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Aspects of Agricultural Land Use in Prince Edward Island



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Social and Geographical Aspects of

Agricultural Land Use in

Prince Edward Island

A Case Study of the O'Leary Area

by

L. F. Bradley and Andrée Beaulieu



Preface

En mars 1969, les gouvernements du Canada et de In March 1969 the governments of Canada and Prince l'Île-du-Prince-Édouard ont signé une entente d'une Edward Island signed a 15-year agreement for the implementation of a Development Plan for the Island. durée de quinze ans pour la mise en oeuvre d'un programme d'expansion dans cette province. Ce plan d'amé-The objectives of the Plan include the promotion of nagement a pour but de promouvoir le développement economic development and increases in income, employment opportunities and the standard of living. Essential économique, d'augmenter le revenu et le niveau de vie des habitants et de créer des emplois. Conformément to the attainment of these objectives are programs designed to bring about improved returns from the aux objectifs ci-haut mentionnés, des programmes spé-Island's large agricultural resources. ciaux ont été conçus dans le but de tirer le meilleur parti Through an agreement between the Canada Land possible du vaste potentiel agricole de cette province.

Inventory (CLI) and the Economic Improvement Cor-Grâce à un accord entre le Service de l'Inventaire des poration (a provincial Crown corporation charged with terres du Canada et l'Economic Improvement Corporation the preparation of the Development Plan) studies were (une corporation provinciale de la couronne chargée de undertaken which combined the CLI land capability la préparation du plan d'aménagement), plusieurs études, analysis with socio-economic studies to provide intecombinant l'analyse des possibilités agricoles des sols et grated planning of land resources. Two earlier reports certains facteurs socio-économiques, ont été entreprises in the Geographical Paper series of the Department of afin d'obtenir une planification intégrée des ressources Energy, Mines and Resources (Nos. 45 and 48) have agricoles. Deux documents antérieurs publiés dans la described aspects of this work. In the present publicasérie des «Études géographiques» (nos 45 et 48) ont déjà tion, the authors analyze the social and structural probdécrit certains aspects de ce travail. Dans la présente lems facing agricultural improvement in western Prince publication, Mlle Beaulieu et M. Bradley analysent les County, especially in the O'Leary area. Both the probproblèmes d'ordre social et foncier concernant l'améliolems and the methods of analysis are typical of Prince ration de l'agriculture dans la partie ouest du comté de Edward Island and similar agricultural situations else-Prince et plus particulièrement dans la région d'O'Leary. where in the Maritime Provinces. Problèmes et méthodes d'analyse quoique typiques à Although this report describes the work of a large l'Île-du-Prince-Édouard dans son ensemble peuvent parfois se rencontrer ailleurs dans les provinces maritimes.

team drawn from the Federal Government and from the Economic Improvement Corporation, the authors of this and of the earlier publications wish to acknowledge Bien que cette étude décrive le travail d'une équipe the particular debt of gratitude they owe to Charles W. considérable de chercheurs du gouvernement fédéral et Raymond. He was largely responsible for both the de l'Economic Improvement Corporation, les auteurs de inception and the direction of the planning studies and, ce rapport ainsi que des publications précédentes vouin a very real sense, is a joint author of all these research draient exprimer tout particulièrement leur reconnaisreports. sance envers M. Charles W. Raymond. Monsieur Raymond fut l'instigateur et l'âme dirigeante de ces études de planification et en un sens, il est le co-auteur de ces R. J. McCormack travaux.

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Préface

R. J. McCormack

Directeur, Direction générale des terres Service de la gestion de l'environnement Ministère de l'Environnement

Acknowledgements

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The authors are grateful to C. W. Raymond for the proposal and direction of the study; to P. Glaude for basic research and field work; to P. Glaude and G. de Belle for the field work for the land use map of the O'Leary area; to J. W. Maxwell for assistance with the western Prince County regional study; to Gordon Grant for statistical research and compilation for the western Prince County regional study; to Dr. J. Lovering for helpful criticism and encouragement; to W. C. Phillips for the photographs; and to Dr. C. I. Jackson for assistance in preparing the manuscript.

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Abstract

Present and future land use in Prince Edward Island is greatly affected by the social and economic situations of the landowners. This report studies the influence of the socio-economic characteristics on the organization of the physical resources, with equal emphasis on present and future land use.

The report begins by introducing a hypothetical family, the Allans, and describes how the circumstances of their neighbours affect the Allan family's efforts to enlarge their landholdings. In Part I, the problem is discussed analytically in the light of a social and geographical examination of a pilot area around the village of O'Leary. Part II presents a statistical analysis of the region that places the O'Leary pilot study area in a broader perspective. The report concludes by outlining some of the effects that proposed programs of Prince Edward Island's Development Plan will have on families such as the Allans.

Résumé

Ce rapport étudie l'influence des caractéristiques socio-économiques et physiques sur l'organisation des ressources physiques de l'île du Prince Édouard et plus particulièrement sur le mode d'utilisation des sols, tant actuel que futur.

Le prologue relate les circonstances auxquelles une famille type—les Allan—doit faire face si elle désire consolider ses terres agricoles. Au cours de la première partie, le problème est analysé dans le cadre d'une étude sociale et géographique d'une zone pilote autour du village d'O'Leary. La seconde partie présente une analyse statistique du potentiel agricole de la région et situe la zone pilote dans son contexte régional. En conclusion, le rapport esquisse certaines améliorations que se propose d'apporter le Plan de développement de l'île et leurs implications sur la famille Allan.

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When you drive into the village of O'Leary, you get of which 77 are improved, and another property of 30 the feeling that you have been there before. The flatimproved acres purchased about two years ago. A third property of 38 improved acres is rented on a year-toroofed buildings, the square store fronts, and the solitary year basis. This area (of 145 improved acres) is available feed shed standing tall by the railway present a scene familiar from the Maritimes to the Prairies. In addition to for cropping and, in a typical year, used as follows: oats, 35 acres; hay, 50 acres; potatoes, 15 acres; imsuch visual impressions, there are many social and economic similarities between this community, located proved pasture, 45 acres. On the home place there is a at the western extremity of Canada's smallest province, rough pasture of 21 acres and a 39-acre woodlot.

As the use of the land indicates, the farm operation Although the farmland surrounding O'Leary is moderreally consists of several different enterprises. Twelve dairy cows and six replacement heifers are kept for dairying; eight feeder cattle will be sold in the fall; eight sows, producing about 112 weaner pigs per year, Raymond Allan is 32 years old and married and has make up the hog enterprise; hens and other poultry are kept, and there is a potato crop. Last year the gross income received from these enterprises was \$10,266. According to Mr. Allan, however, operating expenses were \$7,163, and the profit earned was thus \$3,063. This figure does not include the cost of Allan's own labour. If he were to sell the farm for \$40,000 and invest the proceeds at 7 per cent, he would receive a return, before tax, of \$2,800. It could therefore be argued that of Allan's apparent profit from farming, he only gains \$263 for working a full year, and that it would be to his From conversations with the Allans it is apparent that advantage financially to sell the farm, invest the money, and obtain employment that paid more than \$263 a vear.1

and other small agricultural communities in Canada. ately good, nearly all of the farmers in the area are experiencing difficulties. A look at one family, the Allans, will illustrate some of the problems they face. two small children. He derives his main income from the farm turned over to him by his parents when he married four years ago, Elderly Mr. and Mrs. Allan still live on the old homestead; the younger Allans purchased a house close by, which they moved to the property and are now renovating. Raymond is regarded as one of the more successful farmers in the community, but if it were not for the income his wife receives from teaching school (about \$3,200 a year), the family would find it hard to make ends meet. they, like many other farmers, find it difficult to under-

stand why they are not more prosperous. It is not that they are not used to hard work. Indeed, they are often But Raymond Allan does not wish to sell; he would upset by journalistic accounts implying that Maritime prefer to develop his farming ability to get a better return farmers are careless, casual and slow moving. They from agriculture. What reasons prevent farmers like quickly assert that they work harder and longer hours Raymond Allan from earning more? Some of his friends with fewer holidays than individuals in central Canada maintain that farmers do not have adequate subsidies. who write columns for newspapers and magazines. They Other point to poor markets, and most agree that there point to the many problems the farmer has to facereally are many reasons; physical, social, legal, technical, shortage of labour, low prices for his products, the high administrative and so on. Raymond Allan himself recognizes many of these cost of machinery, adverse weather, etc.-things of much less concern to the average salaried person in problems. For him, however, the small size of his present the city.

