

A STUDY OF THE SPATIO-TEMPORAL COMPETITION
IN THE DAIRY INDUSTRY:
WITH PARTICULAR REFERENCE TO VANCOUVER ISLAND

by

ENOCK EPHRAIM ELNOTTE MOYO

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We accept this thesis as conforming
to the required standard

C. J. Wood

M. A. Micklewright

J. Schofield

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UNIVERSITY OF VICTORIA

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Supervisor: C.J. Wood

ABSTRACT

This study qualitatively describes oligopolistic behaviour and institutional response in a sector of the food industry. The analysis focuses on the dairy industry on Vancouver Island. In particular, it attempts to identify some inefficiencies and spatial inequality in the dairy industry.

The problem concerns the identification of the optimum size, the location and number of processing plants that would minimize the total costs of the dairy industry on Vancouver Island. A trans-shipment model of linear programming is used to evaluate costs of shipping raw milk, processing and shipping the final product to the consumer. An iterative procedure is used to incorporate economies of scale in processing in addition to transfer costs in obtaining the minimum cost solution.

All the dairy farms on Vancouver Island constitute sources of milk in the model, and five cities on Vancouver Island chosen on the basis of their population sizes constitute potential plant sites, and the population in hinterlands constitutes the market for processed milk.

The solution of the linear programme problem shows that the present plant size pattern and plant numbers is inefficient, in terms of total industry processing costs and total transfer costs. The solution suggested would save processors and farmers a considerable some of money in transfer costs. However, savings in processing costs cannot be computed because of lack of current data. It suffices to mention that the suggested transfer cost minimization schema would be both equitable and efficient in terms of using local resources efficiently and distributing the benefits of such a development equitably among the consumers, processors, and retailers. It would also enable processors to rationalize their locational choices in order to ensure long term benefits from the operation of the dairy industry.

The solution also shows that the attainment of optimum conditions in the dairy industry is conditional to the Province limiting the movement of milk within specific regions. Related legislation, already in existence, could be activated to implement this recommendation. The solution calls for a system of monitoring both the efficiency and spatial equity aspects of the industry.

C.J.B. Wood

M.A. Micklewright

J. Schofield



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CHAPTER I

INTRODUCTION: SCOPE AND PURPOSE

To call observed behaviour logical action and to write about profit maximization and manipulative politics under the label of rational behaviour is nothing less than a sophisticated technique for rationalizing the status quo. The reason, is of course, that in the mind of modern man the concept of logic has assumed the position once played by God himself.

(Gunnar Olsson, 1974)

A Forethought About Milk

The Masai people of East Africa subsist on a diet of milk and blood. The Queen of England takes milk in her 4:00 p.m. tea, everyday. Your family doctor recommends milk for your sick child who will not take her solid food. An expectant mother has decided she will not breast feed her baby in order to maintain her "wholeness".

All these people have one thing in common, they value milk for its many qualities. They also come from different cultures, social backgrounds and economic levels. To them milk is more than a simple drink, it must be life itself.

Can life be the same without milk? Can society afford the disappearance of this valuable product or its availability

at prices that would put it out of reach of many people? These are questions for which no simple answers can be found. For people who have always used milk, such a question never arises.

1.1 Introduction

In the quotation above, Olsson demonstrates the inherent futility of some theoretical postulates in the planning field. He also shows how analysis can be instrumental in reproducing inequality by assuming observed behaviour is normal, and by so doing ignoring the inherent errors and inequalities of phenomena.

Such errors are commonest in market economies, where planning is founded on theoretical postulates that espouse the impartiality of market forces in the allocation of resources. Markets, it is argued, are the most efficient forms of industrial organization. Competition is assumed to be a promoter of allocative efficiency because it is a manifestation of the collective wishes of the community at large.

However, in reality, the optimality of competitive markets may not hold for a number of reasons. First, while it may be true that competitive forces do an excellent job in allocating resources efficiently, they often fail to promote an equitable distribution of gains and

losses (Morrill, 1974).

Secondly, there is also the impure nature of real markets. The conclusions of competitive optimality rest on the comparison between the economist's strict definition of purely and perfectly competitive markets on one hand and other market forms on the other. Policy choices are arrived at by selecting various states of imperfection (Asch, 1970).

Lastly, the theoretical postulate states of imperfection are also not precise and as such are prone to be misuses by analysts. This may also lead to analysts selecting theoretical constricts to suit pre-selected policy formulations (Morrill, 1974; Pred, 1967).

1.2 Purpose and Methodology

This thesis examines the market for milk on Vancouver Island focussing on its efficiency and equity.* In this study the market is considered too impersonal to be the main arbiter in the allocation of resources in a developmental process. Sufficient evidence and theory has already been developed to illustrate this. Some of these are detailed below. It is not the purpose of this thesis to develop new theory, but such existing theory will be used as a basis for understanding, prediciting, evaluating and controlling the interaction between spatial evolution and economic development.

*In this study spatial equity is defined as a measure of

A linear programming model is the method used to project the optimum allocation of milk to locations and the number and size pattern of processing plants that would minimize the total costs of the dairy industry on Vancouver Island. The main emphasis in this study is on the distribution of benefits from such a cost minimization exercise, among the main participants, namely, the producers, consumers and processors.

It is also felt that any analysis of a developmental process has to take into account an examination of the totality of that process. Such a totality is embodied in the historical evolution of processes. It is also within such a history that decisions about the economy are taken by businessmen on one hand and the state on the other. The two decision making elements together with society in general represent movement in history. The benefits and losses to society can be measured within such a totality. Chapter II attempts to catalogue the economic history and the development of the spatial structure of the dairy industry and the impacts of decision makers on society's well-being.

The next task involves the selection of an epistemological framework within which decisions are taken. Decisions are largely taken on the basis of two underlying philosophies, namely, the primacy of market forces in allocating resources

the distributive consequences arising out of the location of facilities or the exploitation of resources allotted to the dairy industry.

in space efficiently on the basis of supply and demand, or the arrangement of development processes to meet prescribed policies, or simply the planning process.

These decisions have a tremendous effect on the development processes. Chapter III thus reviews location theory from the two philosophical points of view and as a basis for designing the hypotheses and methodology to test these. It is also hoped the analysis of the different location theories will help in the understanding of how the spatial inequalities of the B.C. dairy industry have come about, and also how they can be resolved. Chapter IV contains a statement on methods, hypotheses and data collection. It also contains a model for testing the hypotheses developed. The hypotheses, in particular, state that partial intervention by the state in the market is an ineffective method of resolving problems of spatial equity and efficiency in the dairy industry. A linear programming model is used to attempt to prove the above statement as well as providing a framework on which the solutions envisaged, namely spatial planning, can be founded. Methodology, is thus, fashioned to meet specific objectives, which in this case, is spatial equity and efficiency in the dairy industry. The objective function is defined as the minimization of assembly and processing costs of the whole industry and the benefits from such

an exercise should be both the optimum possible and equitably distributed. Chapter IV uses data collected to describe the Island's economy and demography in their spatial setting. This in turn provides a framework on which criteria for the solutions advanced can be based. This leads on to Chapter VI in which the hypotheses are tested. This also provides the rationale for adopting spatial planning as a method of meeting spatial equity and efficiency criteria.

The conclusions reached in Chapter VI also constitute the recommendations tabled in Chapter VII. These are largely designed for use by a constituted planning authority in the dairy industry.

The rationale for the adoption of the above approach and methods is that

- (a) inequalities in the spatial organization exist but these have to be proved. Linear programming models satisfy this goal. Chapter IV and VI will attempt to prove that the industry is both inefficient and inequitable.
- (b) Successive governments in British Columbia have not been totally indifferent to the problems experienced by the dairy industry. Chapter II will discuss this in detail.

However, government intervention has been partial and aspatial.

(c) Therefore, there is a need to point briefly to what spatial planning involves.

1.3 Spatial Planning

At one time in this province government planning was assumed to be bad for economic development as in most western capitalist countries. However, this has changed, as countries come to realize that competitive forces, as they prevail today, do not usually allocate resources fairly. This necessitates intervention by policy makers in the form of spatial planning. The relevance of spatial planning is based on the understanding that if development has to be efficient it must be comprehensive in scope. This is not found in situations where market forces are left to decide.

The growth of an economy also results in the development of regions or areal classes (Hoover, 1971). Each region, in a nation's economy, is an open system, responding to developments in other regions and in turn influencing developments in other regions (Hilhorst, 1967). This assertion recognizes the significance of the impact of economic development on spatial evolution and the impact of spatial structures on economic development. In essence,

there is a two way process of interaction, and the process of controlling and directing development must be conceived in a dynamic context (Friedman, 1966; Misra, 1969).

1.4 Types of Planning

This study distinguishes between two types of planning; namely, adaptive and developmental spatial planning (Cameron, 1969; Friedman, 1967; Kuklinski, 1969).

Adaptive spatial planning is based on the recognition that regional trends of development impact on the spatial system. For instance, concentration of wealth in one region, has an impact on the total system as well as its evolution. The task of adaptive spatial planning is to streamline the process of spatial evolution so as to achieve at any point, a spatial structure which matches the needs of industry efficiency. No theory of adaptive planning exists, but there is sufficient literature to provide a theoretical base for this. This is largely based on industrial structure and the economic system on one hand and the pattern of settlements on the other. Adaptive planning aims at steering the process of industrial development towards a structure that meets the requirements of efficiency and economic development. Since adaptive planning, by its very nature, is based on the assumption that spontaneously generated change in the spatial system

reflects the preferences and efficiency considerations, the question of goals for spatial development do not arise (Cameron, 1969). In essence, it assumes the status quo is right, and its behaviour should be the basis for policy. It exploits the existing trends of spatial evolution by channelling investment to these. It also totally ignores the developmental potential of those areas that may not be preferred by those in charge of locating industry. Economic development in space is assumed to take place spontaneously under the guidance of market forces. Predatory behaviour of entrepreneurs and their manipulative politics are ignored, totally.

A second type of spatial planning is known as developmental or active spatial planning (Kuklinski, 1969). It is based on the "feedback relations" between economic development and spatial evolution. It seeks to achieve within a dynamic historical context, a pattern of spatial evolution that at any point in time is judged to be the most efficient from the point of view of sustained economic growth (Friedman, 1966). The spatial organization of economic and socio-cultural activity is conceived as a means to promote long term development, taking into account the feedback of spatial organization on economic efficiency, rather than viewing spatial organization as something which has to be adapted to existing conditions

(Friedman, 1966). In a sense, it reflects the infallibility of spatial development and the fact that socio-cultural needs are not always met in economic development.

Some authorities have argued that intellectually, developmental spatial planning is superior to adaptive planning, but it rests on a weaker theoretical foundation. However, there are severe gaps in spatial theory relating to spatial organization and the evolution of economic efficiency. It also lacks a mechanism of detecting subsystems within systems that may be diversionary to general trends. There are also gaps as to the proper criteria for intervention and steering economic development, through market forces or administrative investments, to connect it and to extend linkages in space (Hermansen and Allen, 1968).

Despite the above shortcomings, it is evident such planning cannot await better empirical and theoretical constructs. The fundamental imbalances in welfare levels of living and trends in development, in both developed and developing countries, indicates fundamental deficiencies in the forces presently at work creating structural imbalances that are aggravated rather than diminished in the process of marginal adjustments (Hermansen, 1969). Developmental, spatial planning, by the government, is essential in that it provides a mechanism for systematic corrective actions.

1.5 Underlying Theoretical Postulates For Developmental Spatial Planning

There are four questions that have to be answered as a basis for developing a body of theory for developmental planning (Hermansen, 1969).

1. What exists? This approach is descriptive in that it details the quantity, quality and location of phenomena.
2. The second type of questions seek to know why existing patterns are what they are. This is sometimes described as "positive". These questions seek to explain the characteristics of spatial patterns and forces responsible for their existence. The work of Losch (1954) and Weber is related to this field of questions. This is largely abstract and only provides broad patterns of the behaviour of spatial phenomena.
3. What ought to be? This is sometimes termed normative and related to optimum allocation or optimum allocation in space. A normative theory necessarily involves value premises and as such no optimum in an absolute sense can be found.

4. Normative theory is based on explicit objective functions, and as such it provides guidelines for what is termed control theories. This is concerned with how to intervene and direct change in spatial organization in order to attain specific goals. Ideally, these goals are formulated on the basis of assumptions about the mutual interrelations between spatial organization and economic development. It deals precisely with questions arising out of policy making, planning, implementation and evaluation (Hermansen, 1969).

There are no specific theories to explain the questions raised above. This inhibits the development of general theory for developmental planning. The task of this study is not to develop more theory for related questions, but to use whatever theory has been developed, as a basis for understanding, predicting, evaluating and controlling the interaction between spatial evolution and economic development in this case the milk industry.

On the basis of spatial organization, defined as:
(i) the set of clusters of human activity characterized by relative locational position, size and function composition; (ii) the network of movement facilities for commodities, people and information that connect the

clusters; and (iii) the distribution and density pattern of space utilizing activities from which some conclusions can be drawn (Hermansen, 1969). First, other things being equal, a spatial organization is better the less total transportation is required because the resources used in transportation could be used in something else. Secondly, other things being equal, a spatial organization is better the less travel is required, because the consumption of transportation, such as commuting rather than adding to welfare, reduce it. And lastly, other things being equal, a spatial organization is better the higher the degree of integration it permits, because (1) this stimulates the division of labour and the exploitation of economies of scale; (2) ensures a rapid reallocation of resources required by the trends of change in demand and technical progress; (3) promotes rapid diffusion of innovations throughout the economic space; and (4) ensures the efficient use of resources throughout the area (Friedman, 1961).

However, policy objectives derived from the above scheme do not always operate in harmony. For instance, a policy may be designed to minimize movement, and in so doing affect spatial equity. In other instances, the pricing of transportation may not always reflect distance travelled. Such price discrimination in transportation

may thus fail to promote spatial equity. To avoid such problems, the objectives of analysis and the scope within which such objectives should be attained should be spelled out clearly. They (the scope and objectives) provide the framework within which decisions should be taken and out of which recommendations should be made.

1.6 Scope and Objectives

This thesis is concerned with the operation of the dairy industry in British Columbia with specific reference to Vancouver Island. Vancouver Island, as a distinct region of B.C., offers many characteristics of problems experienced by other parts of the province; these, in many instances, are problems of increasing functional specialization and integration of the different areas of the province, and the fact that such integration does not always permit harmonious co-existence between different regions of the province. They thus reflect problems of a free market economy, and highlight the need for comprehensive government intervention.

Specifically, this is a case study of partial government intervention with a lack of spatial development planning and the resultant spatial disorganization of the dairy industry. The Island has been selected as an example of the manifestation of the spatial processes under a market economy system.

For the dairy industry and indeed the economy of the province as a whole, the large scale functional changes in demand, technology and energy prices are transmitted vertically within and between regions and as such are the major causes of what takes place in the different areas of space in which the economy functions (Stohr and Todtling, 1977). Along with increasing scale of private and public decisions, such vertically initiated changes cause local and regional disturbances and "fall outs" of increasing complexity in the form of idle resources, lack of markets, and increasing costs to the industry. Vancouver Island, it has been argued in some places, may be a region experiencing these problems. These effects are not limited to one industry or locale in space, but are complexly intertwined in a web of economic relationships.

For example, the B.C. dairy industry has evolved through decisions taken by individual milk producers, the retail outlets, the transport sector, the input sectors, and above all, government decisions. Each decision-making unit within the web of inter-relationships not only creates favourable conditions for itself, but draws the course for spatial development within the industry.

Each of these units operates with the aim to maximize gains from such decisions. The government operates to maximize political gain, and business men as a whole, operate

to maximize profits. Thus decisions as to where milk should be produced, how it should be marketed, and where it should be marketed are shared by these units. The section below deals with roles played by each decision making unit.

a) The Farmer

The locational decisions of the farmer are largely constrained by the physical environment, the market for his product, the capital he owns or can assemble, and state policies. From this premise, he is at the bottom of the pyramid of vertical control. His fortunes depend largely on the decisions of the other decision making units. They also control his access to capital, since it is they which can improve his capital formation through purchases for the retail outlets, and through the pricing mechanism, which for the dairy industry in B.C., is largely in the hands of the government and the retail outlets.

The physical environment also constrains the fortunes of farmers. Land suitable for agriculture is scarce and farmers cannot own very large units of land. The sparse distribution of land often leads to higher transportation costs. Also, the magnitude of pressure on the basic resource, land, determines the price of that input.

In addition, the locational decisions of the outlets that buy his milk determine returns to his operation. The farmer is made to relocate or face losses in response to the locational behaviour of outlets for his milk.

b) The Market

The market includes food chains, independent stores and processing plants. Consumers are assumed to be part of the locational mode of food stores. These units exert varying influences on the locational decisions of each other, as well as that of farmers.

The power exerted by each unit depends on the capital owned, and methods adopted to increase such capital. Studies of economic behaviour of economic units show that the greater the territorial scale of control the more territorial interests will approach the aggregate functional ones (Todtling and Stohr, 1977). The territorial control exercised by food chains is almost universal in the province and thus tends to obliterate the efforts of smaller concerns at local levels.

This has largely been attained through the use of horizontal and vertical integration by major food chains (Parbly et al, 1976). By centralizing production and processing of milk in the Vancouver region, and extending *tentacles of control* through branch stores, the territorial

space for milk trade is controlled by food chains. This affects the locational decisions of local dairies that depend on local farms for their milk supply, and independent stores for markets. These schemes by major food chains represent an effective barrier against the economic success of the local shops, dairies and farms. Whatever problems arise in the dairy sector related to cost have to be taken in the light of the experience of the industry as a whole. They also have to take into account the vertical transmission of impulses throughout the system.

c) Government Policy

Successive governments in B.C. have pronounced their belief in the allocative efficiency of market forces. This, however, has not ruled out partial government intervention in the market whenever things have not worked to its satisfaction. While on one hand advocating a free hand for market forces to allocate resources, it has gone ahead to set up planning bodies to direct the course of agricultural development. The Milk Board and various planning bodies in the Ministry of Agriculture point to this fact.

Setting up bodies to direct the course of agricultural development is one thing, and actually seeing to it that plans are implemented is another. The planning bodies run by the Ministry of Agriculture operate under the notion of

the optimacy of market forces, but take decisions under the political direction of whatever is in power. Thus the notion of market economy provide the rationale while politics directs decision-making. In essence, it could be claimed that there is no planning in the Ministry of Agriculture, but a system of reacting to crises. This can also be termed planning by crisis management. The spatial evolution of the industry has to be seen in the context of the above observation.

The gains and losses, in spatial terms, can thus be measured in terms of the relative successes of farmers, processors and the integrated chains. The main task of this study is to identify these losses and gains, expressed spatially, and then advance relevant solutions. Thus, spatial equity in the distribution of gains and losses in the dairy industry is the main goal of this study.

On the basis of the above observations the following are the objectives of the study.

- (a) To describe the dairy industry on Vancouver Island in its spatial setting and in the context of the economy as a whole.
- (b) To explain why current patterns exist.
This involves reviewing literature on related subjects as a basis for deriving hypotheses on the behaviour of the dairy industry in B.C.

- (c) The third objective involves the detailing of a normative framework to evaluate the performance of the industry. This necessitates the selection of an objective function. The objective function selected for this study involves the minimization of costs of allocating raw and processed milk to markets and the optimum location and size of processing plants on Vancouver Island. The resultant optimum pattern will be used to evaluate the performance of the industry on the Island.
- (d) The optimization exercise forms the basis for the last objective: the adoption of control strategies for the industry. For instance, what should be the amount of milk produced and where should it be marketed on the Island? The Milk Board can then design legislation for this purpose. The model suggested would enable policy makers to design legislation for the industry that would safeguard both the efficiency and spatial equity criteria.

The major advantage of the methodology to be employed is that it forms the basis for selecting strategies of spatial organization as explicit components of regional planning policy

and coherent policy instruments are adopted to specific conditions of the respective regions. From this premise, specific needs of the Vancouver Island dairy industry cannot be submerged under aggregate provincial interests. The full potential of all the regions is taken into account.

CHAPTER II

THE SPATIAL EVOLUTION OF THE DAIRY INDUSTRY
ON VANCOUVER ISLAND

Stratification is to an important degree an integrating structure in the social system.

Talcot Parsons, *Essays in Sociological Theory*,

2.1 Introduction

This chapter describes qualitatively, the spatial evolution of the dairy industry in British Columbia, with particular reference to Vancouver Island. The level of integration in the industry, provincially, justifies the treatment of the Island as representative of what takes place in other parts of the province. Of interest is the erosion of opportunities for carrying out dairying experienced by certain parts of the Island, and how this could be symptomatic of the nature of the operation of market forces as well as the role played by the government* in the development of the industry.

In the analysis of the erosion of opportunities to carry out dairying in certain parts of the Island, of what can be best termed spatial inequalities, two methodological questions arise. Firstly, there is the problem of grasping

*Government in this study refers to the Government of British Columbia unless otherwise stated.

the totality in economic space within which the dairy industry operates. Analysis has to grasp the place of dairying in the economic space of Vancouver Island. Lastly, there is the problem of how to interpret the meaning of the space of this totality in terms of accumulated time. For the dairy industry in particular, the totality encompasses the economic, social and politico-cultural aspects that are part of its environment. It is felt that the dairy industry operates within a specific space which is also the space of other elements of the economy, and the relationships between the elements is a continuous process. In essence, total space is as continuous as the space of its parts (Santos, 1977, p. 8).

The two questions above do not have easy answers. It is not the purpose of this chapter to attempt to answer them. If it can be assumed that space defining elements are "variables whose nature and significance varies according to the level (of space)" considered, then the problem of spatial delineation assumes another dimension; since each of the parts is assumed to be a replica of that totality (Santos, 1977, p. 4). On this basis, a description of what takes place on Vancouver Island should sufficiently represent what takes place in the dairy industry in other parts of the province.

Space constraints necessitate an examination of the evolution of spatial inequalities on Vancouver Island only. Wherever possible and necessary, mention will be made of developments outside the Island that have significantly contributed to the spatial evolution of the industry. The universality of the causal factors is a function of the level of integration in the economy. Thus, the space of the Island dairy industry is seen as continuous as the space of the industry not only in the province as a whole, but as that of the rest of the economy as well.

In describing the spatial evolution of the dairy industry, the approach taken in this chapter emphasizes the role of causal factors and the resultant space formations rather than simply describing the manifestation of those formations at a particular time. This differs from the traditional approach in social sciences that tend to emphasize things that have already crystallized rather than their actual crystallization (Santos, 1977; Pahl, 1969). Santos (1977, p. 8) describes such an approach as prone to presenting an inverted image that prevents the apprehension of reality, unless history is made to intervene. He concludes that if social scientists desire to interpret human space as a historical fact it is the history of that society that serves as a basis for understanding spatial reality or for transforming that reality

into one useful to mankind.

This study thus sees the social relations of production and their concretization in space as responsible for the kind of distribution of returns of such production, at each moment in time. In the words of Santos (1977, p. 8) the mode of production, social formation and space are the best means for understanding the evolution of economic phenomena in space. He describes these, collectively, as technical-productive structures expressed geographically by a specific distribution of activities of production.

It should also be noted that there are differences in the articulation of production in space. Modes of production become concrete in a historically territorial space. In other words, modes of production operate within certain boundaries, and in so doing, lay the foundation for future modes. It is in this movement of history and the modes of production society adopts that spatial forms are shaped (Harvey, 1972).

Santos (1977, p. 8) has also noted that modes of production, in their geographic determination, are selectively re-inforcing the specificity of particular places. The time lag with which different modes of production impose their different requirements on each portion of space are responsible for the different lifetimes of its multiple elements or variables. "Diachronism is

at the root of spatial evolution but the fact that the variables act synchronically, that is, in an arranged order inside a true organization, assure the continuity of space" (p. 8).

For B.C. the dominant mode of production is based on notions of the free market, or what is commonly termed capitalist. In other words, space is being shaped by capital and the actual formations in space are defined by its ownership. The sections below will attempt to describe the evolution of the dairy industry on the basis of capitalist formations. Specifically, an attempt will be made to show that the capitalist mode of production, with its aversion for comprehensive spatial planning, is both wasteful in its use of resources and allocates the benefits of production processes inequitably.

Modes of production in the context of this study are not simply a question of social relations expressed materially, they also include their non-material expressions, such as political ideology. In the context of B.C., their non-material expression is mostly capitalist or its many variants. It is not the purpose of this chapter to discuss the material expressions of production. However, mention will be made of these, wherever applicable.

Each geographic form in the history of the evolution of the dairy industry is thus an expression or representative

of the dominant mode of production at one of its moments. In essence, the history of the dairy industry is the history of a succession of modes of production. The section below examines the phases in the successions of modes of production.

2.2 The Dairy Industry Before 1910: Laissez Faire Stage

The information used in this chapter has been obtained from census reports, newspapers, and various reports of the Provincial Ministry of Agriculture. An *Annual Report* published by the Ministry of Agriculture since 1891 proved very useful. The earliest reports, in particular, contain minute details about farming and dairying, in particular, in the various localities of the province.

Perhaps the most important factor in the spatial evolution of the dairy industry is that pioneer communities relied on cattle as a source of meat. In the renewal of this vital resource, they obtained milk. Milk was also essential to supplement dietary requirements for children. Dairying became an essential activity in all pioneer communities and predates the establishment of commerce and manufacturing industries.

By 1891, cattle could be found wherever settlements were found. Missionaries kept them on "residential" school farms to supplement the dietary requirements of their pupils, and some farmers kept them to supply milk to trading posts and new mining towns like Nanaimo.

The size of population in each settlement also defined whether milk was sold fresh or in the form of butter and cheese. For instance, farmers in the Saanich Peninsula sold milk fresh to Victoria and were left with very little for butter. Farming communities in the remote and small settlements like Comox and Alberni were left with large surpluses of milk, from which they made butter.

Some communities excelled in butter-making to such an extent that their butter even found markets in England. Such was the dairying community in Salt Spring Island whose butter-making skills and techniques became the pride of the whole province.

The areal differentiation in the production of milk and its use also defined the future course of the Island dairy industry. Locational analysis shows there is a degree of monopoly conferred by space in the location of economic activities in terms of control it allows of the surrounding area, to those who occupy it (Isard, 1956). For the dairy industry, proximity to markets defined the degree of monopoly space conferred. This was also augmented by

other constraints like the state of transportation technology and the methods of refrigeration. Thus, proximity and access to areas of demand conferred a degree of spatial monopoly to farmers closest to the main population centres. This, in turn, defined the areal extent of capital formation within this agricultural sector.

At this early stage of the industry, the number of people engaged in the production of milk tended to be very large, and the farms were small by present standards. From this premise the industry was very competitive, in that no single farmer was significantly better off.

In addition, each farmer was his own source of capital, and production was largely constrained by his physical stamina. Technology was also very primitive, with most of the work done by hand. This limited output of milk per cow as well as the duration in a year milk could be produced.

The growing population in the major settlements and rising incomes necessitated further investments of capital into increased milk production. With such capital farmers would clear land, purchase equipment and improve marketing. On their own, farmers were unable to raise the necessary capital to bring about this production, and the then lending institutions were not interested in agriculture. The provincial government came to the farmers' rescue by

enacting the Creameries Act of 1896. This Act specified that the Lieutenant Governor in Council could:

. . . advance out of the un-appropriated and public monies of the province and lend each company or associates now or hereinafter duly incorporated for the purpose of erecting or acquiring or maintenance or management and operation, within the province, a creamery or creameries upon the co-operative system, a sum not exceeding \$2500 to any one company or association provided that the aggregate of such loans shall not at any time exceed \$15,000.

The following conditions had to be met:

1. That the district within which it is proposed to operate a creamery is competent and fit to support and that there is reasonable prospects of the same being a financial success;
2. That the contracts contingent upon the operation of the creamery have been entered into for the supply there-to of, milk if not less than 300 cows, or that such supply is otherwise sufficiently guaranteed or secured;
3. That the location of the creamery is such as to prevent the encroachment upon the limits of an established creamery, while allowing a radius to the proposed institution of at least 6 miles;
4. That the subscribed capital of the company or association is sufficient, if fully paid up, to enable the company or association to acquire a site to erect and thoroughly equip an efficient creamery of a capacity to use the milk of not less than 300 cows;
5. That the plans of the creamery building and the nature of the proposed plant and equipment be submitted for approval.

This Act marked, for the first time, the beginning of government participation in the dairy industry. It allowed capital to be directed to both individual and collectively owned dairy plants. At this stage, not many farmers could establish dairy plants on their own. It is, thus, not surprising that by 1900, the first creameries opened in Victoria, Duncan and Comox, each having a creamery operated on co-operative lines. Nanaimo and Salt Spring Island followed two years later.

The introduction of creameries or processing plants enabled farmers to expand production and later these creameries branched to other manufactures like cheese. The sale of fresh milk, for a time, remained in the hands of individual farmers until the government, through stricter enforcement of sanitary laws, made it impossible for individual farmers to market fresh milk. The co-operative creameries gradually assumed this role.

The resultant picture, at this stage, was a situation whereby a majority of farmers were banding together to amass capital through co-operatives. Creameries would assist in the marketing of milk to individual retail outlets. Even those farmers who could not market fresh milk were assured of markets for their cream, through co-operative creameries. This expanded the milk production area, and when the railway line was built between Victoria and

Nanaimo in the late nineteenth century, more fresh milk for Victoria and Nanaimo could be obtained from the Cowichan Valley.

At this time, the enforcement of sanitary laws with regard to the handling of milk, boosted the price of fresh milk over butter, and thus set the trend for the future. All farmers henceforth, would strive to secure markets for fresh milk. Fresh milk also became attractive, in terms of profits, for the non-farming community. Thus, the next phase in the development of the dairy industry saw the introduction of independent dairies who, unlike the co-operatives contracted individual farms for their supply of milk.

2.3 The Industry Grows - 1910 to 1941: Laissez Faire Falters and The Government Intervenes

By 1910 the industry had grown tremendously. There are no reliable figures on output for each region, however, it suffices to mention that milk advertisements in local papers had increased tremendously. Dairying news and related issues occupied whole pages in the *Daily Colonist* and the *Daily Times*.

At the same time, private capital began to covet profitable industry. This also became a real threat to co-operative creameries, which were frequently ill-managed

compared to private ones. It is not surprising that by 1910 the only co-operative dairy in Victoria (the Victoria Creamery Association, founded in 1890) had collapsed, and in its place were two independent dairies (*Annual Report*, 1911). The new requirements by the government that all fresh milk sold be pasteurized brought more problems to co-operative dairies in terms of new equipment required and money to purchase it. Private firms could afford this by obtaining loans from banks and wealthy merchants, some of whom were already selling milk. Members of the co-operatives were not big enough to secure such loans.

This phase ushered in a period of intense competition between independents and the co-operatives. Such competition for markets was not limited to Vancouver Island only, but was even more violent on the mainland, where the Fraser Valley Milk Producers Association had just been founded (1916). Independents began to erode the market share of co-operatives by paying higher premium prices to producers. By so doing, they divided the loyalties of some producers who were already members of the co-operative.

The price war between independents and co-operatives became so critical that by 1927, the government had to establish a Commission of Inquiry into the dairy industry. In the meantime, the government introduced "an Act for the

relief of dairy farmers (1927)", mainly to alleviate the problems experienced by ordinary farmers.

When the report came out in 1929, a new Act, the Dairy Product's Sales Act, was passed by Parliament. This Act equalized returns to producers by way of levying some of the proceeds from fluid sales for distributors to producers who had lower percentage utilization in this category. This meant that farmers who found themselves with large quantities of unsold milk could earn some money from the levy on milk sales by retailers and dairies to offset costs incurred. Two years later, as a result of mounting opposition from independents and legal suits, the Act was ruled *ultra vires* (see also Lawson versus Interior Tree Fruit and Vegetable Committee of Direction, 1931, S.R.C. 57).

The struggle between independents and co-operatives also affected ordinary farmers who were not members of co-operatives. A combination of the Depression and unreliable markets for producers ruined many family farms on Vancouver Island. It also convinced some farmers to form co-operatives. In 1933, some of these farmers came together to form the Vancouver Island Co-operative Association, with branches in the Alberni Valley and Victoria.

The period between 1931 and 1937 saw a further expansion in plants operated by independent dairies. In most cases the new plants were branches of either national plants like Palm Dairies or plants based on the mainland like Royal City Dairies. The struggles between independents and co-operatives intensified. The government, in 1937, was forced to re-introduce the ill-fated Dairy Product's Sales Act of 1929, under a new name, the Natural Product's Marketing Act. As expected, it suffered the same fate as its predecessor. In 1941, it was ruled *ultra vires*.

The failure of the Natural Product's Marketing Act was nullified by the breakout of the Second World War. All provincial governments were required by federal statutes to impose new orders to ensure that there was a steady flow of food for the war effort and for the population in general. Independents and co-operatives alike, co-operated with this Act and prices were stable for the duration of the war.

2.4 Commentary

The industry's early history illustrates the course taken by the self-expansion of capital. Since this is attained by the sale of goods, it assumes a territorial dimension. The relative sizes of capital owned by independents, on one hand, and co-operatives, on the other,

defines the possible size of territory they could control. Thus, the more capital owned, the greater the territorial space controlled.

Independent dairies were small companies or owned by individual entrepreneurs who made contracts with individual farmers for their milk supplies. Some did engage in production of milk, but these were very few. To minimize turnover time and effective circulation of the product, they tended to select farms as close to their plants as possible and around the largest population centres. Thus, whenever marketing conditions changed, they could easily break the contract with specific farmers in favour of ones who would suit the changed marketing conditions. To them, profit and the quest for more capital was the major driving force for their locational choices.

Co-operatives, on the other hand, depended on small producers, most of whom could not secure contracts with independents. The locations of such farmers, in most cases, did not reflect a desire on the part of the co-operatives to minimize turnover time. Thus, the co-operatives were more of a service for the disadvantaged members of the farming community than money-making concerns.

During the Depression years independents could suddenly break off contracts with farms on the grounds that the market was not healthy. The farmer, who might, as often

was the case, have borrowed money from the independent, would find himself having to sell his farm to the same independent for very little money, to pay back such loans. Many farmers lost their farms this way. At the same time, independents remained attractive to most farms by paying higher prices for farmers' milk than co-operatives, and providing loans when they were most needed. By so doing they undercut the market share of co-operatives and caused the collapse of these in many parts of the province.

This stage in the development of the dairy industry did not alter the production space of the dairy industry. It, however, affected the ownership of capital, hence the means of production and ultimately, the flow of profits. Farmers found themselves unwilling pawns in the struggle for profits and this would eventually determine their very survival in certain locations.

2.5 The War and Immediate Post War Period: Government Intervention

In 1942 all agricultural products came under the War-time Prices and Trade Board. This Board, from its inception, exercised strict controls on both consumer and producer prices. These controls came to an end in 1946, and it was left to the Province whether to continue to control prices or not. The Province responded by

amending the Provincial Public Utilities Act to include milk. This amendment allowed the creation of the Milk Board which immediately issued orders to maintain "minimum buying and selling prices of milk in the Vancouver and Victoria areas" (*Annual Report*, 1946, p. 43).

The price of milk steadily rose from ten cents in June 1946 to twenty-two cents in July 1946. This increase in price affected consumption, and while population rose consumption decreased by 2.06 per cent (*Royal Commission on Milk*, 1955, p. 13). This alarmed distributors and in 1951, Canada Safeway Ltd. applied to the Milk Board for "the elimination of all fixing of milk prices beyond the producer level and the fixing of milk sold in its stores lower than the price of milk delivered to homes by an amount which (would) reflect the difference in cost between the two types of distribution" (*B.C. Executive Papers*, 1953). Under Order No. 37 effective April 21st, 1952, permission was granted to stores to sell milk one cent below the price of home delivered milk. This was followed by Order No. 41, 1953, which abandoned consumer price controls. Safeway followed this by dropping their price by another cent.

These decisions had the effect of increasing field sales in the Vancouver area by 3.53 per cent in 1953 and 4.20 per cent in 1954. In 1955 milk sales in Vancouver

increased by 7.32 per cent, most increases being in stores (*Royal Commission on Milk*, 1955, p. 13).

The new phase in the struggle for control of markets was spearheaded by retail outlets. It also coincided with a trend for greater volume of shoppers frequenting supermarkets. Supermarkets could afford to sell milk cheaply by transferring costs to other essential items. Small retail outlets and dairies that specialized in milk distribution could not do this.

