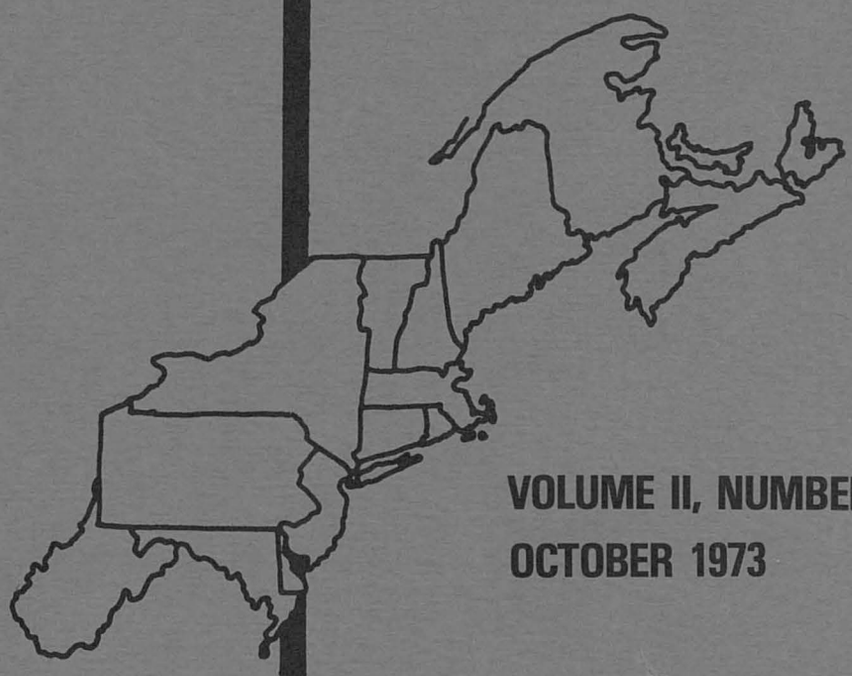
JOURNAL OF THE

Northeastern Agricultural Economics Council



VOLUME II, NUMBER 2
OCTOBER 1973

AN EVALUATION SYSTEM FOR THE NATURAL RESOURCE SECTORS OF THE PRINCE EDWARD ISLAND DEVELOPMENT PLAN

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Introduction

Prince Edward Island, one of the four Atlantic Provinces of Canada, has recently, in conjunction with the Federal government, undertaken a comprehensive development plan in an effort to break the "vicious circle" of poverty, low income and low productivity characteristic of a depressed region. Before the development plan was instituted, levels of unemployment on the island were consistently three to seven percent above the national average. The economy is characterized by a heavy dependence upon land based resource industry, particularly agriculture, and the resources of the sea. The small amount of manufacturing is related almost entirely to these resources and is organized in small production units. Accordingly, per capita income ranges between 60% and 70% of the national average. The P.E.I. development plan is broad-based, massive in relation to the economy of the island, and contained in a single geographical and political unit. Development projects are planned, not just for a few sectors of the economy, but for practically all sectors and at a scale of investment where significant changes should occur.

Economic and social development such as hat envisioned for Prince Edward Island is a complex process involving many kinds of change. It is the task of the development plan administrator and planner to organize for the achievement of these changes. Specifically, the administrator is responsible for determining the changes which most need to be speeded up, the projects which give the most promise of bringing about the desired changes, and administering these projects as efficiently as possible. Unfortunately, the art of inducing and guiding social and economic change is not yet highly developed.

The development of a body of concepts and practices which could be applied in such a way that they would contribute to the improvement of the efficiency and effectiveness of the administration of development plan projects and programs would appear necessary. Such a body of concepts and practices may be termed an evaluation system. Evaluation is essentially the collection and interpretation of data in such a way

that the development plan administrator or decision-maker is better able to allocate the scarce resources at his disposal. The objective of this paper is to develop such an evaluation system for the natural resource sectors of the P.E.I. development plan.