Not that the Allans want to move to the city: they have roots in O'Leary and like the area. Their farm business is of moderate size by local standards and is at present valued at about \$40,000. It consists of two separate parcels of land: the home place of 137 acres,

Prologue

¹These figures were derived from a 'benchmark farm' outlined by E. Coffin and L. Buote, under the direction of Dr. J. Lovering, in Possibilities for the Development of Farm Business in the West Prince Area of Prince Edward Island (unpublished), Table 12,

This assumes that it is only the farm and farm buildings that are sold and not Mr. Allan's house and garden. It also assumes that other sources of income in kind from farming are balanced by fringe benefits associated with salaried jobs, e.g. paid vacations and health insurance.

operation seems the biggest barrier to higher returns: in order to remain competitive he believes that he must enlarge his farm. He has been making efforts to expand, and managed to buy the small additional property of 30 acres two years ago. This, however, he does not find enough, and more land is hard to find. It is difficult to acquire land in O'Leary because, although there is a considerable acreage that is not intensively farmed, it is occupied in one way or another. Mr. Allan confidentially admitted that he would like to buy an adjacent property to consolidate with his own so as to provide a total unit of about 200 to 250 improved acres. He believes-and the local agricultural adviser agrees-that this would enable him to make more efficient use of his machinery and permit him to produce a much greater output at a reduced cost per unit. The circumstances of his neighbours, however, seriously restrict his chances for expansion.

The property to the east of Raymond Allan's farm has 90 improved acres. The owner, James McCullough, is past middle age and does not farm intensively. Nevertheless his six cows and seven acres of potatoes are enough to keep him busy and to supplement his Old Age Pension. Because Mr. McCullough has no children and is a lifelong friend of Raymond's father, he has hinted that he may eventually sell the property to Raymond. But Mr. McCullough is only 66 and in good health. He enjoys farming and may continue at it for another 10 years.

Reg Murphy, who lives across the road, feels much the same way but for different reasons. Mr. Murphy has a farm that is smaller even than James McCullough's, only 65 improved acres. A talk with Mr. Murphy makes it guite evident that he has a strong sentimental attachment to the place. He is proud that it was here he was born 75 years ago. Here he brought his wife as a bride, here he raised his family, and here he intends to end his days. Though he has lived alone since his wife's death a year ago, he is reluctant to change his way of life more than necessary. The homestead is only a couple of miles from O'Leary and its six or seven stores are adequate for his day-to-day needs. The 40-bed hospital in the village makes him feel as secure in O'Leary as he would in Charlottetown. Mr. Murphy does very little farming now. He grows a few acres of potatoes, but the Old Age Pension is his main income. The rest of the property is farmed by a nephew who lives six miles away. Mr. Murphy does not ask for rent from his relative. The nephew, however, has as little chance of acquiring the property as Raymond Allan, because Mr. Murphy long ago set his heart on leaving it to his son and daughter. He still clings to this plan even though it is now more than 20 years since his son moved to Toronto and 18 since his daughter married a Halifax school-teacher.

The small farm to the west of Raymond Allan's is owned by Alex Spencer who has practically given up agriculture although he is only in his 40's. A few years

ago he managed to combine his farming with other activities: he drove the school bus, worked in the potato warehouse in the fall and did other odd jobs as they became available. In the beginning these nonfarm jobs were only incidental income sources, but Alex Spencer found himself relying on them more and more to support his growing family household. When he lost his school bus route this year (some say because of local politics), he took a job as a mechanic in Summerside and now commutes the 30 miles each way every day. There is no stock left on the farm except a few feeder cattle, which he will sell in the fall. Raymond Allan would be willing to buy this land or even to rent it, and Alex Spencer would probably make more from the rent than he does from feeder cattle. But Alex Spencer doesn't see it that way: to him the land represents security. If he lost his job he could always "fall back on" his 53 acres for a living.

And that exhausts the possibilities of expanding the Allan's farm on the land of their immediate neighbours, except for about 50 acres at the back. These belong to a man from Boston who used to bring his family to the Island every summer on vacation. The last time he was here Raymond Allan raised the question of a long-term lease, and the owner agreed to think about it. But that was two years ago and he has not been back since. The hay used to be cut at least once every summer, but for the past few years it has been left uncut and bushes are starting to grow.

Unable to obtain any land adjoining his property, Raymond Allan was forced to look farther afield, but he found that the attitudes of his immediate neighbours were characteristic of other landowners in the community. Consequently, the 38-acre property he was able to rent is eight miles away. Travelling this distance costs time and money and puts further strains on an already tight farming budget. Another difficulty with Raymond Allan's leasing arrangement is that it is valid for only one year at a time. He would prefer to negotiate a longer lease-say 10 years-but the owner will not agree to this: like Alex Spencer, he wants to be able to revert to farming should he lose his present job at the air base near Summerside. Because of this uncertainty, Raymond Allan is naturally reluctant to made expenditures on such things as fertilizer and fencing. This, in turn, means that he gets lower crop yields than would otherwise be possible and is restricted in the use of the land; for example, cattle cannot be pastured in fields with inadequate fences.

The preceding description is fictional, in the sense that it does not refer to actual people living in O'Leary. Allan is a surname found on Prince Edward Island but not in this community. However, the range of problems facing the Allans and their fictional neighbours is, to a greater or lesser extent, characteristic of the agricultural pattern of O'Leary and much of Prince Edward Island. Nor is it confined to the Island: similar social factors

Land fragmentation, therefore, is only one of the problems facing agricultural improvement and having major social implications. It may not be the most important problem: no one has yet demonstrated that on At present the province of Prince Edward Island and Prince Edward Island low farm income is a function of land fragmentation. It can be argued that available funds would be more wisely invested in farm-management training than in land consolidation. Given better operation of existing small or fragmented holdings, farmers may be able to achieve land consolidation through the normal land market, if only because they are better credit risks. Nevertheless, it seems that land consolida-The relevance of social factors to agricultural improvetion will occur if the agricultural objectives of the Development Plan are achieved. It is envisaged that the present 6,000 to 7,000 farms will be replaced by 2,500 commercial farm units, the major structural changes taking place in the first seven years.

inhibit the modernization of agriculture throughout the Maritime Provinces and in other areas that have a long tradition of small farms. the Federal Government are cooperating in a 15-year Development Plan for the Island. One of the principal objectives of the Plan is to triple the net value added of the 1967 agricultural output by 1983;² yet it seems that the improvements in agriculture, needed to achieve this output, involve changes in rural society, especially in regard to landholdings and land use. ment goes beyond their effect on landholdings and land use. There are problems related to finance and the ability to raise credit. Although Allan recognizes the need to expand his holdings to achieve a better farming pattern, he might have difficulty getting a loan to buy The present study therefore examines the O'Leary the land even if it were available.

area as an example of the agricultural communities Even supposing the land were available and the likely to be affected by the Development Plan. The necessary finance could be obtained, other social present pattern of landholdings is examined in detail, problems remain of major significance. Raymond Allan, as we noted, was regarded as one of the more successful and suggestions are formulated about the possible future pattern. This requires some understanding of the farmers in the O'Leary area, but he would be the first to broader pattern of agriculture in western Prince County, agree that a larger farm will bring with it increasing and a means of gaining this understanding guickly and management problems with which he will need help or quantitatively is described. In the analysis, various training if he is to succeed. If agriculture in Prince Edward Island is to prosper, it will also have to be more additional problems, social, economic, financial or technical, are identified, and these require further closely related to the needs of an increasingly sophistiinvestigation by the appropriate agencies. It is hoped cated and continent-wide market for agricultural prodthat this pilot study of the O'Leary area and western ucts. Allan runs his farm as a number of different enterprises-dairving, hog-raising and potato-growing-Prince County will contribute to the development of so that low prices in one sector can be balanced by programs that will assist agricultural improvement while minimizing the social costs of adjustment. good returns in another. He recognizes that he might do better if his business were more specialized, but he ²Department of Regional Economic Expansion, Development Plan for Prince needs advice on how to do this. Edward Island, Ottawa, Queen's Printer, 1969, p. 33.



FIGURE 1. Location of study area.

