord to discuss annual cropping practices and to make joint management decisions is greater than with a cash rent arrangement.
Risks due to low yields or prices, as well as profits from high yields or prices, are shared between the two parties.	As prices or technology change, the lease should be reviewed for fairness. Sharing arrangements may need to be changed.
The income received from a crop share agreement by the landlord is eligible for a Net Income Stabilization Account (NISA) and is considered farming income, which may be important for a landlord who wants to maintain farming status for tax advantages.	The results of a tenant's superior management are shared with the landlord.

Source: OMAFRA 2001

6.2 Surtaxes

Developing some parcels of abandoned farmland would be difficult without incentives or coercive, financial or legal measures. This is particularly true of fragmented parcels in urban areas subject to land speculation, among others. One way of dealing with this type of situation is to levy a surtax on such abandoned land, along with the creation of a bank of parcels available to agricultural producers. The experience of the municipality of Laval will be described here.

When the *Act to Preserve Agricultural Land and Agricultural Activities* went into effect in 1978, the City of Laval found itself with 810 ha of fragmented parcels in a permanent agricultural zone (Hubert 1998). Although this land had excellent agricultural potential, land speculation in the 1960s and 1970s had severely

fragmented it, making it difficult to cultivate. In 1992, the municipality established Agriculture Laval (AGRIL) with the mandate of working to consolidate the fragmented unused plots in Laval's permanent agricultural zone and put them back into cultivation.

Among the solutions studied by AGRIL, the levying of a surtax on unused fragments of land in the agricultural zone was chosen as the basis for consolidating this land and returning it to cultivation. Over the years, the surtax has allowed an agricultural consolidation fund and land bank to be built up. Parcels in the bank that were extensive and homogeneous enough to be farmed have been transferred to farm producers so they can put them back into cultivation.

From 1997 to 2007, a surtax of $100 was levied on uncultivated land less than 3,300 m^2 in size, allowing 2,815 of 6,222 abandoned plots to be reclaimed. Since 2007, the amount has been raised to $200 and extended to all lots 6,000 m^2 in size or less, or 92% of all lots identified in the green zone (St-Amour 2007). Revenues from this tax in 2007 are estimated to be $500,000.

In 2007, Laval mayor Gilles Vaillancourt stated that the amounts levied were not enough to allow the continued consolidation of unused land (St-Amour 2007). He proposed the creation of a national fund to support municipal efforts of this kind. This type of measure is not limited to Laval but interests other municipalities as well. For example, Longueuil's city council also adopted a surtax to consolidate abandoned land in the municipality and put it back into cultivation (Longueuil 2007). The amount of the surtax is the same as that of Laval.

6.3 Other experiences around the world

The problem of abandoned farmland is common throughout the world and has been studied extensively to find solutions. The phenomenon has been examined in a number of countries, including China, Sweden, Great Britain, Spain, France, Panama and several US states, among them Florida, Vermont and Arizona. This section will describe some of these studies to provide inspiration for projects to develop abandoned farmland by using agroforestry systems.

China

Reasons for farmland abandonment differ greatly from country to country, in step with variations in climate, soils, geology and farming practices around the world. For example, in China, wind erosion makes cultivation very difficult in a region characterized by very sandy, degraded soils. This situation has led Chinese researchers to examine the possibility of introducing agroforestry systems on these soils.

A study by Zhang and Shao (2003) shows that using agroforestry systems on sandy soils has a strong potential to improve yields. According to the authors, local agroforestry development is already 10 times more profitable than large tracts of forest with very little sunlight and competition from roots. In this region, crops that have no protection from wind erosion are very difficult to grow.

This example shows that, instead of abandoning farming on very sandy soils, agroforestry systems that make this land productive and cost-effective to farm can be implemented.

