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RURAL DEVELOPMENT PLANNING: A SCIENCE?\*

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Low incomes, lack of job opportunities, etc. have been identified as a problem for many rural regions in Canada. Large expenditures have been directed to overcome such problems. According to Lessard, \$1.1 billion was spent on rural development programs in Canada over the 1961-75 period. In the planning process a rural development plan refers to a set of programs which include integrated projects with a fixed budget set for a period of years.

It is our contention that simulation procedures exist which allow researchers to approximate a scientific test of the effectiveness of rural development planning. Simulation (Johnson and Rauser, p. 162) is a process of experimenting with economic models which has been applied to one plan in Canada (Tung, MacMillan and Framingham, and Tulloch and MacMillan). If a plan is viewed as a single experiment a validated regional model can be used to simulate ex post results with the plan (a treatment) and without the plan (a control). A comparison of results with and without the plan completes a single test for a plan in one region. Several ex post experiments with different plans in different regions are required to complete the testing of rural development planning.

The critical issue is that agreement does not exist among economists and planners with respect to the common set of research procedures required

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to test the effectiveness of rural development planning. As a result rural development planning as commonly practised generates few recorded observations that are comparable.

Testing rural development planning is discussed below with respect to: (1) a proposed definition of rural development planning research steps; (2) a summary of research conducted for the evaluation of the rural development plan for the Interlake Region of Manitoba; (3) applicability of the research steps for rural development planning in British Columbia; and, (4) observations on rural development planning.

#### A Proposed Definition of Rural Development Planning Research

It is implicit in our definition of research steps that the economist's role is to assist policy makers and administrators make more effective planning decisions. Consider the null hypothesis -- the rural development plan has no effect in achieving the development objectives. Many classifications of procedures exist for an economic research investigation. For example, twenty-three steps are outlined by Ferber and Verdoorn for solving a typical consumer research problem. Six research steps (Figure 1) are defined below as a guide in the testing of rural development planning:

- (1) identification of quantitative rural development objectives including measures of income and job opportunities, and standards of living for residents of a rural region,
- (2) a model is constructed for the rural region with the capacity to simulate estimates of aggregate regional indicators of development with and without the projects contained in the plan,