Landholdings and Landowners

in the O'Leary Area

THE STUDY AREA

There are four reasons why O'Leary was chosen as The designation of land as being in Class 3 implies an area for specific study. A very important considerathat for most crops, the limitations on productivity are tion was the existence of a local voluntary association more severe than on Class 2 soils.⁵ Specifically, the of farmers and others, the O'Leary Development Agency, which was concerned with the future developnegative characteristics of the soils in the study area are relatively low fertility, acidity and wetness. The wetment of the local community. From an earlier program ness is due to the generally poor drainage characteristics of interviews with landholders throughout Prince Edward of the subsoil and an almost level topography, and it is Island³, it was apparent that the O'Leary area contained many farmers who were relatively successful and wished the most difficult and expensive problem to correct.⁶ to expand their businesses. The physical opportunities for The physical difficulties facing O'Leary farmers should such expansion seemed favourable: the greater part of not be overemphasized. The large amount of Class 3 the area is included in Class 3 of the land capability land does offer considerable opportunity for productive rating for agriculture by the Canada Land Inventory farming, as the following quotation indicates: (CLI). Although less desirable than Class 2, these soils "O'Leary soils are among the most important agricultural "under good management... are fair to moderately soils of the province. Although about 40 per cent of the area is under woods, they are well suited to mixed farming, dairying and high in productivity for a fair range of crops".4 Finally, beef production. Though the soil is medium-textured, potatoes the western part of Prince County is a region that conare grown as a speciality and on many farms as a cash crop. The tains a large number of low-income families. An over-all soils are also suited to peas, beans, cole crops and strawberries. Recently, corn has been grown for silage. On most farms, much of objective of the Development Plan is to raise the standard the land is used for hay and pasture. of living for everyone, and its success is especially im-"Though less well suited to a wide range of crops than the portant in this area. It should be stressed, however, that Charlottetown soils, under good management these soils give the characteristics just referred to are widespread and that high yields of most of the field crops commonly grown on the O'Leary was chosen less for its distinctiveness than Island. Pastures are also highly productive."7 because it is a reasonably representative community: PRESENT LAND USE the main findings of the study should be valid throughout much of the province and in other similar areas.

The O'Leary study area (Figure 1) is about 40 square miles. Its total population in 1966 was 1,754, of whom 1,061 lived outside the village itself. O'Leary is the only centre within the study area, and in it are to be found a hospital, a bank, a post office, several stores and gas stations. It serves as the centre of community life for a considerable part of western Prince County, catering to the needs of two or three times the number of people who live in the study area itself.

PHYSICAL CHARACTERISTICS OF THE LAND

Of the 25,788 acres in the study area, 20,427 are rated as Class 3 for agriculture by the Canada Land Inventory (Figure 2). A further 1,076 acres are rated as Class 2, which means that 83 per cent of the land is of potential

PART I

importance for productive agriculture. The remaining land is included in Classes 4 to 7 or is under urban use.

Included in the national program of data collection by the CLI is a survey of present land use. In the study area, however, the CLI data are based on an interpretation of field work that was done in 1959,8 and it was felt

⁷G. B. Whiteside, op. cit. p. 37.

³Beaulieu, Andrée, Land Adjustment Problems in Prince Edward Island, Geographical Paper No. 45, Department of Energy, Mines and Resources, Ottawa, Information Canada, 1970.

⁴Canada Land Inventory, Soil Capability for Agriculture, Prince Edward Island (map), Ottawa, Queen's Printer, 1968.

⁵For an explanation of the Canada Land Inventory classes see Department of the Environment, Soil Capability Classification for Agriculture, Report No. 2, Ottawa, 1972. Also see the Appendix.

These drainage problems have been described by Whiteside, G. B. Soil Survey of Prince Edward Island, second edition, Ottawa, Queen's Printer, 1966, p. 35, and were further investigated and described in an unpublished report prepared by the Land Use Planning Group of the Island's Department of Development.

^{*}C. W. Raymond, J. B. McClellan and J. A. Rayburn, Land Utilization in Prince Edward Island, Memoir 9, Geographical Branch, Department of Mines and Technical Surveys, Ottawa, Queen's Printer, 1963.



FIGURE 2. Integrated land capability for agriculture and recreation based on CLI classifications.

that for the present study more up-to-date information was needed. Consequently, field mapping of present agricultural land use in the O'Leary area was carried out in the summer of 1968, and a map was prepared at a scale of 1:12,000. A reduced version of this map is reproduced as Figure 3, and accompanying this is Table I, which was calculated from the original largescale map.

TABLE I-LAND USE IN THE O'LEARY AREA, 1968

	Total (Acres)	Per ce
Improved		
Hay, grain and improved pasture	7,941.3	30.8
Potatoes	1,773.3	6.9
Corn	81.7	0.3
Recently cleared	90.7	0.3
Sub total	9,887.0	38.3
Unimproved		
Forest	13,967.0	54.2
Rough pasture	1,704.2	6.6
Recently grown up woodlands	36.8	0.1
Extractions	38.9	0.2
Built up	155.0	0.6
Sub total	15,901.9	61.7
Total	25,788.9	100.0

Over half the study area is forested. This acreage provides its owners with little economic benefit since the O'Leary area is not well suited to the growth of commercial timber. Virtually the whole area is included by the CLI in Class 5 of the land capability classification for forestry, "lands having severe limitations to the growth of commercial forests", 9 for the following reasons:

"... a number of factors can be considered as limiting in Prince Edward Island. Of these, wind is probably the most important. Whereas its effect is undoubtedly greatest close to the coast ... practically no part of the Island is free of this influence ... Excessive soil moisture is probably the second most important limiting factor. Its effect was greatest in the heavy soils of western Prince County ... The soils of the Island are inherently low in fertility and affect the capability classification throughout."¹⁰

Added to this general unsuitability is the fact that the O'Leary woodlots are generally small (Figure 4): the average size is 59 acres. They represent the end product of decades of fairly haphazard use, which has meant that most of the useful species were extracted long ago. When asked at a public meeting what value they placed on their woodland, farmers in O'Leary tended to reply "None". Most said that the small return possible from wood made it more profitable for them to spend their time at other enterprises.

Some may wonder then, why farmers like Raymond Allan do not enlarge their improved acreage by land clearing. If asked, most operators will express the opinion that the costs of clearing are too high. Expenses may run to \$450 an acre and beyond, depending on the soil and density of the cover. Since cleared land sells for \$100 an acre, most farmers find it more economical to buy land already cleared even if their holdings are fragmented. Consequently, land-clearing is generally restricted to very light new growth where costs are below \$100 an acre.

Could it be that the problems that are solved by acquiring or clearing land might be more efficiently handled by a modified use of the land (i.e. different farming practices)? In studying land use, an attempt was made to measure the intensity of use. A well-known measure of intensity is costs (inputs made) per acre. Since there is a statistical relationship between costs per acre and gross receipts per acre in this area, it is possible to use annual gross returns per acre as an indication of intensity. Agriculturists believe that a good level of intensity would be evidenced by operators grossing \$180 to \$200 per improved acre annually.¹¹ In the O'Leary study area it was found that nearly all of the improved acreage was used at a level of intensity below this, including that owned by operators who had competed with each other to obtain scattered parcels of land.

For reasons of confidentiality, a map showing the spatial distribution of average income per acre as a measure of intensity could not be included. Instead, a frequency distribution (Figure 5) was compiled from the interviews conducted by the federal Department of Energy, Mines and Resources. It should be noted that the interview data showed only total incomes for each farm and not the returns for each individual field. Consequently, Figure 5 merely indicates that on the average most farms are not used as intensively as they might be. Also, approximately 5,000 acres that lay outside the study area but were owned by residents of it had to be included in Figure 5 because total farm income included income derived from acreage outside the area.

The interview data were merely intended as a prelude to future studies and, therefore, obviously did not contain time-motion and other information, which would be required to state precisely the difference in operating costs between greater intensification on the one hand and alternatively greater land fragmentation on the other.

THE PATTERN OF LANDOWNERSHIP

As the situation facing Raymond Allan indicates, the characteristics, attitudes and intentions of the landowners are at least as important as the physical character of the land itself. The pattern of land ownership in a spatial context is also of major significance in land use planning. It was for these reasons that an up-to-date map of individual landholdings was prepared for the whole of Prince Edward Island, and approximately 8,500 interviews were conducted with the holders of this

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⁹Canada Land Inventory, Land Capability for Forestry, Prince Edward Island (map), Ottawa, Queen's Printer, 1968.