The entry of food chains into the dairy industry is further illustrated by the application of Safeway's Lucerne Division, under B.C.'s Public Utilities Act, Section 12, "for a certificate of Public Convenience and Necessity and for a milk dealer's licence to permit the Company to operate a milk processing plant in Vancouver" (*B.C. Executive Papers*, 1953, p. 9). Prior to this Safeway used to purchase its milk from local dairies. This represented a departure from a policy of supporting local dairies, to a policy whereby all the profits from the processing to the retail of milk would be concentrated in one organization. This application was rejected the same year on the grounds that "after carefully considering all the submissions and evidence and arguments advanced relative to the above application, the Board rules that public convenience and necessity do not, at this time require

Lucerne Milk Company to equip and operate a public utility, in the Vancouver area for the purpose of supplying milk to the retail grocery stores of Canada Safeway only" (*B.C. Executive Papers*, 1953, p. 9).

The following year Safeway appealed the decision of the Milk Board and won. The evidence presented in this appeal is more telling about the spatial implications of the application. Safeway's lawyer argued that they were "in a position to practice economies of scale and to get milk to the consumer for less than (we) have to purchase the product" (*B.C. Executive Papers*, 1953, p. 9). Some of the advantages they claimed, were that Safeway (the stores), would purchase all the milk from Lucerne (the plant) and there would be no rebates. They also argued that they were not violating the Public Utilities Act because milk was available to the public through Safeway stores. The representative of co-operative dairies in Vancouver argued that "the application to supply one outlet was discriminatory and violates the Act" (*B.C. Executive Papers*, 1953, p. 51). He continued

. . . what Safeway proposes to do here through Lucerne, is to pick . . . the cream of business. They will not service any remote areas and they will not deliver at home at all. If you have to supply integrated areas only, thickly populated and apartments, that would be wonderful, but we are all public utilities. Service

includes densely populated areas and less densely populated areas.

(*B.C. Executive Papers*, 1953, p. 51)

In 1955, Safeway was able to build its milk plant in Vancouver, initially to supply shops in the Vancouver area. In the same year, a commission of inquiry led by Justice Clyne, which led to the enacting of the Milk Act, introduced new regulations in the marketing of milk (*Milk Industry Act*, 1955). The mainland and Vancouver Island regions would constitute different Milk Board regions, with quotas allocated on the basis of these regions. Quotas could not be traded between these regions. On the other hand, milk could be marketed throughout the province (see Appendix B).

The decisions taken by the Milk Board since 1951 are complementary in their organization of space for the dairy industry. The ability of a supermarket to sell milk at prices lower than home delivered milk, meant that in future, when milk became more expensive, it could be assumed that more customers would prefer to purchase their milk in stores. The decision to allow food chains to supply their own stores would rob regional independent and co-operative dairies access to a growing market. This had the effect of relegating the fortunes of non-supermarket dairies to those areas that supermarkets could not control, such as home deliveries and the little "corner

stores". The impact of these developments can be described as a stifling of the potential for growth of the regional dairies or wherever regional producers depend for markets. Safeway and other food chains that have followed its example, can depend for their supply, on the Lower Fraser Valley and thus supply is assured as long as technical improvements are made in the production of milk.

The phases described above represent an expression of modes of production through a struggle and interaction between the new and the old. The new dominates the old and it also seeks to dominate everywhere, but without being able to do so completely. The old is the previous mode of production more or less permeated by social forms and techniques corresponding to the new mode of production, but is unable to dominate everywhere.

2.6 The Spatial Aspects of the Dairy Industry Today

Since the passage of the Milk Industry Act in 1955, the level of concentration in the milk industry has increased tremendously. No attempt has been made to measure this, largely because data is not easily available. However, a study by the Ministry of Agriculture in 1966 throws some light into the respective shares of the dairy market. Table 2.1 illustrates this.

Table 2.1

Share of Qualifying Milk Processed
In Plants For Certain Months

	<u>December 1956</u>	<u>December 1960</u>	<u>December 1966</u>
Producer Co-operatives	52.5 %	62.9 %	56.4 %
Independent Dairies	45.8 %	38.2 %	42.6 %
Producer Vendor	1.7 %	0.9 %	1.0 %

The above table is supplemented by data on the number of dairies for the corresponding periods.

Table 2.2

Decline In Processing Plants
Between 1956-1966

	1956				1966			
	A	B	C	Total	A	B	C	Total
Co-operatives	6	9	3	18	2	4	3	9
Independent	42	24	10	76	18	13	9	40
Food Chain	-	1	1	2	-	1	1	2
Producer-Vendor	130	-	-	130	32	-	-	32
TOTAL	178	34	14	226	52	18	13	83

A = Fluid milk and cream operation only.

B = Combined fluid milk operation and dairy product manufacturing.

C = Dairy product manufacturing only.

Source: *The Dairy Industry in B.C.*, September 1966, p. 56.

Table 2.2 illustrates the level of concentration in the dairy industry. The co-operative's share of the market is largely held by one co-operative, the Fraser Valley Milk Producer's Association. Today, every major food chain owns a dairy. None of these dairies is located on Vancouver Island.

Since 1956 food chains have extended their retail operations to all parts of the province. This has largely been facilitated by the suburbanization of the urban population and the increasing use of the car for shopping purposes. Municipalities have responded by granting licences to food chains in specially designed shopping centres. In addition, the increase in females joining the labour force has altered shopping habits. Today, most families shop once a week, and food chains have responded by locating in special shopping centres, which are sometimes termed the convenience centres, in that all shopping can be done under one roof.

Inevitably, the expansion in the market share by food chains, into areas traditionally held by both independent and co-operative dairies, has affected the locational choices of these concerns. The decline in the number of independents shown in Table 2.2, is explained, partly, by this development.

It is also important to note that the decline in the dairies has been selective. It has been rapid in small population centres. For Vancouver Island, all areas north of the Malahat have fallen victim to the increase in the market share of food chains. The only dairies surviving north of the Malahat have done so for specific reasons. Early in the 1970's the dairy in Courtenay was threatened with closure after 70 years of unbroken operation. The largest co-operative in the province, the Fraser Valley Milk Producer's Association, came to its aid by taking it over. This opened new markets for this dairy, through the securing of retail outlets supplied by the parent co-operative on the mainland. The other plant in Port Alberni survives by shipping over half of its milk to the mainland plants as well as to other plants on the Island.

The lack of markets affects plants in Victoria as well. In the peak production period, they have to ship milk to Vancouver, while at the same time milk is being shipped into the Island (see Chapter V). This cost of handling and shipping milk is borne by all the farmers on the Island, through some special pooling arrangement of the Milk Board (see Appendix B). On average, this amounts to \$1,000 per farmer, per annum. This does not include the cost of transporting milk from the farm to the plant.

The above trans-shipment of milk between regions has been a source of annoyance as well as a financial loss to Island farmers (see comments in Appendix D).

The spatial shift in the marketing and processing of milk has forced farmers either to relocate their farms in such a way that they would spend less in transporting milk to processing plants, and others have gone out of business altogether. The discussion on the implication of this has been left to Chapter V. However, it suffices to mention that, in general, farmers have shifted from remote areas, in terms of distance to processing facilities, to within easy reach of these markets. Areas like Duncan have received most of these farmers.

2.7 Consequences

The spatial shift of processing plants in response to the diminishing access to markets in smaller locations, has caused farmers to spend more in transporting milk to the market. The expansion of the market share controlled by food chains, in the sale of milk, has reduced the market share of local independent retailers on whom local dairy plants depend. This, together with rising energy and feed costs, caused the government to intervene in 1973, by introducing the Farm Income Assurance Programme. This was meant to compensate farmers for unexpected cost overruns,

by paying farmers the difference between the Milk Industry Act determined price and the actual cost of production.

The introduction of a subsidy to alleviate problems experienced by farmers represents a departure from earlier policies whereby the Province used legislation. In the opinion of the writer, it represents a culmination of errors in judgement on the part of the Province on the real causes of the problems experienced by farmers. It also reflects a lack of appreciation by the Province that there are forces working to disequilibrate the marketing of milk in order to force some competitors out of business. The dislocation of the market by food chains would force local dairies to spend more money to supply their share of the market, and eventually reduce their returns.

The Milk Board pricing formula (see Appendix B) pursued all along, failed because it ignores the marketing strategies of major food chains. It treats the industry in terms of perfect competition, and concentrates on the supply management as a means to control output prices. In so doing, it negates the spatial impact of marketing strategies that may eventually cause output costs to rise.

The use of a subsidy, by the government, may restore order in the market and lower prices to producers and consumers; however, it fails to tackle the real cause

of problems in the industry. It is an easy way out to use public funds to keep milk prices low, but it is equally wasteful in terms of the use of scarce resources like public funds as well as being socially inequitable in the provision of opportunities to carry out dairying. Specifically, its fault lies in its treatment of production in aggregate terms, rather than examining how each region that produces milk fares in meeting aggregate output.

On experiencing uncontrollable cost increases in the farm sector, the government is content to use public funds to keep milk prices low. At times, the government rewards the less deserving farmers more than the most deserving ones, and thus perpetuates inequality in space. Specifically, its faults lie in the treatment of production as an aggregate rather than examining how each region that produces milk fares in meeting aggregate output.

The spatial evolution of the dairy industry under the free-market system, or under partial control, as has been illustrated above, is characterized by the emergence of spatial systems, that tend to re-inforce each other. This study sees the analysis of the existing system as essential for the adoption of corrective criteria. In other words, the marketing strategies of food chains are considered the main instruments by which the space for

dairying is reduced or subjected to the interests of these chains.

The phases described above illustrate that this should be expected, because the mission of capital is to expand, and this expansion is effected in the sale of goods. Under a market economy, the dominant mode of production, the institution with most capital, triumphs, and, thus, it is not surprising that independent dairies and shops are increasingly subjected to the interests of food chains. The spatial manifestation of this is increasing sectoralization of economic space in the interest of major food chains. Moreover, institutional practice of only reacting after crises have occurred, re-inforces the concretization of emerging spatial inequalities.

The view taken in this study is that no matter how well intentioned government policy is with regard to safe-guarding the welfare of the farmers, in such pronouncements as most politicians make, the policy will be rendered worthless unless it identifies the instruments that cause the problems experienced by farmers. As has been illustrated above, focussing at the level of the farmer alone would not suffice because farming operates within a larger environment. For this study, the identification of disequilibrating elements in a system is seen as crucial to the adoption of policies and the selection of instruments to correct them.

CHAPTER III

PERSPECTIVES FROM LITERATURE

One thing is certain, that all material wealth is the product of labour. Capital is essentially a product and a tool, no matter who owns it. The earth in which man finds the raw material and the natural forces of production is the gift of the Infinite Father to all his children. The right of every man to free access to the store house of the Father is an axiomatic principle.

The Brotherhood Era, November 27, 1895,
p. 2.

I was convinced that the toilers in the factories could gain little by organization for any other purpose other than to take political action and that this procedure . . . could not be successful until they were joined in such a movement by the toilers in the fields, who are their natural allies everywhere.

George Wrigley, *Canadian Farmers' Sun*, July 29, 1896, Editorial.

3.1 Introduction

The problems of the dairy industry as described in Chapter II merit an equal evaluation from the basis of theory. Specifically such theory should address itself to verifying the interim conclusion reached in Chapter II that market forces are incapable of redressing problems of

spatial inequalities in the dairy industry. They should also explain why successive governments have not focussed on the spatial manifestation of these problems.

In discussing these problems it should be noted that the government and its economic advisors have always upheld their belief in the power of market forces in distributing benefits from production activities efficiently, and that such distribution is assumed to be equitable, too.

To be useful, this exercise should also provide alternatives to the existing approach and hopefully demonstrate how this could help in meeting both spatial equity and efficiency in production processes. In essence, this chapter attempts to demonstrate that asking wrong questions or incomplete ones for that matter, does not contribute to the adoption of correct solutions or instruments to effect them.

The evolution of the dairy industry is seen in this study as a geographic process taking place within an economic system. The patterns with which this process takes place reflect the underlying economic philosophies pursued. For simplicity's sake the evolution of the dairy industry is viewed as a product of decisions of individual businessmen whether they be farmers, processors, food chains or small retail stores. This is generally termed industrial location. Thus, it is appropriate to review the industry's performance on the basis of location theory.

The role of the state in geographic processes has not received as much attention as location theory in literature. However, the analysis of the state's role is important for three reasons. First, as demonstrated in Chapter II, the provincial government has increasingly been involved in the dairy industry as well as the private sector in general through the provision of loans, training of manpower and the provision of services. The state intervened in 1956 when the industry was faced with over-production and again in 1973 when farmers faced high transport and feed costs. The Province has made many pronouncements about preserving the family farm, and this should be an indication of an awareness in welfare issues. Secondly, it is not always easy to demonstrate why the state intervenes the way it does. Dear and Clark (1978) argue that it is the absence or the presence of state intervention in policy issues that is frequently unexplained or is explained from the basis of outcomes of state intervention. They also state that the state is often treated as an exogenous factor in the geographic process and no attempt is made to explain how analysis may be linked by assumptions of the state's intentions.

The discussion below will begin by examining the role of the state, which in this study is the province, in a western democracy, in geographic processes. The second

section will also examine the role of theory in the analysis of problems, which in turn, provides the rationale in government decisions. This section will also attempt to show how it is possible to justify the outcome of economic processes on the basis of underlying theory.

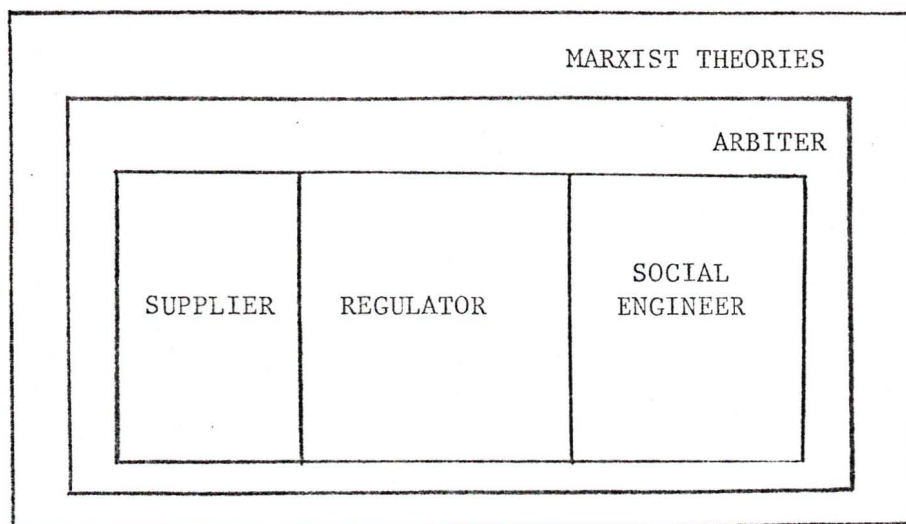
3.2 The Role of the State

Dear and Clark (1978) identify five roles a state may play in geographic process, namely:

- (a) The state as a supplier of public and social goods;
- (b) The state as a facilitator of the operation of the market place;
- (c) The state as a social engineer intervening in the economy to achieve its own policy objectives;
- (d) The state as an arbiter between competing social groups or classes; and
- (e) The state as an agent within society and the economy on behalf of some ruling elite. (p. 174) (See Figure 3.1)

They proceed to define each role of the state as follows:

Figure 3.1
Conceptual Interdependencies Between
Five Theories of the State



Source: "The State and Geographic Process, A Critical Review",
Environment and Planning, Vol. 10, 1978, p. 174.

1. The state as a supplier of public goods.

This role, according to Dear and Clark is the simplest of them all. The state, in this role, allocates resources on the basis of some criteria, and such a role may not take a distributive direction. Thus, the state may consider the distributive aspects as outside its own production, and thus concern itself with allocating resources for the sake of allocation.

2. The state as a regulator and facilitator.

This role of the state usually involves intervention in the market place. This is usually based on the "assumption that a well regulated and efficient market" (p. 174) will be equally efficient in the distribution of benefits. Proponents of the market have been given credence for intervention in market by the Keynesian revolution, which sees state intervention in budgetary, monetary, fiscal and competitive policies, as a necessity (p. 175). The state in the capitalist countries has intervened to promote competition through activistic and antimonopoly laws. The state thus plays the role of a watch-dog in economic development to see to it that the market operates as expected.

3. The state as a social engineer.

In this role, the state intervenes in the market by "adjusting market outcomes to suit its own normative goals" (Dear and Clark, 1978, p. 175). Here the state

interferes with distribution. It may also attempt to equalize returns and market equity. The role of the Department of Regional Economic Expansion (D.R.E.E.) and other agencies of the federal government attempts to achieve this.

4. The state as an arbiter.

The issues arising out of this role relate to three basic areas. First, the state has to find out the area of economic development that "has power to influence outcomes". It also has to decide on the distribution of benefits from state policy and how the state can mediate between interest groups (Dear and Clark, 1978, p. 176).

Dye (1972) has produced five models of public decision-making, namely:

- (a) The decisions taken by the state may be taken as consistent with logic and thus rational;
- (b) The state may pursue "incrementalist" policies, shifting slightly from existing situations to reflect changing conditions;
- (c) The state may also pursue elitist policies, upholding interests of a specific pressure group;

- (d) The state may also be biased towards compensating a specific group; and lastly,
- (e) The state "may be institutionally biased" (Dear and Clark, 1978, p. 176) by refusing to state reasons for following a particular line.

All these options may appear in combination or individually in any capitalist state. They thus do not reflect a particular direction in state roles.

5. The state as an agent. (The Marxist view)

One line of Marxist thought is that the state "operates to protect the continued stability of the economic system, mode of production and attendant social relations as well as to provide economic stimuli as a means of accumulation" (Dear and Clark, 1978, p. 177; Santos, 1977, p. 8). Thus in a capitalist system, the state is an agent of the ruling capital owning, power elite.

Three authors feature most in the Marxian interpretation of the role of the state, namely, Poulantzas (1969, 1976), Gold et al (1975) and Miliband (1969). Miliband and Poulantzas see the state as either an instrument of the ruling class, or representative of the structure of society it represents or as an ideological instrument which attempts to mystify reality through propaganda for its own survival. These approaches may also be termed instrumentalist, structuralist, and ideological, respectively.

No state follows any one line in its role. The state survives by avoiding crises in a capitalist system. Dear and Clark argue that the state acts in the interests of all its members (1978, p. 180). This explains why the most developed western countries exhibit the best forms of exploitation of one class by another, and yet the exploited receive the basic needs of life from the state. The whole concept of the welfare state rests on this premise (Offe and Ronge, 1975, p. 144). For the dairy industry, the role of this state has been exhibited in the state not succumbing to any one class, at the expense of the other, but playing the role of a pleaser for all parties in the development processes.

Dear and Clark (1978, p. 21) call the state a political input-output system, which operates to stave off antagonisms "which actually are crises of inputs and outputs". The output crisis relates to what they call "administrative decisions". This is ideally termed "crisis in rationality". On the other hand, the input crisis relates to what they term "legitimization". After some time the system loses legitimacy through lack of mass loyalty, such as support at elections.

O'Connor (1973, p. 6) puts it more explicitly. The state's effort is devoted to maintaining societal conditions under which profitable accumulation is possible.

Accumulation by opposing groups produces disequilibrium which the state always has to attempt to correct and the continued imbalances create loss of mass support.

In assessing the role of the state in geographic processes or simply, the spatial manifestation of socio-economic development, it appears most governments are content to play it safe to all sides, because failure to do so may lose them votes. It may, thus, be not surprising that over the years the government has passed legislation to facilitate accumulation of capital in both the farm and non-farm sector of the dairy industry. Capital accumulation by individuals leads to conflicts and governments act as arbiters in the ensuring conflicts between individuals. For instance, in 1973 it introduced the Farm Income Assurance Programme to ease the stress exerted on the farming sector by increased costs in the sector. The funds for this were largely derived from the tax-payer. However, no effort was made to relate this problem to some of the real culprits, the controllers of farm inputs, and the food chains, who also forced farmers to spend more on transportation.

As long as the crisis is avoided, the system functions, the state maintains its legitimacy. The state thus exists for warding off crises, a system which is synonymous with "perpetual bribery".

3.3 The Basis of Location Theory in Geography

Perhaps the best description of what constitutes location theory in geography is given by Smith (1966). To him economic geographic analysis should start from the macro-level so that concepts can be developed at a more meaningful level of abstraction and to provide a framework into which micro-descriptions can be placed. From this premise, industrial geography should concern itself with describing and interpreting the real world rather than formulating its own theories. Thus, location theory is firmly rooted in economics.

Economic location theory, on the other hand, is based on the concept of pure-competition. This is the economist's benchmark for discussing price. Competition among firms is seen as the mechanism for allocating resources on the basis of supply and demand. A departure from pure competition is thus associated with non-optimality in the allocation of resources. It is not the purpose of this chapter to reproduce discussions on economic markets. Those will be detailed along the discussions of location theory.

It is also important to note that despite their having a common origin, location theories, over the years have been characterized as an ever-widening search into the refinement of abstraction through the use of specific

assumptions. It is thus, possible to discern four types of location theories, namely:

- (a) "the Isolated State" of Von Thunen which seeks through abstraction, to determine the highest revenue which a given parcel of land can yield, under certain variable conditions (Peet, 1969);
- (b) the "least cost" approach of Weber, which seeks to establish the locational decisions of individuals in a known environment, without the consideration of other firms;
- (c) the "locational interdependence" approach of Hotelling (1925) which seeks to establish locational decisions of a number of interdependent firms in a locationally interdependent situation (Massey, 1973);
- (d) the "behavioural approach" of Cyert and March (1973), Pred (1967) and Greenhut (1956); and
- (e) the "spatial approach" of Losch (1954), which begins by analyzing the behaviour of an individual firm in space and then predicting its potential behaviour in real life.

The different strands in theory are an attempt by economists to attain levels of abstraction that approximate real life situations. As will be illustrated below, each new theory attempts to improve on existing ones. None, however, questions the basic tenets of economic theory. However, recently more and more geographers are coming to question the whole foundation of economic theory. Their work constitutes what has sometimes been termed the structural approach. Some of their work will be reviewed below.

3.4 Approaches to Industrial Location

a) The Isolated State

Some geographers like Chisholm (1962) argue that Von Thunen's work does not constitute a theory on location. Chisholm sees them as amounting to a methodological analysis which may be applied to any situation in time and place, since they have no claim to universality. In other words, he sees Von Thunen's work as constituting a systematic way of presenting ideas, which is actually applicable to many other situations other than location theory.

Basically, Von Thunen's major concerns were to understand the monetary returns over and above the monetary expense incurred by different types of agriculture under

certain limiting assumptions. The major factor determining the location of each type of agriculture is rent. Thus, the type of land use that yields the greatest economic rent will make the highest bid for that land, and thus displace all others. This rent is calculated as a net return above costs. Thus, different costs and products yield different rents, hence locational choices.

He also shows that different forms of land use have different distance-price and distant-cost functions. Thus, there is a relationship between distance and cost for each land use type. From this premise, products with high transport costs relative to their value will be produced closest to the market and the opposite will be equally true.

Von Thunen's work has received the most criticism among location theorists. For instance, Dunn (1954), finds Von Thunen's work disappointing in that it lacks a coherent set of conclusions. This is illustrated by his omission of principles that differentiates between different forms of land use (p. 99).

Most of the criticisms addressed to Von Thunen centre on the level of his abstraction, but do not criticize the substance of his analysis.

The most scathing criticism of Von Thunen's work comes from what may be termed structuralists. The most articulate

of these is Barnbrock (1974) who criticizes Von Thunen for "viewing reality as if it were in a transition period to final completeness. This transition prevents a direct analysis of reality" (p. 61). Von Thunen is also criticized for formulating his ideas of the "Isolated State" in the abstract, and then transferring these to real life. From this premise, the isolated state becomes the end in itself to which man should strive. Von Thunen confirms it himself in the assertion that

. . . in the isolated state, on the other hand, we have had in mind the final goal. With reaching the final goal there is then no further change and disturbance and here we find regularity whereas in the period of transition there seems to be chaos that cannot be analyzed.

(Barnbrock, 1974, p. 62)

To Barnbrock, Von Thunen's conclusions are founded on the Kantian transcendental logic in which the subject is forced to relate to the

. . . abstraction of reality, because the numerous interdependences cannot be conceptualized. Perception is internalized into the subject through a neutral process inherent on the abstraction process.

. . . this abstract reasoning process and the elevation of the thinking subject becomes the sole source of categories of thought.

Since inherent in all forms of idealism is the inversion of cognition In separating the world of matter and sense, we impose a dualism in the world

(between facts and values and between man and nature) and therefore permit the domination of reason over social interaction.

(Barnbrock, 1974, p. 62)

The above observation leads to the conclusion that the "Isolated State" is ideological. It permits man to subordinate social relations by logic. Thus man should be concerned with harmonious relations which are formalized in the mind and neglect the actual formations in real life which may not be harmonious.

The desire to produce harmonious conditions has subsequently occupied the minds of economists for a long time. Mathematical models, based on the idealized harmonious conditions, have been produced. Geographers have flirted with such developments. The irony of it all is that the greater and deeper the mathematization of life, the more obscure the reality becomes. By starting with concepts in the mind and applying them to isolated states (based on limiting assumptions) the real behaviour of economic phenomena is lost.

b) The "Least Cost" Approach

The "least cost" approach has its roots in the work of Weber (1909). While Von Thunen dealt with rural locations, Weber addresses his methodology to the locational decisions of a factory owner. To him, demand

was not considered a factor in location. To simplify the problem, he only considered the locational decisions of a single firm in a perfectly competitive situation. Under such conditions the firm has perfect knowledge about demand and supply and thus seeks to maximize profits from its locational decisions.

Some economists have criticized him for adopting a "Robinson Crusoe" type character who also would have an extremely fertile mind to understand the intricate mechanics of attaining the maximum profit from locational decisions.

Subsequent modifications of Weber's location theory have focussed on its major weaknesses. Such work has been undertaken by Hoover (1937), Moses (1958) and Smith (1966). In general, these improvements involve the inclusion of revenue surfaces. Moses in particular, contributed the most. He introduced the idea of "input substitution". Thus, instead of treating inputs, labour and materials, as fixed, locations would respond to the pricing of inputs. Inputs would no longer be a constraint as long as substitutes could be found. Thus a firm would not only weigh its input costs in location decisions, but the possibilities of substituting expensive inputs by cheaper ones. In essence it broadens the locational choices of firms as well as reducing the constraints imposed by transfer costs on locations.

c) Locational Interdependence or Market Area Approach

In the early 1920's it had become apparent that the notion of perfect competition was not universally applicable. Economists brought in the theory of imperfect competition. To this school of thought belongs the work of Fetter (1924), Hotelling (1929), Robinson (1934), Chamberlain (1936), Lerner and Singer (1939), Smithies (1941), and Ackley (1942). The major assumptions of this school of thought are as follows:

- (a) all firms have identical costs;
- (b) they sell in spatially distributed market, (unlike in Weber's case where the market was not considered);
- (c) the price of the product varies with distance the product is delivered from the factory (the transportation costs may also reflect the difficulty of overcoming space);
- (d) each seller attempts to maximize the areal extent of his market;
- (e) the consumers, through their behaviour, influence the areal extent of the market and other forms of behaviour affect the extent of this market; and lastly,

- (f) each manufacturer has a degree of monopoly in the areas where his product is delivered at least cost (Smith, 1971, p. 137).

The resulting spatial structure is characterized by the interdependence between firms. The resultant spatial organization of firms represents an equilibrium condition even if conditions do not represent perfect competition. Fetter (1924) in particular was the first to investigate what would happen if firms compete for market share. This work was finalized by Hotelling who produced a simple model to demonstrate what would happen if two ice-cream sellers tried to secure the greatest share of the market at each other's expense. His solution envisaged the sellers ending back to back, each serving half of the market.

By extending the number of competitors to three, Chamberlain (1936) showed that the Hotelling solution would not hold. Two firms would pair up to share one half of the market and the other plant would control the rest of the market.

The work of the "market area" school of thought ushered in ideas about non-optimizing behaviour in location. Notions about oligopoly and other non-optimal forms of behaviour were investigated. Non-optimal behaviour was considered indicative of firms adopting certain behavioural postures which could not be found if they were perfectly competitive.

d) The "Behavioural Approach"

By the early 1950's it was becoming more apparent to economists that the mechanistic ideas of the classical location theories could not be applied to real life. The scale of industrial activity in the western world had expanded to the extent that new forms of locational behaviour had manifested themselves. Many people started questioning the whole idea of the "economic man", whose perfect knowledge enabled him to maximize utility. Greenhut (1956) had observed this in his study of large firms in what was later termed oligopolies. Their non-optimizing behaviour was later formalized into a theory of locational behaviour by Cyert and March (1963). They argued that in real life firms do not have perfect knowledge and thus tend to select the best out of many possible situations. The selection exercise itself is bounded by the inability of the decision maker to master the many combinations and permutations in the locational milieu. In other words, perception plays an important role in locational decisions. And since perception depends on the amount of information possessed, the location selected, thus reflects the amount of information possessed as well as the quality of that information.

Pred (1967) extended this to include "the ability to use" the information possessed. Many other economists and

geographers have attempted to apply the idea to other social physics ideas like migration (Wolpert, 1967). The development of these ideas was also accompanied by a whole host of models based on stochastic processes and probability.

Subsequent modifications by Wood (1969) added the idea of firms responding to changes in economic conditions. From this basis a theory of interpreneurial decisions could be built. This could then be tied to a general theory of industrial linkages, which in essence define the path followed by a firm under changing economic conditions.

The extension of location theory into the behavioural approach is best summarized by Krumme (1969). He concludes that a great deal of economic geography consists of identification and description of spatial characteristics of processes and changes in economic activity patterns. These also form the basis for explaining the present and projecting future patterns. The structural and functional characteristics of the micro unit and the way it combines productive factors and adapts exogenous changes are important links in the chain through which economic forces work.

e) The Spatial Equilibrium Approach

Losch (1954) was the first to formally introduce the idea of spatial equilibrium to general economic equilibrium. From the assumption of a uniformly distributed population he derived a set of hexagonal markets in which firms operate under conditions of no excess profit. The superimposition of the different hexagons could also produce a hierarchy of economic landscapes. He also introduced the idea of demand to general location, in which consumers maximize utility by purchasing from the least costly sources in terms of transportation.

Massey (1973) says the system contains a decentralized mechanism that sustains a general equilibrium solution "and conformity to the latter with the marginal conditions of Pareto optimality", which "has become a weapon in aspatial economics". The arrangement produces harmonious conditions which assume the optimality of market forces, or the "existence of market control mechanisms in the social order" (Bramhall, 1969, p.

The optimality of Losch's model is also challenged by Palander (1935) who has shown that agglomerations cannot cause towns to form unless the model postulates some mechanism whereby firms co-ordinate their choices. Massey (1973, p. 37) has also demonstrated that on the surface,

Losch's model "assumes that given the right conditions the market economy could produce the right results". He also shows that the model requires some mechanism of control and co-ordination not included in the model. The fact that space accords a degree of monopoly on those who occupy it violates the welfare criteria the neo-classical location theories advocate when the end of Losch's model is examined, specifically, when F.O.B. prices equal average cost and delivered price exceeds marginal cost plus transportation. Von Boventer (1962, p. 165) sums the short-comings of the spatial equilibrium approach in these words:

. . . the main difficulty with location theory is that in order for a general equilibrium model to have an optimum solution which the market or theoretical solutions . . . and which fulfills the usual welfare conditions of production, it is necessary to assume a linear homogeneous production function. Indivisibility and agglomeration economies which are basic for locational analysis, in particular for urban analysis, cannot be incorporated in such a model. If they are included, the substitution principle, if it is applied at the margin only, loses much of its force and becomes useless in finding the optimal spatial structure. For this reason, the marginal principles have to be supplemented by the total conditions of equilibrium.

3.5 Why Markets May Be Incapable of Meeting Conditions of Spatial Equity

The location theories discussed above assume that welfare is catered for in the general activities of firms.

Thus, if a firm locates in a particular area, society should be able to derive benefits from such a location. Thus, if the welfare criteria or specifically distributional justice was met in the locational decisions of different firms engaged in the dairy industry no region should complain about having been over-shadowed by the locational decisions of these firms.

Chapter II showed that the locational patterns that have emerged on Vancouver Island have not proceeded according to the criteria of spatial equity. The industry may be efficient in certain locations like the Lower Fraser Valley, but in total, exhibits elements of waste in the consumption of transportation and the under-use of agricultural land. Even if it meets the milk requirements of the Island, these are satisfied at a higher monetary and social cost than is possible.

The answer does not lie in neo-classical economic based solutions as has been demonstrated above. All the theoretical postulates detailed above portray harmonious conditions in which both efficiency and spatial equity are met. Perhaps answers could be attained through the analysis of the structure of economic activities in market economies. Hence the approach detailed below is suitably termed "structural".

3.6 The Structural Basis of Spatial Inequality

The distinguishing characteristic of the market approach (or neo-classical conception of exchange) is its treatment of the individual commodity owner (Harcourt, 1969). In this conception the commodity owner is an autonomous, self-subsisting individual whose existence is independent of society. His independence separates him from the rest of society and as thus he has no obligations to society. His desires and preferences are not related in any way to those of society, but are a product of his own particular nature. His needs become so much a product of his own psychology that their nature can only be known by the individual himself. It is this individualism of the firm that removes locational decisions from societal needs (Shapiro, 1976, p. 17).

The needs of this individual lead him to the world of exchange in which only individuals matter. This exchange becomes solely based on individual needs. This, in essence, is a "Robinson Crusoe" type economy, in which the individual is a self-sufficient producer and consumer. The social becomes the individual and thus the individual is the social. Therefore, in constructing location theory, the market approach sees no need to consider societal needs in general as long as the individual is satisfied. Thus, the discussion of competitive markets only concern themselves

with the individual as the end. It is in essence the "Isolated State". Without altering the basic tenet of the concept of the firm, all location theories are doomed to failure in meeting spatial equity, because in neo-classical economics the individual firm is society and his satisfaction is the satisfaction of society as a whole.

The "societal" relations of production concretize themselves in space in the form of the wishes of the individuals engaged. Thus the organization of space reflects the social relations of production (Santos, 1977, p. 5).

Peet (1975) sees the origins of inequalities in the rural sector as a by-product of the capitalist space economy. He sees individualization typically leading to concentration of investment while "much of the territory becomes locationally obsolete". This inevitably produces a dualistic structure which becomes imprinted in space. Capitalism or the market economy, the dominant mode of production, therefore, writes history in time, while the actual decisions of businessmen write in in space. Santos concludes that

. . . the history of modes of production
. . . is the history of forms it has created
in its service. Social formations write the
history through the super-imposition of
forms created by a succession of modes of
production.

(Santos, 1977, p. 6)

Similar conclusions are reached by Amin (1974). To him, it would be wrong to write about spatial inequality as a situation whereby one region exploits another. The problem of spatial inequality has to be seen as a product of capital accumulation, in which the self-centered, individualistic firms vie for control of space and victorious firms subject the rest of space for their own benefit. The neo-classical approach is incapable of grasping this because the marginalist approach it takes fails to expose the "hidden transfers" that form the basis of capital accumulation.

This is also confirmed by Lee (1976) who sees in the market economy inevitable distributional inequality in space economy based on conflict (competition).

. . . consumers derive their competitiveness in a goods market (distribution) from their position in a factor market (allocation) which discriminates on productivity. The conditions of space automatically removes conditions for perfect competition and so distributional inequality is made an inherent feature of an allocation process based on competitive conflict.

(Lee, 1976, p. 12)

Moreover, the power of the neo-classical approach lies in the fact that it has been able to provide an ideology "that appears convincing to those whose exploitation it justifies" (Lee, 1976, p. 12).

3.6 The Mechanics of Spatial Inequality

From a structural point of view the determinations of economic metabolism can be visualized as a chain of operations or production, circulation and consumption of commodities (Corraggio, 1977). The basic characteristics of each operation are as follows:

- (a) Production operations: These depend on the transformation of natural resources through human labour.
- (b) Circulation operations:
 - (i) Transportation: This facilitates the overcoming of space. It allows the transfer of goods from their sources to areas of consumption or storage.
 - (ii) Storage: Its duty is to preserve the quality of products and avoidance of deterioration.
- (c) Consumption operations: This is the outcome of the reproduction of the labour force.