Sweden

In Sweden, where 348,000 ha of farmland fell into disuse between 1974 and 1999, a study evaluated the impact of growing hardwoods on this land on biomass production and reduction of atmospheric CO_2 levels for two types of rotations (short and long) (Eriksson and Johansson 2006). The results are relevant to our context, given the option for practising extensive silviculture on abandoned farmland (see Section 5.3) and since such crops have potential for reducing greenhouse gas (GHG) emissions.

The authors wanted to know what type of rotation would generate the most benefits in terms of maximizing biomass production and reducing CO_2 emissions for five tree species: trembling aspen (*Populus tremula* L.), black alder (*Alnus glutinosa* (L.) Gaertn), grey alder (*Alnus incana* (L.) Moench.), European white birch (*Betula pendula* Roth) and hairy birch (*Betula pubescens* Ehrh.). The results show that the rotation must be taken into account in reforesting abandoned land to increase carbon sequestration and biomass production. If the objective is to maximize the average amount of carbon stored in biomass, long rotations (around 45 years) are best; if the objective is to optimize the reduction of atmospheric CO_2 emissions, short rotations (roughly 15 years) should be favoured.

It should be noted that the Swedish government instituted a carbon dioxide tax on fossil fuels in the early 1990s (Eriksson and Johansson 2006). This tax and the key role that biofuels can play in reducing GHGs increased researchers' interest in biomass and biofuels.

There is also a growing interest in biofuels in Canada. On April 23, 2007, the Government of Canada (2007b) launched the ecoAgriculture Biofuels Capital Initiative (ecoABC). The $200-million program aims to strengthen the country's renewable fuel capacity by helping agricultural producers to construct or expand biofuel production facilities. In this context, owners of abandoned farmland may seek to make a profit from their currently unproductive land.

France

All regions in France are affected by agricultural abandonment, although the beginning and intensity of the phenomenon may differ depending on the region (Cemagref 2004). In Aquitaine, this type of land use has increased in recent years, particularly on land with little agricultural potential (PNAT 2003). France's truffle industry is not very profitable and abandoned farmland is well suited to this type of crop.

Aquitaine's regional union of truffle growers, the Union Régionale des Trufficulteurs d'Aquitaine (URTA), has established incentives, in the form of financial and technical assistance, to farmers and other individuals for planting truffle oaks. There are three types of issues involved in truffle growing (PNAT 2003):

1) economic: price of the mushroom;
2) environmental: impact on the landscape and reduction in abandoned farmland;
3) social: building of links between recently arrived rural dwellers and farmers through the exchange of experience or services.

According to URTA (PNAT 2003), 55% of the funding for its initiative comes from the project proponent, 25% from the European Agricultural Guidance and Guarantee Fund (EAGGF) and 20% from the Aquitaine regional council (Conseil régional d'Aquitaine). The URTA maintains that although truffle growing is a marginal activity economically speaking, it is nevertheless traditional in the region of Aquitaine and that all these initiatives should help improve the region's image for tourism as well as of its agricultural heritage. The initiative is an interesting example of what could be achieved in Quebec, particularly in regions with tourism potential, through agroforestry projects.

7. Discussion and recommendations

In this chapter, the information gathered is analysed to validate the hypothesis and establish findings. Two components of the hypothesis were tested: the extent of abandoned farmland and the suitability of using agroforestry systems in developing abandoned land. The analysis highlights the three key factors in developing abandoned land and the need to develop a characterization tool for this land for decision-making purposes. Lastly, the various development options are examined and recommendations made on the issue of abandoned farmland.

7.1 Validation of hypothesis

This exploratory study's primary objective was to validate the following hypothesis:

> *In Quebec, there is a significant amount of abandoned farmland and this land's potential justifies that the parties concerned make an effort to develop it using agroforestry production.*

The hypothesis therefore has two basic components: the extent of the problem of abandoned farmland and the suitability of agroforestry systems for developing it.

Extent of abandoned farmland

Since few regions have up-to-date inventories of their abandoned farmland, the exact extent of the area of abandoned land in Quebec's various regions could not be determined. However, the information gathered did allow an estimate of roughly 100,000 ha for all of the province's administrative regions to be made; this excludes the Outaouais and Abitibi-Témiscamingue regions and several MRCs, for which data were not available.