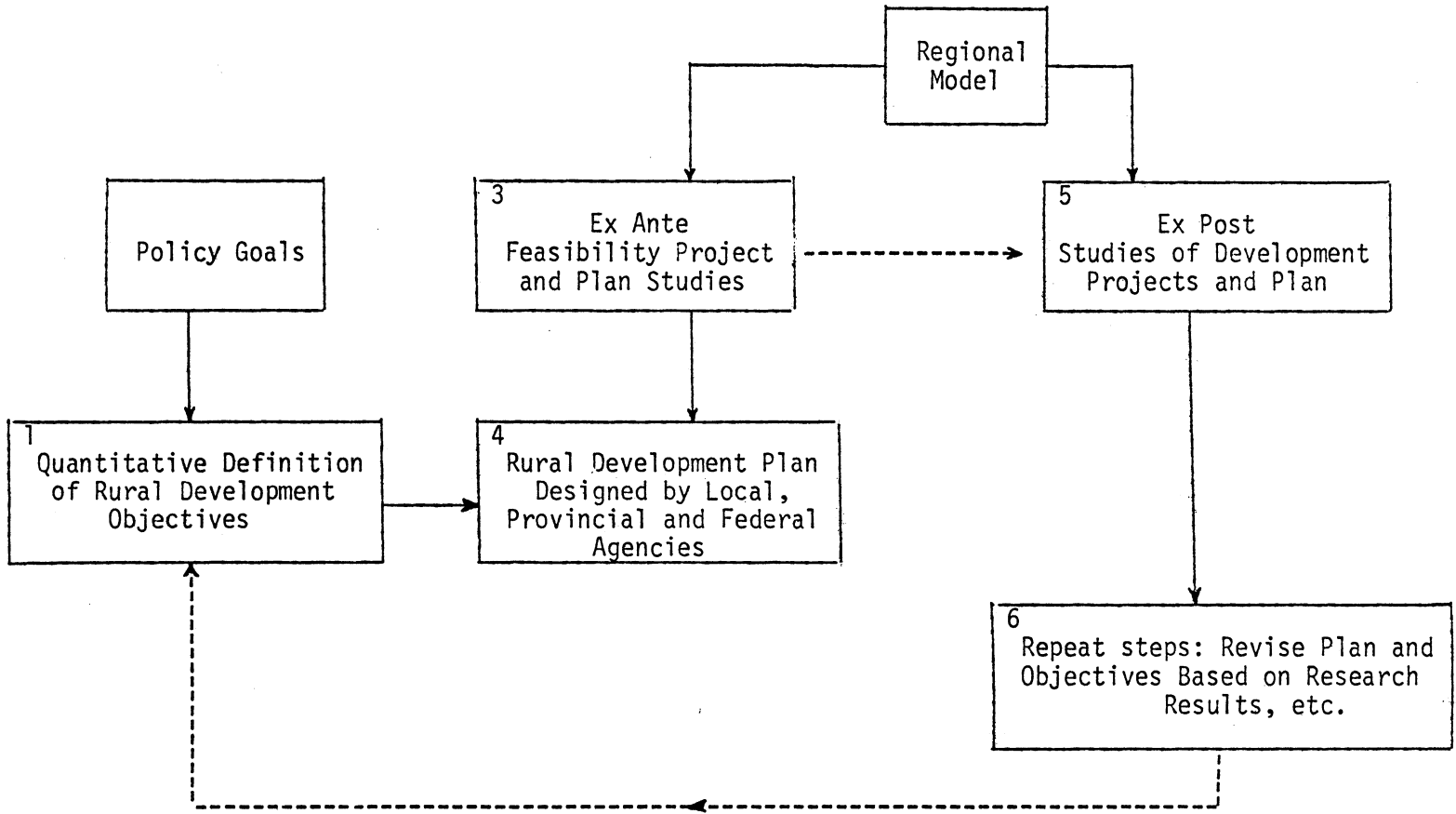


Figure 1. Rural Development Planning Research Activities

- (3) feasibility studies are completed to assess proposed projects relative to ex ante rate of return and income distribution performance criteria,
- (4) a plan consisting of \$X million on selected projects for a fixed number of years is constructed,
- (5) in depth special studies of the development projects and plan are conducted to assess project results ex post relative to ex ante projections, and
- (6) conclusions with respect to improvements in the plan and rural development objectives are made consistent with ex post study results.

Completion of all activities for a single plan generates one observation with respect to the effects of rural development planning. It is common for analysts to focus only on one of these six activities such as ex ante project analyses or sectoral models for a single development plan. While such partial analyses may be interesting and of value, all six activities are a prerequisite for tests of the rural development hypothesis.

Ideally several iterations of these steps would be completed in planning with continual interaction with the plan administrators.

It is recognized that rural development planning can be viewed from many perspectives including: political, administrative, sociological and ecological in addition to an economic perspective. Considerable scope exists for zero or negative economic impacts of plans due to noneconomic factors. Local involvement in specifying goals is one means of reducing noneconomic planning problems. The feasibility of obtaining statements

of development goals has been demonstrated for two rural regions in Manitoba by MacMillan and for Treaty #3 Indian bands in Northwestern Ontario by Kelly, Kelly, MacMillan and Lyon.

Evaluation of the Rural Development Plan for the Interlake Region of Manitoba

A total of \$85 million was allocated to a rural development plan for the Interlake Region of Manitoba for the period, 1967-77. The objectives of the plan were to increase income and employment opportunities and to raise the standard of living of the people of the area. Programs were implemented in the areas of education, manpower training, agriculture, fisheries, transportation and recreation.

The objective of research concerned with evaluation of the rural development plan for the Interlake Region of Manitoba was to measure the economic impact of the plan thus determining whether the broad objectives contained in the plan were being attained (see MacMillan and Lyon). Research results indicate the feasibility of estimating the effects of a rural development plan on indicators of rural development (Tung, MacMillan and Framingham, and Brown and MacMillan). Ex post in depth studies of projects were compared with ex ante feasibility results. Individual project impacts were linked to a dynamic simulation model for the rural region and projections for the region made with and without the plan. Conclusions were reached with respect to improvements in the plan as a consequence of study results. The evaluation research procedures for the Interlake Region were consistent with the six activities listed above.

Unfortunately, the six steps have not been completed for other rural development plans and there is a scarcity of consistent program evaluation results. For example, the cost-effectiveness of programs in job creation range from \$33 thousand per job for highway expenditures to \$6 thousand per job for agricultural development and manpower corps (Table 1). These results appear to be comparable to estimates for United States development programs (Tweeten and Brinkman, p. 436) including public employment (\$36 thousand), industry location through tax write-offs (\$5-\$12 thousand), subsidies to industry for training the disadvantaged (\$6 thousand), subsidized migration (\$3 thousand). Confidence that such job creation effects are generally applicable in rural development planning requires analysis of programs in many rural regions.