¹⁰Idem. ¹¹Personal communication, Dr. James Lovering, Canada Department of Agriculture, Research Station, Charlottetown.





FIGURE 3. Present land use.

EMR Air Photo A-20380-185



FIGURE 5. Gross returns per acre, 1966.

land.12 These confidential interviews are used as the size for these types of operations.¹⁵ The average commercial farm in the study area is much larger than the basis of the following discussion of landowner characteraverage landholding in the area, but still contains only istics in the O'Leary area. about 130 improved acres. Two hundred and thirteen landholders, each holding

five acres or more were interviewed in the O'Leary area, Figure 8 provides further evidence that many of the and, on the basis of these interviews, were separated farmers in O'Leary are attempting to expand their landholdings. The black rectangles on the map indicate into three basic categories: farmsteads occupied in 1967; the arrows show land-I. those whose largest source of income is the farm; II. those whose largest source of income is activities holdings operated from these farmsteads that are not other than farming; contiguous with the land around the farmstead. Such holdings may be owned (solid arrows) or rented (broken III. non-resident landowners. lines). The intricate pattern which is apparent, clearly Categories I and II were further subdivided: landdemonstrates that the commercial farmers and others holders primarily dependent on farming were separated who seek to expand their holdings must frequently into two groups according to whether they received a (a) acquire land in small parcels in a number of areas gross income of \$3,750 or more a year from the sale of and (b) travel several miles to and from such holdings.¹⁶

farm products, or whether their gross farm income was less than this. The former were designated, for the pur-It seems self-evident that such a fragmented and poses of this investigation, 'commercial farmers'. It is scattered pattern of landholdings is not efficient, and recognized that \$3,750 is an arbitrary dividing line and, it is precisely the farmers who are most concerned with in particular, that it is probably too low as a gross improving their operations that are likely to be forced return to define commercial farming.¹³ For the purposes into such haphazard land acquisition. A plan for land of this analysis, however, it was desirable at this stage consolidation must, however, take into account other to include all farmers who had any claim to commercial factors in addition to the present pattern. For instance, operations. The specific figure of \$3,750 is useful because it cannot be assumed that because there are 66 comit is a class interval in the Agricultural Census of Canada. mercial farmers now that there will be the same number in 10 years time. Apart from those who die or retire, Category II was similarly subdivided into landowners the group of commercial farmers may include several earning \$3,000 or more from non-farm sources and those who leave the industry because they see better opportuearning less than \$3,000. The choice of this figure was related to suggestions in the literature¹⁴ concerning the nities elsewhere. An attempt was made to estimate how many farmers in the O'Leary area were likely to be minimum income needed by an average-size family. interested in a major long-term program of agricultural Both these categories include landholders in O'Leary improvement. Each individual interview was appraised, who may reside elsewhere in western Prince County; the term 'non-resident' is used only for landowners who and variables such as present age, income, desire to expand, sons wanting to farm, dependence on non-farm live elsewhere in Prince Edward Island or off the Island. income, etc. were evaluated. As a result, 44 of a total Figure 6 illustrates the classification while Figure 7 of 213 owners were classified as 'candidates for expansion'. It should be emphasized once again that this analysis was designed only to determine approximate numbers.

shows the spatial distribution of the various categories of landowners. To preserve the confidentiality of individual replies to the interviews, the whole of the O'Leary area is not shown but merely a representative section through it. As with present land use and present agricul-Many will find the small number of candidates for expansion disturbing. It implies that, in the future, tural returns the distribution of commercial and noncommercial farmers is not wholly dependent upon agriculture as a basis of livelihood is likely to be characvariations in land capability; in fact, several commercial teristic of only a relatively small proportion of the rural farmers are situated in areas of Classes 4 and 5 land. More important, large blocks of potentially productive 12Beaulieu, op. cit. 13It should be remembered that this grouping and its subsequent subagricultural land are controlled by non-residents and division are made for research purposes only. The classification of non-farmers. farmers into 'commercial' or 'non-commercial' is obviously open to

THE NEED FOR LAND

At a public meeting between the farmers and the planners, land shortage was cited by some farmers as one of their main difficulties. They expressed the opinion that, in order to remain competitive, a farmer today requires from 250 to 300 acres for the type of farm operation that is characteristic of O'Leary (i.e. mixed operations of livestock and potatoes). Professional opinion also tends to agree that 300 acres is a reasonable

argument and, in any case, has no legal or other significance. The purpose of this classification is to establish the broad framework of farming types; it is not appropriate as a basis for the analysis of individual farm operations.

¹⁴For example, the Council of Economic Advisors in 1964 drew a line at annual income of less than \$3,000 for individuals living within households of two or more persons. The AFL-CIO also used this figure. (For a short discussion of methods of defining poverty see Michael Harrington, The Other America (Appendix), Baltimore, Macmillan, 1962)

¹⁵Dr. James Lovering, Canada Department of Agriculture, Research Station, Charlottetown, Possibilities for Farm Development in the O'Learv Area of Prince Edward Island, (unpublished).

¹⁶The situation in the O'Leary area is characteristic of the whole of Prince Edward Island. See Beaulieu, op. cit.



FIGURE 6. Socio-economic classification of property owners.



FIGURE 8. Patterns of farm operation.

present cannot be farmed as a single operation). However, population. There is, however, reason to believe that extensive clearing would be difficult to justify on economic it is in fact an optimistic estimate, and other studies of grounds; nor does the complete answer appear to lie in this kind undertaken elsewhere in the Maritime Provinces have produced similar results.17 encouraging the candidates for expansion to move away from the O'Leary area. As indicated in this section, there Even if there are only about 44 operators in the may be some opportunities for this, since agriculture in O'Leary area who could make good use of opportunities other parts of western Prince County seems capable of for farm expansion, it will be difficult for them to conmuch greater increases in output. Most of the farmers in solidate enough land within the study area into a conthe O'Leary area who wish to expand would find it diffitiguous unit. cult to move, however, since they already have large At present there are approximately 9,000 cleared investments in buildings, water supply and other fixed agricultural acres of Classes 2 and 3 soil in the study area. capital. Even if they did move, they would be likely to If it is assumed that each farm unit should contain about encounter problems of land acquisition similar to those 250 to 300 acres, these 44 candidates for expansion would, facing them in the O'Leary area.

among them, require between 11,000 and 13,000 acres. This suggests that the number of candidates for expansion is appropriate for the type of commercial farming that the Development Plan is intended to foster, and that the principal need is for a mechanism that will transfer the ownership or management of under-utilized land (Figure 9) to these candidates while ensuring that the reasons for the present holders' retention of that land are satisfied in other acceptable ways.



FIGURE 9. Recently abandoned farmland. Small trees and bushes are beginning to grow. The field in the right foreground is at a very early stage of succession whereas the area to the left of the small pond (top, centre) is more advanced. Yet, for a number of reasons, the owners may be unwilling to sell these plots.

Two other possibilities exist for making adequate land available, but these involve problems at least as great as those encountered in arranging for land release in the O'Leary area. There is, for instance, a significant acreage of potentially productive agricultural land that is still under forest. Clearance may be justified in certain specialized cases (e.g. as a means of linking two units that at

What must be determined, before any mechanism for land release can be effective, is why individuals who seem to obtain little financial benefit from their landholdings wish to continue to retain them. To a considerable extent there can be no straightforward answer: an individual's decision to retain or dispose of his land is presumably based on a number of interrelated considerations in which one man's values and attitudes will differ from those of someone else who is apparently in similar circumstances. Nevertheless, in the 8,000 or more interviews conducted across the Island, there emerged a number of factors that probably account, in whole or in part, for many individual decisions to retain land.

WHY IS LAND HELD?

In an area like Prince Edward Island, where the average income is lower than in other parts of Canada and where there is much job insecurity, an important reason for keeping land is to supplement non-farm income, directly by the sale of farm products and in kind by consuming some of the items produced. Nevertheless, a considerable amount of land is at present controlled by owners who gross less than 20 dollars an acre per year. It was found that much of this acreage is not leased. Therefore, although such owners may use part of their holding to supplement wage income, their reasons for retaining the rest of the land are probably not monetary.