These operations are repeated over and over and thus necessitate a level of permanence in the space of their operation to ensure efficiency. Corraggio (1977) identifies four basic requirements:

- (1) Fixed location in geographic space of various means of work (production and circulation operations);
 - (2) Fixed location in geographic space of various means of life (e.g. housing);
 - (3) A recurrent inflow of labour and raw materials to the place of production;
and
 - (4) A recurrent inflow of means of life to the area in which consumption takes place.
- (p. 17)

The schema detailed above operates under a set of regulating mechanisms. These include communication controls, administrative controls like zoning, banking systems that substitute capital for loans, and linear systems like telephones.

The result of the above schema is characterized by:

. . . a complex configuration resulting from the particular spatial configuration of each type of operation as well as inter-operational flows. The material movement of the whole can be approached by analyzing rhythms and levels of work of each operation, their timing with other operations, as well as the levels and rhythms of the natural processes to which they are coupled.

(Corraggio, 1977, p. 17)

From the above schema the operation of the market economy and its impact can be understood. Specifically,

if it can be assumed that the accumulation of capital is the driving force of capitalism, the system will burst through barriers on its accumulation path or will establish channels of control that will render ineffective the presence of other forces. If there are spatial forces opposing accumulation, these are removed, and spatial patterns that favour accumulation "will be seized upon, improved upon and made typical" (Peet, 1975, p. 16).

For capital accumulation to take place, goods should be produced and moved through the linear systems to areas of consumption. This is termed circulation, and usually carries costs. These costs reduce the surplus value on which accumulation depends. Thus, long distances in the marketing of commodities are a counter-vailing force in the process of accumulation, in terms of turn-over time and associated transfer costs, and thus the longer the turn-over time the less the capital.

David Harvey (1975) has demonstrated how this has encouraged production to take place in large agglomerations, which in turn become the workshops of capitalist accumulation.

It is not surprising that milk is produced in large agglomerations throughout the province, but these are not indispensable to the interest of food chains who have a secure source of milk on the mainland. Securing milk from the individual sources would increase turn-over time

and thus hinder accumulation. The "pre-order and drop" system of major food chains permits them to reduce uncertainty in circulation, and moreover it is less costly.

The system of accumulation would not be complete without controlling the consumption centres, through retail outlets located in major shopping centres of the urban milieu. Thus, the structural approach suggested above enables analysis to handle what materially constitutes a spatial formation, and the emergence of the control mechanisms through banking, linear systems, and government regulations. The spatialist bases of the neo-classical approach are avoided. From the schema detailed above the process of capital accumulation and the spatial manifestation of social formations it fosters can be understood. It would also enable those engaged in planning to ask accurate questions about what constitutes regional inequality and to prescribe the rightful remedies. In the words of Williams (1977) regional science tends to deal with the malaise rather than its causes. It would be better if it placed more stress on the antecedent causes - processes that are socio-structural rather than socio-psychological (p. 272). This represents a shift from analysis based on the dichotomy between facts and values to one which tries to reconcile this dualism and is inherently political in nature and approach.

3.7 Assessment

The problem raised in this chapter is whether the state is capable of solving problems of spatial inequality and inefficiency. The record of state practice is characterized by partial intervention which also tends to be aspatial. History has also shown that partial intervention is only a temporal solution to problems.

Even the rationale for state intervention, which is largely based on neo-classical location theories, has been proven ineffective in solving problems of spatial equity. A review of recent literature on location theory shows that the economy is treated as a series of mechanistic encounters between money, goods and factors. Firms are considered as market agents that are not part of the social structure. Conflict in the market ensures an automatic, though interruptible, tendency towards equilibrium. The real impact of firms on social processes is ignored. Lee (1977) describes this as a belief that there is no underlying driving force because the satisfaction of the consumer demand is assumed to be the over-riding objective, and the economic problem is an organizational one - that of matching ends and scarce means which have alternative use (p. 21). Consequently, space is considered as simply a summation of individual market relationships existing between and within firms and households. Hence, it is argued that capital will move to low labour cost areas while labour will move to high employment areas, all achieved by public and private means. But as experience in many countries has shown, this does not occur.

In reality, economic space is a result of the struggles in modes of production. Regional relations are thus a product of the integrating role of capital in its accumulation path. The state only plays a neutral role,

seeing to it that capital accumulation does not create crises.

The analysis detailed above also spells the options open for the dairy industry on Vancouver Island. Neo-classical analyses and related locational theory does not explain how inequalities are formed nor how they can be corrected. It also shows that the state may be incapable of effecting lasting solutions, unless it becomes totally involved in the planning of agriculture and thus that such planning should reflect societal goals of justice.

A method of monitoring locational efficiency and spatial equity in the dairy industry is detailed in Chapter V. This entails total government participation in planning the exploitation of agricultural resources of the Island for dairying.

CHAPTER IV

CONCEPTS, METHOD AND DATA

Burn down your cities and leave our farms, and your cities will spring up again as if by magic but destroy our farms and the grass will grow in the streets of every city in the country.

Bryan, *Cross of Gold*,

4.1 Reflections on Theory

Traditional location theories, as has been demonstrated in Chapter III, treat the economy as if it were made up of isolated units. Proponents of such theories argue that reality is too complex to be stated in a single theory. Thus analysis either deals with pure competition or the many variants of imperfect competition. Such an approach obscures the real behaviour of the economy. It tends to obscure the interrelationships within the system.

In this chapter an attempt will be made to illustrate how the dairy industry has become inefficient in the spatial context. Specifically, an attempt will be made to identify the main causes of spatial inequality in the industry. To complement this exercise a linear programming problem has been developed. It seeks to test the functioning

of the industry today as compared to an idealized situation in which the total costs of the industry are minimized. The linear programming problem also forms the basis for a set of hypotheses, and the solution to the problem defines the testing of the hypotheses set.

The selection of methodology detailed below requires a discussion why a neo-classical approach would not be appropriate for the analysis of the dairy industry. Specifically, three problems arise:

1. It is difficult to explain how local dairy farmers are influenced by the locational decisions of local dairy plants, to which they sell their milk. For instance, the neo-classical approach gives insufficient explanation of how farmers should react to the closure of a plant they have supplied with milk for a long time. Specifically, the closure of processing plants in the Duncan and Nanaimo areas must have affected the decisions of many farmers either to terminate dairying altogether or to select a new dairy to supply. In some instances, farmers could have been forced to relocate farms in relation to dairies. These structural changes in the spatial form of the market impact on the spatial distribution of the dairy farms at each phase in time.

The significance of these interrelationships is crucial to the understanding of the prospects for the

industry under different states of competitiveness. To the author's knowledge no study has ever investigated this.

2. Also, local plants are affected by the locational decisions of retail outlets to which they sell their milk. If the retail structure changes in terms of size of outlets and market share, this may have a positive or negative effect on processing plants, depending on whether the change is associated with a decline or growth. The history of Vancouver Island and indeed the whole country, in the past twenty years, has been characterized by a decline in small independent grocery shops and their replacement by large chain stores. Indeed, this has been facilitated by policies adopted by municipalities to attract business into their communities. Large areas have been carved out to create shopping centres that can only be occupied by the largest of the retail outlets, which in turn can afford the taxes levied. These have become what is termed "convenience" centres, offering easy parking and all household requirements. Thus, if an independent dairy depended on local independent retail outlets for its sales, the demise of such retail outlets spells its demise as well.

3. Lastly, vertical integration in the retail trade has altered the locational decision of local processing

plants. Since 1955, vertically integrated food chains, with dairy plants in Vancouver have established shops on Vancouver Island (see map 5.1 for the location of shops). Vertical integration implies that a retail outlet is supplied from its own plant, thus severing dependence on the outside. The locational decisions of an integrated economic operation not only affect the locational decisions of processing plants and the retail outlets they supply, but the farm sector as well. Thus, the impact of integration on locational decisions cannot be ignored. Unlike the Hotelling schema, the differences in the mobility of resources employed by the different actors affects the ease with which they effect changes.

In traditional locational theory, failure by one of the actors is treated as failure to manage resources properly or simply the natural outcome in a struggle for survival. When the magnitude of failure is alarming and has marked political or social repercussions the state often intervenes. This intervention often involves some subsidies paid to those affected. Usually, these are directed to produce the most dramatic results in the shortest time possible. The neglect of causal factors in such solutions creates the high probability of recurrence of a similar problem in future.

The approach adopted in this study views the manifestation of spatial forms at any point in time as symptoms of the structural malfunctioning of the system. It only represents the outcome of the struggles of the different "actors" or their relative successes in their struggles to secure the greatest profit out of space, as facilitated by social, political and economic means. The driving force behind success is the amount of capital owned, and how the actor transforms space to accumulate more capital or more specially, it shows the significance of "genetic ability".

The amount of capital owned enables the actors to purchase the necessary inputs to make a sound investment in space. Thus, a profitable use of space weighs in favour of those who can assemble most capital.

The existence of large and small "actors" represents the fact that the largest owners of capital prefer those sectors of space from which the greatest profit can be secured. The least profitable sectors are then relegated to the smallest actors. As the largest owners of capital expand their space to acquire more capital, the smaller ones, unable to resist, meet their fate. This largely explains the spatial evolution of the dairy industry since 1955. The demise of the independents and the decline of the farms supplying them, cannot simply be treated as a question

of efficiency, because such efficiency criteria are meaningless unless they take into account the societal losses. There should be a consideration of efficiency at farm level, which relates to the best assembly of a given set of inputs for a given set of outputs, as well as the efficiency of farm gate as measured by the efficiency in the assembly, processing and distribution of milk. Each of the levels of production can be efficient, but taken together, some may not prove to be efficient. Of interest is the fact that while there is a deficit in terms of supply from Vancouver Island farms, local milk is sent to Vancouver, while Vancouver milk is shipped in. The \$1,000 per annum incurred by each Island farm represents an opportunity cost for the Island. One may even pose the question that: if this amount were to be saved, would local farmers have not increased production to meet local demand? To add to the problem, food chains have tended to favour integration at the processing level only, while the production activity is retained by farmers. Production at farm level is the riskiest of all the activities involved, and hence the less financially rewarding. In addition, it requires long term investment, and profits do not obtain as fast as in the retail sector.

Given the above observations, a number of concepts are defined as a means of drawing hypotheses.

4.2 Concepts

On the basis of the above discussion, three issues are considered in this study.

The first issue is the spatial setting of the dairy industry throughout its evolution. This concerns itself with space as a medium for carrying out dairying. Space is thus inherently imbued with aspects of inequality as physical space is not uniformly endowed with qualities of carrying out dairying. Secondly, the nature and form of government intervention impacts on the manifestation of spatial inequalities. Thirdly, the analysis has to consider the position of the dairy industry in the context of the regional economy.

The three issues form the conceptual framework on which hypotheses will be formulated and models to test them built. Each concept will be examined in turn.

a) The Spatial Setting

The commonest problem facing farmers on Vancouver Island is the scarcity of level land. Where such land is available, competition from other land uses forces the cost of such land beyond the means of most farmers. Farms, therefore, tend to be sparsely distributed throughout the Island.

The spatial evolution of dairying is also related to the evolution of settlements. These evolved, largely, in response to the exploitation of the resource base of the Island, namely, mining, lumbering, and fishing. The road and rail infrastructure was established mainly to service these industries. Settlements, like Victoria, Nanaimo, Duncan, and Comox grew as centres for the exploitation of these resources. The land on which they were built was also suitable for farming, and dairying grew in response to the demand for fresh milk in these towns, which because of the perishability of milk, could not be supplied from the Lower Fraser Valley.

The sparse distribution of the farms and settlements throughout the Island meant that the siting of processing plants would be a crucial factor to the farming community. Since farmers pay for the transportation of their milk to the market, the more distant farmers earn less for their product. On the side of plant owners, the most significant cost involves the supply of milk to customers; when these are scattered in a wide area, the cost is forbidding. Hence the friction of distance, measured in transportation costs, is considered a very significant factor in the locational decisions of both farmers and plant operators.

The lack of a broad region on which a large number of farms are located, creates problems for the locational

decisions of plant operators. If the plants are too distant from the farms, this imposes constraints on the farming sector and if they are too far from the market, they incur costs in the distribution of milk. This is compounded in situations whereby there are many retail outlets to be supplied. The effect of price fixing at both producer and retail levels complicates the picture, further (see Appendix B). Both farmers and plant operators cannot manipulate the price to reflect the constraints imposed by space on revenues obtained.

The transportation problem is further complicated by the insularity of the region in the physical sense. This imposes constraints on the movement of goods to and from the Island. The fact that modes of transportation have to be changed over the Georgia Straits is translated into monetary costs. The integration of the milk industry since 1955, while assuring that all milk produced would finally find markets, imposed a "collective fee" to all farmers in each of the regions, involving the shipment of milk from one region to another, in search of markets. This, in all cases, applies to unprocessed milk. These costs contribute significantly to problems experienced by farmers on Vancouver Island (see Appendix D).

b) Government Policy

While on the one hand harping the virtues of a free market economy, successive governments, both provincially and nationally, have never hesitated to intervene whenever the system failed to operate as expected. From the earliest days of settlement, the B.C. government has been an active participant in agriculture. It has provided the necessary training of experts through colleges and universities, as well as providing financial assistance in bad years. All these factors have benefitted the industry throughout its development, and to a large extent, have spelled its success and failures.

Throughout the industry's development, the government has always acted as an outsider, and hence there is no on-going "policy" guiding agriculture in the province. The government has been content to pass legislation to curtail some problems and then lay back to watch the system operate. It was only during the Second World War that the government became actively involved in agriculture, and this role was terminated when hostilities ceased (see Chapter II).

There is one other feature that transcends all government activities. Failure in the farm sector is perceived as a product of either a natural disaster, like

disease and drought, or lack of proper management. If it does not fit into these broad categories, intervention depends on the magnitude of complaints by farmers. Thus, if one or two farmers decide to give up because of specific problems, this is largely ignored. For instance, if farmers give up because they lack markets, this is usually blamed on their not being competitive enough, and competition is treated as efficiency (Mitchell, 1975). Even at the national level, the view taken about the problems of individual farms is that they should be left to collapse because they are not competitive enough, which also seems to imply they are not efficient. Government statisticians churn out figures of how many farmers have left the industry, yet production has increased above when there were more farmers (see Figure 5.1).

The general lack of a "continuing" policy in agriculture shows a lack of direction in the industry (Crown and Heady, 1972). In essence, the government has tended to wait for some calamity to strike before intervening, and in most instances this has tended to involve a subsidy. Such intervention may restore a measure of stability in the system for a short duration, but in the long run, the same causal factors may re-activate themselves, necessitating another intervention. Moreover, subsidies are allotted according to the size of output, and the poorer members,

who may be (but may not be either) most deserving are rewarded less.

Partial intervention, even if it produces dramatic results, does not remove the actual causes of the problem. In spatial terms, problems in agriculture become concretized in space. Once land is paved over or farming is replaced by something else, it may be more expensive to re-activate farming at some point in time than if efforts had been made to retain the activity. In essence, the government has failed to take space into account in its decisions. It treats economic actors as atomistic units that operate somewhere in a non-structural and non-concrete space (Massey, 1973). Therefore, aspatial problems do not require spatial solutions; hence, the failure to resolve concrete and spatial problems.

The view of an aspatial economy is cemented by academia, championed by Grubel and Schwindt (1977). As a supplement to his work on the Milk Board, Grubel told the Standing Committee on Agriculture that farmers should not organize themselves in the "Milk Board", because this tampers with the operation of market forces in allocating resources efficiently. The likening of the Market Board to a trade union abstracts from the fact that farmers need an organization to safeguard their interests in the face of an "informal cartel" of the input suppliers.

It has become easier to attack an organized and formal price fixing arrangement than to criticize an informal one like the agri-business (Mitchell, 1976). The government, unlike academia, while not opposing the role of marketing boards, refrains from investigating the organizational tactics of the oligopolies that control the retail trade and the farm input sector. The sectoralization of the whole industry into separate sectors like farm, retail, and processing, obscures the threads that tie these sectors, whose functioning also manifests itself at each temporal phase.

The view taken in this study is that there is a need for the government to define the goals of the dairy industry and the standard of performance to attain these goals. Such a definition should include a clear statement on the differential impact of policy enacted, as well as a more precise definition of efficiency that does not assume spatial equity. The model developed in this study assumes the government does support spatial equity as well as efficiency, in principle, and it aims at testing the difference between the industry today, with what it could have been had the government actively pursued a spatial planning strategy.

c) Contribution of the
Industry to the Local Economy

The emphasis on this study is on spatial equity and efficiency. These concepts are meaningless unless the existing conditions are measured and, perhaps, their potential is estimated. This also would re-inforce assumptions made about the principle of spatial equity and efficiency.

The best of the tools available are input and output tables for Canadian agriculture developed by Josling and Trant (1966). These are based on the 1958 and 1961 national tables. Some indices have changed, but in the absence of any better tools, these must suffice. Of interest are the tables on "Direct purchases per dollar of output" (see Chapter V). Output for each sub-region of the Island is known, and the purchases that accrue to the local economy will be estimated. These estimates could be valuable in the measurement of the differential impact of the cessation of dairying, on the economy of certain parts of the Island. They could also be used to measure the benefits that could accrue to the rest of the Island economy if the industry had to increase its share of the market. The data were obtained from the agricultural census reports of 1961, 1971 and 1977. This was also supplemented by data collected from a

questionnaire sent to all the farmers on the Island.

The three items constitute a conceptual framework on which two hypotheses are developed, and models to test them formulated.

4.3 Hypotheses

Generally, the neo-classical approach, which forms the basis of government decisions in the field of agriculture, dairying included, assumes space is considered by market forces. Thus, market forces distribute benefits from such activities equitably in space. If this were true, the processing plants would be optimally distributed in terms of location, and their sizes would be the least costly to operate. Consumers and farmers would equally benefit from the least costly assembly and distributional arrangement.

The \$1,000 (*Monthly Reports*, Milk Board, 1977) per year, incurred by Island farmers in the transportation of their milk to the mainland is obviously a cost which is not borne by farmers on the mainland. Since it is identifiable and attributable to the shipment of milk to the mainland, it is assumed the government or the Milk Board can alter this - that no milk should be shipped out until local demand is satisfied. This will largely depend on the adoption of an optimal locational-

allocational strategy for the local industry. Results of this exercise could then be compared with the present arrangement.

Through the employment of a linear programming model, a least cost assembly, processing and distributional arrangement has been formulated. The results of such an exercise should show whether, over the years, the provincial government, by allowing milk to move freely between regions for retail purposes while controlling output, has created conditions for the erosion of profits of farmers located at the periphery of the provincial economy. The periphery, in this context, has spatial connotation, in that Vancouver is the core of the provincial economy, and all other regions constitute the periphery.

Thus, if the present pattern was the most efficient and spatially equitable, then the assertion that market forces are the best allocators of resources would be applicable for the dairy industry. If it shows, to the contrary, the factors creating spatial inequality would have been identified. This would then demonstrate the necessity for a more active involvement by the Province in directing the industry through comprehensive planning.

On the basis of the above conceptual framework it is hypothesized that:

- (a) In an economic environment dominated by oligopolies that are both vertically and horizontally integrated, supply management at producer level without complementary management at the distributive level creates conditions for increased concentration and less equitable distribution of benefits in space; and,
- (b) the planning of economic activity at all levels yields spatially equitable benefits.

These two hypotheses are complementary and relate specifically to conditions in the dairy industry. Negative supply management applies to attempts undertaken to control over-supply in most agricultural commodities. Over-supply means supply in excess of demand at product prices that would yield adequate returns for resources invested in agriculture. In the B.C. dairy industry, negative supply management involves the employment of quota restrictions at producer level, accompanied by very strict fines on violators of quotas.

The economic environment is dominated by oligopolies interspaced with fringe competitors. In Chapter II, it was demonstrated how these oligopolies came about, and how "fringe competitors" persist, and also how the mission of "capital" is to expand and acquire more. This is

facilitated by the fact that in the area where higher profits are made, circulation remains uncontrolled. In order to succeed, it has been demonstrated in the United States that food chains branch into processing to supply their own retail outlets which, by reason of their size, increase their share of the market at the expense of unintegrated concerns. The integration of independent processors to local farms means that the decline in their share of the market affects the farms which supply them as well. When vertically integrated firms purchase from one region and sell their product in all regions, regional inequalities, in terms of benefits from production activities arise.

The opposite is a situation whereby those in authority monitor the spatial impacts of decisions at all levels. Thus the impact of negative supply management at production level would be complemented by similar management at processing and retail level. In other words, policy instruments should pay attention to space formation, especially the differential impact of the capital accumulation activities of some actors.

4.4 The Linear Programme Problem

A model has been designed to measure both the efficiency and spatial equity of policies followed by the Province with regard to the dairy industry. This necessitates a measurement of distributive consequences that have arisen as a result of the introduction of vertical integration by food chains on the Island. The issue is whether market

forces under the oligopolistic market structure and vertical and horizontal integration have benefited all regions of the Island. This is complemented by an investigation of the impact of government policies with regard to the industry. For instance, there is also the need to find out whether milk could have been supplied to all regions of the Island, as cheaply as possible, without incurring costs through the duplication of supply as illustrated above. This study, then, sets out to measure whether the present assembly and distributional arrangements are the least costly possible and the plant numbers, their locational patterns and sizes, the most optimum.

In the context of the B.C. dairy industry, the problem posed is: There are various areas (farms) that produce a given output of raw milk as determined by quotas allocated to individual farmers, and a given demand of processed milk, based on per capita consumption. Transportation costs for fluid and processed milk are given and do not vary with quantities shipped. The cost of processing milk varies with size of processing plants and the location of these plants. In this framework the questions to be answered are:

- (1) Where should processing plants be located?
- (2) What should be the optimum number, size and distributional pattern of these plants that

would minimize the assembly and distribution of milk at least aggregate cost?

Unlike the general private facility location models that consider efficiency measures without an equal consideration of distributional benefits (Lea, 1978), the model envisages benefits accruing to the producers through lower transportation costs and to the processor, through least aggregate processing costs, and finally to the consumer through least prices of the final product, milk.

In real life this is a very complex problem. Its complexity lies in the inability of analysts to incorporate all the variables, both quantifiable and non-quantifiable, that contribute to efficient and equitable decisions. The model is weakened in its aspirations for optimality by the adoption of the following assumptions:

- (1) A single firm is considered;
 - (2) the product has inelastic supply and demand functions (see Bartlett, 1963); and,
 - (3) the solution envisages a planning situation in which the present plant locations do not exist.
- (See Bohm and Conner, 1976; Cobia and Babb, 1964).

Under normal circumstances, assumptions of inelastic supply and demand functions would be unrealistic, especially under F.o.b. conditions. Under such conditions, the more distant customers would face higher prices and such analysis

would have to consider the time and costs borne by such customers in the delivery of their product. It would also depend on the competitiveness of the market.

The B.C. milk industry is not free in terms of the determination of price. The Milk Board has a pricing formula based on a number of variables that is reviewed from time to time as prices of inputs and the index of the cost of living change. The price at producer level is uniform, but at the retail level, there are upper and lower limits between which retailers are free to charge their customers. Thus, the price of milk is not determined by market forces.

Under conditions of free play of market forces, producers and suppliers are free either to increase or reduce supply to effect reasonable returns from their investments. At farm level in B.C. this may not be possible because the government restricts output by use of quota. At the retail level, on the other hand, the state determines the lower price level retailers can charge and retailers are also free to vary their prices to reflect the competitiveness of the market above the minimum price. In the case of Vancouver Island, food chains charge higher prices for local milk sold in their stores. (This varies between three and seven cents per litre.) They also charge the highest price possible in areas where they have absolute monopoly.

Both strategies yield the best results for food chains in terms of market share. Smaller retailers tend to survive in the small urban centres and rural areas, and supplying them with milk is costly in terms of transport. A simple question of economies of scale forbids their selling milk at the lowest prices permitted by law, and they also lack other "convenience" attributes enjoyed by food chains.

The result of all this is a situation whereby food chains skim off "the cream" of the market, and relegate the rest to independent retailers and their dairy suppliers. The system may be efficient for major food chains and the people who shop in them, but fails to meet criteria for distributional justice, in terms of the small dairies that have to supply the sparsely distributed, small food shops. It also does not accord distributional justice to the farmers who have to rely on such a sector of the food industry.

Given the above arrangements, both farmers and dairies on whom they depend, have to make locational adjustments to remain in business. These may not always be complementary or contributory to harmonious existence between processors and farmers. Processors have to adjust their locational choices to reflect access to the market, and since they do not pay for the transportation of milk from the farms, their

only consideration is the cost of supplying the retail market. Farmers, on their part, are compelled to ship their milk to wherever they can find a market, and this is not always the least cost operation.

Thus, both processors and farmers have to subject their locational choices to those of third parties, the major food chains. In so doing, they have to incur unnecessary transportation costs.

In addition, processors are constrained in their selection of sizes of processing plants by the marketing strategies of food chains. The size of plant selected reflects the amount of milk that can be sold without incurring unnecessary transportation costs. When this market share is eroded by the expansion of market shares of food chains based on the mainland, the plants can only survive by shipping milk to other plants that can sell it, both on the Island and the mainland. This does not cost the plant owners anything, since farmers have to bear this cost, but it affects the ability of farmers to produce milk at the least cost possible.

Given the causes and results of the above problems, it is the opinion of the writer that solutions, to be effective, should tackle these causes rather than the manifestation of these problems. A model that belongs to a family of models in agriculture, first developed by

Stollsteimer (1964) has been used. It attempts to solve problems of location and allocation of agricultural products.

The original Stollsteimer model has been modified over the years (see Logan and King (1964); Chern and Polopolus (1971)). In this study three basic assumptions in the original model have been altered. These are as follows:

- (a) The Stollsteimer models assume that processing plant costs are continuous and, thus, linear. Real life examples show that the handling and processing of agricultural commodities does not yield a linear cost function.
- (b) Implicit in Stollsteimer's model is the assumption that an identical total plant cost function exists for each plant, and therefore, the nature of the linear function limits the impact of the size of individual plants in determining the industry's total costs.
- (c) The assumption that all input costs in a production process are completely divisible is an over-simplification of the issue, especially in the long run. Logan (1964) has demonstrated that plant costs, in the long run, become discontinuous because of the alternative technologies and equipment available for the

industry or, what Moses (1958) calls, "the level of substitution possible for the industry". Therefore, the number of segments of discontinuous total plant costs would be identical with the number of possible plant sizes.

Chern and Polopolus (1970) have developed a two step model which incorporates the discontinuous plant cost function. They begin by differentiating between durable and operating costs, and then create three scenarios to illustrate the significance of discontinuous plant costs in the locational problem. The following terms are defined:

IPC = total processing costs of the industry with respect to the number of plants, such as R and K;

X = given supply of raw product in the industry;

X_i = quantity of raw product in an individual plant size i;

TPC_i = total plant cost for any output possible achieved in a plant size i;

P_i = total durable cost (T.D.C.) for a plant with size i; and

V_i = total operating cost (T.O.C.) for X_i .

Scenario One

The authors assume the total durable cost is discontinuous or is a step function and the total operating cost V_i as linear, without an intercept. Therefore:

$$(1) \quad V_i = cX_i$$

where $c =$ the constant unit operating cost.

Thus, if a firm expands its output by expanding its size from i to j , the gain in terms of economic scale Y_{ij} can be measured in terms of unit durable cost. Therefore:

$$(2) \quad Y_{ij} = P_j / X_j - P_i / X_i$$

= unit cost after expansion minus unit
cost before expansion

An increase in plant numbers from K to R may result in a loss of total economies of scale. The alternative would be to select a plant size pattern that would minimize total durable cost for the industry. On this basis the plant size pattern S_R corresponds to plant number R . Therefore, the loss in economies of scale can be measured as:

$$(3) \quad Y = IPC_R - IPC_K$$

$$= \left(\begin{array}{c|c} R & \\ \hline \sum_{r=1}^R P_r & S_R + cX \end{array} \right) - \left(\begin{array}{c|c} K & \\ \hline \sum_{K=1}^K P_K & S_K + cX \end{array} \right)$$

$$= \left(\begin{array}{c|c} K & \\ \hline \sum_{r=1}^K P_r & S_R \end{array} \right) - \left(\begin{array}{c|c} K & \\ \hline \sum_{K=1}^K P_K & S_K \end{array} \right)$$

The results show that total economies of scale for the industry are only affected by changes in durable costs. Thus, if $P > K$, then Y will always be positive. On the basis of this assumption, the fewer the plants, the greater the profit.

Scenario Two

In this case the assumption in (1) is altered to include the intercept, a . Thus:

$$(4) \quad V_i = a + cX_i$$

where " a " is a fixed cost that does not vary with output.

Therefore, the economies of scale lost are as follows:

$$(5) \quad Y = \left(\begin{array}{c|c} R & \\ \hline \sum_{r=1} & P_r \quad S_R \end{array} \right) - \left(\begin{array}{c|c} K & \\ \hline \sum_{K=1} & P_K \quad S_K \end{array} \right) + a (R-K)$$

In this case the total economies of scale are affected by both durable and operating costs. The difference comes about through the adoption of the intercept " a " which then determines $a (R-K)$.

Scenario Three

The assumption of a linear processing cost is replaced by continuous processing cost function. The slope of the processing cost function changes with each size of plant.

$$(6) \quad V_i = a_i + cX_i$$

$$\text{Therefore, } Y = \sum_{r=1}^R P_r + a_r S_R - \sum_{k=1}^K P_k + a_k S_K$$

The three scenarios emphasize the importance of discontinuous cost functions in the determination of optimum locations in agriculture. However, computations based on Scenario 2 and 3 are difficult to do, and the model used in this study uses the assumption in Scenario 1. The original modifications suggested by Chern and Polopolus are followed with slight additions in the context of the B.C. dairy industry.

The following terms are defined:

ITC = total assembly and processing costs;

IAC = total assembly cost for the industry;

C_{ij} = unit cost of assembling raw milk from farm i
to plant location i ;

T_{kj} = unit plant cost of plant k at location j ;

X_{ij} = quantity of raw product assembled from farm i
to location j ;

n = number of locations considered, where $n = 1, 2,$
. . . N ;

R_j = number of plants at location j ;

$Q = \sum_{j=1}^n R_j$ = total number of plants;

L_n = a possible locational pattern for any given n ,
where n varies from 1 to N ;

L_n^* = the optimum locational pattern with respect to
 L_n ;

S_n = the plant size pattern which is selected to
minimize total plant cost for each location in
 L_n^* ; and,

X_m = maximum plant capacity as a constraint.

a. Step 1

The objective function is stated as: *Minimization of total assembly costs with respect to locational pattern for various numbers of locations.*

$$(7) \text{ Min. IAC} = \sum_{i=1}^M \sum_{j=1}^n X_{ij} C_{ij} \Big| L_n$$

with respect to L_n for various n and subject to:

$$(8) \sum_{j=1}^n X_{ij} = X_i$$

= quantity of raw milk available at each
farm i per production period

$$(9) \sum_{i=1}^m X_{ij} = X_j$$

= quantity of raw milk shipped to location j
per production period

$$X_{ij} > 0$$

Two sources of data are required.

- (1) The unit assembly cost matrix, representing the cost of transporting one unit of milk to each potential site, from each farm; and
- (2) the quantity sector showing the amount of milk produced at each farm.

The selection of potential sites is based on the assumption that potential sites should be areas where labour can be obtained. This includes both skilled and unskilled labour. It is further assumed that existing towns, Victoria, Duncan, Nanaimo, Comox, and Port Alberni are capable of attracting the necessary labour. If the whole space of Vancouver Island were treated as suitable for the location of processing plants, the computations would be lengthy and costly.

Also, the assumption of a unit transportation cost varying with distance is not realistic in the context of what takes place on the Island. Some transport firms charge lower fees for distant customers, and the co-operative in Vancouver has different scales for members on the basis of size of output and distance from Victoria. Thus, smaller producers are subsidized by more prosperous members in the transportation of their product. It is assumed an average of these costs reflects the unit cost of transportation.

b. Step 2

Minimization of total assembly and processing costs with respect to the number of locations (n), number of plants (Q) and the plant size pattern (Sn).

This is illustrated as follows:

$$(11) \text{ Minimize ITC} = \text{IAC} \left| L_n^* + \sum_{j=1}^n \sum_{k=1}^R X_{jK} T_{jK} \right| L_n^*, S_n$$

with respect to n, Q, S_n, and subject to:

$$(12) \sum_{K=1}^R X_{jK} = X_j$$

= total quantity of raw milk shipped to and processed at location j.

$X_{jK} T_{jK}$ = total processing cost of plant k at location j with plant size "a" where $b < X_{jk} < a$ and b is the size preceding "a".

$$(13) 0 < X_{jk} < X_m$$

Four procedures are necessary:

- (a) Plant numbers associated with a plant size pattern that would minimize total plant costs for each location in the optimum locational pattern, as derived in 7, are determined.

- (b) The plant sizes and costs when shipment to any location exceeds maximum capacity (X_m) is determined by considering all possible combinations of plants and selecting the one with least plant cost.
- (c) Because the sizes of plants are discontinuous, not all plants will be built so that their capacity equals the quantity of raw product to be processed.
- (d) After plant numbers for each location are determined, the total number of plants and pattern can be aggregated. Then the minimum plant cost can be derived.

The models developed above also solve for transfer costs from processing plants. If the potential location of plants coincides with the nodal centres in the economic space of the Island, then most of the milk would be sold within the vicinity of the plant. Since some population is located outside these nodes, some transfer costs will be incurred in servicing these centres. Nevertheless, this will still constitute less expenditure on transportation than in earlier arrangements.

The models developed above assume all farmers are cost minimizers, willing to assign milk to plants at least transportation cost possible. It also assumes that processors

are willing to locate plants to minimize transfer costs for processed milk. They also provide a framework for monitoring future adjustments with regard to plant locations, plant sizes and the assignment of milk that would minimize total costs of the industry.

4.5 Data Requirements

A questionnaire was sent to all farmers on the Island to measure a number of variables needed for the model. Data on processing costs have been obtained from the main processing plants on the Island. The main variables that constitute the processing cost function were assumed to be uniform for all parts of the Island.

The data collected in this chapter enables Chapter V to describe qualitatively and quantitatively the study area, Vancouver Island. Some of the data will also be used for testing the hypotheses developed in this chapter.

CHAPTER V

THE STUDY AREA

We are faced with historically defined types of societies. This means that there is no society in general, but that society always exists within historically determined trappings.

Nikolai Bukharin, *Historical Materialism: A System of Sociology*. (1972)

5.1 Introduction

The goal of this chapter is to describe the environment in which dairying takes place. And since the goal of the whole study is to determine how dairying can be made to benefit all the people of the region, namely, the farmers, processors, retailers and consumers, by minimizing costs of the industry as a whole, the desired state can have meaning, only if the present state is known. The present state of the industry can then be compared to the objective state in order to evaluate the benefits accruing from the new arrangement.

For this chapter two elements, the economy and the population, were described in their spatial setting on the Island. The descriptions entail the drawing of two

profiles, entitled spatio-demographic and spatio-economic. Each profile contains sub-sections that describe, in detail, selected indices.

It is hoped that through the super-imposition of the two profiles, in their spatial settings, the foundation on which criteria for evaluating the results of the linear-programming exercise, detailed in Chapter IV, can be built. This will also provide an insight into specific recommendations to be tabled in Chapter VII.

Each profile will be described briefly, and specific sub-sections for each profile will be detailed. The final section will attempt to overlay the two profiles, as a means of describing the spatial setting of the dairy industry in the context of the population that is supposed to benefit from its presence.

The information used in the construction of these profiles has been obtained from several sources. For the more general descriptions, data were obtained from returned questionnaires. The response rate of 71 per cent is considered satisfactory for a qualitative description of the dairy industry on Vancouver Island.

The rest of the data has been obtained from census reports, various government reports, and related studies in Canada. Most of this data is based on 100 per cent of population. It is thus presented in a quantitative form.

All the data used thus satisfies the requirements for both a qualitative and quantitative description of the dairy industry.

5.2 Spatio-Demographic Profiles

Two profiles have been drawn in this section. The first deals with the spatial distribution of population on Vancouver Island, based on the 1976 census reports. The second deals with the age structure of the dairy community, based on returned questionnaires.

a) The Spatial Distribution of Population

The nature of population distribution in space, it was felt, is crucial to the understanding of the spatial impact of the allocation or even the exploitation of resources for that population. On the one hand, the population is the consumer of space on which resources have to be exploited for agriculture, and on the other, population distribution constitutes the opportunity for the consumption of the benefits of resource exploitation. It thus determines the possibilities both in physical and economic terms.