The theory which provides the basis for the evaluation system comes, firstly, from the theory of regional economic development, and, secondly, from the theory of the role of budgeting and analysis in public decision making. The first of these groups of theory, that of regional economic development, concerns itself with the fact that differential regional growth has been found to be an integral part of many highly developed or developing countries. This effect is amplified in larger countries since the greater the geographic size of a country, the larger the scope for wide regional variations in natural resource endowment and the weaker the economic linkages between regions.

Several theories have been proposed to explain why growth rates should vary between regions.[1/] The most important of these are the "export-base" theory which emphasizes the role of the export sector and the "sector-shift" theory which emphasizes the development of the secondary and tertiary sectors of the region. In the view of the "export-base" or "staple" theory of regional development, a region becomes economically viable when it is able to export one or more commodities to other regions. The export industries then provide the base for the development of secondary and tertiary industries. The "sector-shift" theory discusses the ultimate process in regional development. This is when a state of self-sustained growth has been reached and the secondary and tertiary industries become export industries.

Budgeting and Analysis

The second theoretical base is the theory of the role of budgeting and analysis in public decision-making. One of the main methods of guiding the process of development and one of the principal decision points in development planning is the allocation of funds in the budgeting process. Traditionally, budgeting in public decision-making has been concerned with management and control rather than planning and analysis. Too much emphasis has been placed on inputs and organizational units as the basis for solving public problems and enacting programs. Generally, this type of incremental change and lack of thorough analysis is inadequate for meeting the heavy demands on the budgeting process in a comprehensive regional development program.[2/]

1/ For more information on regional development see: J.R. Meyer, "Regional Economics: A Survey" American Economic Review, LIII, No. 1 (March, 1963), 19-54.

2/ For futher elaboration of these points see Aaron Wildavsky, "Rescuing Policy Analysis from P.P.B.S." Public Administration Review, XXIX, No. 2 (March-April 1969), 189-202.

Instead, analysis must be brought directly into the budgetary and decision processes. The type of analysis needed is that which will identify objectives and pay attention to whether or not these are achieved. This is done through devising alternative ways of handling problems and considering the total future costs and benefits of each solution. Analysis aims at providing information that contributes to making an agency politically and socially relevant.

The most frequently used procedure for including analysis in the budgeting procedure is the planning, programming, and budgeting system. This is an approach to decision-making based on relating actions to objectives, making explicit the costs and consequences of major choices, and encouraging the systematic use of information in the making of public policy. P.P.B.S. offers a program-oriented framework which focuses on the problems to be solved rather than the inputs used. Features of the system include a multi-year time horizon, an improved information system, and the application of systems analysis techniques to public problems.