There are indications that some land is retained through pride of ownership or sentimental attachment. During the interview program, landholders who were asked whether they would be willing to sell their idle land while retaining the farmstead and two or three acres, often replied as follows: "No, I don't want to sell any of it. I have lived here all my life. I just want to be able to walk over those fields and know that they are mine." Evidence of this pride of ownership was provided by the widespread interest shown in the Century Farm Project during 1964. Farmers across the Island attached special signs to their gate-posts to indicate that the farm had been owned by

¹⁷See, for example, C. I. Jackson and J. W. Maxwell, Landowners and Land Use in the Tantramar Area, New Brunswick, Geographical Paper No. 47, Department of Energy, Mines and Resources, (CLI Report No. 9, Department of Regional Economic Expansion), Ottawa, Information Canada, 1971.

a member of the family for the past 100 years. This pride in tradition naturally leads to a desire to retain ownership for the sake of future generations.

Possibly the most important reason, however, is that the land represents a form of security. The landowner perhaps has come to depend primarily on non-farm income to support his family but, being unskilled, has a persistent fear that he may lose his job. "Should times get hard, we always have our 50 acres to fall back on. We'll never starve." This "We'll never starve" attitude is probably the reason why a large number, of small parttime farmers keep land even though they have an adequate non-farm income.

These attitudes are thought to be fairly representative of those who depend less on the land than on occupational pluralism for support. In addition, Figure 6 shows that there is a considerable number of low-income farmers. What makes them continue to try to eke out a living on the farm? Some, apparently, are in a period of transition. They are gradually depending more and more on non-farm income for support, and their farming will eventually become nominal. Others seem to be locked into the landscape. Ruth Gasson¹⁸ has suggested that there are two kinds of immobility: 'occupational immobility', due to age or lack of training or experience, and 'personal immobility', due to occupational preference or ties with the family, district or community. Even if a farmer is poorly off, he may prefer to remain where he is because his farm represents a preferable life style to the alternatives as he perceives them. The feeling that a farmer has greater control over his life than workers in other occupations is probably the reason for the continuation of many unprofitable farm businesses. The owner's values are not primarily economic.

Such attitudes may supplement, or may be a rationalization of the fact that those who have land to sell may not obtain for it a price that is attractive. It was suggested that Raymond Allan's enterprise is worth approximately \$40,000, but much of the idle land is owned in much smaller parcels. At a present market price of about \$100 per improved acre, a 40-acre holding would not provide an attractive annuity. It should also be remembered that the value of the farmstead is often less than the price of alternative accommodation. Should a small farmer sell both the land and the house, he may find it difficult to purchase another house, let alone live on the proceeds of the sale.

In an attempt to assess the social effects of land release in the O'Leary area, the landowners not classified as 'candidates for expansion' were grouped as follows: the elderly, non-residents, non-farmers, or dual-income owners (Figure 6).

The elderly category consists of landholders who are 60 years of age or over and who are not included as candidates for expansion, often because they have no obvious potential successors. In O'Leary 59 landowners are in this category; between them they owned in 1968

roughly 2,595 acres of cleared agricultural land. Since the candidates for expansion seem to require about 6,500 additional improved acres, it is clear that only a part of the land required can come from this group.

Non-residents own 382 acres of cleared land in O'Leary, a total that in its ratio to the whole area is probably not atypical of much of Prince Edward Island. They do not contribute greatly to the agricultural economy of the Island and, since their ownership of land may cause potentially productive areas to remain idle, various means of encouraging them to sell or lease such land might be envisaged. Again, however, it is clear that such strategies would go only a small way in providing land for farm expansion.

The same is true of the non-farmers, who possess some 702 acres in O'Leary. It is the members of this group who often keep land "as something to fall back on". It is likely that such people can be persuaded to give up their idle land, more by the creation of a greater degree of personal security than by the imposition of negative incentives.

The members of the dual-income group will also need positive incentives if they are to release their land. This group is dependent on the land to some extent as a source of income and therefore cannot be separated from it without a potential drop in living standards. In all but a few cases, however, the amount of capital investment required for them to become commercial farmers would be prohibitive. As a group, these landholders are extremely important for programs of farm expansion, since they own among them 4,765 improved acres in O'Leary. This is more than half the acreage held by the four groups unlikely to become commercial farmers. That land in turn, a total of 8,444 acres, is more than half the cleared land of suitable quality in the O'Leary area.

If land is to be released, therefore, most of it will have to come from the dual-income category, but it is not easy to see how they can be encouraged to make this land available. Seventy per cent of the heads of households of this group and of the non-farmers are 40 years of age or more and are therefore apt to find it difficult to acquire alternative employment even if they are willing to change. Of the remaining 30 per cent of the dual-income and non-farmers groups, half have four or more dependents, some as many as 12. This suggests that for all but the remaining 15 per cent of landholders in these two groups, moving would be a very difficult matter, even with the Canada Manpower programs for retraining and relocation. It might indeed be argued that, for the majority, it would be a poor exchange to leave O'Leary for an unfamiliar urban environment with problems of adaptation, high rents, high competition for jobs and a host of other problems. Unless these deterrents can be satisfactorily countered, the land necessary for farm consolidation and expansion may not be made available in sufficient quantity or in suitable locations.

Agricultural Returns and Land Potential in Western Prince County

INTRODUCTION

The detailed study of the O'Leary area was a smallscale pilot investigation of the social problems associated region is 151,611 acres. with land consolidation and farm expansion. It was The land is generally flat or slightly undulating and undertaken mainly to determine the relative importance average slopes of less than 2 per cent prevail over most of different problems in the belief that O'Leary is repreof it. In an earlier study, Raymond and others²⁰ divided sentative of many areas throughout the province that are the study area into three subregions based on the physical likely to be affected by the agricultural policies of the and cultural characteristics of the landscape. These are, from west to east: the Northwestern Shore, the Alberton-Development Plan. It is desirable, however, that the programs developed under the Plan should take into account O'Leary belt and the Egmont Wet Lands (Figure 10). The soils of the Northwestern Shore are generally only the wider picture: O'Leary no doubt differs to some extent from other areas, and such detailed investigations of moderate quality. Patches of drought-prone aeolian in every community are impossible on grounds of both deposits such as dune sand are a common feature of the time and money. The data bank compiled from the coastal area; heavy, poorly drained, clay loams are often province-wide interviews with landholders provides the found inland. A large part of the cropland is under hay basis for much of this broad-scale analysis. Summaries of and improved pasture. In this area, a number of farm the key agricultural statistics in each lot, for example, operators have turned to alternative forms of employhave been published by Beaulieu.¹⁹ ment. This is especially true of the coastal belt in connec-To be utilized effectively such interview data need to be tion with the fishing and Irish moss industries. There is analyzed in a spatial context, in conjunction with the also a heavy reliance on welfare sources not only in this physical information provided by the Canada Land area but in most parts of the study region.

Inventory. In this section, one form of such analysis is presented, the whole of western Prince County being used as an example. Within this geographical region, the potential of land resources to support agriculture is examined on a quantitative basis. Similarly, by using annual gross dollar returns per acre as an indication of agricultural intensity, the present and possible future levels of exploitation can likewise be measured and assessed.

The analysis is not intended to provide a comprehensive picture of the economic potential throughout the region, but it should provide a basis for planning for more effective land use and agricultural development by indicating levels of adjustment needed in the various parts of the study area to match the development already attained in the better agricultural regions. It also provides a basis for the evaluation of the production level of the O'Leary pilot area in relation to surrounding areas of equal potential.

THE STUDY AREA

The study area covers the 12 lots comprised in the western part of Prince County, Prince Edward Island. Its southern boundary is that of lot 12 continued across to Malpeque Bay (Figure 10). The total area of this

The best agricultural soils are found in the crescentshaped Alberton-O'Leary subregion. The fine sandy loams that predominate in the vicinity of Tignish and Alberton grade into heavier clay loams in the O'Leary area. It is in this core area that the best farming is found. Grain and forage crops are widespread, and potatoes are extensively cultivated. Dairy cattle get the principal livestock emphasis. Tobacco has recently been introduced in the vicinity of Alberton, but at the time of the field study (1967-69) it covered only a very limited acreage.

