

### The research task

The major objectives of the proposed research are: (1) description of the process of agricultural transformation in the Annapolis Valley region of Nova Scotia in the period 1946-1972; and (2) analysis of the effects of this transformation upon the numbers, distribution, and integration of the human population of the region. Throughout, the main concern is with processes which integrate individuals, groups, and communities into larger social units, and by which a formally defined region becomes functionally integrated. The degree to which the region is becoming more integrated is a matter for empirical research. Evidence for integration will include increased centrality of towns, increased interconnectivity of organizations, and increased specialization and interdependence of areal subunits.

Processes of concern in the proposed research are those operating in the production and population systems of the region, and the approach to data-gathering will be developed in terms of six subsystems, each of which summarizes an important dimension of regional organization and constitutes an analytically separate data domain:

#### A Production system

- 1 Physical resources --soils, climate, topography, hydrology
- 2 Farms --units of land use, resource allocation, and production
- 3 Markets --organizations engaged in supply of inputs and marketing, processing, and distribution of agricultural commodities

#### B Population system

- 1 Demographic system --operation of birth, death, marriage and migration processes
- 2 Social organization --social relations and recurrent patterns of interaction among members of the population

### 3 Settlement pattern --spatial-temporal distribution of activities, events, and individuals of the population

Each of these subsystems provides a perspective from which to view the organization and operation of the region. The table which follows represents my present development of the variables, event-types, and units which comprise each of the six subsystems. I have attempted to specify the forms of any existing data, the present units of data aggregation, and (in general) the approaches that will be followed in gathering further data.

Following the summary table, each of the subsystems is discussed in detail, important interrelations between subsystems are indicated, and methods for further data-gathering are briefly considered. This is intended to indicate the general direction of my efforts as I presently see them; I anticipate that interaction with larger and more complete bodies of data will define new and more sharply focused questions, guide the selection of appropriate informants, and enable more coherent syntheses. In particular, the elaboration of subsystems A2, A3 and B2 will require extensive interviewing of individuals located at strategic points in the organizational and institutional landscape of the region.

	<u>Form of existing data</u>	<u>Units of aggregation</u>	<u>Sources for additional data</u>
<b>A 1 Physical resources</b>			
Soils	types (many), generalized capability classification (6)	maps	area > 1 km <sup>2</sup>
Climate	solar radiation income, rainfall, temperature	A&M reports (annual)	sample points
Topography	elevation	maps	(continuous variable)
<b>A 2 Farms</b>			
Land use	18 categories (M&R)	maps	area > 1 km <sup>2</sup> aerial photos
Scale of operation	crop specialization	Census	county, census ground checks subdivision
Production	4 categories; also by income class, capital investment, acreage	A&M	annual "
Population	major crops and commodities	Census	county, census interviews subdivision
	farm families, hired labor	Census, A&M (annual)	county, census surveys in A3 organizations
<b>A 3 Markets</b>			
Organizations			
a) marketing	scale and specialties of enterprises which supply inputs and buy, bulk, store, process and transport agricultural produce	T&I report (1970)	single enterprises, Boards of Trade (historical research)

A 3 (cont)

a) marketing (cont)  
 wholesale, retail and service trade volume, receipts, labor force  
 Boards of Trade, farmer organizations  
 Boards of Trade, interviews

b) administrative  
 marketing boards, Boards of Trade, farmer organizations  
 interviews

Prices  
 by commodity  
 monthly price reports  
 A&M

Census  
 type of business by county, by town > 1000 pop  
 Boards of Trade, interviews

B 1 Demographic system

Population processes  
 birth, death, and marriage  
 Vital Statistics (annual) > 1000

Summaries  
 total population  
 T&I (1970) towns > 300

age, sex, occupation, education  
 Census  
 counties, census subdivisions, towns > 1000

B 2 Social organization

Formal organizations  
 churches, clubs and associations, schools, political parties, businesses  
 (Data presently accessible on social organization in the region are limited to weekly newspaper reports for the last 4 months)

Other groups  
 cliques, classes, factions, interests, age-cohorts

B 3 Settlement pattern

buildings and roads  
 maps  
 aerial photos

land value  
 (tax records)  
 sample points  
 realtors

central places  
 T&I report towns > 1000

A&M: Nova Scotia Department of Agriculture and Marketing

M&R: Canada Dept of Mines and Resources

T&I: Nova Scotia Department of Trade and Industry

Census: Census Canada, formerly Dominion Bureau of Statistics  
 (quinquennial summaries)

### A 1: Physical resources

This subsystem is concerned with the array of factors which place ultimate limiting conditions upon human settlement, land use, and agricultural production. For the most part, physical resources are essentially given and change slowly; any indications of rapid change will of course have important consequences in A2.