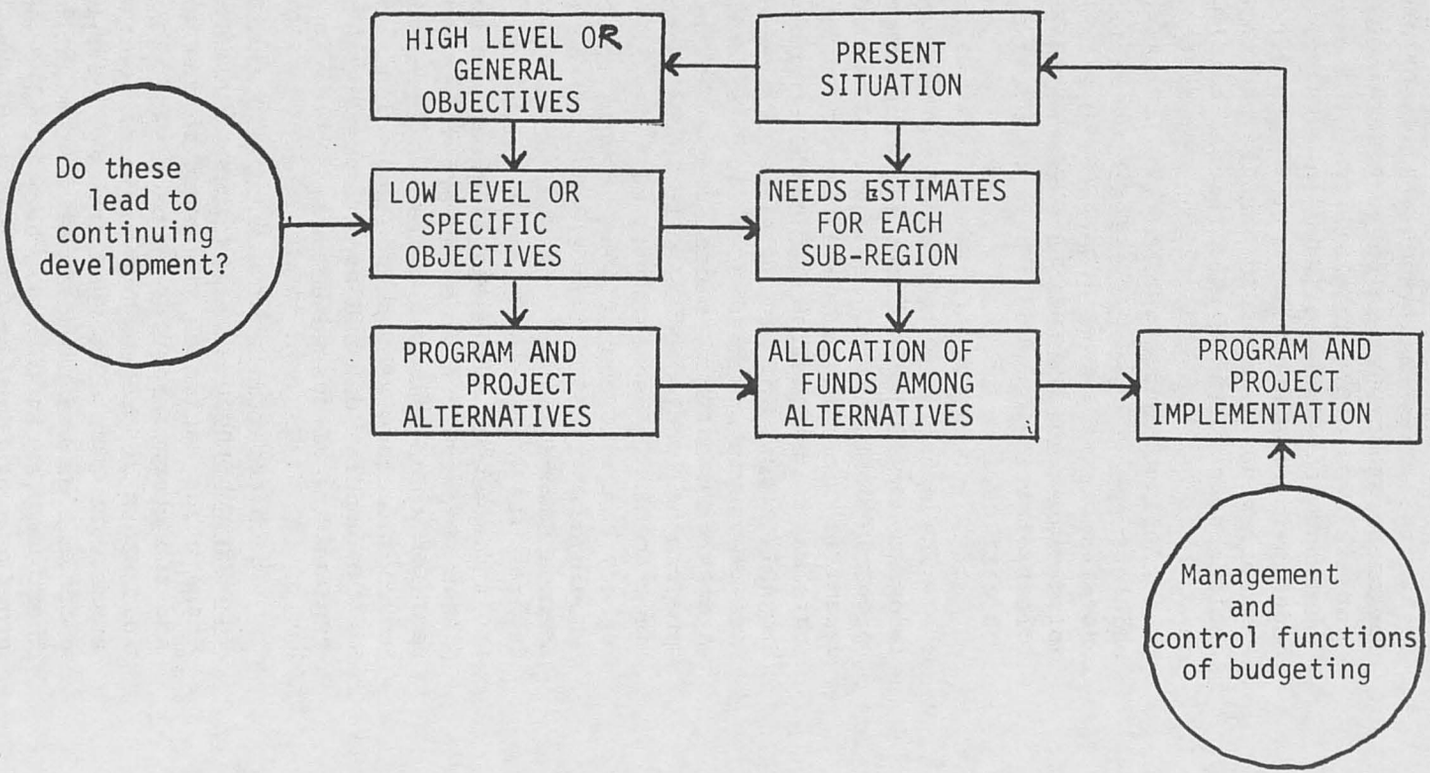
Previous experience with analytical budgeting systems and the characteristics of these systems suggest two policies which should be followed in implementing such a procedure. Firstly, the system cannot be expected to automatically and objectively make all budgeting decisions. It is impossible to have an overall procedure which will turn out an effective and efficient set of government expenditures. Subjective elements and questions of judgment will inevitably and necessarily be present in any budgeting decision process, especially at the higher levels. At the lower levels of budgeting, the costs and benefits of an individual project may be relatively easily calculated and a decision made on the project's usefulness.

A second policy which should be oriented toward the departments or agencies responsible for the individual programs and projects. The departments or agencies are the most familiar with the individual projects and are therefore usually called upon to carry out much of the project analysis. In other words, the departments or agencies inevitably bear the costs of any analytical procedure. It would appear that any analytical system would be improved if those bearing the costs were also able to capture some of the benefits through using the analytical system in their own budgeting procedures. This would occur through having the individual departments or agencies responsible for the system.

A Suggested Budgeting Procedure

A typical agency or department budgeting structure may be shown in the form of a flow chart as in Figure 1. The procedure begins with the setting of high level or general objectives for the development plan as a whole. These should be set by the overall planning authority based on information on the present situation in the area. Applying national norms or standards to the profile of the area should yield an acceptable "first fit" of the high level objectives.

Figure 1. Flow Chart for the Budgeting Procedure within each Department



Data indicating such factors as average income levels, the distribution of income, and rates of unemployment may be used here. The general objectives are usually in the form of income or employment targets.