The southern part of the study area is formed by the Egmont Wet Lands. This band is covered in large parts. by low-quality forest, sphagnum bogs and tidal marshes. Large patches of organic deposits, ranging from wellhumidified to partly decomposed plant materials, occur there. Cropland is limited and is concentrated on the better-drained lands. This broad belt of poor agricultural land separates the productive agricultural area of Alberton-O'Leary from the prime agricultural region of eastern Prince County.

¹⁸R. Gasson, Occupational Immobility of Small Farmers, Occasional Paper No. 13, School of Agriculture, Economic Branch, Cambridge University, 1969, p. 20-28.

¹⁹Beaulieu, op. cit., Appendix II.

²⁰Raymond et al., op. cit., p.3.



FIGURE 10. Land use regions.



FIGURE 11. Soil capability for agriculture.



FIGURE 12. Integration of land use and CLI data.

PHYSICAL POTENTIAL TO SUPPORT AGRICULTURE

Two sources of data were used to relate the present land use in the study area to its physical potential to support agriculture.

Soil Capability for Agriculture

As in the rest of southern Canada, the soils of western Prince County have been mapped by the Canada Land Inventory into seven classes according to their inherent level of agricultural productivity. The first three classes are considered suitable for sustained production of common field crops. Although Class 1 soils do not exist in the area studied, nor for that matter anywhere else in Prince Edward Island or the Maritimes, Class 2 and Class 3 soils are quite extensive. The fourth class represents marginal areas for sustained arable agriculture, and the remaining classes present severe limitations for agricultural use.

The extent of soils in Classes 2 and 3 is shown in Figure 11; it is on these lands that commercial agriculture must be concentrated.

Land Use Map

A land use map of western Prince County was prepared from a field survey conducted in 1968-69. The data were recorded on photo mosaics at a scale of 1:18,000 and the resulting map was then reduced to a scale of 1:50,000. For the purpose, a simple division between improved agricultural land and the remaining areas is sufficient; the basis for this distinction is shown in Table II.

TABLE II—LAND USE CATEGORIES

Unimproved agricultural land or land in other uses
Rough pasture and scrub grass
land
Recently grown-up woodlands
Forest
Swamps and marshes
Sand and other unproductive
land
Extraction
Outdoor recreation
Built-up areas
-

The CLI capability analysis and this simple classification of present land use were then combined (Figure 12) to provide a map of improved agricultural land on Classes 2 and 3 soils. On this map, grid lines were superimposed; these are based on the Universal Transverse Mercator (U.T.M.) grid of the 1:50,000 National Topographic System maps, and they divide the study region into 300 squares of four square kilometres (988 acres) each. The areas of improved and unimproved Class 2 and Class 3 soil in each grid square were measured and recorded on computer cards. This and subsequent analysis were carried out at a map scale of 1:50,000. Figure 13 shows at a reduced scale part of the output of the analyses and identifies in broad outline the areas in which high agricultural productivity is to be sought.

From these analyses, the Alberton-O'Leary land use region appears to present the best potential of the area in

terms of the amount of improved high-quality agricultural land. A particularly high concentration of this type of land is found west of Alberton itself, while the O'Leary pilot area and the zone south of Tignish also show good potential. In contrast, the Egmont Wet Lands contains a very low acreage of good-quality improved agricultural land.

It is important to emphasize that the criteria used in this preliminary examination are essentially defined by the land resource. Other major factors influencing agricultural development, such as availability of labour, the service and utility infrastructure and market demand, have not been considered. It is also implicit that future major land clearance is unlikely.

THE LEVEL OF EXPLOITATION

The second stage of the analysis is a summary assessment of the present magnitude of farming activities throughout the study area. This was provided by utilizing the map of property ownership prepared in 1968-69, together with the data collected from the interviews with the persons holding land of five acres or more²¹. The interview data provided numerous criteria pertaining to the actual level of agricultural production from which to choose; gross farm income was selected as one of the best single quantitative measures.

Within the U.T.M. grid pattern already used for the evaluation of the physical potential, income data were aggregated within each grid square. The source of agricultural income was located at the owner's farmstead, i.e., at the centre of his farm operation, although, of course, his income might be derived partly from holdings extending beyond the grid square in which his farmstead was located or from additional holdings within or outside that square. Figure 14 therefore provides a generalized view of the gross income level from agricultural exploitation.

As might be expected, the highest levels of farm income seem to coincide with the distribution of good agricultural land and are concentrated in the crescent-shaped Alberton-O'Leary land use region. Similarly, the lowest income levels are found in the Egmont Wet Lands, where good agricultural land is scarce. A closer comparison of Figures 13 and 14, however, shows that this general correlation does not apply in all areas. For example, in the northern part of the Alberton-O'Leary region the physical potential of the land suggests that the returns from agriculture might be considerably higher than they are at present.

LEVELS OF FARM INCOME AS RELATED TO LAND CAPABILITY FOR AGRICULTURE

The third stage in this macroscale analysis is to provide a quantitative measure of the effectiveness with which land resources are at present being used. At this stage the grid network was reduced from 300 squares to 75 by amalgamating the smaller squares into blocks of four,

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²¹Beaulieu, op. cit., p. 2 and Appendix I.



FIGURE 13. Improved acreage on soils of Classes 2 and 3 for agriculture.





FIGURE 15. Comparison of observed and predicted farm income, 1968.

each containing 16 square kilometres (3,954 acres). This reduces the statistical problems caused by small samples (especially the number of farms in individual grid squares); it also increases the likelihood that all the gross income reported for a grid unit is produced in the area covered by that unit. In addition, it provides an areal unit of a size more appropriate for macroanalysis on a province-wide scale.

By using these 75 grid squares as data sources, aggregates of gross farm income were correlated with the number of farms, the acreage of improved land in CLI Classes 2 and 3 for agriculture, and the total acreage of all improved land. The selection of the number of farms as one independent variable was made on the hypothesis that each farmer will have an incentive to obtain some minimum level of return from his operation and that a positive correlation may therefore be expected. Given the wide variation in farming activity in western Prince County, however, it is not surprising that the correlation is not very close (Table III); much better levels of explanation are achieved by comparing aggregate gross income with the acreage of improved agricultural land.

TABLE III—CORRELATION BETWEEN SELECTED VARIABLES AND FARM INCOME

Independent variables	Correlation Coefficient	
Number of farms	0.4769	
Acres of improved Class 2 and 3 land	0.7176	
Total acreage of improved land (all classes)	0.7375	

From Table III it can be seen that there is a reasonably good correlation between gross farm income in the large grid squares and the amount of improved land in CLI Classes 2 and 3, which these squares contain. The correlation is slightly better if all the acreage is included, but since so much of the improved land in western Prince County is classed as 2 or 3, the values of the two correlation coefficients are close. Multiple correlation between all three independent variables and aggregate farm income does not raise the level of explanation significantly, owing to the large amounts of internal correlation among the independent variables. For this reason the remaining analysis continues to focus on the relation between aggregate farm income and the amount of improved land in Classes 2 and 3.

A correlation coefficient of 0.71 implies that approximately half the variation in farm income can be explained by the 'land' factor: the availability of land of good potential productivity.²² The remaining variation is presumably to be accounted for by factors of 'management': farm income is affected by size of holding, efficiency of operation, type of enterprise and similar considerations. It is on these management factors that attempts to improve agricultural productivity in Prince Edward Island must be based, and it is therefore important to map the residuals resulting from this correlation analysis. This provides an indication of those areas that are performing below the present norm for western Prince County and for those that are being farmed more efficiently than the average for that area. In view of the characteristic low gross returns per acre, it may well be that these better areas are capable of still greater productivity, but it is also desirable that the productivity of other areas should be raised to levels that are already being achieved in western Prince County.