In addition, research and interviews allowed several regions to be identified that are dealing with a problem of large amounts of abandoned farmland:

- Bas-Saint-Laurent (Lower St. Lawrence);
- Saguenay–Lac-Saint-Jean;

- Capitale-Nationale (Quebec City);
- Outaouais;
- Gaspésie (Gaspé);
- Chaudières-Appalaches.

The Abitibi-Témiscamingue region should probably also be on this list, but the lack of information could not allow this to be formally confirmed. The regions in question are either far from or close to major urban centres. According to the information obtained, little abandoned farmland is present in the following regions:

- Mauricie;
- Lanaudière;
- Laurentides (Laurentians);
- Centre-du-Québec (Central Quebec).

It is important to underline that the reasons for the existence of abandoned farmland vary from region to region, which has an influence on this land's development potential in a given region. For example, the industrialization of agriculture in the Saguenay–Lac-Saint-Jean region has meant that the least productive land has been abandoned, while in the Outaouais region, the situation is due mainly to the type of landowner found, in this case, city dwellers who buy a piece of land but do not intend to farm it or harvest it for timber. This explains why both remote and urban areas are included in regions with a large amount of abandoned farmland.

Suitability of agroforestry

As discussed in subsection 5.2, agroforestry provides an alternative to reforestation, which is the commonly used solution in Quebec for developing abandoned land. Depending on the land's potential, the information gathered indicates that agroforestry systems are a feasible solution for restoring value to much abandoned farmland.

The few inventories of abandoned land carried out generally show results according to potential for agriculture, forestry or mixed use (agriculture and forestry). Generally, land with agricultural potential is much scarcer. However, a portion of the land deemed to have potential in forestry could be used for agroforestry systems such as alley cropping, fruit production (shrubs), silvopastoral systems or intensive

silviculture. When completed, some current projects, particularly the one at the Rocher-Percé MRC, could provide useful information in validating this hypothesis.

Overall, this analysis tends to validate the hypothesis that the extent of abandoned farmland and its potential is great enough to justify *a priori* that efforts be made by the parties concerned in developing this land for agroforestry production.

In accordance with this analysis, it is recommended that the investigations and search for solutions in the development of abandoned farmland be continued, particularly the approach involving agroforestry practices.

The sections that follow will go into greater detail on specific aspects of the development of abandoned farmland.

7.2 Rationale for an inventory of abandoned farmland in Quebec

It has been already clearly established that some regions are faced with having large areas of abandoned farmland. Gathering information on this subject has been rather difficult and time consuming due to the lack of recent amalgamated data on the subject. The literature and conversations with stakeholders in the farming and forestry sectors show the need for an inventory of abandoned land in certain regions, where there is an abandoned farmland problem but not very much is known about it.

Currently, the lack of information limits our understanding of the problem of abandoned farmland and hampers the search for solutions. However, the large number of these parcels poses a problem. It would be beneficial to have a more accurate assessment of the area of abandoned farmland in each region to evaluate the usefulness of putting into place concrete measures such as decision-making tools, methodologies and programs. This would make it easier to enlist support, co-operation and funding for a project to develop abandoned land through means other than the traditional solution of reforestation. In addition, using geomatic technologies would be an interesting possibility here.

Given the lack of information available on abandoned farmland, it is recommended that an inventory be carried out of such land in Quebec to determine more accurately the extent and location of the problem, in such a way that facilitates the development and implementation of the measures required to develop this land.

7.3 Key factors in developing abandoned farmland

Information gathered in the study allowed three key factors to be identified in the development of abandoned farmland. Operationally, these factors could be used, for example, to set criteria for evaluating the development potential of specific plots, which could be adapted to each region's specific context.