It is then the responsibility of each natural resource department or agency to translate these general objectives into specific objectives for its area of responsibility. The specific objectives would show what had to be accomplished in each natural resource sector in order to accomplish the overall task of economic development. Factors which are hindering development in each of the natural resource sectors or bottlenecks which must be removed may be identified here.

An important aspect of the specific objectives is ensuring that achievement of these will lead to continuing development. That is, the development plan should not act as a subsidy scheme, such that when the plan ceases the various sectors revert to their previous state. A clear distinction should be made between welfare and development objectives.

The specific or low level objectives should then suggest definite programs or projects for their achievement. Several projects will probably be suggested for each specific objective. For example, if a specific agricultural objective is to improve the net income of farmers, this may be accomplished through extension service improvement or farm consolidation. Since funds are limited and the programs and projects are of varying degrees of utility in achieving their objectives, each agency or department needs some method of allocating funds to each program and project. As well, an element of commonality between departments is necessary so that the Treasury Board or central budgeting agency can make comparisons between agencies. The budgeting system should also take into consideration the regional differences within Prince Edward Island.

The method suggested is a sub-regional type of analysis. The first step is to divide the province into a small number of sub-regions; each of which will be, as far as is possible, homogenous with respect to such factors as resource endowment, socio-economic characteristics of the population, and administrative jurisdiction. The actual sub-regions are discussed below.

Each department or agency will then develop the needs or objectives in each sub-region for its area of responsibility. As shown in Figure 1, these needs estimates are based on the department's specific objectives and the characteristics in each sub-region. The needs estimates are indicators of program and project opportunities. The extent of problem areas, the size of target groups, and the significance of any economic deficiencies are examples of what might be included in needs estimates. Their purpose is to show where development action is needed and to provide a standard against which program and project alternatives can be measured and compared.

The next step for each department is to allocate its funds among the alternative programs or projects. Each program or project must first be evaluated as to its effectiveness. Estimates are made of the extent to which each project goes in fulfilling the needs in each sub-region. The effects of variations in the scale and scope of projects should be analyzed.

In theory available funds should then be allocated by a department so that the marginal benefits of each project per dollar spent on the project in each sub-region are equal. In practice such an equimarginal allocation of funds will probably not be possible because of the impossibility of making trade-offs between benefits. This may be due to conceptual problems in measuring and comparing benefits or it may be due to the fact that the objectives of the development plan state that certain benefits in specific sub-regions must be achieved. Another decision criteria, such as allocating funds so there is an equal percentage achievement of needs in each sub-region, may be necessary.

Even though this procedure assumes an initial budget allocation to each natural resource sector, an iterative procedure may be adopted to improve the initial allocation. Once project effects have been matched to needs, comparisons can be made between sectors and a decision made on whether the intial budget allocation should be altered. Resource sectors with a relatively low overall achievement of needs would be prime candidates for further funding while sectors with a high overall achievement of needs may have their budgets reduced.

The final step is implementation of the chosen programs and projects. The management and control functions of budgeting are important here. After a period of project implementation, the present situation changes which may lead to a reformulation of objectives and a repeat of the whole process.

The Sub-Regions

The sub-regions themselves may be seen in Figure 2. They are a series of delineations of the province into five separate areas based on available data, current administrative structures, and trading areas or town orientations. Each of the delineations was done so that the sub-regionalizations would coincide as far as possible. The factors used in defining the sub-regions are summarized in Table 1.

The towns and cities of O'Leary, Summerside, Charlottetown, Montague, and Souris each have a sub-region centered on them. The Department of Agriculture and the Land Development Corporation have each established their regional offices in these centres.