With regard to the dairy industry, the distribution of population determines the availability of land to carry out dairy farming as well as the market for the dairy

products. Where the population out-competes dairying in the demand for land, opportunities for dairying are diminished, and where there is a happy relationship between the two, in terms of the allocation of space, the size of the population, assuming it is economically well off, determines the fortunes of the industry.

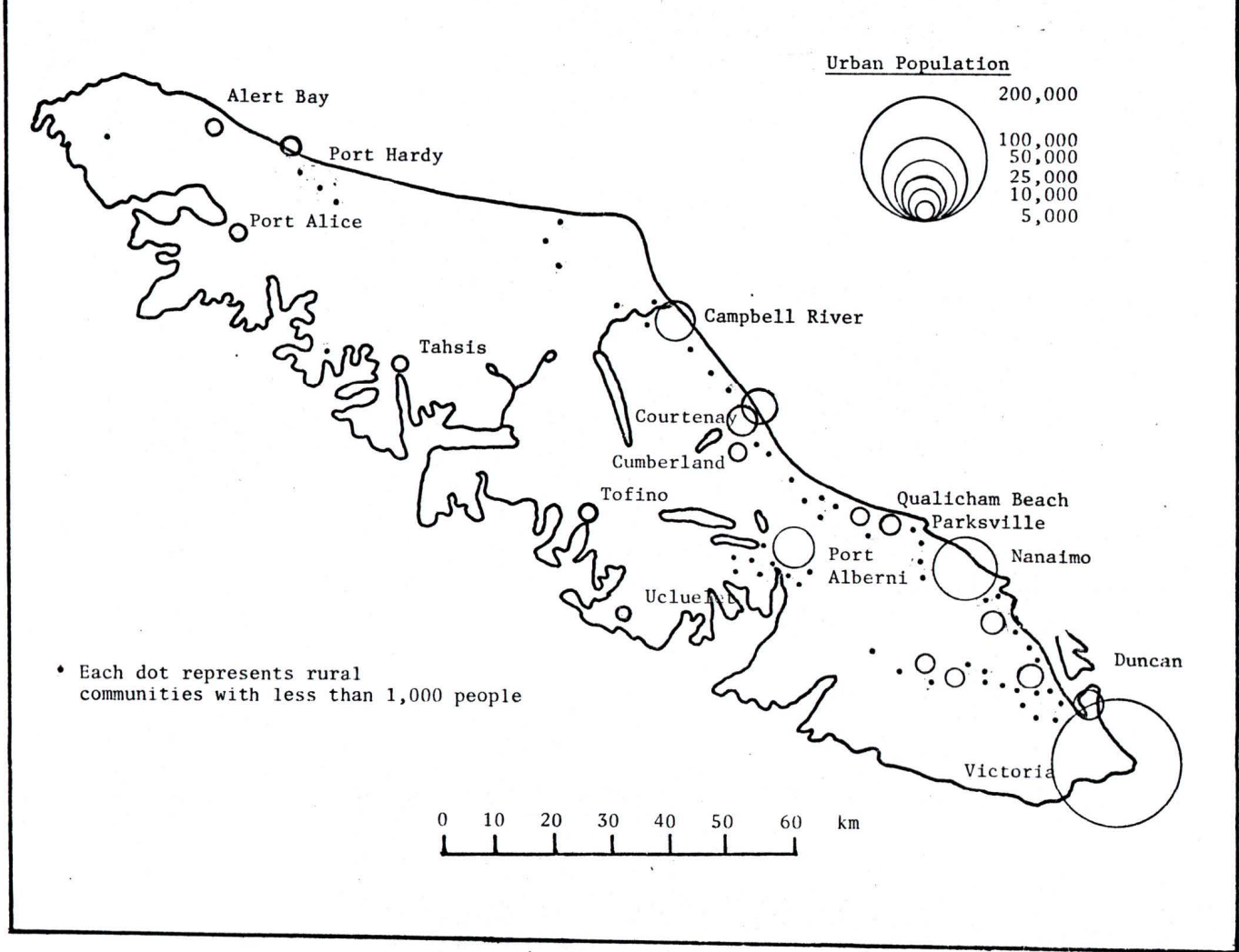
Map 5.1 shows the spatial distribution of population on the Island. More than half of the population is located south of Duncan. Given the scarcity of land suitable for arable farming as well as urban land use, this tends to diminish the prospects for dairying. The rate of growth of population and the nature of land use such growth encompasses affects the performance of the agricultural sector.

Another crucial factor in the distribution of population is the rate of urbanization as well as the spacing of such urban centres. Over 70 per cent of the population lives in urban centres and these are located on a narrow strip of territory along the eastern coastal area. These settlements tend to form distinct hierarchies, at the apex of which is the City of Victoria. The sub-hierarchies are dominated by five cities, Victoria, Duncan, Nanaimo, Port Alberni and Courtenay.

The nodality of the five centres has been re-enforced by administrative practice, which has made them regional

Map 5.1

THE DISTRIBUTION OF POPULATION ON VANCOUVER ISLAND



centres. Each one of them contains the administrative infrastructure which in turn has attracted commerce and industry. For this study, the sixth regional district, Mt. Waddington, which has recently dissolved itself, is considered part of the Comox-Strathcona regional district.

Table 5.1 shows the distribution of population according to regions as well as the proportions of the total population residing in each regional district capital (see also Map 5.1).

Each regional district capital represents the focal point for commerce, industry and administration. Major food chains have established retail outlets in all these centres and very few are found in the smaller centres (see Map 5.1). These centres have become the focal point in the regional economic activity as well as being the focal commuting points. Farmers purchase their inputs from these centres, and all other major services for the farming community are centred on these.

The nodality of these five centres also validates their selection as potential cities for the location of dairy plants in the model detailed in Chapter IV. Once a processing plant is located in a centre, transfer costs in the distribution of milk to the various other centres would be minimal, and since most groceries are purchased in these centres, transfer costs would constitute an insignificant

Table 5.1

Population, Land Area and Population Density, For Census Divisions And Subdivisions, 1976
(Based on 100% Data)

	Population	Land Area in Square Kilometres	Population Density Per Square Kilometre
British Columbia	2,466,608	893,072.8	2.8
Alberni-Clayoquot	32,174	7,738.3	4.2
Alberni-Clayoquot, Sub A	9,663	7,701.6	1.3
Port Alberni, C	19,585	16.5	1,187.0
Tofino, VL	612	2.9	211.0
Ucluelet, VL	1,180	2.9	406.9
Alberni-Clayoquot, Indian Reserves	1,134	14.4	78.8
Capital	230,592	2,317.4	99.5
Capital, Sub A	6,425	364.7	17.6
Capital, Sub B	29,437	260.5	113.0
Capital, Sub C	5,763	1,461.1	3.9
Central Saanich, DM	7,413	42.6	174.0
Esquimalt, DM	15,053	6.7	2,246.7
North Saanich, DM	4,697	36.8	127.6
Oak Bay, DM	17,658	10.4	1,697.9
Saanich, DM	73,383	98.6	744.2
Sidney, T.V.	6,732	5.0	1,346.4
Victoria, C	62,551	18.8	3,327.2
Capital, Indian Reserves	1,480	12.1	122.3

	Population	Land Area in Square Kilometres	Population Density Per Square Kilometre
Comox-Strathcona	57,186	20,031.0	2.9
Campbell River, DM	12,072	116.9	103.3
Comox, T.V.	5,359	5.5	974.4
Comox-Strathcona, Sub A	2,170	9,385.0	0.2
Comox-Strathcona, Sub B	8,544	8,759.7	1.0
Comox-Strathcona, Sub C	14,502	1,721.8	8.4
Courtenay, C	7,733	7.7	1,004.3
Cumberland, VL	1,697	1.0	1,697.0
Gold River, VL	1,942	10.2	190.4
Sayward, VL	383	1.0	383.0
Tahsis, VL	1,663	5.1	326.1
Zeballos, VL	337	1.4	240.7
Comox-Strathcona, Indian Reserves	784	16.0	49.0
Cowichan Valley	47,100	3,379.4	13.9
Cowichan Valley, Sub A	18,556	3,124.0	5.9
Duncan, C	4,106	1.8	2,281.1
Ladysmith, T.V.	4,004	7.4	541.1
Lake Cowichan, VL	2,369	2.6	911.2
North Cowichan, DM	15,956	187.3	85.2
Cowichan Valley, Indian Reserves	2,109	56.2	37.5
Mount Waddington	12,476	21,464.4	0.6
Alert Bay, VL	605	1.4	432.1
Mount Waddington, Sub A	1,004	13,689.3	0.1
Mount Waddington, Sub B	3,038	7,711.6	0.4
Port Alice, VL	1,497	7.4	202.3
Port Hardy, DM	3,653	35.5	102.9
Port McNeill, VL	1,480	5.8	255.2
Mount Waddington, Indian Reserves	1,199	13.5	88.8

	Population	Land Area in Square Kilometres	Population Density Per Square Kilometre
Nanaimo	61,879	2,041.3	30.3
Nanaimo, C	40,336	88.2	457.3
Nanaimo, Sub A	7,883	1,268.8	6.2
Nanaimo, Sub B	8,235	666.5	12.4
Parksville, VL	3,187	5.7	559.1
Qualicum Beach, VL	1,724	8.7	198.2
Nanaimo, Indian Reserves	514	3.4	151.2

proportion of the total costs. Compared to the present arrangement, whereby, plants located in the northern and southern ends of the Island have to transport large amounts of milk to the locations at the centre, this would constitute a major financial saving to the industry as a whole.

b) The Age Structure of the Dairy Farmers

One of the arguments put forward by proponents of the market economy is that labour tends to move to areas of high employment while capital moves to areas of labour surplus. This, supposedly, contributes to the bridging of regional imbalances in economic development. Specifically for the dairy industry, the collapse of the local industry or its being outcompeted by the industry on the mainland would result in people currently employed on the Island relocating on the mainland, where presumably, they would find employment.

The mobility of resources invested in agriculture is one issue, and it is not the purpose of this study to analyze this. What is of interest, however, is the ability of the people who earn their living from the local industry to relocate themselves, when such a need arises. Their ability to move is impeded by their ages as well as their ability to recoup some of their investments (Heady and Crown, 1972). Age in this sense, determines the

ability of an individual to learn new skills, as well as the employer's willingness to invest in the training of the new employee. Moreover, there is no guarantee that relocated farmers would obtain the same jobs or opportunities to farm when relocating, especially when the number of farms throughout the province is declining every year, and the remaining farmers substitute machinery for labour.

Many writers have also observed that farming is not only a means of earning a living but a way of life (Heady and Crown, 1972). Most of the people engaged in dairying have been on the farm all their lives, and others have entered farming because it offers those qualities of life to which they have always aspired and striven to attain. The emotional investment of the participants sometimes supersedes the monetary investments.

Table 5.2 shows the age-structure of the dairy farmers on the Island.

The age-group level, 30-49, tends to obscure the real ages of farmers in this group. There was no way of telling which of the farmers were approaching the age of 50. What came out clearly was the fact that most of the farmers in this age group had either inherited the farms or had acquired them in partnership with parents and subsequently taken them over.

Table 5.2
Age Structure of Dairy Farmers

Age-Group	% of Total Sample	Cumulative %	% Born on Farms
30 - 49	50	50	80
50 - 59	29	79	65
60 +	21	100	47

Table 5.2 also shows that half of the population is over the age of 50, and these would be less likely to relocate in the event of the collapse of their businesses, and their chances of securing alternative employment locally would be very small.

The policy implication of the age structure of the dairy community also shows that it would be advantageous in the long run for the government to see to it that most of these people remained on the farm, and failure to do so would add to the growing unemployment in the region.

When asked to state what they would do "with the farm on retirement" nearly all the respondents stated that a family member would take over. This also confirms the

assertion that dairying represents a source of livelihood as well as a way of life to those who practice it. The continuity factor is demonstrated by the economic behaviour, in terms of investments and the general desire and effort to make the industry a worthwhile exercise. This is illustrated in the economic profiles drawn in the next section.

5.2 Economic Profiles

Throughout this century, the major feature of the dairy industry has been the rapid decline in farm numbers, complemented by greater output per cow and larger herds per farm. The expansion in output per cow has been facilitated by the raising of better milk cows and the use of better feeds than ever before. Figure 5.1 shows the decline in farm numbers and the average output per cow on Vancouver Island. (See also Table 5.3 on changes in herd size per farm).

All these developments have been made possible by the employment of more capital than ever before. The old family farm could not survive the demands made on it in terms of quality and quantity of the product, milk. Those farmers who were unable to amass the necessary capital collapsed.

Figure 5.1

Mean Output Per Cow In B.C. Between 1920 And 1978



Based on 100% population source census reports.
1920-1976 Annual Reports, Ministry of Agriculture, 1977 and 1978.

Table 5.3

Changes in Herd Size:
December 1973 - December 1977

Area	% Change in Herd Size	Number of Farms Responding	Total Number of Farms in 1977
Capital	19.6	13	13
Cowichan	38.9	42	59
Nanaimo	51.8	10	17
Alberni	12.2	6	7
Comox	63.0	15	25
Vancouver Island	40	86	121

Based on returned questionnaires.

The rapid decline of family farms during and after the depression alarmed successive governments in Canada. They responded by initiating financial programmes and the necessary research into better farming methods that would enable farmers to meet the food requirements of the expanding population. The rapid expansion in production enabled market forces to keep food prices low, which in turn enabled the rest of society, in general, to lead a very high standard of life (Mitchell, 1975).

These developments were also made possible by improvements in the input sector. In order to purchase these inputs, farmers were forced to expand production, which in turn deflated incomes to the sector. Thus, while the input sector had enjoyed high incomes throughout this century, dairying has often times been reduced to receiving subsidies. (For example, the Farm Income Assurance in 1973). The survival of the sector has depended on the fixing of prices, by the Milk Board (see Appendix B).

The victims of what has come to be known as the "cost price squeeze" under the policy of "cheap food" are many. They include the many family farms that have been unable to obtain the financial assistance provided by the state or private lending agencies (see *Farm Credit in B.C.*, 1978), or could not expand output to keep them in business. Others have been victims of marketing strategies of food

chains, that, through vertical integration, have expanded their market share at the expense of the independent dairies, on whom local farms are dependent. This study focusses on the latter, especially the creation of conditions whereby farmers are forced to spend more on transportation. This is, however, not meant to exonerate those farmers who have collapsed out of their own inability to manage their business. The approach adopted here, is closely aligned to the framework developed in Chapter II, in which the industry is seen in the light of struggles of modes of production, with the victorious mode characterized by concentration.

Three profiles have been drawn in this section. The first deals with the availability of physical resources on which dairying is based and the second with actual output of milk in the past twenty years and lastly the location and allocation of milk. The profiles will be presented each in turn and their implications to the functioning of the dairy industry will be discussed.

a) The Physical Resource Base

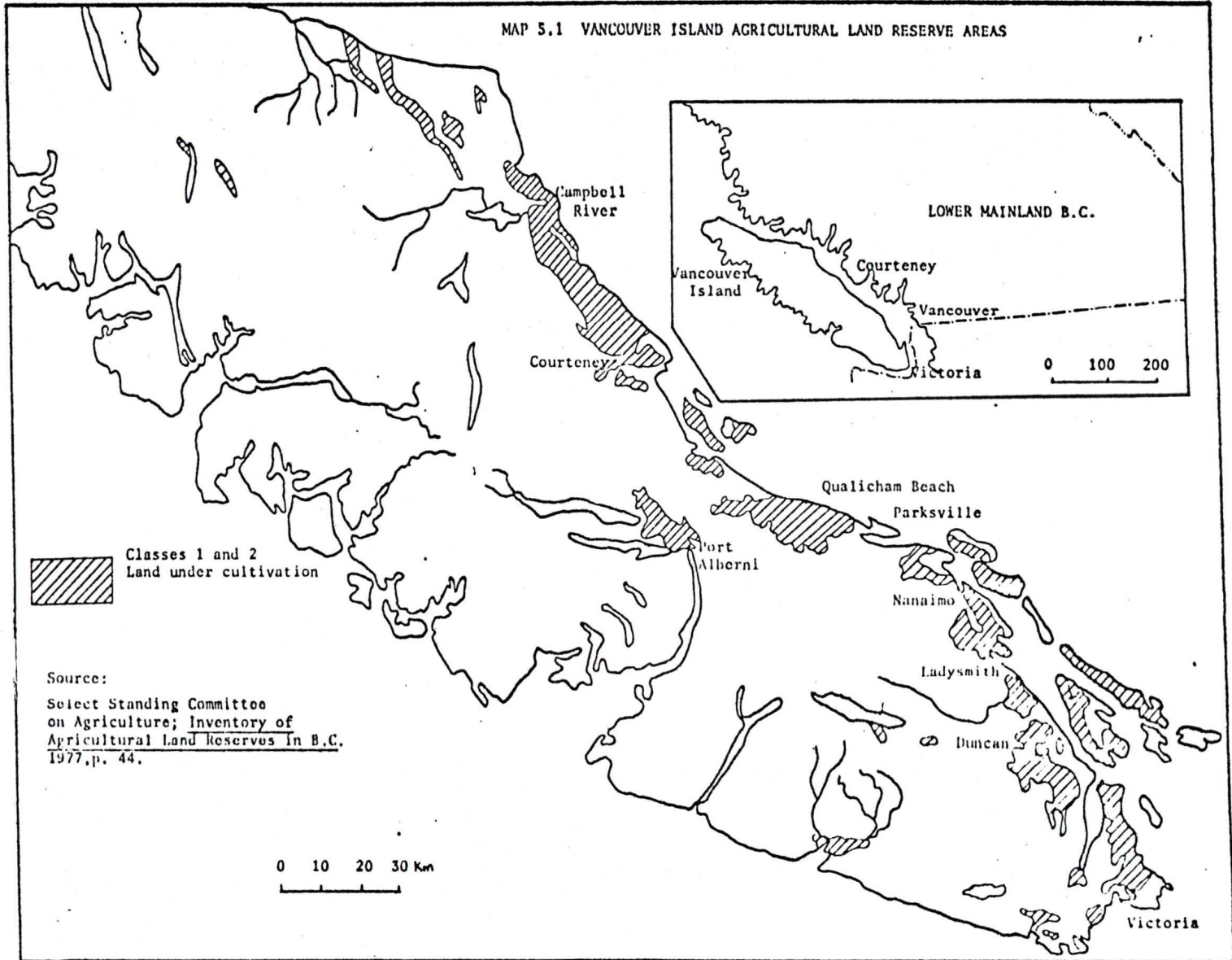
The availability of land suitable for growing fodder and on which to build the barns, as well as the prevalence of climatic conditions suitable for growing such fodder is central to the successful operation of a dairy industry.

Climatic conditions also determine the type of stock to be reared and the performance of such stock.

These conditions are not always met, especially when these are also ideal for other land uses. The scarcity of land for dairying is compounded in situations of extreme land shortage. Not only does the pressure come from other farmers, but from other competing land uses.

According to the 1971 census, only 1.5 per cent of the land on Vancouver Island is suitable for farming, and only half of this is improved. Of this improved land, only 18 per cent is used for forage and crops.

Vancouver Island also lacks a uniform belt of land suitable for agriculture. (See Map 5.2). In most cases the land available is too close to urban areas. In such rural-urban interfaces, urban land uses tend to erode into the rural land on account of rent. The erosion of agricultural land by urban land uses had become so alarming in 1973, that the then government introduced legislation to preserve agricultural land. At the time the legislation was introduced, many farms had already been subdivided for future sale, and in some areas, developments incompatible to farming had been allowed to take place, with the owners of such agricultural land consoling themselves that they would in future sell their land to developers, that no remedial action could retrieve



the harm done. These farms remain as hobby farms, with their owners bidding their time when they would be allowed to sell their land to developers, by a favourable government.

Wherever possible these farms have been rented by dairy farmers who either use them to grow extra fodder, or to graze stock. The existence of these farms has allowed dairy farmers to expand their herds without incurring extra costs of buying land, and as a result, dairying has kept in production land which could have otherwise remained unproductive for a long time. Table 5.4 shows the amount of land owned by farmers and the amount of land that they rent.

In terms of climate, Vancouver Island has a cool Mediterranean climate. The southern tip of the Island has the longest growing season in the whole of Canada. Most of the rain falls in winter, and the drought in summer necessitates the use of irrigation water to grow silage and other fodder crops.

Rainfall increases from the east coast to the west and from the southern tip of the Island to the North. This also defines requirements for irrigation. This has been estimated as follows: Sidney, 259 mm; Duncan, 246 mm; Nanaimo, 218 mm; Parksville, 259 mm; Courtenay, 196 mm; and Alberni, 145 mm.

Table 5.4

Land Ownership And Land Use

REGION	LAND OWNED		LAND RENTED		ALL LAND	
	% of Land Owned	% of Land Owned Under Irrigation	% of Land Rented	% of Land Rented Under Irrigation	% of Land Irrigated	% of Land Not Irrigated
Capital	61	48	39	20	37	63
Cowichan Valley	67	73	33	5	49	51
Comox	91	67	9	33	63	37
Nanaimo	66	38	34	28	52	48
Alberni	85	94	15	0	80	20
Vancouver Island	74	50	26	25	54	46

Source: Based on 86 out of 121 farms.

In order to effect the necessary improvements in the production of milk, farmers have, wherever possible, substituted local inputs for imported ones. An increase in the number of cows milked requires a substantial increase in feeds, both grains and fodder. It is cheaper to import grains from the Peace River region. The cost of hauling feeds from the depots on the mainland adds to the cost of feed paid by local farmers, and wherever possible farmers grow as much feeds as they can. Most parts of the Island are capable of yielding two crops of hay, and under irrigation three crops can be produced. The dairy inspectorate estimates that each acre can yield two tonnes of hay without irrigation and up to four tonnes under irrigation.

A sample of 50 farms contacted by phone said they produced at least 95 per cent of their hay requirements. The more northerly farmers who have to pay extra overland freight costs grow all their hay requirements. And since most of the farms are small in terms of area, they have had to rent extra land from neighbouring non-dairy farms that do not use it. Some farmers, especially in large centres like the capital region secure rights to cut hay from vacant lots as well as around airports.

Table 5.4 also shows the proportion of land under irrigation and non-irrigated. The greatest proportion of

land under irrigation is on farms on the extreme northern parts of the Island. Here all land available has to be used to produce hay.

In addition to growing hay, farmers benefit from corn silage from non-dairy farms. In the southern part of the Island where most corn is grown, this represents a substantial source of feed for dairy farmers.

The amount of land irrigated also shows the level of capital employed in support of dairying. The farmer has to invest in expensive tractors, trailers and machines for making hay, as well as in the labour for carrying out such activities. The Canada Farm Labour Pool officials estimate that up to 500 people are employed directly on dairy farms on the Island. Most of these students, and the army of the regularly unemployed. There are no published figures, to the knowledge of the writer, on the monetary contribution to the economy of this sector of the dairy industry. However, the magnitude and scale of activities cannot be under-estimated.

b) The Contribution of the Industry to the Local Economy

Besides contributing directly to the local economy in terms of cash payments to people employed, as well as utilizing the land which would have otherwise remained unproductive, the dairy industry contributes directly to

the economy of the regions it occupies through the purchase of inputs. In the absence of a specific input-output study for the B.C. dairy industry, a study for Canada as a whole was used. It is based on the 1958 and 1961 input-output tables for Canada. Table 5.5 shows the purchases per dollar of output by the dairy industry.

In the selection of this table certain assumptions were made. First, it is assumed the input-output relations for the agricultural sector has not been altered significantly since 1961. Obviously, there have been changes in the relative use of inputs in response to technological changes in the industry. However, changes have been all-around, and it would be difficult to disaggregate the purchases of this sector. Besides, there are no new tables for Canada.

The number of agricultural outputs varies from region to region. The number of agricultural products tends to increase southwards. Thus, in some regions, milk is the dominant agricultural product. Tables 5.6 and 5.7 show the relative standing of the dairy sector for each regional district as well as the share of agricultural products in 1971.

Dairying constitutes over 40 per cent of the total agricultural output in 4 of the 5 regional districts. Dairying being also a consumer of some of the by-products

Table 5.5
Direct Purchases Per Dollar Of Output

Sector	Ratio of Total Purchases*	REGIONAL DISTRICTS: REAL VALUES					Total
		Alberni	Capital	Comox	Cowichan	Nanaimo	
1. Other grains	0.0122	6,049	10,361	16,118	30,257	11,765	74,550
2. Other field crops	0.0125	6,198	10,616	16,514	31,001	12,054	76,383
3. Cattle	0.03807	19,189	32,128	51,128	95,981	37,320	236,483
4. Dairy	0.9199	9,867	16,900	26,290	49,354	19,190	121,602
5. Other farm produce	0.0005	248	425	661	1,240	482	1,222
6. Grain mills	0.1861	92,277	158,044	245,862	461,550	179,462	1,137,195
7. Chemicals	0.0125	6,198	10,616	16,118	31,001	12,054	76,383
8. Petroleum products	0.0182	9,024	15,456	24,045	45,138	17,551	111,214
9. Machinery	0.0187	9,272	11,881	24,705	46,378	18,033	114,270
10. Other manufactures	0.9396	19,636	33,630	52,317	98,213	38,187	241,983
11. Construction	0.0312	15,471	26,496	41,219	77,380	30,087	190,653
12. Financial, Real Estate, Insurance	0.0341	16,908	28,959	45,051	84,572	32,884	208,374
13. Transport and storage	0.0401	19,884	34,054	52,977	99,453	38,670	245,038
14. Services	0.0185	9,173	15,711	24,441	45,882	17,840	113,047
15. TOTAL INTERMEDIATE INPUTS	0.4642	230,174	394,216	613,269	1,151,272	447,642	2,836,573
16. Imported materials	0.0002	99	170	264	496	193	1,222
17. Taxes on domestic goods and services	0.0374	18,545	31,762	49,410	92,756	36,066	228,539
18. Wages and salaries	0.0584	28,958	49,596	77,154	144,839	56,319	356,863
19. Net income from unincorporated business	0.4157	206,125	353,029	549,194	1,030,986	400,872	2,540,206
20. Depreciation	0.0242	12,000	20,552	31,971	60,019	23,337	147,878
21. TOTAL PRIMARY INPUTS	0.5358	265,676	455,023	707,861	1,328,848	516,688	3,274,097
22. TOTAL INPUTS = (TOTAL OUTPUTS)	1.0000	495,850	849,240	1,321,130	2,480,120	964,330	6,110,670

Source: J.T. Josling and G.I. Trant, *Interdependence Among Agricultural and Other Sectors*. The Agricultural Economics Research of Canada, 1966, p. 59.
Dollar values from Census Report 1971.

Table 5.6

Value of Agricultural Products As Percentage

Types	REGIONAL DISTRICT						
	Alberni	Capital	Comox	Cowichan	Nanaimo	Vancouver Island	British Columbia
Dairy products	65	11	55	54	46	36	24
Field crops	1	5	5	5	5	5	9
Other crops	6	39	9	3	15	21	22
Livestock and poultry	21	26	22	23	24	24	31
Other livestock products (excluding dairy products)	6	19	9	15	10	14	14
All Products	100	100	100	100	100	100	100

Source: Census 1971.

Table 5.7
Actual Value of Output

Type	REGIONAL DISTRICTS						
	Alberni	Capital	Comox	Cowichan	Nanaimo	Vancouver Island	British Columbia
Dairy products	495,850	849,240	1,321,130	2,480,120	964,330	6,110,670	47,366,520
All other products	267,260	6,490,730	1,071,150	2,144,900	1,123,560	11,097,600	152,230,380
Total	763,110	7,339,970	2,392,280	4,625,020	2,087,890	17,208,270	199,596,900

Source: Census, 1971

of the other agricultural sectors, has the role of an anchor for the local agricultural economy.

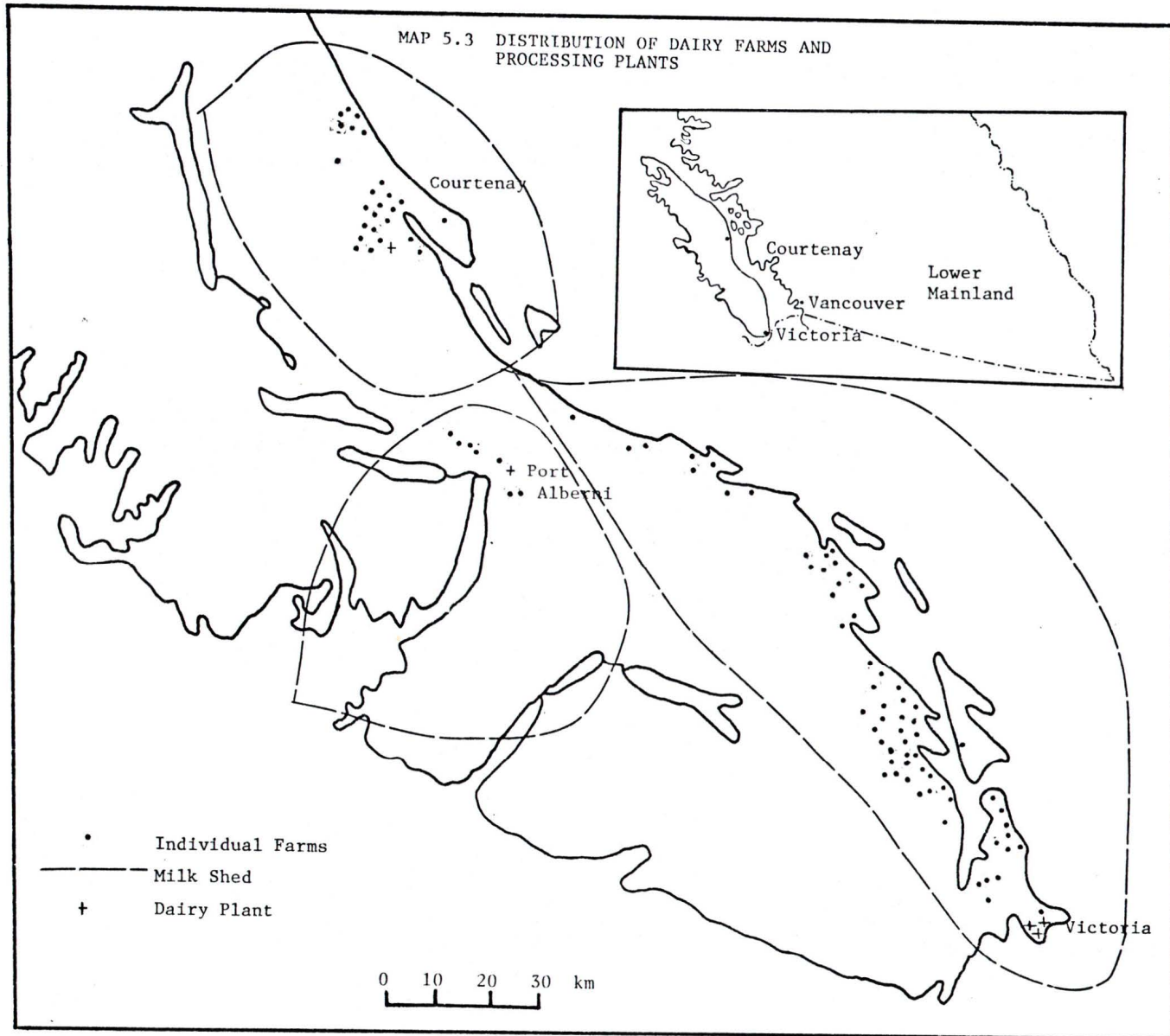
For some regional districts the contribution of the dairy industry also lends credence to the provincial land policy of preserving agricultural land. If it is assumed that the non-use of some land today is only a temporary matter, then dairying is doing a good job in keeping this land open and productive, by either renting it or leasing it for growing fodder. In addition, dairying acts as an efficient re-cycler of waste from other agricultural activities, like corn growing.

5.3 The Sources and Sinks

This section of the chapter describes the spatial distribution of sources, the farms, and sinks, the main areas where milk is shipped to. As demonstrated in Chapter II, the spatial distribution of farms and processing plants has changed over the years tending towards concentration in the north and southern part of the Island. Map 5.3 shows the distribution of farms and processing plants on Vancouver Island.

Some of the milk shipped to processing plants is rerouted to other plants on the Island and on the mainland. This varies from season to season and year to year. There are no published data on interplant shipments of milk,

MAP 5.3 DISTRIBUTION OF DAIRY FARMS AND PROCESSING PLANTS



however, the Milk Board publishes data, annually, on milk shipped to the mainland, and from the mainland to the Island.

The unsold milk produced on the Island is then shipped to local retail outlets, in fluid and other forms. Most of this goes to independent food shops and some is delivered to homes on a daily basis. Only a tiny fraction goes to shops owned by major food chains.

There are no published figures on the amount of milk shipped from each dairy processing plant to each regional district. However, the location of major food chains and other food shops is a good indicator of the relative access of each dairy on the Island to the local market. Map 5.2 shows the locations of the major food chains that are integrated to their own dairies on the mainland. This is also supplemented by Table 5.8 which shows the number and types of shops in each regional district.

Most of the dairies are located where the number of independent food stores is large. The surplus milk not sold in the locality is then shipped to the outlying regions which are not serviced by major food chains; this is more prevalent in Alberni and Comox. The Comox dairy, in particular, has to service the outlying areas within the region as well as the whole of the Mt. Waddington region. The same applies to the sparsely

Table 5.8

Population Density and Food Chain Number By Census Region

Census Region	Population Density 1976	Total No. of Food Stores	No. of Food Chains	No. of Food Chains Integrated To Mainland Dairies
Alberni- Clayoquot	10.8	14	9	3
Capital	257	131	44	15
Comox- Strathcona	7.4	17	18	8
Cowichan	36.1	32	14	5
Nanaimo	78.5	15	19	8
Total of Five Regions	63.6	209	104	39

Source: Census Data 1976.

See also Map 5.4

populated Alberni region, especially the outlying communities like Tofino.

The three dairies in Victoria have access to the most densely populated part of the Island and with its large number of restaurants. They also make forays into the Nanaimo and Cowichan regional districts. Map 5.3 shows the extent of the area served by each dairy.

The major food chains with dairy plants in Vancouver ship milk to all points where their shops are located. There are no published figures on the amount of milk shipped to each regional district by food chains. However, if it is assumed that these shops tend to be of some standard size then the amount of milk shipped into each region is proportional to the number of shops in that region. Then the map showing the spatial distribution of major food chains also illustrates the ratio of amounts of milk shipped to each regional district centre. (See Map 5.4)

Table 5.9 shows the amount of milk produced, and the proportion of this consumed on the Island. It also shows the amount of milk shipped into the Island as well as the total amount of milk consumed, between 1957 and 1976. However, data on milk shipments out of the Island are incomplete.