Soil types and topography can (at least in the present time scale) be considered as stable and entered directly into the data matrix (discussed in the methodological appendix) as constants. Soil qualities and capabilities may be changing noticeably in some areas (eg, through poor management, leading to erosion, exhaustion, and leaching; and through efforts to reclaim, improve, and regenerate productive land). Variation in climate can be summarized annually, but is unlikely to be an important explanatory variable in the proposed research. Hydrological change, particularly irrigation and pollution, is potentially of considerable importance; a 1969 Atlantic Development Board report notes pollution of wells (traceable at least in part to overuse of nitrogen fertilizers) is now reported for part of the region. The main research questions concern changes in the uses made of the array of resources by units of A2, accessible through analysis of aerial photographs.

### A 2: Farms

The landscape accessible through this subsystem consists of ownership and resource-allocation units which produce agricultural commodities. Demands made upon the array of potential natural resources (A1) by farmers change spatially over time, and reflect

changes in production technology (mechanization, capital intensification, new varieties, etc) and changes in demands for agricultural produce (A 3). The main processes to be examined in this subsystem are changes in the number of farms, in the scale of production, and in the array and volume of commodities produced. Summary data for these processes are available in agricultural census returns, and can be entered directly into the data matrix and analyzed as space-time trajectories. More detailed data on particular problems (eg, factors of production for individual commodities, individual histories of adaptation) can be gathered from farmers once the general trajectories are clearer.

The process of removal of farms from the population (by abandonment, consolidation, and removal from production) can be modeled as one of decision making within a population of Farmers who are 'playing' against an Environment which has physical, ecological, economic, political, social and cultural parameters, which change as the game is played. The model is unwieldy (one might well ask if the Game is not in fact playing the participants), but it serves to focus attention upon the problems faced by the population of farmers.

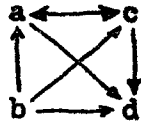
In a situation of rapidly changing technology and market parameters, a farmer has a number of alternative courses of action among which to choose. He can:

- (a) decline to change, and settle for a reduced (and declining) level of living, withdrawing gradually from the consumer economy;
- (b) attempt to stay abreast of changes, which involves the mobilization of capital and information resources and (usually) an increase in scale of operation;

(c) seek part- or full-time jobs outside of agriculture, using the farm as a means to supplement wage income;

or (d) abandon production, sell out and move to town, or away.

Once one of these strategies is embarked upon, further options become limited in the following way:



( —→ : can become)

The requisites, limiting factors, and net results of each option can be stated in general terms:

	<u>requires</u>	<u>limiting factors</u>	<u>net result</u>
(a)	--	--	become a passive participant in production (and consumer) economies
(b)	managerial skills, information, personal connections, energy	access to necessary capital and information resources	become an active participant in the production economy
(c)	saleable skill and market for labor	demand for labor	become a marginal participant in production economy
(d)	buyer, destination, willingness	land market	(withdraw from the sector)

Viewed as a Game played by a population of Farmers, option (a) is essentially passive, and is a common decision (often of necessity) of those who are too old to undertake (b), or lack the skills (or opportunity) for (c); (a) and (c) are not very different, and some people oscillate between them according to the vicissitudes of the labor market. Both are supported by a public-welfare floor. Option (b) is actively risky, and involves those who select it in a highly

competitive game; the number of big winners is limited, and losers must opt for a change in status to (a), (c), or (d). Option (d) has little risk associated with it, but the only gain comes from the sale of resources, and those who select it suffer relegation to a kibitzing role in the game of Farmer.

Looking at the Annapolis Valley region, it is clear from census data that the operation of the 'game' over the last 25 years has changed the population of players considerably. Between 1951 and 1961 some 45% of census farms were removed from the system (ie, entered category (d), above), and their operators either retired or were assimilated by another sector of the economy. Explanation for this process is to be sought in the relations between A2, A3, and B2; its effects are summarized in changes in rural aspects of B3.

### A 3: Markets

This subsystem is concerned with the enterprises which connect agricultural production units (A2) with the external markets for their produce. Processes operating within this subsystem include change in the population (numbers, scale, location, and activities) of enterprises, and externally originating changes in demands for agricultural products. Presently available data are limited to a 1970 report listing manufacturing locations and numbers of retail and service enterprises, and census returns by town and industry. Mapping the present population of marketing organizations is an early task of research; historical material is available through Boards of Trade, and will enable analysis of closing of now-defunct



enterprises. Once the marketing landscape is clearer, it will be possible to ask more detailed questions regarding the operation of particular marketing organizations and sectors. Among the phenomena that require detailed study and integration with events in A2 are the recent growth of secondary processing enterprises, the disproportionate expansion of Kentville and Middleton as service centers, the development of local and provincial cooperative marketing agencies, and change in prices for agricultural commodities.