Geographic location of parcel

As we have seen, the proximity of an urban area provides an indication of the type of abandoned farmland present in a given region. Such information also allows the outlets for the goods and services produced to be assessed, whether commercial, social or environmental in nature. For example, the improvement of landscape value may be more appreciated in a periurban area where residents seek a beautiful landscape nearby. The same example is equally applicable in some remote regions like the Gaspé, renowned for its rugged landscapes that are tourist attractions in their own right.

Interviews carried out as part of the study show that it is easier to restore agricultural value to abandoned land located in remote regions than in periurban regions. The advisers interviewed in periurban regions seemed significantly less well informed about the situation of abandoned farmland in their region. This can be explained by, among other things, the fact that most of this land does not belong to agricultural producers, who are therefore less in contact with MAPAQ rural planning and development advisers.

Currently, the few existing development projects are concentrated primarily in the Rocher-Percé MRC in the Gaspé region, Basques MRC in the Lower St. Lawrence

region and Islet MRC in the Chaudière-Appalaches region, which is a testament to these regions' interest in developing their abandoned farmland for agriculture. Some current development projects may not have been identified in the study, however.

The Saguenay–Lac-Saint-Jean region stands out in this area due to its regular inventory of abandoned farmland in each MRC. The region keeps the data up to date, which demonstrates its concern about the issue. It is recommended that any new development projects should be undertaken in regions that already have information on land use.

Landowners' interest in developing abandoned farmland

According to Bertrand Anel (personal communication, 2007), the landowner's interest is crucial to the success of any project to develop abandoned farmland. At a minimum, of course, the landowner's consent is essential. However, establishing a level of trust and co-operation between stakeholders and the landowner is preferable and very beneficial. This factor cannot be neglected since it is essential to the project's success.

When seeking to develop abandoned land, is it easier to approach landowners that are agricultural producers or non-producers? It is difficult to confirm that abandoned land belonging to agricultural producers has greater development potential. The study on landowners' perceptions by Benjamin et al. (2006) mentions a certain degree of resistance by farmers to silvicultural treatments. According to the study, these people tend to be opposed to the reforestation of such land and do not wish to increase the area of plantations in the region. However, this does not necessarily mean that they are not interested in another form of development and some producers are already involved in projects to develop their abandoned land.

Admittedly, some owners of abandoned land who are not farmers may have little interest in any form of agricultural development, hoping rather to remove the land from the agricultural zone. Agricultural development is probably not suitable for this type of landowner. However, some may be interested in developing their land and reforestation or agroforestry could have an appeal to certain landowners. Identifying this land and interviewing its owners would clarify the situation to a greater extent

and allow landowners' motivations concerning the development of their abandoned farmland to be determined.

Given the importance of the type of landowner in resolving the problem of abandoned farmland, it is recommended that an in-depth study be carried out on the role of the type of landowner in the prospects for this land, in order to design and implement measures adapted to the situation.

Successional stage of abandoned land

The successional stage of the vegetation cover on the abandoned land provides an excellent indication of development possibilities and the nature of the work required to put the land back into production and maintain agricultural land use.

Theoretically, owing to its almost unlimited combination of practices, agroforestry allows almost any type of abandoned farmland to be developed. However, conversations with stakeholders working in farming, forestry and agroforestry show that young parcels, in other words, those that have not reached the treed stage, are more suited to agroforestry development.

Returning land to cultivation and planting trees are easier when succession is at a relatively unadvanced stage—i.e., herbaceous or shrubby. At this stage, work is less difficult and can sometimes be similar to traditional agricultural work, with the advantage that conventional farming equipment can be used.

7.4 Need for a methodological tool for characterizing abandoned farmland

To facilitate decision making by land managers, advisers and landowners on the development of abandoned farmland, it would be beneficial to have methodology that allowed a quick evaluation of the key parameters that must be taken into account in proposing feasible development scenarios. Such methodology must be able to be adapted to the individual context, since a case-by-case assessment is

often required. Table 4 provides a partial list of criteria arising from the three major factors identified in section 6.3: geographical location of land, interest of the landowner and successional stage of vegetation.