What is clearly shown in this table is that while production has increased over the years, food chains have

MAP 5.4 CHAIN STORE LOCATION AND THE URBAN SETTLEMENT SIZE PATTERN

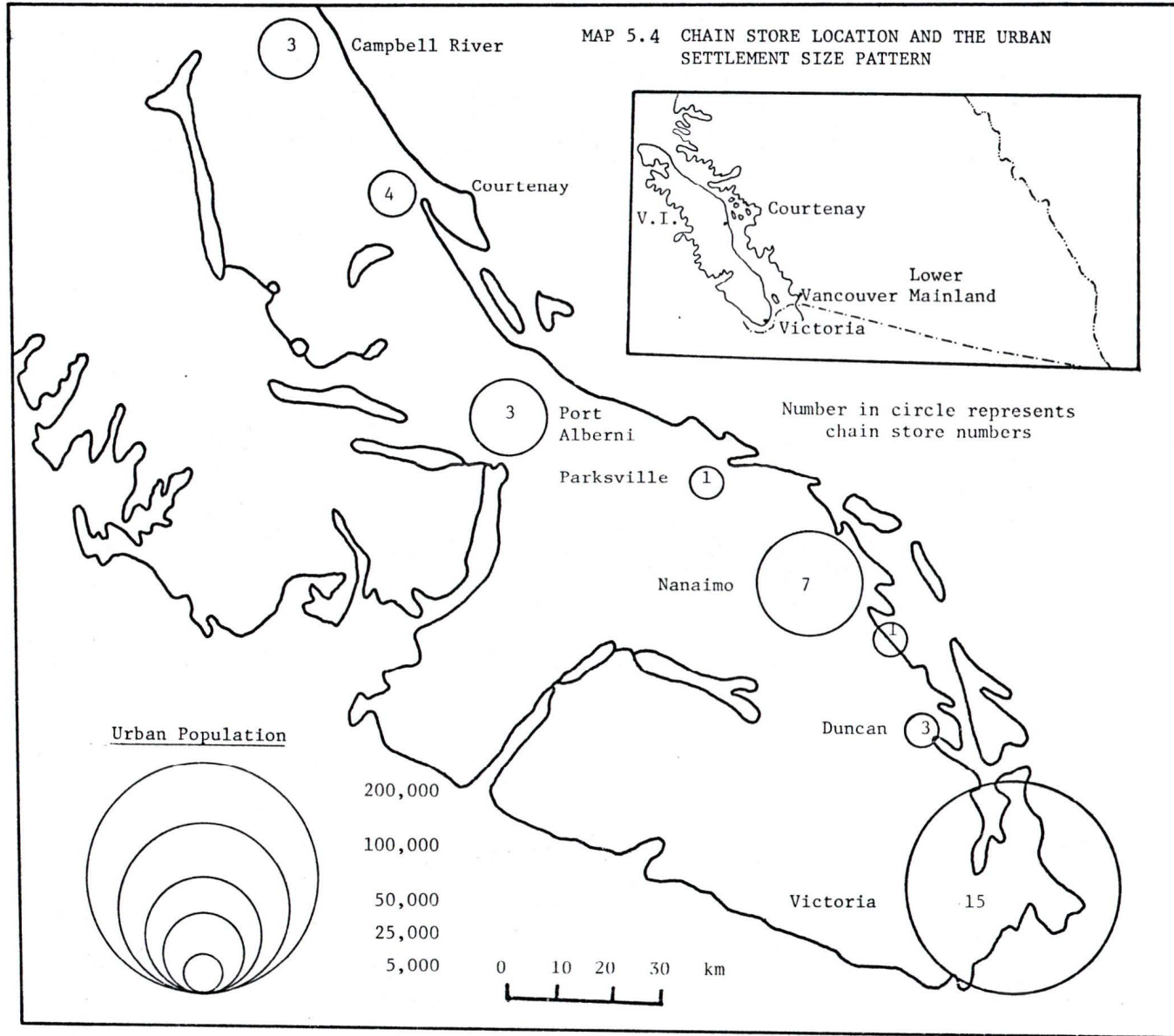


Table 5.9

Production, Utilization of Vancouver Island Milk Between 1957 And 1976 (in lbs)

Year	Production on the Island	Utilization on Island	Utilization as % of Production	Shipment to Vancouver Island	Total Consumption on Island	Shipment to Vancouver Island % of Total Consumption
1957	54,908,507	50,241,807	92.15	*	*	*
1958	56,611,023	50,901,163	89.92	*	*	*
1959	58,772,361	51,642,645	87.87	*	*	*
1960	62,310,185	53,134,916	85.28	8,499,151	61,634,067	13.79
1961	65,145,793	54,629,492	83.86	9,295,758	63,925,250	14.54
1962	67,194,945	57,072,696	84.94	8,682,297	65,754,993	13.20
1963	67,642,408	59,797,310	88.40	8,578,308	68,375,618	12.55
1964	71,121,791	62,941,801	88.49	8,610,855	71,522,655	12.03
1965	73,671,800	66,001,019	89.59	11,694,828	77,695,847	15.05
1966	76,045,938	67,663,149	88.97	14,003,185	81,666,334	17.15
1967	78,304,964	*	*	16,095,684	*	*
1968	82,220,442	71,786,890	87.31	16,487,267	88,274,157	18.68
1969	83,909,750	74,764,210	89.10	17,183,248	91,947,458	18.69
1970	86,263,633	76,729,907	89.18	19,656,853	*	*
1971	89,141,682	74,311,019	83.36	20,414,598	94,725,617	21.55
1972	90,311,781	75,868,391	84.01	21,566,080	97,434,471	22.13
1973	92,337,797	78,731,986	85.27	22,820,906	101,552,892	22.47
1974	96,967,418	82,757,606	85.35	23,314,249	106,971,855	21.98
1975	102,175,393	83,323,586	81.54	21,744,417	105,068,003	20.70
1976	103,009,898	84,670,286	82.19	27,956,358	112,626,644	24.70

Source: Annual Reports of the Milk Board.

continued to increase their share of the market at the expense of local dairies. Given the fact that quotas are assigned on the basis of local demand, and the fact that farmers have to bear the cost of shipping milk to each plant, they as individuals, and collectively, bear the cost of shipping it out of the Island. The policy of allowing milk shipments from the mainland is costly to the local industry, and is wasteful in terms of energy consumption.

a) Overlaying The Spatio-Demographic and Spatio-Economic Profiles

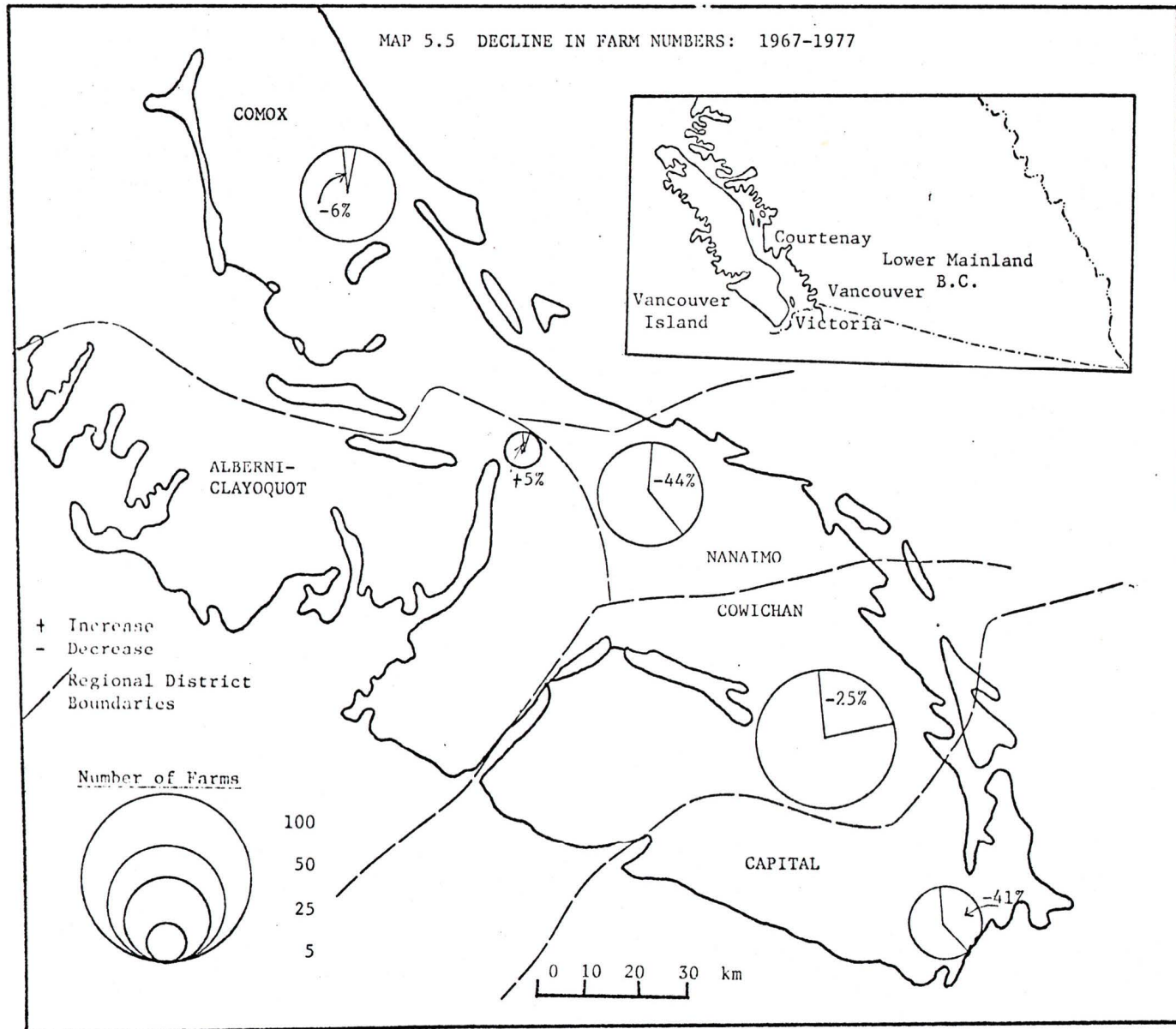
The distribution of the population and dairy farms is such that each population concentration can be well served for its dairy requirements from local sources. The law preserving agricultural land assures the industry its physical resource base in perpetuity. It also assures the communities concerned a constant supply of milk and farmers a source of livelihood. Above all, it allows for a co-ordinated and balanced exploitation of resources of the region for agriculture.

The presence of food chains that are vertically integrated to dairies on the mainland and insist on selling milk from their own plants, only, dislocates the orderly marketing channels. In a way it causes the local dairies to cross higher cost thresholds in the supply of

milk. These costs are then transmitted to the consumer through the pricing formula, and tend to reproduce themselves as long as the root cause is not removed.

The decline of farms, in certain locations, as illustrated in Map 5.5, even if it cannot be explicitly proven to have been caused by the collapse of local dairies, shows, what could happen if the market for milk has become inaccessible. At the same time the erosion of the market share of local independent shops on which local dairies depend, leads to less local milk finding local markets. Dairies can always ship all their milk to Vancouver, but this may reduce the abilities of farmers to produce more milk, since this usually involves farmers having to pay for such shipments. The escalation of energy costs, inevitably affects farmers.

The outcome of the above developments is a situation whereby farmers are forced to pay more for the transportation of their milk to both local and external markets. Those farmers facing the highest transportation, either have to give up farming, or relocate to areas where they would spend less on transportation. This, then exerts pressure, in terms of demand, on certain locations. The scarcity of land in general, and high demand in certain desirable locations, would then force the price of land up, and inevitably the price of milk. The decline in the market



share of local independent shops on which local dairies depend, would cause more milk to be shipped to the mainland, and the spillover effect, would be the same as above.

If the remedies advocated by the government in the past are indicative of the general attitude of the state to such problems, the state would then intervene by means of a subsidy to farmers or would offer loans to farmers in order to keep prices low. The Farm Income Assurance programme is one of such programmes. Such a solution is only temporary and in most cases only benefits the well to do members of the farming community.

The overlaying of the economic and demographic profiles of the environment in which dairying takes place, thus show that no remedy will work in solving problems experienced by dairy farmers, unless it unravels the root causes, which as shown above, relate to the allocation and location aspects of the industry. Chapter VI attempts to show what would happen, in terms of cost minimization, if the government controlled the movement of milk as well as output.

CHAPTER VI

ANALYSIS

The metropolis expropriates economic surplus from its satellites and appropriates it for its own economic development. The satellites remain under-developed for lack of access to their own surplus and as a consequence of the same polarization and exploitative contradictions which the metropolis introduces and maintains in the satellite's domestic economic structure. The combination of these contradictions, once firmly implanted, re-inforces the process of development in the increasingly dominant metropolis and under-development in the ever more dependent satellites until they are resolved through the abandonment of capitalism by one or both interdependent parts.

Andre Gunder Frank, *Capitalism and Underdevelopment in Latin America*, 1971, p. 34.

6.1 Introduction

The purpose of this chapter is to prove that failure to control the marketing side of the dairy industry, by the Milk Board, has caused the industry to operate both inefficiently and inequitably, in terms of the distribution of gains and losses of its operation. In order to prove that there is spatial inequality and inefficiency, the analysis should describe how the industry operates, in terms of its present structure. This structure will then be compared to an ideal one constructed on the basis of

what is defined as efficient and equitable. In essence, the efficient and equitable structure is based on the optimum model described in Chapter IV.

Thus, it is by comparing the ideal with the existing structure that corrective measures can be taken. The construction of the efficient and equitable structure should enable the analysis to identify areas of divergence and convergence in terms of the criteria defined above.

6.2 Proof of Spatial Inequality and Inefficiency

Figure 6.1 shows the structure of the dairy industry on Vancouver Island today. The various indices used in its construction are defined below, and areas where inefficiency and spatial inequality have been detected will also be illustrated.

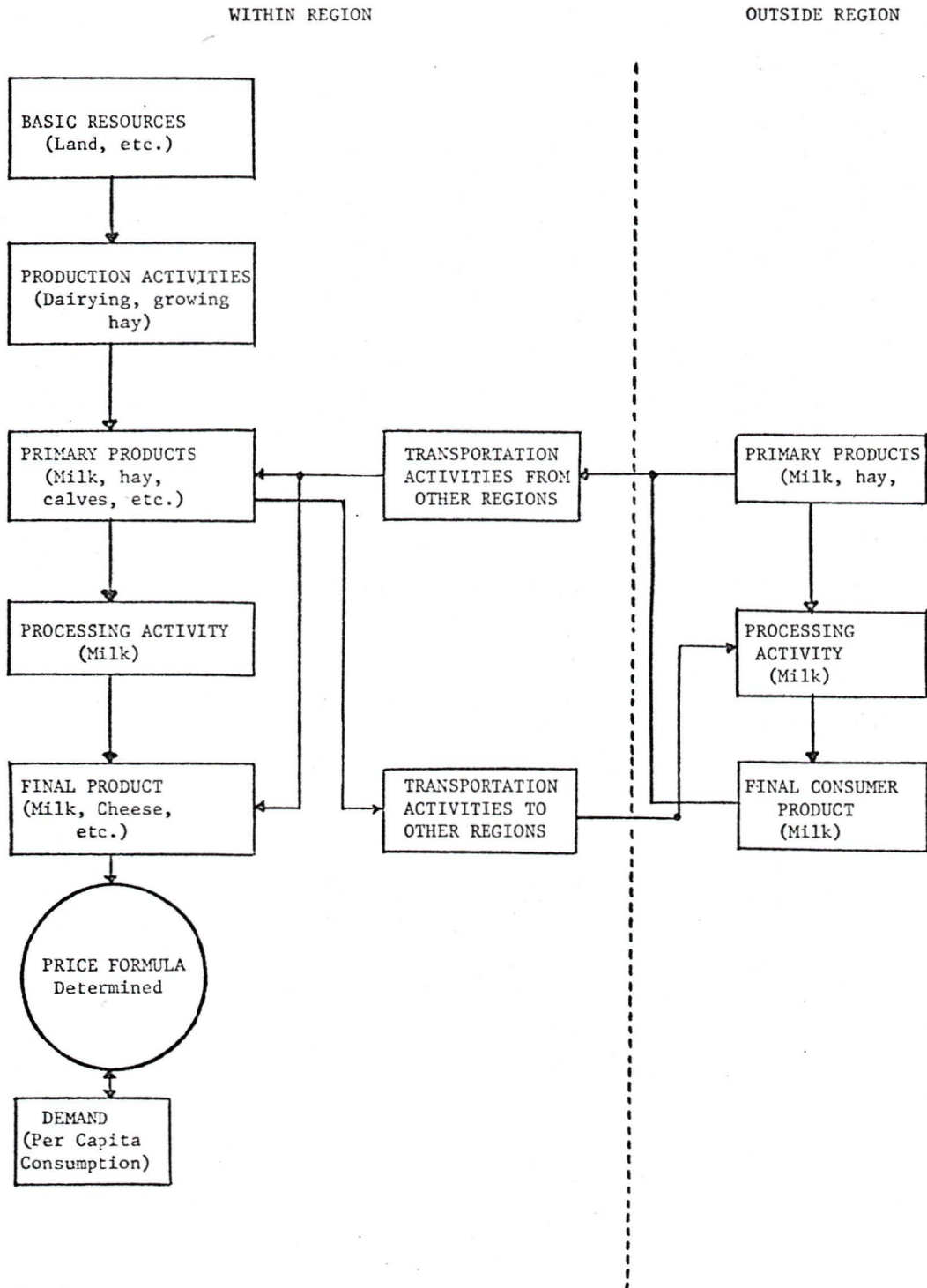
a) Basic Resources

These include land, the climate, the human resources (labour) and infrastructure such as feed plants and special services for the dairy industry. For this study, special emphasis is placed on land availability as it affects the possibilities of undertaking dairying.

The availability of land for dairying is discussed in Chapter V, however, it suffices to mention that dairying is the most productive agricultural activity on Vancouver

Figure 6.1

The Structure Of The Dairy Industry On Vancouver Island



Island, and because it is carried out throughout the year, it sustains higher yields per unit area than any other activity in the farm sector (see Table 5.1). In many areas, it is the only activity that lends credence to the preservation of agricultural land (see Chapter V). When dairying is replaced by other agricultural activities, productivity per unit area is lowered, and in most cases the agricultural activity that replaces dairying is hobby farming, which is neither an industry nor of benefit to the local economy.

b) Primary Production Activities

Most dairy farms produce a variety of items, other than milk. The commonest by-product from dairy farms is manure, which is used on hobby farms, green-houses and at times, on lawns. Stock is also raised for sale on the Island or for replacement purposes. Farmers may also raise poultry, horses and grow fruits and vegetables. On most farms, these non-dairy activities constitute up to 5 per cent of the total revenue from dairy farms.

As shown in Figure 5.1, output per cow has risen tremendously over the past 60 years. The dairy farm is no longer a simple operation whereby dairy cows are kept to produce any amount of milk they are capable of producing. The farmer, facing high feed costs, is keen to retain only

those milk cows that give the highest yield. In essence, dairying has become an industry, like any other.

The actual location of production activities is constrained by the availability and quality of basic resources. The farmer has also to take into consideration access to markets. In other words, the constraints have a localizing effect on the industry.

Over the years the changing locational pattern of processing plants has affected the location of farms. As shown in Map 5.4, the greatest changes have taken place in terms of access to markets in the more remote areas like Nanaimo and Parksville, and, in response to the pressure of urbanization, as in Victoria. A sample survey of farmers in the Cowichan Valley showed that out of the twenty-five people surveyed, eight had relocated from other areas, in the past 10 years. Out of these, three came from the Victoria region, and the rest came from around Nanaimo and Parksville.

No attempt was made to measure the monetary implication of this relocation of dairy farms on Vancouver Island. However, it suffices to mention that the demand for land in the Cowichan Valley is increasing, and this may eventually force up the price of land in the area. Higher land prices could then be transmitted to the consumer in terms of higher milk prices (see Map 5.5 for the distribution of farms).

c) Transportation Activities

Once milk has been produced it has to be shipped within a day or two to the processing plant. When refrigeration was primitive, in the early part of this century, milk had to be delivered to processing plants only a few hours after it was produced. Today, each farmer has a cooling plant and hauling trucks are fitted with refrigerators. It may, thus, take two days before it reaches the market.

In addition, milk is a bulky substance and the longer the distance through which it is transported the higher the costs. Refrigeration may, thus, have freed the industry from having to locate plants close to the farms, but this has not freed it from high haulage costs. As has also been demonstrated in Chapter V, the sparse distribution of producing areas on Vancouver Island makes transportation a significant consumer of resources in the dairy industry. The magnitude of these costs is compounded by the locational choices of processing plants that buy Vancouver Island milk (see Map 5.4 for the location of processing plants).

As an example, farmers in the Nanaimo area who have lost local processing facilities over the years, have to ship milk over 100 km to Victoria, where it is processed and shipped back to consumers in Nanaimo. Farmers, as

a group, have no means of avoiding high transport costs, unless they decide to stop dairying altogether.

Processors too, may be responding to greater market opportunities in Victoria, but the size of this market is not sufficiently large to absorb all their products in view of the fact that food chains command the greatest share of this market. They are then compelled to ship milk back to where it came from. The consumption of transportation has also to be considered in the light of the fact that local dairies service a "multitude" of outlets, including hotels and restaurants, homes, hospitals, as well as independent grocery shops. Servicing these outlets is expensive.

At the same time, there is no guarantee that once milk reaches the plants it is going to be processed locally. Processors are often compelled to ship milk to other plants on the mainland or on the Island for lack of markets of processed milk. The inter-plant cost of shipping milk is borne by all the farmers of the region. This inter-plant movement of milk should also be considered in the light of increasing shipment of milk from the mainland by food chains that are integrated to the mainland dairy industries. When this is done it is possible to differentiate between necessary transportation of milk and unnecessary transportation of milk. The movement of

milk from farms to processing plants is necessary although this could still be reduced by locating plants close to farms, but the trans-shipment of milk between plants is unnecessary given the fact that milk is being shipped from other regions to displace local milk. It is this consumption of resources in transporting milk from one region to another that constitutes inefficiency. It is also a waste of non-renewable resources (see Comment 2).

The high transportation costs incurred by the local industry, both at the processor and farm level is symptomatic of the dislocating action of capital, skimming off the "cream" of an economic sector, and relegating the "waste" to its competitors. In other words, the inefficiencies of the dairy sector are not endogenous to the industry, but are induced by the marketing strategies of major food chains. To them, securing retail markets is more important than what happens to farmers and processors who have to service the non food chain outlets on the Island. They also appear innocent to the population at large by producing milk at lower prices than local processors, whose inefficiency they have induced.

The disruption of local markets also causes spatial inequality, in that some farmers are forced to ship their milk to distant markets. In addition, farms in general are not guaranteed fluid milk prices once their milk has

been sent to plants on the mainland. Thus, a farmer may project his income situation in terms of fluid prices, but receive some of his revenue in terms of industrial milk. Processors on the mainland are at liberty to purchase milk from the Island and re-classify it as surplus fluid milk, which in reality is industrial milk.

For regions like Port Alberni, the duplication of supply and related transportation costs assumes grave proportions, in that three quarters of the milk produced is shipped out of the region, while at the same time, an equal amount is shipped in by food chains. This is highlighted by farmers in the region who see the lack of corrective action by the Province as a system of condoning inefficiency, as long as the aggregate system appears stable (see Comments 3 and 4).

d) Processing Activity

Map 6.1 shows the present locations of processing plants and, as illustrated in Chapter II, the pattern has been different in the past. The reasons for these changes have been discussed in Chapter V.

The locational constraints imposed on local dairy plants is related to the marketing strategies of major food chains. For example, the operators of the plant in Port Alberni say they are capable of doubling their present

output if they could process local supplies instead of having this local milk shipped to the mainland.

Thus, while fixed and variable costs are rising and the plant has to raise output in order to increase its revenues, without markets of its own, the plant is forced to resell this milk to other plants that can market it. In essence, the plant becomes a depot for other plants.

This arrangement, in the short-run, may prove profitable, since the plant does not incur the trans-shipment costs. However, in the long run, rising trans-shipment costs may force farmers either to leave dairying altogether, or maintain output at a certain fixed level. Both options may be detrimental to the very survival of the plant as an economic operation.

The same arguments are applicable to plants in Victoria and Courtenay. They may have selected locations to minimize transfer costs, as illustrated in Chapter V, but in the long run, the very fact that their clients have to ship milk over long distances will reduce their abilities to receive the milk quantities required.

Thus, the present structure of the industry is both inefficient in terms of the duplication of supply and the transportation of milk over long distances, as well as inequitable, in terms of dairying farmers opportunities

to carry out dairying and to receive projected incomes. It is also inefficient in that it makes it difficult for small processors to rationalize their sizes and locational choices. In attempting to rationalize locational choices and sizes of operation, they are made to take measures that may be detrimental to their very survival in the long run.

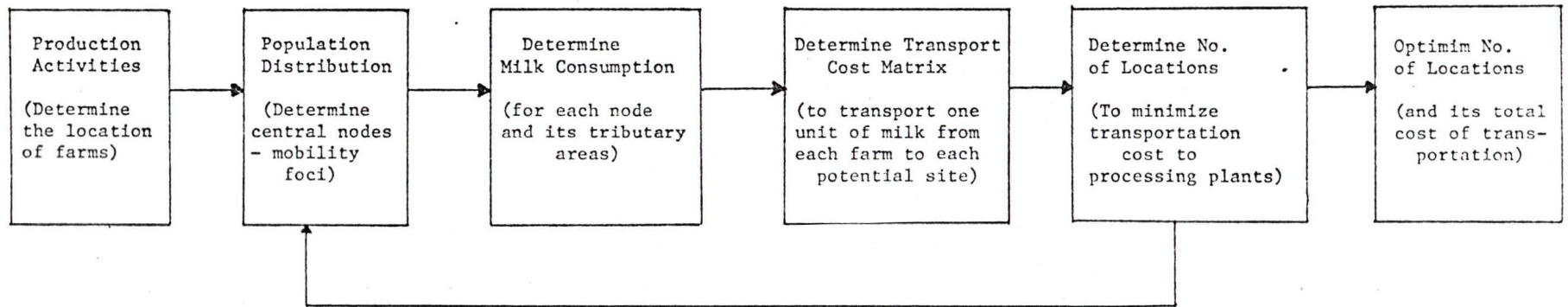
The following section will focus on the removal of the spatial inequality and inefficiencies identified above. To attain this, an idealized model, in which processors rationalize their locations in order to minimize transportation costs incurred by farmers and also distribute processed milk at least cost has been constructed. This is complemented by rationalizing the plant size pattern in order to minimize total processing costs for the industry. By adding minimized transport costs to minimized processing costs, the least operating costs for the whole industry would have been attained, and the benefits from this new arrangement would accrue to farmers, processors and consumers of the region.

6.3 Minimizing Transportation Costs

The following values in the least cost algorithm are defined (see Figure 6.2):

Figure 6.2

Decision Schema for Determining Number of Plants and Allocation of Milk That Would Minimize Transportation Costs



- (a) The determination of the location of farms and output from each farm (X_i).

Map 6.1 shows the distribution of farms on Vancouver Island. Actual output from each farm is shown in Appendix D. Part of the data on output were obtained from returned questionnaires and the rest were obtained from various farmers' organizations. The data shows output in terms of quotas allocated to each farm in 1977. Thus, the data may not reflect the actual amount of milk produced in 1977. However, since farmers are legally expected to produce within a certain range of the quota allocated to them, this provides a close estimate of the amount of milk produced in the same year.

- (b) The unit transportation cost matrix (C_{ij}).

Four firms handle milk on the Island. Three are co-operatives and one is independent. The two co-operative dairies also operate milk hauling trucks to serve members. They charge the lowest rates on the Island, and this is largely due to the fact that all operations come under one management. There is also a co-operative hauling firm operated by farmers which also serves non-members. The fourth company offers services to those farmers not members of a co-operative.

The independent haulage operations charge a wide range of rates. In order to derive a single hauling rate

for the whole Island, the four rates were averaged. Table 6.1 shows the hauling rates for all areas on Vancouver Island.

(c) Selecting potential plant locations.

In Chapter V, the section on spatio-demographic profiles, showed the general pattern of the distribution of population on Vancouver Island. It was also illustrated that the current regional district capitals, Victoria, Duncan, Nanaimo, Courtenay and Alberni, are nodal in terms of general mobility patterns of population. (This may also explain why all major food chains have supermarkets in these cities). The five cities were then selected as potential sites for the location of processing plants.

Simple logic also shows that the greater the number of locations the lower the cost of transportation will be. At the same time, it may be shown that small plants are uneconomic to operate, in terms of economies of scale. The opposite case would be to operate a large plant at one of the locations, that would enjoy lower costs in terms of economies of scale. This, however, may not satisfy spatial equity, as producers and processors would have to spend large sums of money transporting milk.

The solution then, lies between the two extremes. The problem, then, is how to determine the size of plant that would be economic and the distributional pattern that

Table 6.1
Transportation Cost Schedule

Distance From Plant in Km	Cost/100 litres
0 - 99	1.25
100 - 149	1.48
150 - 199	1.59
200 +	1.70

would meet spatial equity criteria. The eligibility of each node for selection as a potential site could then be based on the criteria of equity and efficiency. The five cities selected as potential sites satisfy the above criteria. This can also be verified by inspection of the population distribution in relation to farms (see Maps 5.1 and 6.1). Locating processing plants in any of the smaller cities would not meet the criteria of spatial equity and efficiency.

(d) Assigning milk to plants (X_n).

Fluid milk consumption is assumed to be inelastic with price. This only applies to small price changes in the short run. Large price changes, in the short run, may reduce consumption but as incomes rise, the level of consumption may pick up again. Bartlett (1963) estimated the short run price elasticity to be between -0.2 and -0.5 . On this basis, milk has been assigned proportional to population of each node selected as a potential site. Table 6.2 shows the amount of milk to be assigned to each node from local farms. Since the Island is not self-sufficient in liquid milk production the deficit could be met from mainland sources.

(e) The transportation cost matrix (c_{ij}).

This involves multiplying the cost of transporting one hundred litres to each potential location by the

Table 6.2
Population Size and Milk Assignment

Regional District	Proportion of Island Population	Quantity of Milk Allocated
Alberni	0.7	9,432
Capital	0.52	70,060
Comox*	0.16	21,557
Cowichan	0.11	14,820
Nanaimo	0.14	18,862
TOTAL	1.00	116,731

* Comox population includes Mount Waddington regional district.

distance between each farm and each potential site
(see Appendix

6.4 Selecting the Locational Pattern That Would Minimize Total Transportation Costs For The Industry

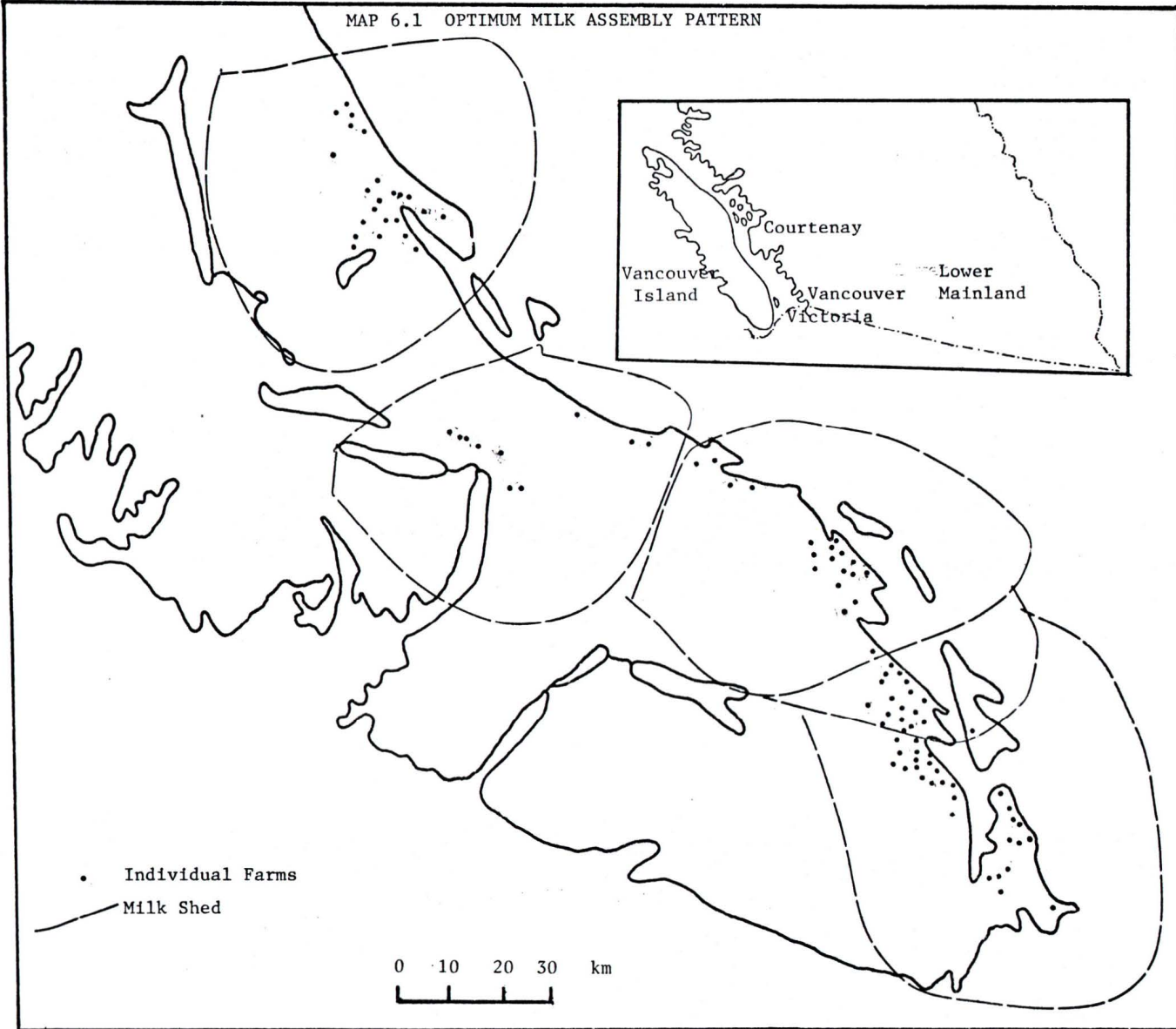
This problem involves selecting the number of locations (n) out of the total possible locations (N) that would minimize total transport costs. In essence, this is an iterative procedure in which transportation costs are calculated for each location and a combination of locations, until the least cost is attained (see Figure 6.2).

The permutations and combinations are too large to be worked without the assistance of a computer. The results of the permutation and combination are shown in Appendix D.

Essentially, the table shows where each farmer should send his milk if he has to minimize his transportation costs. Map 6.1 shows the new pattern of assembling milk on Vancouver Island.

It is also assumed that most people shop in the five nodes selected as potential sites, and as such a small proportion of the milk would be transported to outlying areas, except in the Mt. Waddington regional district and parts of the Alberni-Clayquot regional district. Thus, the industry would save some money it currently spends on transportation.

MAP 6.1 OPTIMUM MILK ASSEMBLY PATTERN



6.5 Results

From the computations, the industry would spend daily \$17,090.93 on assembling milk from farms. Comparing this with the current pattern, \$173.70 would be saved per day, or \$63,402.69 per year. Since all the milk would be sold locally, the industry would also save \$82,343.15 it presently spends shipping milk to the mainland (see Map 6.1 and Table 6.2) (Source: Monthly Reports, Dairy Branch, 1977).

On the distributional side, it is very difficult to estimate the amount of money that would be saved. In the first place, processing plants are unwilling to divulge how much money they spend shipping milk to regions or towns outside the area in which their plant is located. For instance, there is no data on how much plants spend servicing outlying areas like Nanaimo and the Mt. Waddington regions, that are not already serviced by food chains. On the whole, it suffices to mention that there could be less movement of milk from processing plants under the new management strategies.

6.6 Discussion

The location of processing plants is crucial to both processors and producers. If processing facilities are located close to areas of consumption, the industry saves money in terms of transfer costs. Also, as

illustrated in Chapter V, milk producing farms are located close to the five centres. Locating processing plants in these towns would significantly lower costs for producers, in terms of transportation.

Most of the milk sold by local dairies goes to small grocery stores, local independent supermarkets, hotels and restaurants as well as homes. The monopoly exercised by major food chains in major urban centres relegates the rural markets and shops in small urban centres to local dairies. These are very expensive to service. Home deliveries have actually been terminated in all areas except Victoria, and there is a likelihood these too may soon be terminated. If this were to happen, it would cut off up to 15 per cent of the market share of local dairies.

The demise of local dairies and the shops they serve is compounded by land use policies pursued by all urban governments. New developments in urban areas are characterized by the carving out of large shopping complexes, which tend to favour large retail outlets. Each new shopping complex becomes a "convenience" centre. These then take away the market share of local independents. If local dairies have no access to these new economic entities, they are relegated to the "misfortunes" of small grocery stores.

There are no published figures on the proportions of milk sold in food chains and small grocery stores. However, if the recent study on the food industry by the B.C. government (the B.C. Standing Commission on Agriculture, 1978) can be taken as applicable to the dairy industry as well, Safeway supermarkets were shown to be in control of 39 per cent of the food retail trade in the province. This is complemented by Arcus (1973), who demonstrated that major food chains control two-thirds of the retail trade in food. It could then be concluded that major food chains control two-thirds of the retail trade in food in the five urban areas of Vancouver Island mentioned above. Local dairies are then left to service the small urban areas plus the one-third of the market in the five urban areas. Authorities in the Ministry of Agriculture estimate that the industry spends up to \$40,000. per year, shipping milk to consumers on the Island. The total amount spent transporting milk from the farm to processing plants and between processing plants is \$145,745.75 (\$82,343.15 + \$63,402.60). Therefore, the total amount that could be saved, in terms of transportation, is \$185,745.75.