#### Rural Development Planning in British Columbia

Rural development planning in the Interlake Region of Manitoba started with several years being spent on feasibility studies prior to a specification of development goals and detailed projects in the plan (see Hordo and MacMillan for a review of management stages in the plan). The discussion of quantitative development objectives and feasibility studies currently being initiated in British Columbia is consistent with a preplan management phase in the evolution of a plan (steps 1, 2 and 3, Figure 1).

An opportunity exists in the Province of British Columbia to follow the research procedures outlined above. Under an agreement between the federal and provincial governments an expenditure of \$60 million between 1977 and 1984 was authorized under an Agricultural Rural Development Act (A.R.D.A.). Four program areas are included:

Table 3. Job Creation per \$1 Million in Alternative Rural Development Programs, Interlake Region of Manitoba

Sectoral Program	Man-Years Employment Created per \$1 Million (1968 dollars)	Timing of Job Impact
1. Agricultural Development <sup>a</sup>	160	Perpetual or Life of Drain
2. Food Processing <sup>b</sup>	50	Perpetual
3. Education <sup>c</sup>	85	Annual Expenditure Required
4. Housing <sup>d</sup>	80	Annual Expenditure Required
5. Highways <sup>e</sup>	30	Annual Expenditure Required
6. Recreation <sup>f</sup>	60	Annual Expenditure Required
7. Manpower Corps <sup>g</sup>	160	For the Working Life of Trainees

Source: James A. MacMillan and Shirley Lyon. The Interlake Experience: A Description and Evaluation of a Rural Development Program, 1967-1977, Winnipeg: Department of Agricultural Economics, University of Manitoba, Occasional Series No. 9, 1977, p. xvii.

<sup>a</sup>Estimated from analysis of agricultural development programs by F.L. Tung, J.A. MacMillan and C.F. Framingham, "A Dynamic Regional Model for Evaluating Resource Development Programs", American Journal of Agricultural Economics, 58:403-414 (1976). Drainage, land clearing and farm management training, \$8.4 million, generated 1.4 million man-years of employment.



Footnotes Continued

<sup>b</sup>A \$1.4 million in DREE industrial incentives for a rapeseed processing plant is estimated to generate 47 plant jobs and 20 trade centre jobs, J.A. MacMillan, et al., "Parklands Region Manpower Information Study", Unpublished Report, Department of Agricultural Economics, University of Manitoba, 1974, pp. 514-521.

<sup>c</sup>The 1968 Interlake education expenditures of \$7.4 million create 635 jobs, 536 man-years of employment in the school system and 99 trade centre jobs. P. Molgat and J.A. MacMillan, Education in Area Economic Development, Winnipeg, Manitoba: Centre for Settlement Studies, University of Manitoba, 1972.

<sup>d</sup>J.A. MacMillan and E. Nickel, "An Economic Appraisal of Urban Housing Assistance -- Rental Supplements Versus Public Housing", Canadian Public Administration, 17:443-460, No. 3, 1974.

<sup>e</sup>P.G. Douglas and J.A. MacMillan, Simulation of Economic Impacts of Highway Expenditures, Research Report No. 9 (Winnipeg, Manitoba: Centre for Transportation Studies, University of Manitoba).

<sup>f</sup>The job impact is calculated per \$1 million of operating expenditures at Hecla Provincial Park, \$700 thousand in 1976. The capital cost of \$5 million is excluded. N. Brown and J.A. MacMillan, "Recreational Program Development Impacts: A Dynamic Regional Analysis", American Journal of Agricultural Economics, November, 1977.

<sup>g</sup>The \$5 million Manpower Corps Expenditure 1967-76 increased wages from \$82 to \$219 per week and reduced the unemployment rate from 80 percent to 20 percent after training for 1,300 trainees resulting in an investment of 160 jobs. Marco Fernandez, "Evaluation of Manpower Training Programs: The Interlake Manpower Corps", Ph.D. Thesis, Winnipeg, Dept. of Ag. Econ., Univ. of Manitoba, 1977.

- (1) research, planning, training and market promotion (\$4.95 million),
- (2) co-ordinated resource management (range improvement, \$19.8 million),
- (3) primary resource development (irrigation and drainage, \$15.0 million),
- and (4) support services and community development (\$20.25 million).

The agreement provides for local, provincial and federal participation in the planning process, but a formal plan is yet to be formulated. Funds have been allocated to program areas with a minimum of completed economic analysis. A cursory review of the programs indicates a substantial proportion of the total budget is being directed to a small number of beef producers. Given this situation, the objective of research is to assist policy makers and administrators make more effective planning decisions. If analyses can be structured according to the six activities listed above the needs of policy makers and administrators can be met as well as the requirements for testing rural development planning.