Table 4: Criteria for Evaluating Land's Development Potential

Geographical Location	Landowner's Interest	Successional Stage of Vegetation
Size Zoning/land use in development plan Accessibility Proximity of urban areas Community activity and demand Presence of markets Agricultural potential of soil Type and nature of soil Adjacent use of soil Hydric and topographic conditions Climate (wind, precipitation, GDDs, etc.) Nearby vegetation Sector's landscape value	Occupation If farm producer, type of crops and/or livestock raised If farm producer, openness to new practices (e.g., alley cropping, silvopastoral systems) Time available Machinery available Personal interest Potential investment	Successional stage Mean vegetation height Percent cover (herbaceous, shrubby, treed) Hardwood/softwood percentages Species present Dominant species

Although the study allowed us to confirm that these three main criteria should be evaluated before developing abandoned land, there is still not enough information to validate the relevance of these criteria. The observation of trials currently under way will allow the relevance of these criteria to be validated.

Based on these three key factors, it is recommended that a methodological tool be developed for characterizing and assessing abandoned farmland in order to make development decisions.

7.5 Discussion of development options for abandoned farmland

This section discusses several development approaches described in section 5 that could make up elements of a solution.

Reforestation

The most common method used for developing abandoned farmland in Quebec, reforestation has the advantage of providing economic development through the production of fibre. This solution is adequate for some parcels that are unsuitable for other methods. However, when used on land with agricultural potential, it has the disadvantage of removing the land's agricultural and economic potential for several decades. In addition, reforestation is less advantageous to rural communities and can create a bland and boring landscape. For these reasons, reforestation should be seen as a last resort. Other solutions between conventional agricultural and forestry should be envisaged.

Intensive silviculture

Intensive silviculture allows fibre to be harvested in a shorter rotation than traditional reforestation, thus preserving the land's agricultural use. According to the sources consulted, it would be viewed rather favourably by landowners. Various trials are under way in the province, some involving hybrid poplar and willows. Harvesting equipment is also being developed. There are various markets for the products, including pulp and paper, fibreboard and energy. Depending on the characteristics of the land to be developed, intensive silviculture is a promising option and should be considered.

Agroforestry

Agroforestry offers numerous possibilities in terms of practices and systems for producing timber and non-fibre products. At first glance, with its multiple combinations of trees, shrubs, crops and livestock production, agroforestry offers a wider range of solutions to the problem of abandoned land than reforestation and intensive silviculture.

This study has led to the identification of several avenues to be further developed or validated in the field of agroforestry, based on the specific contexts of the regions and sectors involved, with the most promising being

- alley cropping
- silvopastoral systems
- understorey crops
- native fruit trees and shrubs
- organic farming

The emerging field of agroforestry presents a number of advantages in dealing with abandoned farmland (De Baets et al. 2007), including the maintenance of agricultural land use, diversification of agricultural income, stimulation of biodiversity and beautification of the landscape. On the plus side, agroforestry has a great deal of potential in developing abandoned land. On the minus side, very few agroforestry systems have actually been designed and implemented to date, which may be due to a lack of knowledge, technical support and adapted funding. Section 5.5 describes the project to develop rural land in the Rocher-Percé MRC by recognizing the multifunctionality of agriculture there. In this project, a series of agroforestry systems were tested with forestry and agricultural stakeholders and the local community.

There is enough expertise in Quebec to be able to identify and develop the first generation of agroforestry systems adapted to abandoned farmland. Given the extent of this type of land and the consequences for the rural community, it is time that steps be taken by the organizations concerned to launch design and demonstration projects of agroforestry systems adapted to abandoned farmland.

It is recommended that government and non-governmental organizations concerned with the issue of abandoned farmland make an effort to develop and demonstrate agroforestry systems and practices adapted to the context of abandoned farmland.