The administrative structures used in devising sub-regions were those of the P.E.I. Department of Agriculture, Land Development Corporation and Canada Department of Fisheries. The Department of Agriculture

Figure 2. Regionalization of Prince Edward Island

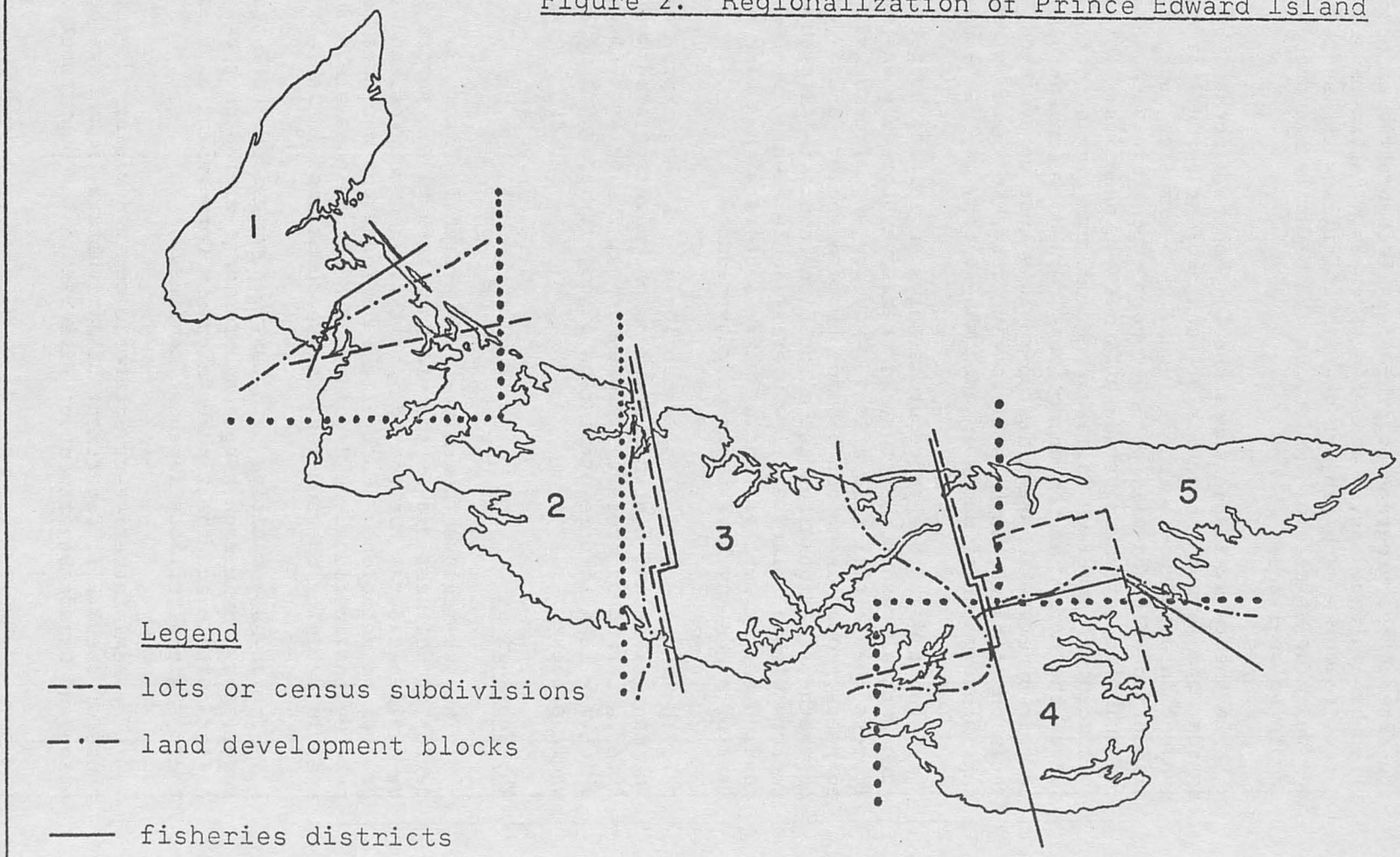


Table 1. Regionalization of Prince Edward Island

Sub-Region Number	1	2	3	4	5
Principal town	O'Leary	Summerside	Charlottetown	Montague	Souris
Lots or census subdivisions	1-12	13-21, 25-28, 67	22-24, 29-37, 48-50, 67	51-54, 57-64, 66	38-47, 55, 56
Fisheries districts	82	83	85 and 86	87	88
Plates or Forestry maps	9-1 to 9-4	9-5 to 9-8, 9-15	9-9, 9-10, 9-11, 9-16, 9-17	9-18 to 9-21	9-12, 9-13, 9-14
Land development blocks	Northwestern Shore, Alberton-O'Leary, Egmont Wet Lands (western half)	Egmont Wet Lands (eastern half), Eastern Prince	Central Hill Lands, Charlottetown	Montague, Georgetown, Murray Harbour, Southeastern Hill Lands, Wood Islands Shore	Mount Stewart-Morrell, Eastern Forest Belt, Souris Shore
Regional high schools	Tignish, Alberton, O'Leary	Tyne Valley, Miscouche, Evangeline, Kensington, Athena, Englewood	Stella Maris, Central Queens, Charlottetown Rural	Montague	Souris, Morrell
Educational area	1	2	3	4 (south)	4 (north)
Hydrometric divisions	1 CA	1 CB	1 CC	1 CE	1 CD

and Land Development Corporation both use census sub-divisions or lots for their administrative regions. These are listed in Table 1. The Canada Department of Fisheries districts, used for data collection and administration, are also listed in Table 1.

Data from the forest resources inventory for P.E.I. is available by map sheets or plates. These have been assigned to sub-regions in Table 1.

The fourth set of data used in the sub-regionalization come from the Prince Edward Island macro land use plan and used land development blocks for the classification of its data.[3/] The blocks were defined on the basis of the internal homogeneity of such items as soil capability, topography, and present land use. Variability in these items is greater between blocks than it is within blocks.

Two other regionalizations carried out on P.E.I. but not used in this budgeting procedure as they do not pertain directly to the natural resource development projects are those for education and watersheds. These are also included in Table 1. They indicate that data are available for possible expansion of the sub-regional budgeting procedure.

Weighting the Needs and Objectives