With respect to the first step -- identification of quantitative objectives -- one major policy goal of the B.C. Ministry of Agriculture is to achieve greater self-sufficiency for major food commodities. The goal is consistent with the narrow development strategy of import substitution. A regional model can be used to illustrate the impacts on quantitative measures of rural development objectives including income, job creation, and income distribution of projects introduced to increase self-sufficiency. Currently an interregional linear programming model of agricultural sectors in British Columbia is being constructed.

Given that under the present system of production most ranchers are cow-calf producers, with calves being shipped to and finished in other provinces planners are interested in the feasibility or impacts of backgrounding

Table 2. Impact Measures (income to livestock producers, regional incomes, employment and income distribution) of Six Alternatives

	Range Improvement Projects	Irrigation and Drainage Projects
Cow/Calf	$Y_{11}$	$Y_{12}$
Backgrounding	$Y_{21}$	$Y_{22}$
Feedlot	$Y_{21}$	$Y_{32}$

more calves (carrying calves over the winter to the feedlot yearling stage) and/or feedlot expansion in British Columbia. It is clear that an increase in cow-calf, backgrounding or feedlot activities is consistent with the policy goal of import substitution, but may not be consistent with other objectives.

Ex ante rates of return can be calculated for the A.R.D.A. program expenditures -- range improvement (\$19.8 million) and forage production increases due to drainage and irrigation (\$15 million) using a regional model. Given estimates of costs and increases in feeding capacities for spring, summer, fall and winter feeding due to (1) range improvement, and (2) forage availability, estimates of the incremental income associated with any combination of the three production enterprises -- cow/calf, backgrounding, and feedlot -- can be calculated. Furthermore, it is necessary to illustrate the sensitivity of net income impacts ( $Y_{ij}$ ) to alternative basic assumptions (Table 2). The impacts will vary if prices represent a peak, trough or average over product and input price cycles. Given the estimates symbolized in Table 2, planners can review the initial allocation of development funds with respect to range versus forage improvement projects and alternative beef production activities or some combination of alternatives.

The A.R.D.A. Subsidiary Agreement was initiated in July 1977 and a review is scheduled for July 1979. Given time constraints, a preliminary analysis can provide a ranking of the six development alternatives or combinations outlined in Table 2 based only on one impact measure, the net income to livestock producers generated per \$1 million development expenditure. The discussion has been simplified by referring only to net income for the beef sector. If multiple objectives of income growth, employment growth,

and income distribution are accepted for seven sectors (dairy, poultry, beef, grains, forage, fruits and vegetables) in 9 rural regions an objective function of 189 components results. Special studies are needed such as the community pasture evaluation by Barichello to provide a detailed analysis of the economic efficiency and income distribution impacts of all individual projects. Current research on rural development planning in British Columbia can be grouped into three activities:

- (1) identification of quantitative rural development objectives,
- (2) construction of a sectoral interregional model for agriculture, and
- (3) ex ante feasibility studies. Research on three other activities:
- (4) definition of a plan made up of development projects, (5) ex post evaluation, and (6) conclusions with respect to the plan and objectives are required to test rural development planning in British Columbia.

#### Observations on Rural Development Planning

A checklist of six research activities was outlined above to assist in designing and testing of rural development plans. This list requires refinement, but the general nature of the tasks is not likely to be disputed by many agricultural economists. We do not know of any rural development plans in Canada other than the Manitoba case which all six steps have been completed. The problem is that policy makers and administrators are not convinced of the relevance of a major commitment of economic research in Canadian rural development planning. A substantial increase in the documentation with respect to project and plan evaluations is required to increase the confidence of policy makers, administrators and rural people in rural development planning models and research procedures. The cost of such documentation for

B.C. is not large relative to the total budget of \$60 million.

A commitment to testing rural development planning in B.C. requires improved communication between agricultural economists and plan administrators to overcome the following problems: (1) the desire by administrators to maintain flexibility by avoiding specificity and quantitative objectives, (2) the consistent underestimation of the time required to develop models and complete ex ante research, (3) the underestimation of the time required to implement programs and projects, (4) the conflict between adequate planning and the desire to commit project funds, (5) the difficulty of translating complex research into information useful to plan administrators, (6) the tendency of economists to make hasty generalizations about the means of improving rural development planning based on incomplete analyses of questionable data. Finally, if agreement by agricultural economists and planners with respect to the appropriate research procedures cannot be achieved then rural development planning in Canada will continue to be a nonscientific activity.

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