The above amount also reflects what it has cost the dairy industry as a result of the lack of management of the marketing of milk. Also, even if it cannot be proven

explicitly that dairies collapsed in certain areas because of the marketing strategies of major food chains, the resulting inefficiencies in the marketing of milk and the decline of farms in certain locations should have encouraged the government to take remedial action. However, the government has responded by offering subsidies to farmers. Politically, this is an easy course to take because it does not affect the monetary returns of food chains, and farmers receive some share of the "proceeds". The consumers bear the burden of inefficiencies through higher milk prices, and less benefits from their tax contributions.

6.7 The Size and Number of Processing Plants In for the Efficient Structure

Having established the number of locations where processing plants should be located and the amount of milk to be processed in each location, the next step involves determining the total processing costs of the industry. Again, this is an idealized situation in which the processor is considered an optimizer in terms of selecting the least costly plant sizes. The actual selection of locations is assumed to be based on the constraints imposed by minimizing transport costs.

6.8 Determining the Values to be Used In the Algorithm (Figure 6.3)

(a) Selecting the plant size pattern.

Each processing plant has a maximum capacity (X_m) representing the quantity of milk it is capable of processing per normal working day. It also has a lower level, below which it would lose money. The range of plants on Vancouver Island allows the construction of processing costs functions from plants that are barely profitable to ones that are considered efficient.

In the computation of processing cost functions engineering techniques were employed. As illustrated in Chapter IV, this involves taking into account both fixed and variable costs of production. In the absence of data, existing plants were used and the cost functions, thus, reflect the actual performance of existing plants.

To derive the cost functions a number of assumptions were made. First it was assumed that there is no variation in performance between machines of different ages, as well as makes. Workers in the same field suggest the error is small if the machines do not differ significantly in age. Four of the five dairies used machines with a range of six years in age, and the smallest of the dairies used machines that are 10 to 15 years older than the rest. After consulting the engineering department of the Ministry

of Agriculture, they suggested the error could be corrected by adding a cent to the processing costs of the oldest machine.

Secondly, the variable costs included in the computation of processing costs are: depreciation, the cost of utilities and labour. (There are no variations in the cost of labour because of union activity, and the cost of utilities is almost uniform for all parts of the Island). Real estate costs were omitted because one firm considered used family owned land, and other firms tend to relocate when real estate costs increase. Opportunity costs of the land were also left out and lastly, all other inputs were assumed to be uniform for all parts of the Island.

Since processing costs for various sizes of machines tend to overlap, the "tail ends" were "clipped off". Table 6.3 shows the processing cost functions for different sizes of machines on Vancouver Island.

6.9 Algorithm for Selecting the Least Cost Processing Plant Pattern (See Figure 6.3)

For each of the locations selected milk has been allocated to the largest plant possible in order to take advantage of economies of scale. If consumption is below the capacity of the largest plant, the milk would be

Figure 6.3

Algorithm For Minimizing Processing Costs

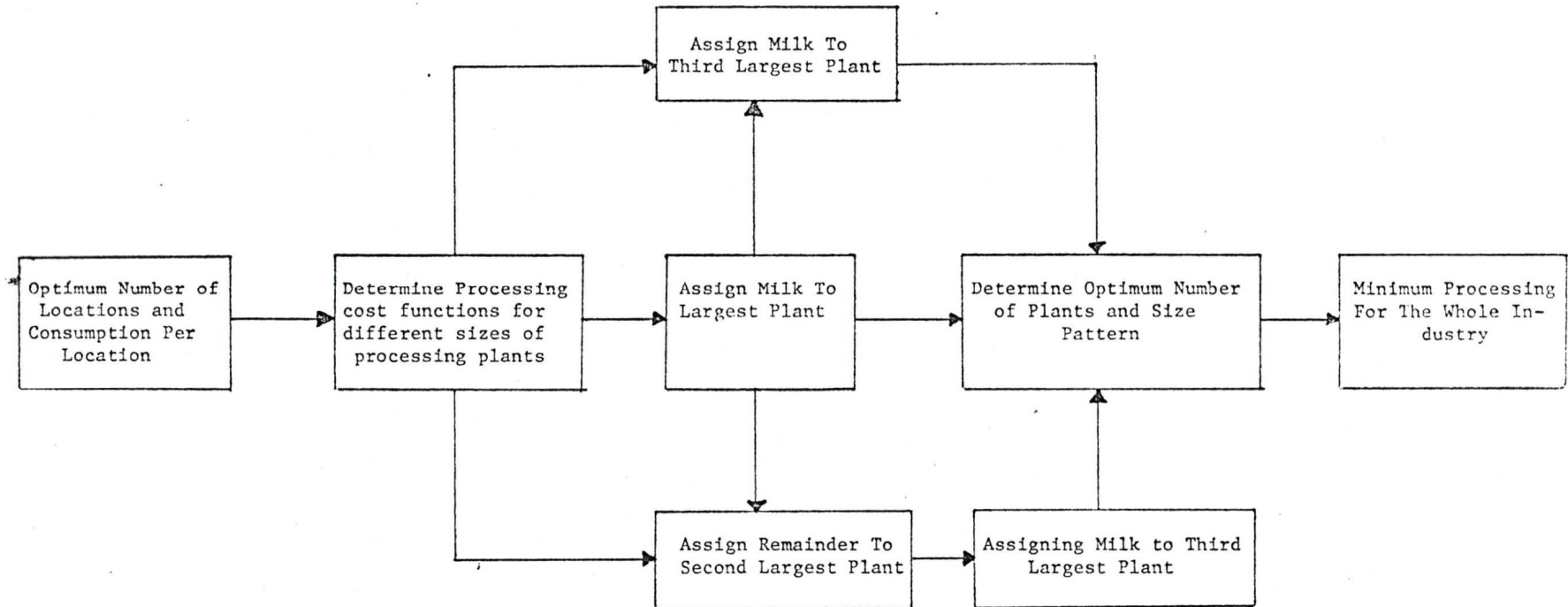


Table 6.3
Processing Cost

Quantity of Milk in litres/day	Processing Cost Per Litre
1) 5,000 - 12,499	61 cents
2) 12,500 - 19,999	54 cents
3) 20,000 - 24,999	46 cents
4) 25,000 - 35,000	42 cents

* Plants processing 30,000 - 40,000 litres are generally considered efficient (Parker, 1973)

shipped to the second largest plant. The assignment of milk follows this iterative procedure until all milk is allocated. Each plant, thus established, would increase in size with increasing demand, until the efficient plant size is attained.

6.10 Results

On the basis of the above solution Victoria would need only two plants processing at least 35,000 litres each per day. This is considered efficient in terms of economies of scale. Above this level, diseconomies of scale appear. New plants would be built in Nanaimo and Duncan and one plant each would be retained for Alberni and Courtney. Table 6.4 shows the number and sizes of plants for each potential location.

6.11 Discussion

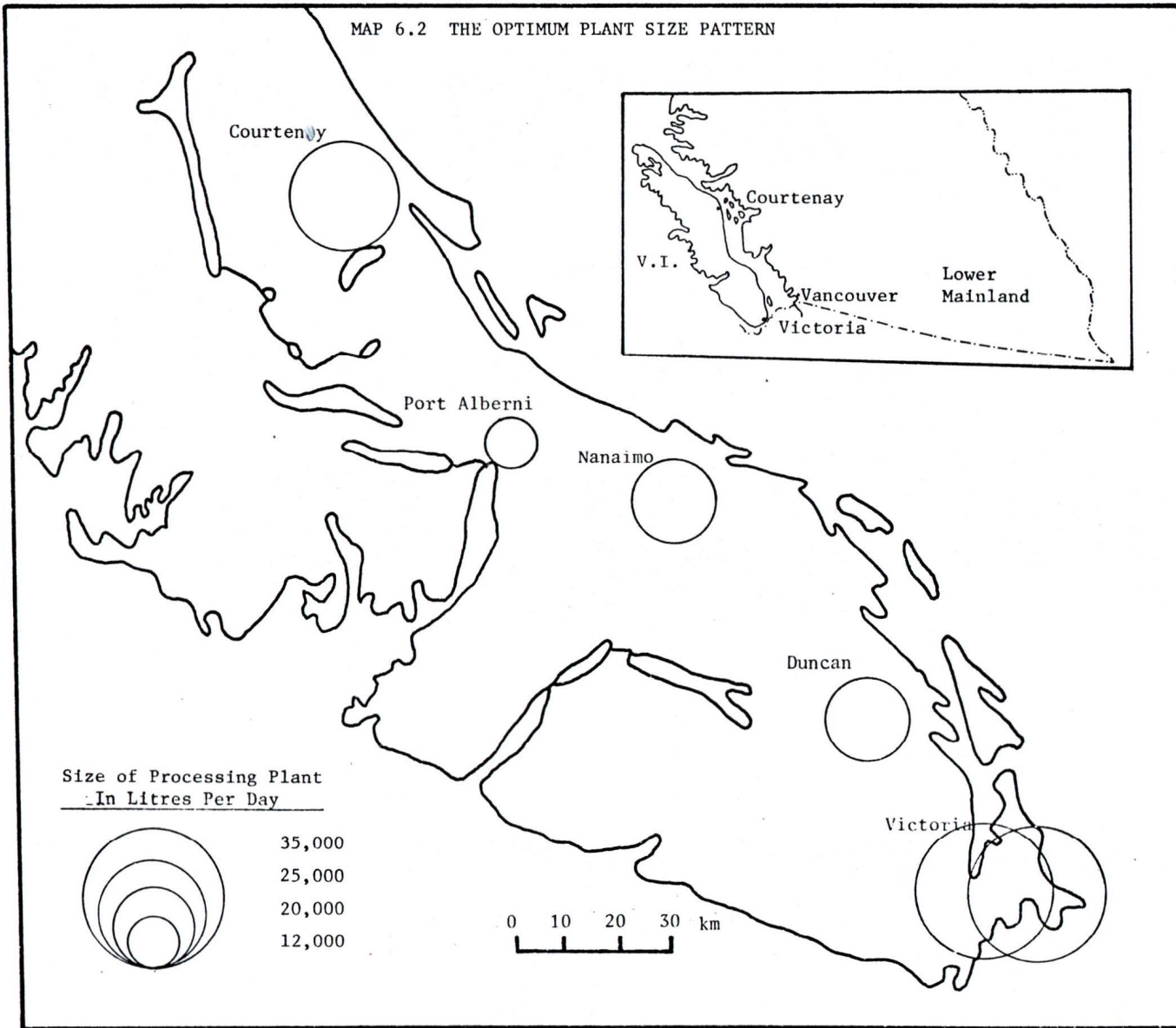
The solution detailed above allows for the monitoring of demand by a constituted authority like the Milk Board, to determine how much milk has to be sent to each of the regional districts. Such information could enable processors to rationalize their decisions with regard to the location of their processing plants. At the moment processors base their locational decisions on the basis of the market, and if the market is dislocated by mono-

Table 6.4
Plant Size Pattern

Location	Quantity Assigned	Plant Size Combination
Victoria	70,060	2 in size #4
Duncan	14,820	1 in size #2
Nanaimo	18,862	1 in size #2
Port Alberni	9,432	1 in size #1
Courtenay	21,557	1 in size #3

See also map 6.2

MAP 6.2 THE OPTIMUM PLANT SIZE PATTERN



polies, it becomes very difficult for a small firm without resources, to monitor economic space, in order to select the best location. Such decisions may be economical in terms of revenues reviewed, but in the long run this may erode the very ability of plants to survive, especially when farmers find it difficult to remain in business.

The solution detailed above is based on data for only one year. It thus appears too rigid, especially when milk demand increases every year. With the arrangement detailed above new plants would be added as demand reaches a certain level. The range in output for each size of plant enables operators to add new machinery without experiencing extra costs (see Table 6.3).

The actual savings realized under the new distribution of plants and size patterns cannot be quantified. The main problem is that the actual output from each of the plants in operation, in 1977, cannot be obtained. Therefore, company costs cannot be computed. In addition, processors are unwilling to reveal their financial standing. However, it suffices to mention that the optimum arrangement, detailed above, would be both efficient and equitable in terms the minimization of transport costs and processing costs.

In conclusion, this chapter has illustrated why and how the dairy industry has become both spatially inequitable and inefficient. Lack of data did not permit the computation of costs incurred by the processing sector, but it did illustrate that the location and size of processing plants was less than optimal.

The spatial inequalities and inefficiencies can be traced to two sources. First, the statute (*The Milk Industry Act*, 1956) permitting the shipment of milk to all regions while controlling output facilitated the domination of the economic space by food chains. It gave them the rationale to integrate backwards into processing.

Secondly, the major food chains have made it difficult for local dairies to serve the farm sector efficiently. In attempting to rationalize their locational choices, they have caused their suppliers to spend more on transportation, and thus sown the "seeds" of their own collapse. Food chains have thus, caused the industry to be inefficient and inequitable in the distribution of gains and losses of its operation.

This dislocation of economic space has not been understood by the government. It has continued to treat failure at each sector of the industry as a problem of inefficiency on the part of those hardest hit by these problems. It has thus failed to perceive the integrating power of

capital in its expansion path, which is largely responsible for dislocating existing market arrangements.

The differential impact of the above developments manifests itself in regional inequalities. For regions that depend on agriculture for their rural income, a decline in the dairy sector, inevitably swells the other sectors with employment seekers. The programme is also wasteful in that it does not employ the resources assigned to agriculture fully. It thus reduces the effectiveness of the Land Policy and programmes to support rural communities.

The hypothesis developed in Chapter IV is thus accepted. *Output management without similar schemes to manage the marketing side, is rendered worthless, in an economic environment dominated by vertically integrated concerns.* Vertical integration manifests itself, in spatial terms, as a process whereby, the total geographic space is subjected to the profit making motives of one centrally located concern. This concern selected the profitable sectors of space, and relegates the rest of space to its competitors. The financial resources it has permits it to outperform its competitors, and since space is not uniformly profitable, the dislocated space controlled by its competitors may not be as profitable as the whole space. As its competitors collapse, it assumes all

those areas they have given up. Port Alberni provides the best illustration. The City of Port Alberni provides the most profitable market for the local plant, but this is also the prime market for food chains. Since over 40 per cent of the population in the regional district reside in the city, and its nodality attracts another 30 per cent for shopping purposes, the local plant remains in control of only sparsely populated areas, as well as shipping milk to other plants.

The opposite is also true. If supply management was complemented by marketing management, or specifically, planned, the optimum conditions described above could result, and the benefits would accrue to both farmers and processors and the general population. In terms of economic development, the circulation of benefits from such a development would contribute to regional prosperity.

CHAPTER VII

SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

. . . the circuits of individual capitals intertwine, presuppose and necessitate one another, and form precisely in this interlacing the movement of total social capital.

Karl Marx, *Capital*, Vol. II, p. 357

7.1 Introduction

The preceding chapters have examined the evolution of spatial inequalities and inefficiency in the dairy industry on Vancouver Island. Solutions to some of them have been suggested on the basis of conclusions reached in this study.

The conceptual framework selected for the analysis of the problems is also crucial to the solutions envisaged. The framework selected for this study sees all problems in the dairy industry as interrelated. Therefore, solutions prescribed for one problem should take into consideration their impacts on the rest of the problems.

The lack of comprehensive policies for dealing with problems in the economy are not limited to the dairy industry, but may be found in the treatment of the economy as a whole. In essence, this is characteristic of the

market approach to economic problems. Such an approach treats each sector of the economy as a separate entity and as such, solutions prescribed may miss the main causes of problems in the system as a whole.

Inevitably, such solutions tend to be partial because they tend to ignore the inter-relationships within the system as a whole. As such, the main causes of the malfunctioning of the system are overlooked. Failure to remove all the "causal factors" partly explains why the system experiences "busts and booms".

The best illustration of the adoption of partial solutions to problems is the "B.C. Land Freeze" which is meant to protect B.C. farmland but lacks a supportive programme to make such land productive. Some of the legislation may even be contradictory. The best illustration for this is the *Dairy Industry Act* (1955) which purports to protect farmers against fluctuations in prices but does not protect farmers against "induced" price increases, such as those that have taken place in the transportation of milk and the resultant duplication of the supply.

The failure of successive governments to solve the problem of rising costs in the dairy sector, and indeed the farm sector as a whole, on Vancouver Island, is seen in this study as a problem of uncontrolled expansion of capital in a free market economy. The State operates like

an input-output system, whereby the inputs are the votes governments in power have to collect and the outputs are the services it has to offer the electorate in order to be elected in successive elections. In a market economy, the input-output system operates by facilitating the accumulation of capital by individuals. And since each holder of capital can only expand the capital they hold by selling more goods, the role of the state is, then, to facilitate sales of goods. The struggles of capital holders manifest themselves in territorial expansion in search of markets. The greater the capital held by each individual in the market, the greater the propensity for territorial control, and since economic space is not infinite, the triumph of one capital leads to the demise of others.

The State has to facilitate all this by enacting legislation and providing the necessary incentives for capital accumulation. Since the triumph of one capital owner leads to the demise of others, the State avoids crisis in the input-output relations by compensating the losers, mainly in form of subsidies or loans. In other words, the State uses taxes it collects from the general population to ensure the smooth operation in the accumulation process. These examples abound in the course of the development of the dairy industry in B.C. The State has used legislation, loans and subsidies to facilitate

the smooth operation of the industry. However, these measures have not remedied the inevitability of crises arising in the accumulation of capital. They have, in fact, restored order in the market without removing the causes of disorder in the market, once and for all. In essence, these are "stop-gap" measures that fall short of total solutions. They, in fact, lengthen the life of the system at a great cost. In other words, they induce inefficiency and spatial inequality, by causing some actors to be indebted to the public through loans and subsidies.

It was also demonstrated that even where planning is advocated, the root causes of problems are never exposed. The manifestation of problems at a particular point in time is taken to be what is worth correcting. Thus, if the problem is related to capital shortage, the solution is to award financial assistance to those experiencing such a problem.

This study has adopted an approach that seeks to expose the main causes of spatial inequality and inefficiency in the dairy industry. Solutions could then be directed to specific causes of problems so that they can be eradicated once and for all.

On the basis of the above conceptual framework, the following conclusions were reached:

1. The problems experienced by the dairy industry, especially the decline of farms in certain locations and the disruption of least cost market arrangements can be blamed on the following items:

(a) The ownership of capital necessary for expansion is not equitably distributed among the participants. The food chains, whose other enterprises include transport, the retail sector, mining, energy, and the manufacture of farm machinery and feeds as well as processing milk, have a greater propensity to control those profitable sectors.

(b) Since it is the mission of capital to expand, and this expansion is facilitated by the sale of goods, food chains integrated backwards into processing milk, and forward into retailing their own milk.

2. At the interface of this expansion, local dairies, on whom farmers depend have been displaced both in terms of market share and spatial location. For instance, the dairies in Duncan and Nanaimo have closed down, and those in Alberni, Victoria and Courtenay, survive by servicing the non-incorporated sectors of the milk market, which because of the sparse distribution or dislocation, is expensive to service. At the same time, they have been forced to ship milk to Vancouver.

3. The spatial shift in the location of processing plants towards the more prosperous centres has caused farmers to spend more on transportation than ever before. Those who have been unable to expand revenues by increasing output, have been forced to sell their farms, or hang on to their land because there are no buyers for their assets.

4. Farmers also incur extra expenses in the shipment of milk to the mainland and where it may fetch less money, if classified as industrial milk, in spite of its having been produced as fresh milk (Class 1).

5. All of these developments have been facilitated by administrative practice which through the Milk Act, curtails output but does not restrict the movement of milk from one Milk Board region and another. This in effect, permits food chains to market as much milk as they can wherever they have outlets, and relegates the local producers to the independent retail outlets.

6. The result has been a total disruption of marketing channels, with dairies throughout the province selling milk wherever they can secure markets.

7. These inefficiencies caused by the duplications in marketing are transmitted to the consumer in form of higher prices, via the Milk Board pricing formula.

8. All these developments take place within the background of an industry which has proven itself to be

productive as far as output per cow is concerned.

Dairy farmers on the Island have managed to produce more milk per cow than any other part of the province despite obvious disadvantages like shortage of land and higher input costs.

9. In four out of the five regional districts producing milk, dairying constitutes over 50 per cent of the total value of output in agriculture.

10. It also purchases over 80 per cent of its inputs from the regions in which it is located; and

11. Above all, it has kept in production land which would have otherwise been left unproductive due to the agricultural "land freeze" (on average 27 per cent of the land used in dairying is rented.)

If the industry were to minimize costs, and assuming that all milk produced locally were to be used on the Island only where demand exceeded supply, would milk be brought in from the mainland.

12. It would save up to \$180,000 per annum in transportation costs; and,

13. This would also involve locating processing plants closer to the market. On the basis of this assumption plants would have to be re-established in Duncan and Nanaimo. The sizes of plants that together with minimized transportation costs would minimize total industry costs

would be as follows:

- (a) Victoria: 2 plants processing between 35,000 and 40,000 litres of fluid milk per day;
- (b) Duncan: 1 plant processing up to 20,000 litres of fluid milk per day;
- (c) Nanaimo: 1 plant processing up to 20,000 litres of milk per day;
- (d) Alberni: 1 plant up to 12,000 litres of milk per day; and
- (e) Courtenay: 1 plant processing up to 25,000 litres per day.

14. The increase in demand would be monitored by a relevant authority.

7.2 Recommendations

The above conclusions form the basis for the following recommendations.

1. In the light of the recurrence of problems in the dairy industry, especially rising costs, and farmers in certain locations being forced to give up farming, the government should revise its policies concerning these problems. Specifically this would involve enacting an ongoing apparatus for monitoring the impact of decisions of the firms involved especially to see how these are translated into the viability of the industry in all parts of the province.

Such an apparatus would also have to assess the value of the industry to the specific regions and the availability of alternative opportunities for both the human and the physical resources of the region. It would also have to assess the cost and benefits of the transformation of these resources.

2. While curtailing output from each farm to stabilize prices, the government would have to examine the extent of integration of the industry to local areas, in terms of markets. In the past the government has ignored the role of vertical integration and how this is capable of dislocating existing markets, especially where the integrated economic concern controls the largest share of the market or has the propensity to control the largest share of the market.

3. The government should also co-ordinate its development policies, so that each sector of the economy can benefit from the other sectors. For instance, programmes to maintain and support the family farm should be complemented by programmes in the marketing of products as well as the conservation of energy.

4. Minimum standards of performance in the dairy industry should be set. Specifically, this should entail the establishment of minimum movement of both raw and processed milk within each Milk Board region, except in situations

where such movements entail satisfying a deficit. In essence, the government would have to re-enact the amendment to the Dairy Industry Act, limiting the movement of packaged milk.

7.3 Implications

The enactment of regulations restricting the movement of milk would benefit both farmers and processors. In the first place it would reduce transportation costs borne by farmers. Secondly, it would enable local processors to market all their milk locally. Lastly, the restriction of milk movement would compell local processors to relocate some of their plants in the mid-Island region, currently without processing plants.

Since name brands are vital to the marketing strategies of major food chains, processors would have to package their milk to be sold in food chain stores under these brand names.

The benefits accruing from such an arrangement would accrue to the regions concerned. These benefits would not only accrue to the processors and the producers, but the local input sector as well as contributing to the lowering of prices of milk.

The solution suggested above focuses on human needs in their spatial setting, as the prime target for policies

in the dairy industry, rather than responding to dictates of the "faceless" market forces. Also, implied is the maximization of economic efficiency. It would also introduce a mechanism monitoring the "ills" of the industry as they occur, without waiting for them to "mature". At the moment farmers are taught that problems they encounter are either of their own making or they are caused by market forces, and because this is an intangible entity; solutions ascribed belong to that intangible realm.

7.4 Future Research

Future research has to focus on the refinement of methodology in two related areas. First it has to focus on the totality of life and how this totality is reproduced over and over throughout the years. Secondly, it has to focus on the refinement of data collection and analysis methods, for it is through these that useful conclusions can be drawn. Each problem area will be discussed briefly and related suggestions made.

It is the opinion of the writer that while it is true that economics shapes the use of resources in space, it is the totality of life that determines everything. This study focussed on the dairy industry within a certain framework of analysis. It could have been

enriched by other events in the cultural, political and social spheres of life. Failure to incorporate this totality and continuity to life obscures the fact that historical study rests on the premise of totality.

Future studies should focus on the affiliation between society and a particular mode of production, not only for the dairy industry, but for other sectors of the economy. Solutions arrived at from such an approach would be more meaningful, in that they would be based on the whole rather than parts. Laws could then be derived to describe the socio-economic formations and their spatial manifestations for the particular mode of production.

The analysis of these formations could also assist in the collection of data. Farmers in B.C. have become accustomed to the notion that problems are either caused by their own incompetence or are the unavoidable workings of the market. These ideas abound in academic circles and the government alike, to such an extent that farmers mistrust anybody associated with such institutions. Specifically, farmers resent the "marginalist" economics which espouses efficiency as the cornerstone for judging performance without reconciling these with real life experiences. For instance, farmers detest being told they are not efficient yet they produce more milk per cow than

in any other part of the province or the nation.

Future research has to devise methods of winning the confidence of the farming community. In designing the questionnaires for this study, farmers assisted in selecting format and content of the questions. Their leaders were also encouraged to spread the idea that the study could be valuable, and also helped in the interpretation of the conclusions reached. Future research should also construct models that would lead to solutions of some of the other problems that are encountered by the farming community. Such models would have to focus on causal factors. The Linear Programming techniques used in this study could only provide solutions under certain limiting assumptions. Some of these assumptions can be removed. For instance, the shopping patterns of people in each regional district could be detailed more explicitly. This would help in the designing of plant sizes and milk distributions patterns.

Other assumptions to be verified include the assumption that milk demand is inelastic with price. This would also help determine the per capita consumption in each region.

In the absence of the above data, the linear programming models used in this study are a refinement of the thumb rule estimation of the spatial location-allocation aspects

of the dairy industry. It is also hoped that the solutions prescribed for dairy farmers on Vancouver Island are applicable to other regions of the province, where the vertical integrated food chains have disrupted the market for local dairy products.

APPENDIX A

THE QUESTIONNAIRE

Department of Geography
University of Victoria
Victoria, B.C.
V8W 2Y2

February 19, 1978

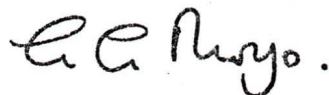
Dear Respondent:

I am a graduate student at the University of Victoria and I am currently undertaking research towards fulfilling requirements for an MA in Geography.

The content of my research has to do with the operation of the Milk Industry on Vancouver Island. Specifically, I am interested in the problems faced by dairy farmers in marketing their product in the light of stiff competition from packaged milk imported from the mainland. I shall be very grateful, if you could furnish me with the information detailed in the accompanying questionnaire and return it to me at your earliest convenience.

Please note that the information provided will be treated in strictest of confidence. The study has no connection with any government agency, dairy group or retail outlet. However, it is hoped the findings will be of help, not only to those concerned with planning agricultural activity but to the dairy farmers on the Island as well, by pointing to areas of cost minimization and effective marketing strategies. If you wish, I could furnish you with a summary report, when the study is completed.

Yours faithfully,



Enoch Moyo

VANCOUVER ISLAND DAIRY FARM SURVEY

A. ABOUT YOURSELF

1. How long have you been a dairy farmer? _____ years
2. Your age (a) less than 30 _____ (b) 30 - 49 _____
(c) 50 - 59 _____ (d) over 60 _____
3. Do you intend to remain in the farm business in the next five years? _____.
4. If not, what do you hope to do with your farm?
 - (a) Sell it _____
 - (b) Transfer it to daughter(s) _____ son(s) _____
relative(s) _____

B. RAW MILK SHIPMENT

Enclosed is a map of Vancouver Island showing the centres where milk processing plants are located.

- (1) Indicate with a dot the approximate location of your farm.
- (2) Insert X on the centre to which you ship your milk.
- (3) What is the approximate distance of your farm from the processing plant to which you ship raw milk.
_____ miles
- (4) Does the amount of milk you ship to this plant vary in different months of the year? _____
- (5) If yes, give average quantities of milk shipped per day in the following months.

<u>Months</u>	<u>Quantity Shipped Per Day</u>
(a) May, June, July, August	_____lb/day
(b) Sept, Oct, November	_____lb/day
(c) December, January, Feb, March, April	_____lb/day
(d) How long have you shipped milk to this plant?	_____ years

C. ACRES IN FORAGE CROPS

Please enter the number of acres in grass-legume, pasture, hay, silage, and corn silage, by year, under the following headings:

<u>Year</u>	<u>Forage Acres Owned</u>		<u>Forage Acres Rented</u>	
	<u>Irrigated</u>	<u>Non-Irrigated</u>	<u>Irrigated</u>	<u>Non-Irrigated</u>
1974				
1975				
1976				
1977				
1978				

D. DAIRY HERD SIZE

- Number of cows milked in 1973 _____
- Number of cows milked in December 1977 _____
- If the dairy herd has risen between 1973 and December 1977 what approximate percentage of cows were:
 - stock raised on your farm _____ %
 - purchased on the Island _____ %
 - outside the Island _____ %

E. FLUID QUOTA

- Did you obtain quota in

1974 by purchase _____ lbs	by building _____ lbs
1975 by purchase _____ lbs	by building _____ lbs
1976 by purchase _____ lbs	by building _____ lbs
1977 by purchase _____ lbs	by building _____ lbs
- What is the size of your quota now? _____ lbs

F. LABOUR REQUIREMENTS

The following categories are used:

- Hired labour is all labour including paid family labour employed on the farm.
- Unpaid family labour includes sons and daughters who work on the farm as part of family help.

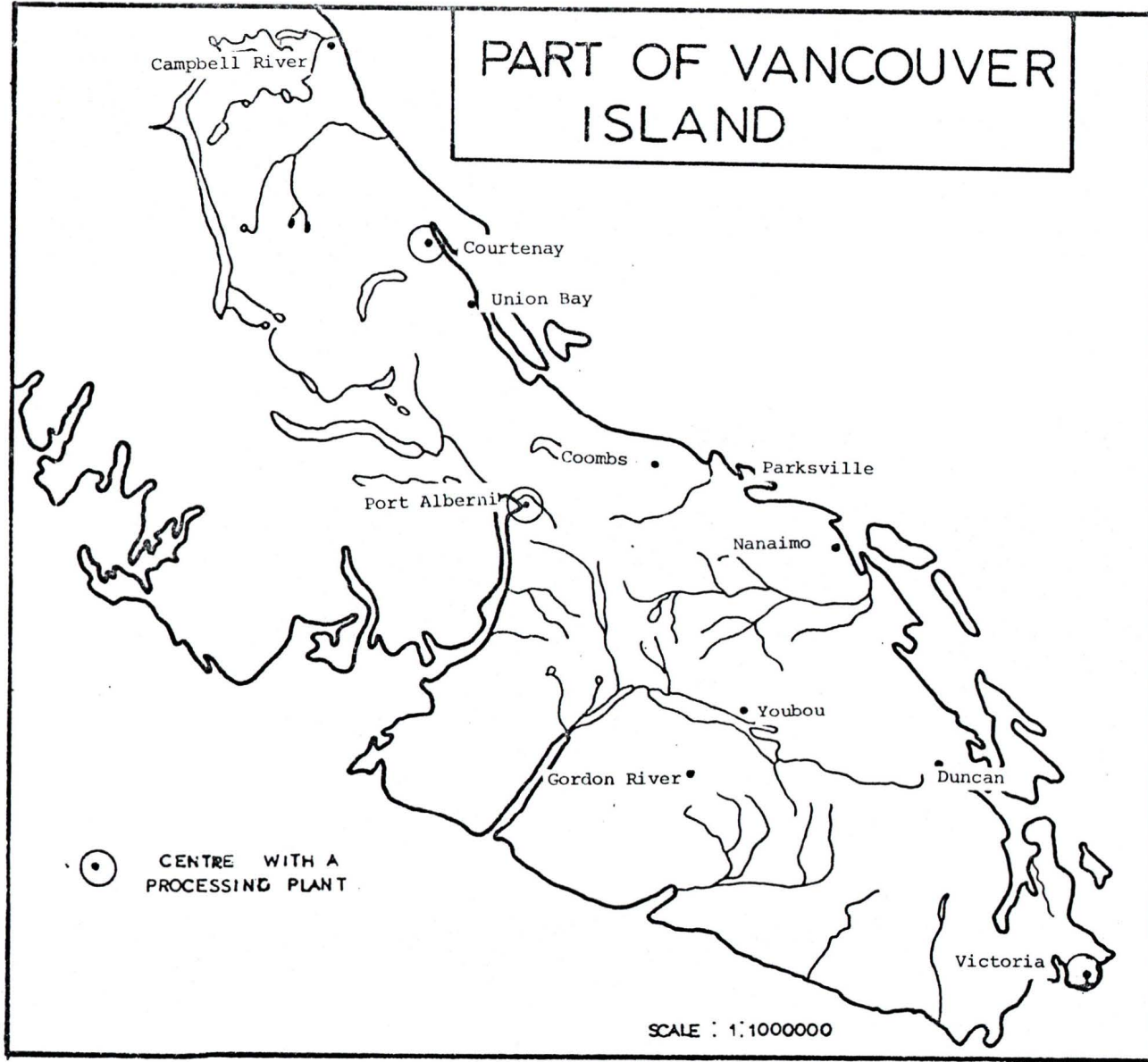
- Number of people employed in 1977.

Enter the details below.

<u>Full Time</u>	<u>Total Part Time</u>	<u>Total No. of Months</u>
<u>In 1977</u>	<u>In 1977</u>	<u>of Pt Time</u>

Hired

Unpaid



APPENDIX B

THE MILK INDUSTRY ACT

There have been a number of revisions since the Act's inception. The 1977 Milk Industry Act incorporates all the revisions that have been made.

APPENDIX C

COMPUTER PRINT-OUT ON MILK ASSIGNMENT
AND PLANT LOCATIONS

APPENDIX D

COMMENTS ON THE MILK INDUSTRY

The comments were selected from a number sent by dairy farmers on Vancouver Island. They are presented in their original form.

COMMENT NO. 1

1. If we did not ship our excess milk to Vancouver we would have full utilization here on the Island. Means more dollars circulating here on Island

2. We feel the dairy industry on the Island is an important sector of the economic structure, we create jobs, and, of course, circulate dollars. Also feel the consumer is unaware of how important agriculture is to our province's well being, they also do not feel it important enough to understand the complexities of the industry and will only become aware when it is too late, the product they want will not be on the shelf from a local source but a very high priced import controlled by multi-national corporations.

COMMENT NO. 2

1. The problem in the Alberni Valley is that all the milk from the eight farmers could be utilized here on the fluid market; however, Super Value and Safeway bring in their own brand and some of our milk is trucked to Vancouver or Victoria and probably comes back here in a different carton. Its madening when you think of the waste in energy.

COMMENT NO. 3

1. If you truly are interested in the marketing aspect of the milk industry on the Island, it might interest you to know that in the Port Alberni area the local processing plant cannot get local milk placed on the shelves of several large chain stores (Safeway, Super Value) because the processing plant workers do not belong to the stores unions and therefore cannot work inside the stores. The union workers in the store do not appear to be willing to stock the shelves (if the processing plant is lucky enough to get shelf space); this most likely is because management prefers to handle the chain brand of milk - which is all brought in from the mainland. It might be noted that the local processor has even offered to carton local milk in chain brand cartons, however, this offer was turned down.

2. As a consequence even though local dairy farmers produce less than a third of the locally consumed milk approximately one-half of their production is shipped to the mainland where it is packaged and shipped back to the Island.

3. Obviously the transportation costs could be saved both ways on the locally produced milk which is being shipped out as well as giving the consumer a fresher product. In our energy conscious world the need exists for some legislation which will stop this useless depletion of a non-renewable resource.

COMMENT NO. 4

AGRICULTURAL LAND - PRESENT AND FUTURE REQUIREMENTS

Mr. Chairman and Members of the Select Standing Committee on Agriculture:

Because Agriculture land is frozen, nothing can be done with it, except farming.

At the present cost of farm land, plus the taxes having to be paid on this land, it is impossible to get any return on the investment, with the exception of market gardening or dairying types of farming.

There are millions of dollars spent every year to import food stuffs that could be produced here, on the Island, if the land were available at a price that would insure cost of productions; (just a few items imported are - beef, sheep, hay for dairy cows).

We certainly think that the tax on farm land has to be adjusted if we are going to keep the cost of production down. Also we suggest that the services to the land, be taxed to that land; (e.g. irrigation, dyking, ditching). Services to people, be taxed on the home and Homesite principle (e.g. schooling, hospitals, recreation, police, fire).