Need for a support framework

A number of obstacles to the development of abandoned land have been cited in this report: the fact that some landowners are not farmers, the lack of funding and technical support for landowners who wish to develop their land, speculation in periurban areas, fragmentation of farmland, the poor agricultural potential of some land, remoteness, etc. Some solutions have also been proposed: various development options, a comprehensive ongoing inventory of abandoned farmland, characterization tools, an approach for analysing the territory of an MRC and designing an action plan, sharecropping (leasing of land) and a surtax providing an incentive to develop the land.

The solutions put forward need to be implemented harmoniously and effectively, based on an analysis of the territory's potential. In addition, all regional and local stakeholders must be involved in the search for a solution, and sustainable benefits both for the environment and the community must be provided. It must also be remembered that certain solutions, if improvised, may conflict with other solutions or threaten some uses (agricultural, landscape, ecological, etc.) for an indeterminate period.

Given the destructive consequences of abandoned farmland on Quebec's territory, the implementation of a structural policy framework that also supports agricultural and rural stakeholders who wish to put their land back into cultivation is needed. Rural stakeholders and concerned organizations must participate in a reflection process and identify a concrete approach in order to provide the means necessary to develop abandoned farmland.

It is recommended that a multidisciplinary workshop on the issue of abandoned farmland in Quebec be organized to examine the issue in greater depth; take stock of the approaches, solutions and tools needed; identify concrete actions to be undertaken; and initiate the establishment of an organizing policy framework.

Conclusion

This exploratory study has demonstrated that there is a problem with the abandonment of many farm fields in Quebec. Conservative estimates put the amount of this land at roughly 100,000 ha for the entire province, which represents the equivalent of the tilled area of about 1,600 Quebec farming operations. Few regions or MRCs have an up-to-date inventory of the abandoned farmland in their territories and the potential of such land has rarely been assessed. Although this type of inventory exists in a few MRCs, there is no standardized classification method. This situation points to an acute need for knowledge about and information on such farmland as well as the development of evaluation methods.

Interviews conducted with regional stakeholders reveal that the causes for land abandonment vary depending on the region. Some reasons given include the industrialization of agriculture, the poor potential of some soils, the fragmentation of farmland and distance between plots, funding constraints and landowners' lack of interest, particularly in the case of land targeted by speculation or owned by non-farmers.

For landowners who wish to develop their abandoned land, the main option currently available is reforestation. This has some disadvantages, including a notable one from an agricultural point of view: the shift away from agricultural land use, meaning that this land cannot be cultivated for a number of years. The study showed that other development options—including extensive silviculture, fruit production and agroforestry—have economic potential and maintain the agricultural use of the land. Returning abandoned land to cultivation can be encouraged through administrative measures (taxes on abandoned land) or voluntary approaches (leasing of land by landowner to an operator, or sharecropping). An overall development approach could combine these measures based on an evaluation of the land's potential and comprehensive planning for the entire territory.

This study put a little more emphasis on one particular development option, agroforestry, which is gaining ground in Quebec. Various agroforestry systems and combinations of systems could be envisaged for the development of abandoned farmland. Such approaches would provide benefits to both landowners and the local

population. To facilitate decision making on the implementation of agroforestry systems on specific pieces of land, factors that constitute potential evaluation criteria were also identified. Tools to assist in decision making and the management of abandoned land could be developed based on these factors.

In short, there is a great deal of abandoned farmland on the one hand and, on the other, potential solutions that could generate economic, environmental, ecological and social benefits. Agroforestry is a useful solution not only for the development of abandoned land, but also for rural communities that will benefit from agricultural revitalization. Although many different solutions are possible, one crucial concern is to ensure that these solutions are harmonized in order to avoid inconsistencies in implementing them. Therefore, special attention must be paid to encouraging co-operation between the various stakeholders working in a region.

Lastly, a certain number of needs were identified during the study and several recommendations were made regarding them. Above all, however, the goal of the exploratory study was to verify the importance of the abandoned farmland problem and validate the appropriateness of continued development efforts. The study's findings show that there are good reasons for organizations and stakeholders concerned with the issue of abandoned farmland to continue with the process initiated in this study to ensure that solutions are implemented to return abandoned farmland to cultivation.