Figure 15 presents the results of the foregoing analysis. From the aggregate values of gross farm income plotted in each grid square, it can be seen that there is a wide variation in farm income from one part of the area to another. This, of course, is inevitable, since land quality and management activity vary widely. More significant is the threefold classification of the difference between the actual and the expected gross farm income that is based on the amount of improved Class 2 and Class 3 agricultural land. To get an over-all picture of the spatial distribution of existing disparities between observed and expected income levels, a regression analysis was performed and the residual values obtained were converted into percentages. The results were then grouped into three categories: observed values as expected or higher, observed values slightly lower than expected and observed values considerably lower than expected. The first category identifies the section in which aggregate farm incomes are equal to or above the average amount expected in view of the variation in land quality and current farm practice. In many parts of the area the small amount of good land means that large returns are not to be expected. Two grid squares in the extreme south produce, for example, only \$5,100 and \$6,200 in gross farm income, but in view of their physical potential this represents reasonably efficient farming by presentday standards in western Prince County. In the latter square, in fact, the analysis suggests that the average level of management would produce returns of less than \$2,000 gross. The village of O'Leary lies in the middle of a large area where farming efficiency is also above average. One grid square, for example, produces \$179,300 gross farm income; as the 'expected' value in terms of average expectancy is \$86,540, the residual of \$92,759, or 51 per cent, is a measure of the degree of farming efficiency in the O'Leary neighbourhood. Similarly, efficient farms occur in a few other areas, notably north of Alberton.

At the other extreme are those areas where agricultural income is well below the expected figure in view of the land potential. In a large number of squares only nominal amounts of agricultural income are produced at present and in some of these there are areas where major improvements in management would probably not be worthwhile. In the extreme north of the area, shown in Figure 15 for example, the gross income of \$1,200 is insignificant in terms of economic agriculture, and even the 'expected'

²²It should be noted that the CLI land capability for agriculture also includes consideration of climatic factors affecting potential productivity.

value is only \$11,563. In other areas, however, the situation is different. West of O'Leary there is a block of land that at present grosses only \$2,200, but the 'expected' value is \$61,133, which suggests that changes in management practice might have major effects.

Probably offering greater short-term opportunities for farm development are the intermediate areas, where farm income varies from the 'expected' to half the 'expected' values. In most cases these already yield significant agricultural returns by the standards of the area (more than \$20,000 gross per grid square) but they appear to offer opportunities for further development. For example, a strip of seven grid squares running north-south through the middle of western Prince County has at present an aggregate agricultural income of \$427,900; the analysis suggests that, if this area were brought up to the average level of activity, it would yield \$557,370.

It should be stressed that the values indicated as 'expected' relate only to the expectations based on the average level of agricultural activity at present prevailing in western Prince County. Agricultural productivity in the whole of Prince Edward Island is relatively low: as mentioned in the Prologue, the Development Plan has as one of its objectives the tripling of the value added in agriculture. Western Prince County has a low agricultural productivity when compared with other parts of the Island. As Beaulieu²³ has shown, the average income per improved acre by lot nowhere exceeds \$66 and the majority of lots return less than \$45 per improved acre. In view of the wide distribution of good agricultural soils in western Prince County, it seems probable that agricultural improvements could lead to increased yields far beyond those now considered normal. The analysis itself supports this conclusion. One grid square, for example, yields gross returns of \$231,300, whereas the 'expected' value is only \$95,783.

In summary, the pattern of agricultural activity indicated in Figure 15 shows marked contrasts within western Prince County in terms of the activity value of agricultural output, and there is a clear reflection of the land use regions recognized a decade ago by Raymond and others. The Egmont Wet Lands yield only small agricultural returns in contrast to the Alberton-O'Leary areas, while the Northwestern Shore is also relatively low. There are also signs that the contrasts are increasing rather than diminishing: the areas of low potential frequently produce at present less than their potential, whereas the best lands are already in many cases farmed fairly intensively. This tendency of agriculture to concentrate on the best lands may be expected to continue and should be recognized and fostered in the Development Plan. It would be a mistake to conclude that all the areas shown in Figure 15 that are not producing their potential should be encouraged to do better. Investments should be concentrated on the areas where the present potential is quantitatively large.

²³Beaulieu, op. cit., Appendix II.

In this analysis of the problems facing agricultural suggested that the task of the Corporation would be a development we have moved from the situation of an large one. individual farmer-a realistic situation, although not an "On the basis of the surveys and the age and income structure of actual case-through an analysis of the characteristics the population, it is estimated that over a ten year period a total of landowners in the O'Leary area to a quantitative of 411,600 acres of land could be offered to the Province. Of this land 306,000 acres would be Class 2 and 3, of which 157,000 overview of agricultural achievements and potential in acres would be improved and 149,000 acres unimproved. In adthe whole of western Prince County. The complexity of dition, there will be 17,000 acres of improved Class 4 soils suitable the problems associated with improving agricultural for crop production and about 93,000 acres that should be withdrawn from the agricultural sector and diverted to alternative uses productivity are apparent; it is less easy to suggest ways such as forestry, recreation, wildlife and watershed management."25 in which they may be solved. What help, for instance, can be provided for Raymond Allan that is likely to be The acreages involved are therefore substantial, but effective?

It is clear that the problems facing Raymond Allan as he tries to enlarge his farm to a fully commercial operation are not peculiar to his immediate locality. They exist throughout the O'Leary area and, as the interview program demonstrated, throughout Prince Edward Island.²⁴ Raymond Allan is one of a relatively small minority of farmers on whom the success of the agricultural objectives of the Development Plan is likely to depend: yet the probability that he will be successful is decreased unless he benefits from increased knowledge which will enable him to improve not only his farming capabilities but his management abilities as well. Important also is the need to devise alternative ways of satisfying the requirements of the owners of the land to be released. Their needs are more diverse, and the persons to be satisfied more numerous, than are the number of candidates for farm expansion. To some extent the passing of time will provide a solution: Raymond Allan is likely to acquire James McCullough's property on the latter's retirement or death. But is it realistic to wait for time to solve such problems? The Development Plan is intended to raise the living standards of the *present* generation and to lessen the present dependence of the province on federal financial assistance.

Such considerations provide the background for the creation of the Prince Edward Island Land Development Corporation as part of the Development Plan. The Corporation is the principal agent concerned with land consolidation and farm enlargement under the Plan. The land ownership survey and the associated interviews

Conclusion

these totals themselves tend to hide the real problem, which is that such land is likely to be made available in very small units, given the present average size of farms on the Island. It follows therefore that the Corporation cannot function merely as an agency that assists in the transfer of land from one owner to another. The willingness of landholders to dispose of land is not necessarily directly related in time and space to the ability of others to make effective use of it. It may take, for example, several years to acquire a number of small individual holdings, which can then be amalgamated and made attractive to provide an opportunity for commercial farming. The Land Development Corporation, in short, must function as a land bank and as an interim landmanagement agency if it is to succeed in its task of assisting in the creation of commercial farm units.

Provided that it is able to acquire the land, the Land Development Corporation is likely to be beneficial to Raymond Allan and the others who have been described in this report as candidates for expansion, the commercial farmers of the future. A number of schemes for assisting these farmers by management training, farm credit and accounting systems is also being developed under the Plan.²⁶ Whether present landholders will be willing or able to transfer their land to the Land Development Corporation depends, as has been emphasized throughout this report, more on social policy than on agricultural policy. One scheme at present being administered by the Land Development Corporation is designed to achieve the release of land at present held by elderly farmers who make little use of it, and, at the same time,

to provide them with security of income and continued occupation of the farmstead.

"The Province will offer owners of low-income farms the market value of farm land and buildings . . . Farmers 60 years of age or over may sell or, alternatively, accept a pension. This will consist of a fixed element of \$150 a month for married men, \$100 a month for single men; and a variable element amounting to bank rate plus 1% on the value of the farm land and buildings, for five years or death whichever comes first. The minimum pension payable taking account of both these factors would be \$2,400 for married men and \$1,800 for single men, in 1967 constant dollars. The farm owner will be eligible, if he chooses, for a lifetime lease from the Province for his house and one acre of land and with guaranteed access. The lease terminates on death of the farmer or spouse, whoever is the survivor, and buildings, property and access rights are returned to the Province."27

This scheme is presented here only as an example of the possible means by which land release is achieved.

It is not the purpose of this study to suggest or evaluate such schemes but merely to demonstrate the need for a detailed consideration of the social and economic condition of landowners, both at the individual level and at the macroscale in the evaluation of the agricultural potential of different parts of Prince Edward Island. Raymond Allan, O'Leary and western Prince County are each examples of situations represented throughout the Island, and the problems and opportunities they represent are both a justification for the Development Plan and examples of the facts with which it must deal.

²⁴Beaulieu, op. cit.

²⁵Department of Regional Economic Expansion, 1969, *op. cit.* p. 36. ²⁶Ibid., p. 34-38. ²⁷Ibid., p. 36.