There are a few items in the Land Freeze that certainly need some attention.

1. The right to drain the land and keep the waterways in a proper condition so to enable the farm to be operated in a satisfactory manner.
2. The Fisheries Department, the Wild Life Department, and the Environmentalists seem to think they should have some say in what must be done on certain farms. If these people make drainage and other conditions such that the farmers cannot operate or grow crops economically, then the Land Commission should release the farm from A.L.R. or purchase it from said farmer, that he may relocate.
3. Another area of concern would be the land that is not economical to farm at the present time, but might be needed in 50 to 100 years hence. It seems to us that this land should be either released from the A.L.R. or purchased by the Land Commission, at market value. The A.L.R. release could have certain restrictions starting for example; 20 acre lots and only certain types of buildings that may be depreciated over 30 to 50 years, with a covenant. Then, the land, if needed, could be reinstated in the A.L.R. This land that we are relating to would likely grow trees, grain and other fodder, but, with the market value of land today, and the present tax structure, on land, it certainly makes for an uneconomic operation in today's farm business.

COST OF AGRICULTURAL PRODUCTION AND THE IMPACT
OF MARKETING BOARDS ON PRODUCERS AND CONSUMERS

The dairymen on Vancouver Island recognize the need of the Marketing Board.

Marketing Boards are a necessity, in today's agriculture, because of the high costs of financing a viable farm enterprise. We have the problem of the dairy farm, where large capital requirements are needed to set up an operation that would return an income comparable to other sections of our society. With the amortization of these costs over a 15 to 20 year period, there is no hope of getting the needed replacements of up-coming investment and labour. The only way that we see of getting this assurance is in an "orderly Marketing system", such as we have in the dairy industry, today.

The dairy farmers on Vancouver Island are very much aware of the necessity to have a Milk Board that controls a fluid milk quota system.

It is only within such a system that we can guarantee a constant supply of milk to the consumer and also have stability in the industry. The dairy industry need the Milk Board to control the flow of fluid milk in such a way that we can recover our cost of production.

The cost of producing milk on Vancouver Island is 60 to 70 cents per 100 lbs. more than anywhere else in B.C. This fact is recognized by the B.C. dairy industry.

Factors causing our higher cost of production include:

- Services not as readily available because around 125 dairy farms are scattered all over Vancouver Island.
- Cull cows, going to slaughter, shrink more because of the long haul. The cost of the hauling comes to \$20 to \$25 per head.
- Feed and labour costs tend to be higher.

The only way to recover our higher cost is to have a higher percentage of our milk utilized on the fluid market.

The production of milk, on Vancouver Island, does not meet the Class I needs of Vancouver Island. Thus, we recognize the need for some milk to come from the Mainland Pool. We are suggesting the utilization of Island quotas be 10% higher than the Mainland quota utilization, thus returning the Island producers their extra costs of production.

The cost of home delivery for milk is becoming so great, that some home deliveries have already stopped for economic reasons. This means that more and more milk will be sold through the super-market outlets.

We can very well understand that the super-markets, who operate their own dairy plants, will try to sell their own brand of milk, first. This super-market milk is Mainland Pool milk and does not help our utilization of fluid milk, as Vancouver Island is a different Milk Board area.

At the same time, some Vancouver Island milk has to be transported to the Mainland manufacturing plants, at a great cost to the Vancouver Island producers, with no benefit to any consumer.

While fuel energy supplies are dwindling and the cost of this fuel is rising, it becomes necessary to produce food as close as possible to where it is consumed. The costs of transportation of milk from Island to Mainland and Mainland to Island, is using far too much fuel energy and is absolute nonsense. If the dairy industry, on Vancouver Island, is to survive, we strongly recommend that the government compel the chain stores to utilize Vancouver Island milk before milk is allowed in from the Mainland Pool. This would not increase the price to the consumer but would go a long way to help solve the problem we are facing.

We sincerely thank the Select Standing Committee on Agriculture for the opportunity of presenting this Brief.

BIBLIOGRAPHY

- Ackley, G. (1942) "Spatial Competition in a Discontinuous Market," *Quarterly Journal of Economics*, 56: 212-230.
- Allen, K. and Hermansen, T. (1968) "Economic Growth: Regional Problems and Growth Centres," in *Regional Policy in E.F.T.A. an Examination of the Growth Centre Idea*. Edinburgh.
- Amin, S. (1974) *Accumulation on a World Scale*. Vol. I. Monthly Review Press. New York and London.
- Annual Reports. B.C. Ministry of Agriculture. (1891-1977).
- Asch, P. (1970) *Economic Theory and the Anti-Trust Dilemma*. Wiley, New York.
- Barnbrock, J. (1974) "Prologomenon to a Methodological Debate: The Case of Von Thunen," *Antipode*, 6: No. 11, 59-66.
- Bartlett, E.W. (1963). "Potential Expansion of Sales of Fluid Milk as Related to Demand - Elasticities," *University of Illinois Agricultural Economics Bulletin* 7: 24-39.
- Boehm, W.T. and Conner, M.C. (1976) "Technically Efficient Milk Assembly and Hard Product Processing for the South Eastern Dairy Industry," *Virginia Polytechnical Institute and the State University Division, Bulletin* 122.
- Bramhall, D.F. (1969) "An Introduction to Spatial General Equilibrium" in Karaska, G.J. and Bramhall, D.F., *Locational Analysis for Manufacturing: A Selection of Readings*, M.I.T. Press.
- Cameron, G.C. (1968) "The Regional Problem in the United States: Some Reflections on a Viable Strategy," *Regional Studies*.

- Chamberlain, E.H. (1936) *The Theory of Monopolistic Competition*. Harvard University Press.
- Chern, W. and Polopolus, L. (1970) "A Discontinuous Plant Cost Function and the Modification of the Stollsteimer Location Model," *American Journal of Agricultural Economics*, 52: 580-586.
- Chisholm, M. (1962) *Rural Settlement and Land Use: An Essay on Location*, London.
- Cobia, D.W. and Babb, E.M. (1964) "Determining the Optimum Size of Fluid Milk Processing Plants and Sales Area," *Purdue Agricultural Experimental Station Research Bulletin* 778.
- Conner, M.C., Boehm, W.T. and Purdue, T.A. (1976) "Economies of Size in Processing Manufactured Dairy Products and Implication for the Southern Industry," *Southern Journal of Agricultural Economics*, 8: 103-108.
- Corraggio, Jose L. (1977) "Social Forms of Space Organization and Their Trends in Latin America," *Antipode*, 9: No. 1, 14-28.
- Crown, R.W. and Heady, E.O. (1972) *Policy Integration in Canadian Agriculture*. The Iowa State University Press.
- Cyert, R.M. and March, J.G. (1963) *Behavioral Theory of the Firm*. Prentice-Hall.
- Dear, M. and Clark, G. (1978) "The State and the Geographic Process - A Critical Review," *Environment and Planning*, 10: No. 2, 173-183.
- Dunn, E.S. (1954) *The Location of Agricultural Production*. University of Florida Press, Gainesville.
- Dye, T. (1972) *Understanding Public Policy*. Prentice Hall and Englewood Cliffs, New Jersey.
- Fetter, F. (1924) "The Economic Law of Market Areas," *Quarterly Journal of Economics*. 38: 520-529.

- Frank, A.G. (1971) *Capitalism and Underdevelopment in Latin America*. Harmondsworth, England.
- Friedman, J. (1961) *Integration of the Social System: An Approach to the Study of Economic Growth*. Zurich, Diogenes.
- _____. (1966). "The Urban-Regional Frame for National Development," *International Development Review*.
- _____. (1967) *A General Theory of Polarized Development*. Santiago de Chile, (mimeographed).
- Gold, D.A., Lo, C.Y.H. and Wright, E.O. (1975) "Recent Developments in Theories of the Capitalist State," *Monthly Review*, 27: No. 6, 36-51.
- Greenhut, M.L. (1956) *Plant Location in Theory and Practice: The Economics of Space*. Chapel Hill.
- Grubel, H.G. and Schwindt, R.W. (1977) *The Real Cost of the B.C. Milk Board*. The Fraser Institute, Vancouver.
- Harcourt, G.C. (1969) "Some Cambridge Controversies of the Theory of Capital," *Journal of Economic Literature*, 7: 369-405.
- Harvey, D. (1973) *Social Justice and the City*. John Hopkins Press, Baltimore.
- _____. (1975) "The Political Economy of Urbanization in Advanced Societies. The Case of the United States," *The Social Economy of Cities, Urban Affairs Annual Review*. 9, Sage Publications, Beverly Hills.
- Hermansen, T. (1968) *Interregional Allocation of Investment for Social and Economic Development*. UNRISD Geneva (mimeographed).
- Hilhorst, J.G.M. (1967) *Regional Development Theory. An Attempt to Synthesize*. Mouton, The Hague.
- Hoover, E.M. (1937) *Location Theory and the Shoe Trade Industry*.
- _____. (1971) *An Introduction to Regional Economics*. Alfred A. Knoff, New York.

- Hotelling, H. (1929) "Stability in Competition," *Economic Journal*, 39: 41-57.
- Isard, W. (1956) *Location and the Space Economy*. M.I.T. Press.
- Josling, J.T. and Trant, G.I. (1966) *Interdependence Among Agricultural Sectors*. Government Printer Ottawa, Canada.
- King, G.A. and Logan, S. (1964) "Optimum Location, Number and Size of Processing Plants with Raw Product Shipments," *Journal of Farm Economics*, 46: 94-108.
- Kloth, D.W. and Blakely, L.B. (1971) "Optimum Dairy Plant Location With Economic Size and Market Share Relations," *American Journal of Agricultural Economics*, 53: 461-466.
- Krumme, G. (1969) "Towards a Geography of Enterprise," *Economic Geography*, 45: No. 1, 30-39.
- Kuklinski, A. (1969) *Goals in Regional Policies and Objectives in Regional Planning*. U.N.R.I.S.D. Seneva.
- Lea, A.C. (1978) *A Model Taxonomy and a View of Research Frontiers in Normative Locational Modelling*. Unpublished Paper presented to the International Symposium on Locational Decisions, Banff, Alberta.
- Lee, R. (1976) "Surprise and Counter-Production in Radical Geography," *Area*, 8: No. 1, 11-14.
- Lerner, A.P. and Singer, H.W. (1937) "Some Notes on Duopoly and Spatial Competition," *Journal of Political Economy*, 45: 145-186.
- Losch, A. (1954) *The Economics of Location*. New Haven.
- Massey, D. (1973) "Towards a Critique of Location Theory," *Antipode*, 5: No. 3, 33-39.
- Miliband, R. (1969) *The State in Capitalist Society*. Basic Books, New York.
- Misra, R.P. (1969) *Regional Issues, Investment Criteria and Strategies for Development*. Paper Presented to the International Geographic Union Congress, New Delhi.

- Mitchell, D. (1975) *Food Politics*. James Lorimer and Company, Toronto.
- Morrill, R. (1974) "Efficiency and Equity of Optimum Locations," *Antipode*. 6: No. 1, 40-44.
- Moses, L.N. (1958) "Location and the Theory of Production," *Quarterly Journal of Economics*, 73: No. 2, 259-272.
- O'Connor, J. (1973) *The Fiscal Crisis of the State*. St. Martins Press, New York.
- Offe, C. and Ronge, V. (1975) "Theses on the Theory of the State," *New German Critique*. 6: 137-147.
- Olson, G. (1975). "Servitude and Inequality in Spatial Planting: Ideology and Methodology in Conflict," *Antipode*, 7: No. 3, 10-21.
- Parker, R.C. (1973). *Economic Report of the Dairy Industry. Staff Report to the Federal Trade Commission*. Washington, D.C. U.S. Government Printer.
- Pahl, R.E. (1965). "Trends in Social Geography" in Chorley and Haggett (eds.), *Frontiers in Geographical Teaching*. Methuen, London.
- Palander, T. (1935) *Beitrage zur Standorttheorie Aemqvist and Wiksell's*. Boktryckeri.
- Parbly, A., Fumare, O., Faminow, M., and Hawkins, M.H. (1976) "A Critique of the Mallen Report," *Canadian Journal of Agricultural Economics*, 24: No. 3, 40-49.
- Peet, R. (1975). "Inequality and Poverty: A Marxist Geographic Theory," *Annals of the Association of American Geographers*, 65: 564-571.
- _____. (1975). "Rural Inequality and Regional Planning," *Antipode*, 7: No. 3, 10-24.
- Poulantzas, N. (1969) "The Problem of the Capitalist State," *New Left Review*, 58: 67-78.
- _____. (1976). "The Capitalist State: A Reply to Miliband and Laclau," *New Left Review*, 95: 63-83.

- Pred, A. (1967). *Behaviour and Location*. Lund.
- Robinson, J. (1934). *The Economics of Imperfect Competition*. MacMillan, London.
- Santos, M. (1977). "Society and Space: Social Formation as a Theory and Method," *Antipode*, 9, No. 1, 3-13.
- Shapiro, N. (1976). "The Neo-Classical Theory of the Firm," *The Review of Radical Political Economy*, 8: No. 4, 17-29.
- Smith, D.M. (1966) "A Theoretical Framework for Geographic Studies of Industrial Location," *Economic Geography*, 42: No. 2, 95-103.
- _____. (1971). *Industrial Location: An Economic Geographic Analysis*. John Wiley and Sons, New York.
- Smithies, A.F. (1941). "Optimum Location in Spatial Location," *Journal of Political Economy*, 49: 423-439.
- Stollsteimer, J.F. (1963). "A Working Model for Plant Numbers and Locations," *Journal of Farm Economics*, 45: 631-645.
- Todtling, F., and Stohr, W. (1977). "Spatial Equity: Some Antitheses to Current Regional Development Doctrine," *Papers of the Regional Science Association*, 3: 33-53.
- Weber, A. (1929). *The Theory of the Location of Industry*. Chicago.
- Williams, S.W. (1977) "Internal Colonialism, Core-Periphery Contrasts and Devolution: An Integrative Comment," *Area*, 9: No. 4, 272-278.
- Wolpert, J. (1964) "The Decision Process in the Spatial Context," *Annals of the Association of American Geographers*, 45: 350-367.
- Wood, P.A. (1969) "Industrial Location Linkage," *Area*, No. 2, 22-39.
- Von Boventer, V. (1969) "Towards a United Theory of Spatial Structure," *Papers of the Regional Science Association*, 10: 163-180.

Von Thunen, J.H. *Der Isolierte Staat in Beziehung auf Landwirtschaft und National-oekonomie*. Jena, 1921. Part I and Part II (first published in 1826, Part I and 1850 Part II. English translation by Peter Hall (1966). *Von Thunen's Isolated State*, Pergamon and W.B. Dempsey's (1960) *Frontier Wage* contains Part II.

VITA

Surname: MOYO Given Names: ENOCK EPHRAIM ELOTTE

Place of Birth: WEST NICHOLSON, RHODESIA

Date of Birth: OCTOBER 8, 1949

Educational Institutions Attended, with Dates of Entering and Leaving:

UNIVERSITY OF MAKERERE, KAMPALA 1972 to 1975

UNIVERSITY OF VICTORIA, B.C. 1976 to 1979

Degrees, Diplomas, Etc., Awarded, with Dates and Names of Institutions:

B.A. Honors 1975 University of Makerere,
Kampala

Honors and Awards:

World University Service 1970 University of Rhodesia

United Nations Education and Technical Programme for

Southern Africans 1972-1975 (University of Makerere)

University of Makerere, Award for Publications, 1975

University of Victoria Teaching Assistantship 1977/1978

Canadian International Development Agency 1977/1978

Publications:

Moyo, E.E. *Tswana Settlement Structures Occasional Paper*

No. 60, Department of Geography, University of Makerere

(1975).

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Title of Thesis/Dissertation

A STUDY OF THE SPATIO-TEMPORAL C OMPETITION IN THE DAIRY INDUSTRY:
WITH PARTICULAR REFERENCE TO VANCOUVER ISLAND.

Author



(Signature)

ENOCK EPHRAIM ELNOTTE MOYO

Name (in block letters)

12th December 1978

(Date)

CHAPTER 243

Milk Industry Act

[Consolidated for convenience only, January 20, 1978.]

1. [Repealed. 1973 (2nd Sess.), c. 128, s. 1.]

Interpretation.

2. In this Act, unless the context otherwise requires,

“analyst” means any analyst appointed by the Government of Canada or by the Government of British Columbia and having authority to make analyses for any public purpose;

“Board” means the Milk Board constituted under this Act;

“cattle” means cows and goats;

“dairy-farm” means a place where cattle are kept for milking;

“dairy-farmer” means the owner or occupier of a dairy-farm, and includes the manager or other person in charge of a dairy-farm;

“dairy plant” includes every place or building

(a) where milk is received from dairy-farmers; or

(b) where dairy products are processed, manufactured, or pasteurized, except where the processing, manufacture, or pasteurization consists only of

(i) the incidental manufacture of butter or cheese by a dairy-farmer from milk produced only on his dairy-farm; or

(ii) the operation and use of any freezing device in a retail store by means of which ice-cream mix, purchased from a licensed manufacturer of the mix, is frozen;

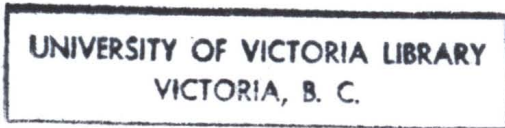
“dairy-plant personnel” means persons engaged in specific duties in relation to dairy products for the performance of which licences are required under standards and qualifications established by regulation;

“dairy product” means milk, butter, cheese, condensed milk, evaporated milk, milk powder, dry milk, ice-cream, malted milk, sherbet, or any other product manufactured wholly or mainly from milk;

“imitation milk product” means any food substance other than milk or a manufactured milk product, of whatever origin, source, or composition, that is manufactured for human consumption and for the same use as or in semblance of milk or a manufactured milk product, and that is manufactured wholly or in part from any fat or oil other than that of milk;

“Inspector” means any Inspector under this Act;

“jobber” means any person who regularly distributes milk, and who obtains such milk packaged, ready for distribution, from



- any vendor, but does not include any person who sells milk at retail in any store;
- “licence” includes a renewal thereof;
- “manufactured milk product” means a dairy product other than milk in fluid form;
- “milk” means milk obtained from cattle, and includes cream;
- “milk in fluid form” means raw or pasteurized fresh milk, and includes sterile milk or milk specially treated to achieve extended keeping quality or the appearance of freshness that is sold, offered for sale, or supplied for the same use or in semblance of fresh milk, but does not include reconstituted milk;
- “Minister” means the Minister of Agriculture;
- “ministry” means the Ministry of Agriculture;
- “municipality” includes a village municipality;
- “package” means a receptacle or covering used for the packing, wrapping, containing, or covering of milk or a manufactured milk product;
- “pasteurized,” in relation to dairy products, means the treatment for the purpose of the destruction of harmful bacteria as provided for by regulation;
- “producer” means any dairy-farmer who produces milk;
- “producer-vendor” means any person who distributes milk produced by his own cattle, but does not include a partnership, corporation, or co-operative association owning or controlling more than two dairy-farms upon which milk qualifying for the fluid market is produced;
- “qualifying milk” means milk which
- (a) is produced on an approved fluid-milk dairy-farm or an approved raw-milk dairy-farm certified as such; and
 - (b) meets such standards for such milk as may be prescribed by regulation hereunder;
- and “qualifying for the fluid market” has a similar meaning;
- “qualified producer” means a producer who produces qualifying milk;
- “raw milk” means milk which has not been pasteurized;
- “reconstituted milk” means milk remade or compounded in a manner provided for by regulation;
- “vendor” means any person dealing in milk, whether by purchase or sale or on the basis of delivery on consignment for sale, and includes agents for producers and co-operative associations, which agents and co-operative associations sell and distribute milk produced by their principals or by the members of such associations, and includes a jobber and a producer-vendor, but does not include a producer as such. 1956, c. 28, s. 2; 1962, c. 38, s. 2; 1963, c. 26, s. 2; 1966, c. 28, s. 2; 1968, c. 28, s. 2; 1977, c. 75, c. 57 (proc. eff. Oct. 21, 1977).

PART I

PROVISIONS AS TO PRODUCTION OF MILK

General farm requirements.

3. Every dairy-farmer shall maintain on his farm suitable milk-houses, housing for cattle, a sufficient supply of pure water, facilities for providing a sufficient supply of hot water, sufficient facilities for cooling milk, and shall use safe and clean methods of production, all in accordance with standards which shall be set by regulations hereunder, and shall not deliver or sell milk from any cow or goat which is suffering from any disease. 1956, c. 28, s. 3.

Classification of farms.

4. (1) A dairy-farm may be classified as

- (a) an approved raw-milk dairy-farm;
- (b) an approved fluid-milk dairy-farm; or
- (c) an approved manufacturing-milk dairy-farm.

Certificates.

(2) A dairy-farmer who owns, occupies, manages, or is in charge of a dairy-farm classified under subsection (1) shall comply with the standards established by regulation; and upon proof of his compliance with this Act, the *Animal Contagious Diseases Act* of Canada, and with the *Contagious Diseases (Animals) Act* and the regulations thereunder, the Minister or an Inspector may issue to the operator a certificate setting forth that the farm is approved in the class and for the sale of milk for the purpose stated in the certificate.

Evidence.

(3) The certificate of the Minister or an Inspector is conclusive evidence that the dairy-farm is approved in the class and for the sale of milk for the purpose stated in the certificate. 1956, c. 28, s. 4; 1962, c. 38, s. 3; 1963, c. 26, s. 3.

No sale of milk except from approved farms.

5. (1) No person shall sell, offer for sale, or supply milk in fluid form unless the owner or operator of the dairy-farm on which the milk is produced is, in the case of milk which will be sold or supplied as pasteurized fluid milk, the holder of a subsisting certificate classifying his farm as an approved fluid-milk dairy-farm, and, in the case of milk to be sold or supplied as raw milk, subject to section 6 hereof, is the holder of a subsisting certificate classifying his farm as an approved raw-milk dairy-farm.

Idem.

(2) No person shall, save as permitted by regulation made hereunder, sell, offer for sale, or supply milk or cream to be manufactured into a dairy product unless the owner or operator of the dairy-farm on which the milk or cream is produced is the holder of a subsisting certificate classifying his farm as an approved manufacturing-milk dairy-farm.

(3) Subsection (2) comes into force and effect on a day to be fixed by the Lieutenant-Governor in Council by his Proclamation. 1956, c. 28, s. 5; 1962, c. 38, s. 4.

Sale of raw and pasteurized milk.

6. (1) No person shall sell, offer for sale, or supply any dairy product except cheese sold or offered for sale in compliance with the *Food and Drugs Act* of Canada

(a) in any municipality having a population of more than five hundred persons; or

(b) in any unorganized territory defined by the Lieutenant-Governor in Council as a milk pasteurization area,

unless the dairy product has been pasteurized in accordance with this Act and the regulations. The Lieutenant-Governor in Council may, in the order defining a milk pasteurization area, provide for the sale within the area of raw milk from approved raw-milk dairy-farms subject to whatever requirements, restrictions, and exceptions may be provided therein.

By-laws.

(2) Notwithstanding subsection (1), the Municipal Council may, if it deems it advisable in the public interest, by by-law provide that raw milk produced on approved raw-milk dairy-farms may be sold in the municipality, and a copy of the by-law shall be filed with the Minister.

Labels.

(3) The containers in which raw milk is sold or offered for sale shall be clearly labelled in letters not less than one-eighth inch in height with the words "not pasteurized" or "raw milk".

Evidence of sale.

(4) Dairy products shall be deemed to be for sale if

(a) contained in closed retail packages on the premises or delivery truck of a vendor or producer-vendor or in a retail store, unless conspicuously labelled "not for sale"; or

(b) delivered or shipped to a vendor in cans; or

(c) held in a farm holding-tank in a milk-house on a dairy-farm where milk is regularly collected by means of a tank-truck, unless it is conspicuously labelled "not for sale". 1956, c. 28, s. 6; 1962, c. 38, s. 5; 1973 (2nd Sess.), c. 128, s. 2; [amended, 1977, c. 53, s. 1, to be proclaimed, amendment not included].

Inspectors.

7. (1) There shall be in the Ministry of Agriculture an adequate staff of Inspectors with such powers and duties under the *Contagious Diseases (Animals) Act* and under this Act as may be assigned to them by the Minister, and such of them as the Minister deems advisable shall be veterinary surgeons.

(2) The Minister may designate other persons as Inspectors under this Act, and any such designation may be in general terms or for any particular case. 1956, c. 28, s. 7; 1964, c. 30, s. 2; 1977, c. 75, s. 1 (proc. eff. Oct. 21, 1977).

8. [Repealed. 1964, c. 30, s. 3.]

Sale of pasteurized milk.

8A. (1) No person shall, except in accordance with a subsisting permit issued by the Minister, sell, offer for sale, or supply pasteurized milk in fluid form unless

(a) all the milk

(i) was pasteurized in a dairy plant holding a subsisting dairy-plant licence issued under this Act; and

(ii) was produced on dairy-farms in accordance with subsection (1) of section 5; or

(b) all the milk is pasteurized or processed in a dairy plant and produced on a dairy-farm where

(i) standards of operation, construction, maintenance, and sanitary control; and

(ii) the compositional and bacteriological standards of the milk produced therefrom

are considered by the Minister or his duly authorized representative to be the equivalent of standards required under this Act and the regulations.

(2) The Minister may issue permits for the sale, offering for sale, and supply of pasteurized milk in fluid form and set forth therein whatever directions or conditions he deems advisable, and he may suspend or cancel any such permit. 1964, c. 30, s. 4; 1966, c. 28, s. 3.

Appointment of Inspectors.

9. The Council of each municipality may appoint a Municipal Inspector or Municipal Inspectors for the enforcement of section 11, and a Municipal Inspector may exercise the powers of an Inspector conferred by this Act only for that purpose. 1956, c. 28, s. 9; 1962, c. 38, s. 7; 1964, c. 30, s. 5.

10. [*Repealed.* 1964, c. 30, s. 6.]

Persons suffering from disease.

11. No person suffering from or recovering from or who has knowingly been exposed to any infectious or contagious disease shall, within a time prescribed by the regulations made under the *Health Act*, work or assist on or in any dairy-farm or any premises where any milk, reconstituted milk, or manufactured milk products is or are obtained, produced, handled, supplied, offered for sale, or sold, and no owner, occupier, manager, or person in charge of any such dairy-farm or premises shall knowingly permit any person suffering or recovering from or who has been exposed to any disease as aforesaid, within the said time, to work or assist in any manner forbidden by this section, and any Municipal Inspector appointed under this Act or any Medical Health Officer may prohibit the sale of milk, reconstituted milk, or manufactured milk products obtained, produced, handled, supplied, offered for sale, or sold on or from any farm or any premises in which any person works or assists contrary to the provisions of this section. 1956, c. 28, s. 11; 1962, c. 38, s. 9.

Uncleanliness.

12. (1) No unclean person or persons in unclean clothing and no animal shall at any time be permitted in any milk-house where milk is handled or treated. "Milk-house," for the purpose of this subsection, means any place or building to which milk has been removed after extraction from the cow or goat.

(2) Every vessel and utensil and part thereof which is used for obtaining, producing, handling, or distributing milk, reconstituted milk, or manufactured milk products shall be thoroughly cleansed before being used for any such purpose. 1956, c. 28, s. 12; 1962, c. 38, s. 10.

PART II

PROVISIONS AS TO PASTEURIZING, PROCESSING, AND
MANUFACTURING OF DAIRY PRODUCTS

- Licences.** **13.** (1) The Minister may issue, in accordance with the regulations,
(a) licences to persons for the operation of dairy plants;
(b) licences to dairy-plant personnel entitling them to be classed
as such,
according to standards and qualifications established by regulations here-
under.
- Suspension
and
cancellation.** (2) The Minister may suspend or cancel licences issued under sub-
section (1). 1956, c. 28, s. 13; 1962, c. 38, s. 11; 1968, c. 28, s. 3.
- Prohibition.** **14.** No person shall operate a dairy plant unless he is in possession
of a subsisting licence therefor issued to him under this Act. 1956, c.
28, s. 14; 1962, c. 38, s. 11.
- Descriptions.** **15.** (1) No vendor shall apply the term "certified" to any milk.
(2) No person shall apply the word "pasteurized" to any dairy
product unless it has been pasteurized in accordance with the regulations.
(3) No vendor shall pasteurize milk which has already been pasteur-
ized, save as permitted by regulation hereunder. 1956, c. 28, s. 15;
1962, c. 38, s. 11.
- Labels and
standards.** **16.** No vendor shall sell, offer for sale, or supply a dairy product
unless the container of the dairy product is labelled as required by
regulation and the dairy product is of the standard prescribed by regula-
tion. 1973 (2nd Sess.), c. 128, s. 3.
- Permits for
reconstituted
milk.** **17.** (1) No person shall make or compound for sale or sell or
supply reconstituted milk without having first secured a permit to do so
from the Minister.
(2) No person shall, save as permitted by terms of permit issued
under subsection (1), sell or offer for sale or supply reconstituted milk
unless each container thereof is clearly labelled with the words "recon-
stituted milk".
(3) The Minister may suspend or cancel the permit issued under
subsection (1). 1956, c. 28, s. 17; 1962, c. 38, s. 11.
- Accounts.** **18.** Every vendor shall deliver or cause to be delivered to the owner
of milk dealt in a just and true account of the quantity, value, and price
thereof. Such account shall be made up on such basis as the regulations
may prescribe, and the value and price thereof, subject to orders of the
Board or regulations hereunder, shall be determined on the said basis by
analysis conducted only by a person or persons authorized by regulation
to do the analysis. Such account shall be delivered at such time and in
such form as may be prescribed by orders of the Board or by regulations
hereunder. 1956, c. 28, s. 18; 1962, c. 38, s. 11; 1966, c. 28, s. 4.

Entry by
Inspectors on
premises and
vehicles.

19. (1) An Inspector has the right at any reasonable time to enter the premises of any dairy-farm or dairy plant, or of any vendor, producer, wholesaler, retailer, storage company, or carrier, to stop any vehicle transporting dairy products, and take and remove samples of the dairy products found therein, and to test or examine or cause to be examined such samples, and to do such other things as are necessary to determine if the provisions of this Act and the regulations are being carried out.

Records.

(2) Every person operating a dairy plant shall make correct records containing information required by regulation of the milk and cream supplied to the dairy plant, and the records shall be kept upon the premises of the dairy plant and at all times be open to inspection by the supplier of the milk or cream and an Inspector under this Act, and a true copy of the records shall be made available to the Milk Board or to the Minister or his duly authorized representative as directed by orders of the Board or by regulation. 1956, c. 28, s. 19; 1962, c. 38, s. 12; 1966, c. 28, s. 5.

Visits by
Inspectors.

20. Inspectors shall, as frequently as necessary, visit all dairy-farms and dairy plants in the Province to see that the provisions of the Act and the regulations are being carried out. 1956, c. 28, s. 20; 1962, c. 38, s. 13.

Prohibition
notices by
Inspectors.

21. (1) Where an Inspector finds

(a) that the premises of any dairy-farm, dairy plant, retailer, wholesaler, or any vendor's or producer's vehicles are being kept or maintained

(i) contrary to the provisions of any Statute or the regulations made thereunder; or

(ii) in a condition which he considers unfit for the production, manufacture, processing, pasteurizing, handling, transporting, or storing of dairy products; or

(b) that the methods employed on the premises or vehicles are detrimental to the quality and purity of the dairy products; or

(c) that the dairy products are, in his opinion, unfit or, by any recognized test he may perform or have performed, found to be unfit to be sold, supplied, or offered for sale,

he shall give to the owner or person in charge a notice in writing prohibiting him from selling, supplying, or offering for sale such dairy products.

(2) Where an Inspector finds equipment that in his opinion is insanitary or unfit to be used in the production, processing, pasteurizing, manufacturing, storing, or transporting of dairy products, he shall give notice in writing to the owner or person in charge, prohibiting him from using such equipment.

(3) Every owner or person to whom a notice has been given under this section who violates the prohibition contained in the notice is guilty of an offence against this Act. 1956, c. 28, s. 21; 1962, c. 38, s. 14.

Prohibition
against sale
of certain
milk.

- 22.** (1) No person shall sell, offer for sale, or supply
- (a) milk diluted with water, or in any way adulterated or contaminated, or any milk to which fat other than milk fat or to which any drug has been added;
 - (b) any milk to which flavouring or colouring matter, preservative, or any chemical substance or vitamin additive of any kind has been added, save in compliance with the *Food and Drug Act* of Canada and with the approval of the Ministry;
 - (c) any milk produced by a cow or goat which is diseased at the time the milk is produced.
- (2) Determination of compliance with this section shall be based on adequate tests approved by the Minister and performed by an Inspector or other competent person. 1956, c. 28, s. 22; 1962, c. 38, s. 15; 1964, c. 30, s. 7; 1977, c. 75, s. 1 (proc. eff. Oct. 21, 1977).

Imitation
milk products
prohibited.

- 23.** (1) No person shall sell, offer for sale, or have in possession for sale any imitation milk product other than
- (a) oleomargarine; or
 - (b) classes of products such as toppings, spreads, and beverage whiteners which the Minister may exempt from classification as an imitation milk product.
- (2) No person shall, within any premises where food prepared for human consumption is sold or served or made available, sell, offer for sale, or serve any imitation milk product unless a notice is posted on every menu or on a sign or label prominently displayed, that imitation milk products are used on the premises.
- (3) No person shall
- (a) use any of the words "milk," "cream," "butter," or "cheese," or the name or description of any derivative thereof, to designate an imitation milk product; or
 - (b) use a word, trade mark, term, or picture portraying or referring to any aspect of the dairy industry in or with the designation of an imitation milk product; or
 - (c) use a dairy product in the preparation of an imitation milk product unless an exemption permit is obtained from the Minister. 1956, c. 28, s. 23; 1964, c. 30, s. 8; 1973 (2nd Sess.), c. 128, s. 4.

Adulterated
products.

- 24.** (1) No person shall sell, offer for sale, or supply any dairy product that has in any way been adulterated or contaminated or to which any drug or any fat other than milk fat has been added.
- (2) Any dairy product found to be adulterated or contaminated or to which any drug or any fat other than milk fat has been added may be
- (a) seized by an Inspector, who may dispose of such dairy products as directed by the Minister; or
 - (b) denatured by the addition of colouring matter or odorous substance by or at the direction of the Inspector; or

(c) ordered by the Minister or his duly authorized representative to be withheld from being sold, offered for sale, or supplied for a period of time prescribed in writing.

(3) Determination of compliance with this section shall be based on adequate tests approved by the Minister and performed by an Inspector or other competent person. 1956, c. 28, s. 24; 1962, c. 38, s. 16; 1964, c. 30, s. 9; 1966, c. 28, s. 6.

Items not to be stored with dairy products.

25. Milk and manufactured milk products shall be handled and stored in such manner that the quality of such milk or manufactured milk products will not be impaired, and so that odours or flavours from meats, fish, poultry, fruits, or other things shall not be imparted to such milk or manufactured milk products. 1956, c. 28, s. 25.

Prohibits use of false grade-name.

26. No person shall sell or offer for sale, advertise for sale, or hold in possession for sale any milk or manufactured milk product under a grade-name established by the regulations unless the milk or manufactured milk product conforms to the standards prescribed by the regulations for that grade, or unless it is graded, packed, and marked in accordance with the regulations. 1956, c. 28, s. 26.

Prohibits use of grade-name on ungraded produce.

27. No person shall apply to any milk or manufactured milk product that is not graded in accordance with the regulations, or to any package containing the same, or use in association with such milk or manufactured milk product, any grade or other designation so closely resembling a grade-name established by the regulations that it is likely to be mistaken therefor. 1956, c. 28, s. 27.

Prohibits destruction of grade-name.

28. Unless authorized in writing by an Inspector, no person other than the final purchaser or consumer shall alter, destroy, efface, or obliterate any grade-name applied to any milk or manufactured milk product or any container thereof. 1956, c. 28, s. 28.

Inspector may seize dairy products or other things.

29. (1) Whenever an Inspector has reasonable grounds for believing that an offence against this Act or the regulations has been committed, he may seize all milk or manufactured milk products and other things by means of or in relation to which he reasonably believes the offence was committed.

Removal of seized goods.

(2) All milk or manufactured milk products or other things seized under subsection (1) may be removed to a public warehouse and detained until all the provisions of this Act and the regulations with respect to the milk or manufactured milk products have been complied with, or they may be disposed of by direction of the Minister. 1956, c. 28, s. 29; 1962, c. 38, s. 17.