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Appendices

Appendix 1

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André Bégin, forestry technician, Quebec Department of Natural Resources and Wildlife (MRNF) (Capitale nationale, Chaudière-Appalaches, Estrie)
André Gélinas, forest engineer, Agences des forêts privées de Québec (région 03)
Bertrand Anel, coordinator of agriculture multifunctionality project, Rocher-Percé MRC
Charles Savoie, remote sensing and geomatics specialist, MAPAQ
Claude Beaudoin, Vallée-de-la-Gatineau MRC (Outaouais)
David Rivest, doctoral student, Laval University
Doris Labrie, project officer, CLD, Islet MRC (Chaudière-Appalaches)
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Appendix 2

Policy on Reforesting Abandoned Land, Agence des forêts privées de Québec

(Document Provided by André Gélinas, F.Eng.)

AGENCE DES FORÊTS PRIVÉES DE QUÉBEC 03

3100, av. du Bourg-Royal, Beauport (Québec) G1C 5S7
Tél. : (418) 664-0003 Téléc. : (418) 664-0009
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Politique de reboisement des friches

- La politique de reboisement des friches s'applique uniquement sur les superficies anciennement cultivées et situées dans la zone agricole.

- Lorsque la broussaille atteint deux (2) mètres de hauteur et plus de 50 % de couverture, la superficie visée par un projet de reboisement doit être considérée comme un terrain forestier et peut être reboisée. Par conséquent, l'autorisation de l'agronome du MAPAQ n'est pas demandée.

- Lorsque le projet de reboisement concerne une superficie non cultivée depuis un minimum d'une année et qu'elle est inférieure à deux (2) hectares, l'autorisation de l'agronome du MAPAQ n'est pas demandée. Toutefois, un seul projet de reboisement par lot enregistré, correspondant à ce critère est autorisé. De plus, un projet ne peut être contigu à un autre se trouvant sur un lot voisin du même propriétaire.

- Dans tous les autres cas, le projet de reboisement doit faire l'objet d'une autorisation préalable auprès de l'agronome local du MAPAQ. Cette autorisation est requise avant l'amorce des travaux nécessaires à la mise en terre (Ex. : préparation de terrain).

    - L'analyse des demandes par l'agronome doit être réalisée conformément aux principes directeurs, applicables selon la politique de reboisement des friches de l'AFPQ 03, indiqués dans l'Entente-cadre entre le ministère des Ressources naturelles du Québec, de la Faune et des Parcs (MRNFP) et le ministère de l'Agriculture, des Pêcheries et de l'Alimentation du Québec (MAPAQ) sur la planification des travaux de mise en valeur de la forêt privée en zone agricole qui a été signée au début de l'année 1987. Ces principes sont :

        - Une terre agricole défrichée située dans une zone agricole peut être reboisée avec l'approbation d'un représentant autorisé du MAPAQ, si la finalité est de créer un brise-vent ou d'empêcher l'érosion par l'eau ou le vent.

Appendix 2 (cont'd.)

Policy on Reforesting Abandoned Land, Agence des forêts privées de Québec

- Une terre agricole défrichée située dans une zone agricole peut faire l'objet de travaux de mise en valeur forestière si le sol est jugé de peu ou sans intérêt agricole compte tenu de son faible potentiel agricole (plus précisément de potentiels agricoles classifiés 6 et 7 par l'Inventaire des terres du Canada), d'une superficie restreinte, d'une localisation dans un milieu qui, d'une façon certaine, ne possède ou n'est susceptible de posséder à l'avenir de vocation agricole ou limitent gravement toute agriculture. La grille d'évaluation ci-dessous est présentée à titre indicatif et comme complément aux principes directeurs.