Canada Land Inventory Land Capability Classifications: Descriptions of Main Classes for Agriculture and Forestry

AGRICULTURAL LAND CAPABILITY **CLASSIFICATION**

In this classification the mineral soils are grouped into The soils are deep and hold moisture well. The limitaseven classes on the basis of soil-survey information. tions are moderate and the soils can be managed and Soils in Classes 1, 2, 3 and 4 are considered capable of cropped with little difficulty. Under good management sustained use for cultivated field crops, those in Classes they are moderately high to high in productivity for a 5 and 6 only for perennial forage crops and those in fairly wide range of crops. Class 7 for neither.

Here are some of the important factors on which the classification is based:

- 1. The soils will be well-managed and cropped, under a largely mechanized system.
- 2. Land requiring improvements, including clearing, that can be made economically by the farmer himself is classed according to its limitations or hazards in use after the improvements have been made. Land requiring improvements beyond the means of the farmer himself is classed according to its present condition.
- 3. The following are not considered: distances to market, kinds of roads, location, size of farms, type of ownership, cultural patterns, skill or resources of individual operators, and the hazard of crop damage caused by storms.
- 4. The classification does not include the capability of the soils for sustaining trees, tree fruits, small fruits, ornamental plants, recreation or wildlife.
- 5. The classes are based on the intensity, rather than on the kind, of their limitations for agriculture. Each class includes many kinds of soil, and many of the soils in any class require unlike management and treatment.

CLASS 1: Soils in this class have no significant limitations in use for crops

The soils are deep and well to imperfectly drained, hold moisture well, and in the virgin state were well supplied with plant nutrients. They can be managed and cropped without difficulty. Under good management they are moderately high to high in productivity for a wide range of field crops.

Appendix

CLASS 2: Soils in this class have moderate limitations that restrict the range of crops or require moderate conservation practices

CLASS 3: Soils in this class have moderately severe limitations that restrict the range of crops or require special conservation practices

The limitations are more severe than for Class 2 soils. They affect one or more of the following practices: timing and ease of tillage, planting and harvesting, choice of crops. and methods of conservation. Under good management they are fair to moderately high in productivity for a fair range of crops.

CLASS 4: Soils in this class have severe limitations that restrict the range of crops or require special conservation practices or both

The limitations seriously affect one or more of the following practices: timing and ease of tillage, planting and harvesting, choice of crops, and methods of conservation. The soils are low to fair in productivity for a fair range of crops but may have high productivity for a specially adapted crop.

CLASS 5: Soils in this class have very severe limitations that restrict their capability for producing perennial forage crops and improvement practices are feasible

The limitations are so severe that the soils are not capable of use for sustained production of annual field crops. The soils are capable of producting native or tame species of perennial forage plants, and may be improved by use of farm machinery. The improvement practices may include clearing of bush cultivations, seeding, fertilizing or water control.

CLASS 6: Soils in this class are capable only of producing perennial forage crops, and improvement practices are not feasible

The soils provide some perennial grazing for farm animals, but the limitations are so severe that improvement by the use of farm machinery is impractical. The terrain may be unsuitable for the use of farm machinery, or the soils may not respond to improvement, or the grazing season may be very short.

CLASS 7: Soils in this class have no capability for arable culture or permanent pasture

This class also includes rockland, other non-soil areas and bodies of water too small to show on maps.

O: Organic soils

(Not placed in capability classes.)

FORESTRY LAND CAPABILITY CLASSIFICATION

In this classification all mineral and organic soils are grouped into one of seven classes based upon their inherent ability to grow commercial timber. The best lands of Canada for commercial tree growth will be found in Class 1, and those in Class 7 cannot be expected to yield timber in commercial quantities. These represent the extremes. Because of the unsuitable climate, several regions of Canada have no Class 1 land, and in certain regions the Class 2 areas will be too small to show at the chosen scales of mapping.

Here are some of the important factors on which the classification is based:

- 1. All information, known or inferred, about the unit is used, including that on subsoil, soil profile, depth, moisture, fertility, landform, climate and vegetation.
- 2. Associated with each capability class is a productivity range based on the mean annual increment of the best species or group of species adapted to the site at or near rotation age. Productivity classes are expressed in gross merchantable cubic foot volume to a minimum diameter of four inches. Thinnings, bark and branch wood are not included. The productivity as expressed is that of 'normal' (i.e. fully stocked) stands. It may be assumed that only good management would have produced stands of this nature.
- 3. The following are not considered: location, access, distance to markets, size of units, ownership, present state and special crops such as Christmas trees.
- 4. The classes are based on the natural state of the land without improvements such as fertilization, drainage or amelioration practices. It is realized that with improved forest management the productivity may change; to the extent that the limitations shown in the symbol may be altered, class changes may also take place. Significant changes, however, will be achieved only through costly and continuing practices.

CLASS 1: Lands having no important limitations to the growth of commercial forests

Soils are deep, permeable, of medium texture, moderately well-drained to imperfectly drained, have good water-holding capacity and are naturally high in fertility. Their topographic position is such that they frequently receive seepage and nutrients from adjacent areas. They are not subject to extremes of temperature or evapotranspiration. Productivity will usually be greater than 111 cubic feet per acre per year.

When required, this class may be subdivided on the basis of productivity into Classes 1 (111 to 130), 1a (131 to 150), 1b (151 to 170), 1c (171 to 190), 1d (191 to 210) and by 20 cubic foot classes thereafter, as necessary.

CLASS 2: Lands having slight limitations to the growth of commercial forests

Soils are deep, well-drained to moderately well-drained, of medium to fine texture and have good water-holding capacity.

The most common limitations (all of a relatively slight nature) are: adverse climate, soil moisture deficiency, restricted rooting depth, somewhat low fertility and the cumulative effects of several minor adverse soil characteristics.

Productivity will usually be from 90 to 110 cubic feet per acre per year.

CLASS 3: Lands having moderate limitations to the growth of commercial forests

Soils may be deep to somewhat shallow, well to imperfectly drained, of medium fine texture with moderate to good water-holding capacity. They may be slightly low in fertility or suffer from periodic moisture imbalances.

The most common limitations are: adverse climate, restricted rooting depth, moderate deficiency or excess of soil moisture, somewhat low fertility, impeded soil drainage, exposure (in maritime areas) and occasional inundation.

Productivity will usually be from 71 to 90 cubic feet per acre per year.

CLASS 4: Lands having moderately severe limitations to the growth of commercial forests

Soils may vary from deep to moderately shallow, from excessive through imperfect to poor drainage, from coarse through fine texture, from good to poor moisture-holding capacity, from good to poor structure and from good to low natural fertility.

The most common limitations are: moisture deficiency or excess, adverse climate, restricted rooting depth, poor structure, excessive carbonates, exposure, or low fertility.

Productivity will usually be from 51 to 70 cubic feet per acre per year.

CLASS 5: Lands having severe limitations to the growth of commercial forests

Soils are frequently shallow to bedrock, stony, excessively or poorly drained, of coarse or fine texture, may have poor moisture-holding capacity and be low in natural fertility.

The most common limitations (often in combination) are: moisture deficiency or excess, shallowness to bedrock, adverse regional or local climate, low natural fertility, exposure particularly in maritime areas, excessive stoniness and high levels of carbonates.

Productivity will usually be from 31 to 50 cubic feet per acre per year.

CLASS 6: Lands having severe limitations to the growth of commercial forests

The mineral soils are frequently shallow, stony, excessively drained, of coarse texture and low in fertility. A large percentage of the land in this class is composed of poorly drained organic soils.

The most common limitations (frequently in combination) are: shallowness to bedrock, deficiency or excess of soil moisture, high levels of soluble salts, low natural fertility, exposure, inundation and stoniness.

Productivity will usually be from 11 to 30 cubic feet per acre per year.

CLASS 7: Lands having severe limitations which preclude the growth of commercial forests

Mineral soils are usually extremely shallow to bedrock, subject to regular flooding, or contain toxic levels of soluble salts. Actively eroding or extremely dry soils may also be placed in this class. A large percentage of the land is of very poorly drained organic soils.

The most common limitations are: shallowness to bedrock, excessive soil moisture, frequent inundation, active erosion, toxic levels of soluble salts, and extremes of climate or exposure.

Productivity will usually be less than 10 cubic feet per acre per year.

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