Adding fats other than milk-fat illegal.

30. Except as authorized by regulations hereunder, and for such purposes and in such amounts as are prescribed by the regulations, no person shall add to or combine with any milk or any manufactured milk product any fat or oil other than that of milk. 1956, c. 28, s. 30.

Penalty for violation incurred by owner of illegal product.

31. Where there is a violation by any person of any of the provisions of this Act or of the regulations, the person on whose behalf the dairy product is received, graded, tested, pasteurized, processed, manufactured, sold, offered, exposed, had in possession for sale, or supplied shall be deemed to be guilty of such violation, and shall incur the penalty provided therefor unless he proves both that the violation was not committed by himself and that it was not committed by a person who at the time of the violation had authority from him to perform the foregoing functions with respect to dairy products. 1956, c. 28, s. 31; 1964, c. 30, s. 10.

PART III

PROVISIONS AS TO MARKETING

The Milk Board.

32. There is hereby constituted a Board to be known as the "Milk Board" with powers hereinafter set out. 1956, c. 28, s. 32.

Constitution of the Board.

33. The Board shall consist of not more than three members, the number of whom shall be fixed by the Lieutenant-Governor in Council. The Order in Council shall appoint the members of the Board, and shall set the terms and conditions of their appointment and their remuneration. If there is more than one member, the Order in Council shall designate one of the members to be Chairman of the Board. In his absence or in the case of his inability to act, one of the other members of the Board may act as Chairman. 1956, c. 28, s. 33.

Board a body corporate.

34. The Board shall be a body corporate and shall have a corporate seal and may sue and be sued in any Court of competent jurisdiction. 1956, c. 28, s. 34; 1961 (2nd Sess.), c. 2, s. 4.

Quorum of the Board.

35. (1) A majority of the members of the Board constitutes a quorum.

(2) The Board may delegate to any executive committee of one or more members such matters as may require prompt dispatch, or may be more expeditiously dealt with in that manner. 1956, c. 28, s. 35.

Minutes and proceedings.

36. (1) The Board shall cause minutes to be kept in books provided for the purpose

- (a) of the names of the members present at each meeting of the Board or any sub-committee thereof;
- (b) of all resolutions and proceedings at all meetings of the Board or any sub-committee thereof, including all hearings conducted by the Board.

(2) Every order issued by the Board pursuant to this Act shall be signed by the Chairman or the Acting-Chairman, sealed with the seal of the Board, and kept on file in the office of the Board. Any person applying for the same is, upon payment of such fee as may be prescribed by regulations hereunder, entitled to receive a certified copy of any order of the Board. 1956, c. 28, s. 36.

- Head office.** **37.** The head office of the Board shall be in the City of Vancouver, British Columbia. 1956, c. 28, s. 37.
- Salaries and expenses of the Board.** **38.** (1) All moneys necessary to pay the salaries of the members and employees of the Board and to meet the expenses necessarily incurred in the carrying-out of this Act shall, in the absence of a vote of the Legislature for that purpose, be paid from the Consolidated Revenue Fund.
- (2) All fees paid to the Board shall, when received, be paid by the Board into the Provincial Treasury. 1956, c. 28, s. 38.
- Books, records.** **39.** The Board shall establish and maintain such accounts, books, and records, and such bank accounts, in such form and subject to such direction as may be made by the Minister. 1956, c. 28, s. 39.
- Milk production areas.** **40.** The Lieutenant-Governor in Council may, by Order, designate any area of the Province as a milk production area. 1975, c. 2, s. 5.
- Powers of the Board.** **41.** For the purpose of controlling and regulating under this Act the marketing of milk produced in British Columbia, the Board has, so far as the legislative authority of the Province extends, power to make orders in relation to the said marketing, and, without limiting the generality of the foregoing, has power to make orders
- (a) providing for the classifying of any or all persons engaged in the production, supplying, processing, distribution, or sale of milk within the Province, and providing for the licensing of persons in any or all of such classes and for the qualifications for such licences, and defining standards and grades in relation to the quality of any such milk;
- (b) imposing licence fees upon the persons in any such classes, and determining the basis upon which the amount of such licence fees in varying amounts shall be fixed in respect of each of such classes, and providing for the collection and payment

of such licence fees, including the fixing of and collection of penalties to enforce payment;

(c) prescribing the form of licences and the term of such licences, and the terms and conditions upon which the same shall be issued, renewed, suspended, or revoked;

(d) prohibiting any person from engaging in the production, supplying, processing, distribution, or sale of milk, or of any class or classes, grade or grades thereof, within the Province unless he is the holder of a current licence from the Board which has not been suspended or revoked;

(e) providing for classes of milk according to acceptability or utilization in each of such classes;

(f) prescribing the terms and times of payment for milk supplied to vendors by producers thereof;

(g) prohibiting the marketing of any milk which does not meet the standards for the same as set by the Board;

(h) fixing the minimum value at which vendors shall account to producers for milk which is sold on the fluid market, which value shall be set by formula as hereinafter provided;

(i) determining the minimum value at which vendors shall account to producers for milk used in manufactured milk products, which value shall be determined on the basis of current yields;

(j) fixing the price which shall be paid to all producers for all milk marketed by them and qualifying for the fluid market, which price shall be a blended price, taking into account the quantity of milk which has been sold on the fluid market and the quantity of such milk surplus to fluid-milk requirements and which must be sold on the market for manufactured milk products and the values applicable to the said quantities respectively in accordance with clauses (h) and (i) hereof;

(k) apportioning the quantity of milk which has been sold as fluid milk among all producers qualifying for the fluid market and fixing the price for milk qualifying for the fluid market so that each producer of such qualifying milk receives

(i) the fluid-milk value as determined in clause (h) for that proportion of all milk qualifying for the fluid market marketed by him which is equal to the proportion that total fluid-milk sales is of the total quantity of milk which qualifies for the fluid market received by licensed vendors in each area of production; and

(ii) the value as determined in clause (i) for the remainder of the milk marketed by him which qualifies for the fluid market;

and providing for the distribution of the total proceeds of milk which qualifies for the fluid market accordingly;

- (l) ordering that the proceeds of the total quantity of milk qualifying for the fluid market and produced by all producers in each area of production and sold on both the said markets shall be pro-rated among all such producers so that each producer shall receive his proportionate share of the total proceeds in accordance with the quantity of milk qualifying for the fluid market supplied by him;
- (m) establishing and adopting a formula for the purpose of the fixing of values hereunder in each area of production or for the Province as a whole, which formula shall take into account relevant economic factors, including changes in the general price level, changes in the price of any or all factors of production, and the quantity of milk which is sold on the fluid market in relation to the total quantity of milk which qualifies for the fluid market. The formula shall be such as to provide a reasonable premium for the production of milk for the fluid market to ensure an adequate but not an excessive supply of milk which qualifies for such market;
- (n) providing that any values or prices fixed hereunder shall be effective for any particular time, and varying such values or prices for periods throughout the year;
- (o) directing that accounts be given by vendors to producers of the milk received by such vendors from such producers, which accounts shall contain particulars of the quantity of milk received, the total value thereof, and the amount due to each such producer at the values and prices from time to time fixed and determined by the Board, and the basis (as to butter-fat content or on other basis) on which such values and prices have been fixed and determined;
- (p) directing the payment of the amounts due by vendors to producers in accordance with the said accounts;
- (q) from time to time designating the vendor to whom or through whom a producer shall market his milk, and requiring every such vendor to accept milk from such producers as the Board may determine;
- (r) in order to ensure compliance with orders of the Board and payment for milk supplied by producers, requiring the furnishing of security or proof of financial responsibility by vendors in such amount and in such form and upon such conditions necessary to attain the said objects as the Board may determine, with power to the Board to discriminate between vendors with respect to such security or proof of financial responsibility in accordance with the volume of milk of any class or classes, grade or grades thereof received or sold by any such vendors;
- (s) providing for the fixing of producer quotas of milk for the fluid market based on the ratio of fluid-milk sales to the amount of

qualifying fluid milk produced in any area of production during such period as the Board may determine, and from time to time to vary such quotas and prescribing the terms and conditions upon which the same may be transferred;

(t) establishing or designating an agency to or through which all fluid milk shall or may be delivered or sold;

(u) establishing by means of quotas the proportion of his production which a producer may sell on the fluid market, and directing the shipment of milk comprising any such quota to such vendor as the Board may determine;

(v) requiring that all books, accounts, and records of a vendor relating to milk and manufactured milk products shall be kept in such form as the Board may provide, and providing for the inspection of the books, accounts, records, and documents of a vendor relating to milk and manufactured milk products by representatives of the Board, and for such purposes to employ auditors;

(w) requiring that persons dealing in milk and manufactured milk products shall, at such times as the Board may order, make returns to it and file with it copies of invoices, accounts, bills of lading, and other documents with respect to milk and manufactured milk products marketed or dealt in by such persons, and requiring all such persons to authorize persons transporting, receiving, purchasing, or in anywise dealing in milk and manufactured milk products for them to furnish to the Board all such information as the Board may require respecting such milk and manufactured milk products received, purchased, or in anywise dealt in by any such person;

(x) providing for the audit, at such times as the Board may direct, of the books, records, and accounts of any person dealing in milk and manufactured milk products;

(y) providing for the review by the Board of marketing contracts between producers and vendors, and for the revision of the same as to the duration and the terms thereof as the Board considers just and equitable in the public interest;

(z) appointing advisory committees of producers, consumers, vendors, and such other classes of persons as the Board may consider advisable to advise and assist the Board in its duties under this Act, and for the payment by the Board of the expenses of any such committees;

(aa) providing for the holding of public hearings on any matter relating to the marketing of milk and the welfare of the industry, including trade practices, on such notices to such persons and at such place or places and at such time or times as the Board may consider advisable. On the written request of fifty persons who are producers, consumers, or vendors of milk, the Board shall hold such hearing. The Board shall

- give reasonable notice of such hearings by advertisement in a newspaper circulating in the area of production;
- (bb) defining the deductions which may be made by a vendor from the price payable hereunder by him to a producer, the purposes for which such deductions may be made, and limiting the amount thereof in respect of any such purposes;
 - (cc) limiting the application of clause (d) of this section to milk to be utilized for any specific purpose;
 - (dd) directing that excess quantities of qualifying milk received or to be received by a vendor shall be transferred by that vendor to another vendor or other vendors in the same area of production or in the Province;
 - (ee) determining the handling and transportation costs of milk transferred by direction under clause (dd) and directing by whom those costs shall be borne; and
 - (ff) prescribing the quantity of packaged milk in fluid form that any person may sell in an area of production, the terms and conditions upon which any person may transfer packaged milk in fluid form from one area of production to another, and requiring any person to make returns to it and to file with it copies of invoices, accounts, bills of lading and other documents with respect to packaged milk in fluid form. 1956, c. 28, s. 41; 1961 (2nd Sess.), c. 2, s. 5; 1964, c. 30, s. 11; 1973 (2nd Sess.), c. 128, s. 5; 1975, c. 2, s. 5.

Moneys payable to Board.

41A. (1) Any sum or sums of money payable to the Board pursuant to the orders of the Board made under section 41 may be recovered by action in any Court of competent jurisdiction as a debt to the Board, and the Court may make an order as to the costs of the action for or against the Board.

(2) A certificate of the Board purporting to be signed by a member of the Board and under the seal of the Board and stating that a specified amount of money is payable to the Board by a vendor pursuant to an order or orders of the Board is prima facie evidence that the amount specified is payable to the Board pursuant to the order or orders without proof of the signature of the member of the Board or of his appointment or of the seal or the affixing thereof, and the onus of alleging and proving that the certificate is incorrect and in what particular or particulars and by what amount is upon the vendor. 1961 (2nd Sess.), c. 2, s. 6; 1963, c. 26, s. 4.

Delegation of functions and duties.

41B. (1) The Board may, with the approval of the Lieutenant-Governor in Council, accept and exercise any authority or power granted to the Board pursuant to the *Agricultural Products Marketing Act* (Canada), as amended from time to time, or any other Act of the Parliament of Canada enacted before or after the coming into force of this section.

(2) Where the Board has accepted authority or power pursuant to subsection (1), the Board may, with the approval of the Lieutenant-Governor in Council, enter into an agreement or arrangement with the Canadian Dairy Commission or any marketing board constituted by the Parliament of Canada under which the Board agrees to pay to the Canadian Dairy Commission or marketing board any moneys collected by the Board in the exercise of the authority or powers referred to in subsection (1). 1973 (2nd Sess.), c. 128, s. 6 (proc. eff. Nov. 23, 1973).

Milk
marketing
plan.

41c. (1) In this section, "Comprehensive Milk Marketing Plan" (herein called the "plan"), means a plan for regulating the marketing of milk in accordance with an agreement or agreements entered into by Federal and Provincial authorities.

(2) The Board may, with the approval of the Lieutenant-Governor in Council, become a party to a plan to which the Canadian Dairy Commission is also a party.

(3) Where the Board becomes a party to a plan,

(a) the Board may exercise and perform the powers and duties conferred or imposed on it by the plan;

(b) the Lieutenant-Governor in Council may confer on the Board any additional powers that may be necessary to enable the Board to carry out its obligations and functions under the plan, including the power to fix and collect fees from producers for services rendered or to be rendered by the Board;

(c) the Board may, with the approval of the Lieutenant-Governor in Council, delegate to the Canadian Dairy Commission or to any marketing board incorporated by the Parliament of Canada, any of the powers of the Board conferred under this Act; and

(d) without restricting the generality of clause (a), the Board may, if required by the plan, pay moneys collected by it in the exercise of any authority or powers referred to in clause (b) of subsection (3) of section 41c to the Canadian Dairy Commission or any other marketing board or agency in Canada in order to carry out any obligations of the Board under the plan. 1973 (2nd Sess.), c. 128, s. 6 (proc. eff. Nov. 23, 1973).

Values
and price
differential.

42. In determining values and fixing prices, the Board has power to apply a fair differential between areas of production on the basis of factors arising in any area of production from the competition of milk produced in other areas of production; but the amount of such differential as applied to the values fixed in clause (h) of section 41 shall not in any case be greater than a fair cost as determined by the Board of transporting milk between the areas of production in respect of which such differential is applied; and nothing herein contained shall obstruct or prevent the free shipment of milk from one area of production to another. 1956, c. 28, s. 42.

Selling below
fixed price
prohibited.

43. No producer shall sell or dispose of any milk at less than the prices fixed by the Board as the prices which he shall receive for milk qualifying for the fluid market and for the manufacturing market respectively, and every vendor receiving milk from a producer shall give such accounts in respect of the same in such form and containing such particulars as the Board shall direct. 1956, c. 28, s. 43.

Status of
producer-
vendors.

44. In the application of the provisions of this Act,

(a) a producer-vendor in his respective capacities as a producer and as a vendor is entitled to all the rights and privileges and is subject to all the duties and obligations given to and imposed on a producer and on a vendor, and shall keep such books, records, and accounts of production and of sales of milk and manufactured milk products, and make such accounting thereof in such form and containing such particulars as may be required by this Act and regulations hereunder and by orders of the Board;

(b) a producer-vendor shall be deemed to have received in his capacity as a vendor from himself in his capacity as a producer the milk, produced only by his own cattle, that he distributes, and to have contracted in that capacity with himself in his capacity as a producer for the purchase thereof upon the condition that the orders of the Board apply. 1956, c. 28, s. 44; 1961 (2nd Sess.), c. 2, s. 7; 1973 (2nd Sess.), c. 128, s. 5.

Review of
Board's
decisions.

45. The Board may review, vary, or rescind any decision or order made by it. 1956, c. 28, s. 45.

Certain
powers to
be exercised
only as to
milk from
area of
production.

46. In the exercise of any or all of its powers hereunder, the Board may provide that such of its orders as it deems advisable shall be applicable only in respect of milk produced in a specified area of production. 1956, c. 28, s. 46.

Bonus in
excess of
Board price.

47. Nothing in this Act contained shall be taken to prohibit any person from paying to a producer a price for milk in excess of the price fixed by the Board hereunder. 1956, c. 28, s. 47.

Licence
exercisable
throughout
Province.

48. Subject to compliance with the Act and regulations, the rights and privileges under every licence issued by the Board are exercisable throughout the Province. 1956, c. 28, s. 48.

Duty not to
disclose
information.

49. Every member and every employee of the Board shall keep secret all information coming to his knowledge during the exercise of his duties under this Act, except in so far as such duties require him to report upon or take action in respect thereof, or except in so far as he may be authorized by the Board to publish or make known such information. 1956, c. 28, s. 49.

- Research.** **50.** The Board shall undertake and carry on continuously all necessary research for the benefit of the milk industry, and shall advise the Minister from time to time with regard to policies for the improvement and development of methods of production and distribution of milk. 1956, c. 28, s. 50.
- Employees of the Board.** **51.** The Board may employ such officers, clerks, and servants for the proper conduct of the business of the Board as may be appointed pursuant to the provisions of the *Civil Service Act*, and may retain and employ such professional and expert assistance at proper remuneration as may be necessary. 1956, c. 28, s. 51.
- Hearings by the Board.** **52.** The Board shall hear and determine any proper matter of complaint on the part of any producer, consumer, or vendor relating to the exercise of its powers. Every such person may be heard in person or by counsel. The Board shall give to every such person reasonable notice of any hearing, shall cause to be taken and kept a true account of the proceedings thereof, and shall furnish to any such person without cost the reasons for its decision. 1956, c. 28, s. 52.
- Evidence before the Board.** **53.** The Board may accept and act upon evidence by affidavit or written affirmation or by the report of any of its members or officers; provided that before any action is taken thereon, every person affected by any such affidavit, affirmation, or report shall be given a copy thereof and an opportunity to answer the same and to be heard thereon in person or by counsel. 1956, c. 28, s. 53.
- Certified copies of certain documents prima facie evidence.** **54.** A copy of any notice, document, report, order, or proceeding of the Board purporting to be certified by a member of the Board and under the seal of the Board is, on any hearing or before any Court, prima facie evidence that such notice, document, report, order, or proceeding was duly given, made, or taken, and of the contents of the original document of which such copy purports to be a copy, without proof of the signature of the member of the Board or of his appointment or of the seal or the affixing thereof. 1956, c. 28, s. 54.
- Appeals from orders of the Board.** **55.** (1) An appeal lies by any person aggrieved who desires to question a decision or order of the Board refusing to issue or renew a licence hereunder or suspending or revoking a licence. The appeal shall be taken to the Supreme Court of British Columbia by way of originating summons, and the Court may give such directions for the conduct of the proceedings, receive such evidence, and make such order or decision thereon as it may deem just, and its decision is final and is not subject to appeal.
- (2) Any person aggrieved who desires to question an order or decision of the Board on the ground that it is erroneous in point of law or is in excess of jurisdiction may apply to the Board to state and sign a case setting forth the facts of the case and the grounds on which the decision or order is questioned, and, if the Board declines to state the

case, may apply to the Supreme Court for an order requiring the case to be stated, and the provisions of sections 85 to 92, inclusive, of the *Summary Convictions Act* apply, mutatis mutandis, to the stated case.

(3) Every person for whom a case is stated as aforesaid in respect of any decision or order of the Board from which he is entitled to appeal under subsection (1) of this section shall be taken to have abandoned his said right of appeal finally and conclusively and to all intents and purposes.

(4) In lieu of proceeding under the foregoing provisions of this section, any person aggrieved may proceed by way of the prerogative writs of mandamus, certiorari, or prohibition, as he may be advised, and such rights as he may have in respect thereto are hereby expressly preserved. 1956, c. 28, s. 55.

Reports by
the Board.

56. The Board shall, on or before the first day of March in each year, make to the Lieutenant-Governor in Council a report for the preceding calendar year showing

- (a) particulars of all applications and complaints made to the Board under this Act, and summaries of the findings of the Board thereon;
- (b) such other matters as appear to the Board to be of public interest in connection with its operations;
- (c) such matters as may be directed by the Lieutenant-Governor in Council. 1956, c. 28, s. 56.

Price.

57. (1) No person who receives any milk and manufactured milk products from a vendor shall supply, sell, or offer the same for sale at a price below the cost thereof to him.

Gifts.

(2) No vendor shall make a gift of any milk and manufactured milk products to any person, other than a charitable institution designated as such by the Board, unless approval to make the gift is first obtained from the Board. 1956, c. 28, s. 57; 1962, c. 38, s. 18; 1973 (2nd Sess.), c. 128, s. 5.

PART IV

GENERAL

Act applies to
all vendors.

58. This Act applies to all vendors, whether co-operative associations or not, notwithstanding the provisions of the *Co-operative Associations Act*, or any other Act, or the terms of any contracts heretofore or hereafter entered into between producers of milk and such vendors. 1956, c. 28, s. 58.

Certificate
signed by
Inspector or
analyst to
be evidence.

59. (1) In any prosecution under this Act or the regulations, a certificate as to the grade of any dairy product signed, or purporting to be signed, by an Inspector is prima facie evidence of the facts stated in such certificate and conclusive evidence of the authority of the person giving or making the same without any proof of appointment or signature.

(2) In any prosecution under this Act, a certificate as to the composition of any product or material signed, or purporting to be signed, by an analyst is prima facie evidence of the facts stated in such certificate and conclusive evidence of the authority of the person giving or making the same without any proof of appointment or signature. 1956, c. 28, s. 59.

Seized products forfeit to Her Majesty.

60. Where a person is convicted of an offence under this Act or the regulations, the milk or manufactured milk products by means of or in relation to which the offence was committed, upon such conviction, in addition to any penalty imposed, shall be forfeited to Her Majesty, and may be disposed of as the Minister may direct. 1956, c. 28, s. 60.

Obstructing Inspector.

61. (1) Subject to section 62, every person who obstructs or impedes an Inspector under this Act in the performance of any duty imposed on him or the exercise of any power conferred on him by this Act, or any regulation or order made or by-law passed under this Act, is guilty of an offence against this Act.

(2) Where an Inspector has been obstructed or impeded as outlined in subsection (1), he may call to his assistance constables and peace officers, and they may do such things as are necessary for the execution of the provisions of this Act and the regulations made thereunder.

(3) In any prosecution under this Act where it appears that the defendant or accused has done any act or has been guilty of any act or omission in respect of which, were he not duly licensed, he would be liable to some penalty under this Act, it is incumbent upon the defendant or accused to prove that he is duly licensed. 1956, c. 28, s. 19; 1962, c. 38, s. 19.

Evidence of authority to be produced.

62. Every Inspector under this Act shall, upon request, produce to any person whose premises he enters in pursuance of this Act an authority in writing, showing that he is duly authorized under this Act to enter and inspect such premises or the products thereon. 1956, c. 28, s. 62.

Offences.

63. Every person who fails to comply with any provision of this Act, or any regulation made hereunder, or any order of the Board, is guilty of an offence, and, if a corporation, is liable, on summary conviction, to a penalty of not less than fifty dollars or more than five thousand dollars, and, if an individual, to a penalty of not less than ten dollars or more than five hundred dollars. 1956, c. 28, s. 63.

Additional penalty for failure to pay price.

64. Every vendor found guilty of paying to a producer of milk a price less than the price fixed by the Board shall, in addition to any other penalty, be ordered by the Court before which the charge against him has been heard, on or before such date as shall be fixed by such

Court, to pay to such producer a sum equal to the difference between the price that was in fact paid to the producer and the price fixed by the Board. 1956, c. 28, s. 64.

Certificate of payment.

64A. Every vendor is,

- (a) after paying to a producer of milk the producer price fixed by the Board for qualifying milk; and
- (b) upon production to the Board of such books, records, and accounts and other proof of payment as the Board may require, entitled to be issued by the Board, upon request of the vendor, a certificate stating that the vendor has paid all moneys due by the vendor to the producer pursuant to the orders of the Board for the qualifying milk supplied by him as specified in the certificate, and, save to the extent that it shall be proven that the books, records, accounts, or other proof of payment furnished by the vendor to the Board upon which the certificate was based do not accurately set out the matters therein contained, the vendor is not liable to the producer for the payment of any further moneys for the qualifying milk in respect of which the certificate was issued. 1963, c. 26, s. 5.

Regulations.

65. The Lieutenant-Governor in Council may make regulations

- (a) (i) for establishing a classification of farms as approved manufacturing-milk dairy-farms, and providing that no milk shall be sold from any such dairy-farm for manufacturing purposes unless the owner or operator of the dairy-farm on which such milk is produced is the holder of a subsisting certificate classifying his farm as an approved manufacturing-milk dairy-farm;
 - (ii) prescribing the standards for
 - (A) approved raw-milk dairy-farms;
 - (B) approved fluid-milk dairy-farms;
 - (C) approved manufacturing-milk dairy-farms,
 including the methods of production to be adopted thereon and the maintenance of such standards, and prescribing the form and conditions of certificates issued in respect thereof and the fees to be collected in respect of such certificates;
- (a1) providing for a system of ensuring payment to producers or to other dairy plants by dairy-plant licensees for qualifying milk or cream supplied by producers or by other dairy plants to the dairy-plant licensee, and in particular
 - (i) directing every dairy-plant licensee, as a condition of such licence, to pay a fee which shall be related to the receipt, by such dairy-plant licensee, of qualifying milk or cream from producers or from other dairy plants;
 - (ii) providing that the fees paid under paragraph (i) of this clause shall constitute a fund whose maximum and minimum size shall be set by the Lieutenant-Governor in Council,

who may suspend provision of payments into the fund or may reimpose such provision of payments according to the amount of money in the fund;

(iii) providing for procedures for establishing claims against the fund and for payments into and out of the fund;

(iv) providing for the manner in which the fund shall be established, managed, and operated; and

(v) providing for enforcement of the fee assessment and for the collection of same as to the manner and frequency of payment;

(b) defining the conditions under which milk which has been reconstituted may be sold;

(c) providing that, in circumstances of emergency, compliance with the provisions of subsection (1) of section 17 shall not be required, and defining the conditions under which such non-compliance may be permitted;

(d) providing for examinations as to competency of dairy-plant personnel, the nature and extent of such examinations and standards required for the passing thereof, the fees to be paid in respect thereof, and prescribing the duties to be performed by such dairy-plant personnel;

(e) prescribing the qualifications to entitle dairy-plant personnel to licences entitling them to be classed as such, providing for classifying such licences in accordance with the qualifications of the applicants and the fees to be paid for such licences, and providing for the cancellation of any such licence;

(f) prescribing the standards and the maintenance thereof for barns, loafing-barns, sheds, shelters, milk-houses, milking-parlours, milking-rooms, farm tanks and tank-trucks, tank-trailers, and dairy plants, and the equipment and qualifications of personnel requisite for the operation of the same; requiring that milk produced be produced, kept, transported, processed, manufactured, and pasteurized by and under sanitary and healthful methods and conditions; and providing the duties of Inspectors in relation to any such matters;

(g) providing for the issue of licences to persons operating dairy plants and the term of such licences and the fees to be paid therefor;

(h) providing for regulations covering the matters set out in section 6 as they are applicable to areas of unorganized territory to be defined in Orders in Council as milk pasteurization areas;

(i) providing for the suspension and cancellation of any certificate of approval of any dairy-farm, and fixing the periods within which and the conditions on which a certificate may be suspended, cancelled, and reinstated, and the notices to be given in respect thereto, and the filing of such notices with the Ministry of Agriculture and with the Milk Board;

- (j) providing for the examination of all cattle, the notices to be sent when they are found to be suffering from general or local diseases, and the steps to be taken to ascertain that such cattle are free from disease and the notices to be given in respect thereto;
- (k) providing that no milk shall be delivered or sold from any cow or goat within such time after such cow or goat has received any veterinary treatment as the regulations may prescribe;
- (l) providing the maximum bacteria content of dairy products prior to or at the time of delivery or sale to vendors or consumers;
- (m) providing that Inspectors may, for the purposes of this Act, enter premises and stop vehicles at any time and take and remove samples of water and milk, reconstituted milk, and manufactured milk products therein or thereon, and make such tests as are necessary for the grading and testing set out in the regulations, and for the purpose of making any other tests and examinations that may be necessary in the public interest, and to determine whether the provisions of this Act are being carried out;
- (n) providing minimum standards of composition under which dairy products may be offered for sale or sold;
- (n1) for the control of the quality of milk by
 - (i) imposing on and collecting from a producer penalties where milk supplied by the producer fails to comply with the prescribed standards of quality for that milk or is produced on premises or with equipment that fails to comply with the regulations,
 - (ii) prescribing the conditions under which, and the time at which, the penalties are payable,
 - (iii) prescribing the amount of the penalties and the method by which they shall be calculated, the maximum penalty not to exceed 5¢/litre of milk for a period not exceeding one month, and
 - (iv) prescribing that the penalties collected shall be applied to the fund established under section 65A.
- (o) prescribing methods to be followed and equipment to be used in the testing, grading, processing, manufacturing, and pasteurizing of dairy products;
- (p) prescribing the basis (whether on butter-fat content or otherwise) on which payment shall be made for milk or manufactured milk products, and prescribing the books, records, and accounts which shall be kept, and the accounting which shall be made, in respect of such milk or manufactured milk products, and the time or times after delivery thereof within which grades shall be allotted to milk or cream;

- (q) prescribing the measures to be taken for the purpose of preventing contamination in dairy plants;
- (r) establishing definitions, standards of quality and composition, grades, and grade-names for dairy products;
- (s) prohibiting the sale or offering for sale of any non-milk product under any name commonly associated with a milk or a manufactured milk product;
- (t) defining the circumstances and conditions under which fats or oils other than those of milk may be added to or combined with any milk or manufactured milk product, and the purposes for which and the amounts in which the same may be added or combined as aforesaid;
- (u) providing
 - (i) for the weighing, measuring, testing, grading, and sampling of any or all lots, deliveries, or shipments of dairy products, for the conditions upon which the same may be weighed, measured, tested, graded, and sampled, for the manner and conditions of analysis of dairy products, checking of dairy equipment for sanitation and compliance with regulations, and checking of measuring devices and calibration of farm holding-tanks, and for the manner and conditions of weighing of dairy products transported in tank trucks, and prescribing fees therefor and determining the basis on which the amount and liability for payment of such fees shall be fixed, and providing for the collection and payment of such fees, including the fixing of and collection of penalties to enforce payment;
 - (ii) for the issuing of certificates respecting weights, tests, and grades of dairy products;
 - (iii) for the form of such certificates and the condition upon which they may be issued;
 - (iv) that Inspectors may from time to time enter any premises and examine any products, equipment, books, accounts, and records to determine whether producers are receiving credit for correct weights, grades, and tests of dairy products delivered by them;
 - (v) for the size, dimensions, and other specifications for packages of milk and manufactured milk products weighed or graded as outlined above;
 - (vi) for the manner in which milk and manufactured milk products or packages thereof may be branded or marked as to the contents thereof, and the standards and grades of such contents;
 - (vii) for limiting the sale of dairy products to packages of specified sizes, and for specifying the sizes of such packages by weight or by dimensions or by volume;

- (viii) for the quality of any milk or manufactured milk product which may be used;
- (ix) [*Repealed.* 1963, c. 26, s. 6.]
- (v) providing that packages purporting to contain the milk of a particular breed of cow shall contain only milk from registered pure-bred cows of such breed;
- (w) prescribing the materials and the amounts of such materials that may be used as colouring, flavouring, stabilizer, or other ingredients of dairy products;
- (x) providing for procedure at meetings of the Board and for voting thereat;
- (y) defining areas of production in addition to the areas described in this Act;
- (z) defining areas of unorganized territory known as "milk pasteurization areas," within which milk delivered or sold to consumers shall be pasteurized, and making such provision as may be just and equitable for the sale of milk from approved raw-milk dairy-farms in such milk pasteurization areas, and the requirements, restrictions, and exceptions under which such raw milk may be sold;
- (aa) generally for carrying out the purposes of this Act, including matters in respect of which no express or only partial or imperfect provision has been made. 1956, c. 28, s. 65; 1962, c. 38, s. 20; 1963, c. 26, s. 6; 1964, c. 30, s. 12; 1966, c. 28, s. 7; 1968, c. 28, s. 5; 1977, c. 75, s. 1 (proc. eff. Oct. 21, 1977); 1977, c. 76, s. 22 (proc. eff. Nov. 3, 1977); [*amended, 1977, c. 53, s. 1, to be proclaimed, amendment not included*].

Fund for promotion of dairy products.

65A. (1) Where, upon the holding of a plebiscite among holders of fluid-milk dairy-farm certificates who have their dairy-farms within the area for which the plebiscite is held, those voting in favour of the establishment of a fund to promote dairy products constitute not less than two-thirds of those eligible to vote and who cast ballots, the Lieutenant-Governor in Council may

- (a) establish a fund to be used for the promotion of dairy products in accordance with regulations that may be made from time to time by the Lieutenant-Governor in Council;
- (b) provide for the collection of a fee by dairy-plant licensees or in any other manner which the regulations may direct and for the remission of those fees to the fund aforesaid in accordance with the regulations;
- (c) fix the fees to be collected under the regulations;
- (d) determine, in accordance with the regulations, the manner in which a dairy-farmer may direct all or a portion of his fees to be allocated and exempt from payment of fees those who, in writing as directed by the regulations, indicate their wish not to have fees deducted for the promotion of dairy products;

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(e) authorize the Minister to appoint a person or persons to manage and administer the fund and to make payments from it pursuant to the regulations, and to establish terms of reference, duties, and responsibilities for such person or persons.

(2) The Lieutenant-Governor in Council may fix the area for which a plebiscite shall be held and the date or dates upon which it shall be held in accordance with subsection (1) and shall by regulation prescribe the manner of holding the plebiscite and give all necessary direction therefor.

(3) The Lieutenant-Governor in Council, if requested to do so in writing by not less than twenty-five per centum of those dairy-farmers from whom fees are being collected for the fund in an area prescribed under subsection (2), may at any time fix a date or dates upon which another plebiscite shall be held in accordance with regulations made under subsection (2).

(4) Where, upon the holding of a plebiscite under subsection (3) among holders of fluid-milk dairy-farm certificates who have their dairy-farms within the area for which the plebiscite is held, those voting against the continuation of the collection of fees under this section constitute not less than fifty-one per centum of those eligible to vote and who cast ballots, the Lieutenant-Governor in Council may revoke the application of any orders and regulations made under subsection (1) to persons in that area. 1963, c. 26, s. 7; 1968, c. 28, s. 6; 1973 (2nd Sess.), c. 128, s. 7.

Part III not to apply to goat's milk.

66. Part III does not apply to goat's milk. 1956, c. 28, s. 66.

Publication.

67. The Lieutenant-Governor in Council may, in making any regulation under this Act, incorporate therein by reference any code or standard or rule or any part thereof relating to the subject-matter of this Act, as amended from time to time before or after the making of the regulation, that he may consider applicable; and, where a code, standard, rule, or part thereof is adopted by regulation, publication in the Gazette of a notice of the adoption referring to the code, standard, or rule and stating the extent of its adoption and setting forth any variations to which the adoption is subject, shall be deemed sufficient publication without publishing in the Gazette the text of the code, standard, rule, or part thereof adopted. 1973 (2nd Sess.), c. 128, s. 8.

Enumeration of power not exclusive.

68. The enumeration in this Act or in any section thereof of any specific power or authority given to the Board or any other authority shall not be held to exclude or limit any power or authority otherwise in this Act or in any such section conferred on the Board or any such authority. 1956, c. 28, s. 68.

Natural Products Marketing (British Columbia) Act not to apply.

69. The *Natural Products Marketing (British Columbia) Act* does not apply to milk. 1956, c. 28, s. 69.

Provisions as
to constitutionality,
intent of
Legislature.

70. The purpose and intent of the Legislature is to confine the provisions of this Act within the competence of the Legislature, and all the provisions thereof shall be construed so as to give effect to such purpose and intent. If any provision or section is held or found to be beyond the powers of the Province, such provision or section shall be read distributively, and the provision or section so far as it deals with matters within the competence of the Legislature shall stand and be valid and operative, and shall have the same effect as if the provision or section had dealt with such matters exclusively; and the remaining provisions and sections of this Act shall not be deemed or held to be inoperative or ultra vires, but shall stand and be valid and operative, and shall have the same effect as if they had been originally enacted as separate and independent enactments and as the only provisions of the Act; and all the provisions of the Act that are within the powers of the Province shall remain in full force and effect, notwithstanding that some provisions are held to be ultra vires, the intention of the Legislature being to give separate and independent effect to the extent of its powers to every enactment and provision in the Act contained. 1956, c. 28, s. 71.

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