B 1: Demographic system

Bogue (1969) identifies four processes which operate continuously in a population to produce its size, composition, and distributions: birth, death, marriage, and migration (a fifth process, social mobility, would be more appropriately considered in B2). Annual summary data on births, deaths, and marriages can be entered into the data matrix directly from Vital Statistics reports, and comparison with quinquennial census totals will provide an indication of net emigration rates:

$$\begin{aligned} & (\text{total population } T_2) - (\text{total pop } T_1) + (\text{total births } T_1 T_2) \\ & - (\text{total deaths } T_1 T_2) = \text{Net emigration } T_1 T_2. \end{aligned}$$

Phenomena of concern are changes in the rates of vital processes and (under B3) in their spatial distribution. Change in rate is assumed to index the adaptation of the population system to changes in its environment --ie, in other subsystems; thus, changes in age-specific fertility rates reflect changes in values of and information available to members of the population, and changes in migration rates reflect

changes in opportunity structure and its perception by members of the population (Shimkin 1969). Summary data indicate general trajectories of processes, but leave the most important questions unanswered: WHO migrates? Where do they go/come from? Who is left? What regional assets are lost/gained? Answers are to be sought in the relations of E1 with B2, B3, and A3.

## B 2: Social organization

From the perspective of this subsystem, the region can be viewed as a landscape of groups which form the locus of social interaction: formal organizations, sodalities, factions, cliques, claques, age-grades, families, etc. Diachronic analysis of the constituents and periodicities of the transactional processes (Barth 1966) which animate this landscape will indicate changes in the form and degree of regional and sub-regional integration. Existing data on this subsystem are very limited, and identification and mapping of these groups is an important early research task.

The formal organizations are the most easily mapped and studied; most of their activities are at least theoretically public, and their intended functions are usually clear and unambiguous. A tentative typology of formal organizations which are particularly relevant to the proposed research can be suggested:

- |                                |                                                                       |
|--------------------------------|-----------------------------------------------------------------------|
| (a) supply and entrepreneurial | business enterprises (cf A3, above)                                   |
| (b) administrative             | local bureaus of external agencies, local government, social services |
| (c) interest articulation      | formal interest groups --unions, political parties, farmers' assns    |
| (d) social and cultural        | churches, schools, clubs and sodalities                               |

Each such organization has a spatially-distributed clientele or membership, a range and periodicity of activities, and a domain of influence within the region; some operate to integrate the region into a single social unit, while others (eg, churches, social clubs) are more local in their effects. For example, each of the towns in the region has a Board of Trade which represents the interests of local business establishments and seeks to attract new ones; these boards meet together annually (as the Annapolis Valley Affiliated Boards of Trade --a regional interest-articulation organization) to consider such common problems as transport system improvements and ways to attract tourist dollars to the valley.\*

Some formal organizations are obviously undergoing transformations --eg, a tendency toward vertical integration in agricultural-service industries-- and new functions are being performed. Other organizations (eg, churches, scout troops) maintain the same formal structure, but may be undergoing important internal changes.

Interesting questions to be asked of the population of formal organizations concern (a) the degree of overlap in membership and participation, particularly in economic and political organizations (useful in identifying leadership --cf Skinner 1958, Vidich and Bensman 1968), (b) the aims and resources of interest-articulation groups, (c) the degree to which social and cultural groups are localized (few are regional in scope --the problem is to determine how local and how concentric their distributions are), and (d) how

\* The meeting this year will be addressed by former Prime Minister John Diefenbaker, an indication of the importance and general political orientation of this group, and of the effectiveness of its leadership.

each of the above has changed over the 25-year period under study. In the course of looking at each of the above, systems of informal organization will become apparent --unofficial power structures, social classes, dialect groups, age-grades, factions, etc. The most promising of these (from the point of view of accessibility) can be examined in detail. Another source of information which may prove useful in discussing socio-cultural integration within the region is the community columns in weekly newspapers, which report the significant doings (visitors, trips, parties, birthdays) of small-town residents; these can of course be compared over time as well.

### B 3: Settlement pattern

Two processes of succession accessible through this subsystem are (a) land use (eg, changes in vegetation, new construction, expansion of urban uses, etc), and (b) occupance (the redistribution of population over the physical landscape). Both can be studied by diachronic comparison of aerial photographs, and both index the effects of events occurring in other subsystems --eg, abandonment and new uses of potentials inherent in A1, changes in the productive value of land (A2,A3), labor market changes (B1,B2), etc. Ancillary data will include changes in market and rental value of land and buildings. The patterns which emerge from analysis of aerial photographs can be related to the evolution of the system of central places within the region; a process of centralization seems indicated in the increasing commercial domination of the valley by Kentville, resulting from concentration of new industrial and population growth within its retail hinterland, but the political and social correlates and effects of this process are not yet clear.