Grille d'évaluation des terres pouvant faire l'objet de travaux de mise en valeur forestière

Zone agricole * / Potentiels agricoles Classe de sols I.T.C. ** / Milieu agricole / Utilisation	Zone agricole			Zone non-agricole
	Bon milieu agricole	Mauvais milieu agricole (en recul)		
		Sol cultivé	Sol en friche	
Classe 1	Non	Non	Non	Oui
Classe 2	Non	Non	Non	Oui
Classe 3	Non	Non	Non	Oui
Classe 4	Non	Non	Oui	Oui
Classe 5	Non	Oui	Oui	Oui
Classe 6	Oui	Oui	Oui	Oui
Classe 7	Oui	Oui	Oui	Oui

* Zone agricole établie conformément à la Loi sur la protection du territoire agricole.
** I.T.C. : Inventaire des Terres du Canada

André Gélinas, ing. f.
Secrétaire exécutif
Le 9 octobre 2003

Appendix 3

Form for Characterizing Abandoned Farmland, Rocher-Percé MRC

(Form Provided by Bertrand Anel)

Projet de mise en valeur de l'espace rural de la MRC du Rocher-Percé par la reconnaissance de la multifonctionnalité de son agriculture Inventaire des terres à potentiel agricole - 2005

Date : Données recueillies par :

Identifiant de la parcelle :							Localité : Coordonnées :								
À l'observation, s'agit-il d'une terre :	en friche		utilisée à des fins agricoles		simplement entretenue		reboisée								
S'il s'agit d'une terre utilisée pour l'agriculture, la culture est :	pâturage		fourrage ou céréale		maraîchage		autre :								
S'il s'agit d'une terre en friche :															
quel est le taux de recouvrement (%) :		quelle est la hauteur moyenne de la végétation (estimation oculaire en classes de 1m):		Répartition (%)		quelles sont les essences dominantes (P = essence présente, D = essence dominante) :									
herbacé												P	D		
arbustif		arbustive				hart rouge									
						aulne rugueux									
						aulne crispé									
arboré		arborée		résineux		épinette noire									
						épinette blanche									
						sapin									
						mélèze									
						thuya									
				feuillus		bouleau blanc									
						bouleau jaune									
						peuplier faux tremble									
						peuplier baumier									
						érable à sucre									
						érable rouge									
						cormier									
						cerisier									

Remarques :

Source: Bertrand Anel

Appendix 3 (cont'd.)

Form for Characterizing Abandoned Farmland, Rocher-Percé MRC

Date : Données recueillies par :

Nom du propriétaire :	Tel :
Coordonnées :	

Il s'agit d'un terrain :	cultivé (section 1)		en friche (section 2)		boisé (section 3)		à usage récréatif		

Section 1	Le terrain est cultivé par le propriétaire :		oui				non					
Si non,	l'entente entre exploitant et propriétaire est d'une durée de :				1 an		2 à 5 ans		6 à 10 ans		11 ans et plus	
	elle fait l'objet d'un bail :	oui		non		avec rémunération	oui		non		combien :	

Section 2	Si la terre a déjà fait l'objet d'un usage agricole :	À quand remonte ce dernier :	
		Quelle était l'activité pratiquée :	

Le propriétaire est intéressé à ce que sa terre soit mise en valeur par	agriculture		reboisement		autre		non intéressé		
Le propriétaire souhaite remettre lui-même sa terre en valeur	oui		non						
Si oui, il rencontre des difficultés d'ordre...									
Si non, serait-il intéressé à ce que ses terres soient mises en valeur par un agriculteur :	oui		non						
Serait-il prêt à s'engager pour une durée de :	1 an		2 à 5 ans		6 à 10 ans		11 ans et plus		
Serait-il prêt à signer un bail avec conditions :	oui		non						
Serait-il prêt à vendre sa terre :	oui		non						
Serait-il prêt à donner sa terre :	oui		non						
Quels sont les freins à la signature d'un bail									

Section 3	Le terrain a été boisé avec :	
	en (date) :	

Remarques :

Source: Bertrand Anel