The problem of weighting the various needs and objectives may arise. If all the specific objectives are considered to be of equal importance, this problem may be avoided. However, if some of the objectives are felt to be of higher priority than others, some form of weighting system will have to be applied. Those needs or objectives which are considered crucial to the success of the plan or which must be achieved before other programs and projects may proceed should be given heavier weights than projects which are of lower priority or of peripheral importance to the plan. A weighting system may also be applied to the sub-regions if development in certain sub-regions is felt to be of greater urgency than in others.

Several possible methods exist for assigning weights to particular objectives or sub-regions. One would be to build the weighting system into the low level or specific objectives. That is, a particularly important objective would be stated forcefully while a less important objective would be given less emphasis. Another method for ranking specific objectives is through the use of constraints. The budget allocation in a particular department would be constrained by stating that certain specific objectives must be achieved or that a given level of certain specific objectives must be achieved. The remainder of the budget would then be allocated amongst the projects and programs which had the highest percentage achievement of the remaining objectives or needs.

3/ Lovering, James et al. "A Macro Land Use Plan for P.E.I." Mimeo, Dept. of Enegery, Mines and Resources, Ottawa, 1969.

A third method of weighting is to assign co-efficients to the specific needs or objectives. Projects which fulfill high priority needs would have their benefits multiplied by a co-efficient greater than one while projects fulfilling low priority needs would have their benefits multiplied by a co-efficient less than one.

Advantages of This Procedure

This procedure offers certain advantages. First among these is its orientation toward the departments and agencies responsible for the individual programs and projects. These departments and agencies are the most familiar with the programs and projects and in any analytical system would be called upon to do much of the analysis. Consequently they would bear many of the costs of the budgeting procedure. An analytical system would therefore be improved and be more successful if those bearing the costs were also able to capture some of the benefits. A sub-regional type of analysis would be of considerable use to the individual departments or agencies in allocating funds amongst projects and sub-regions. The procedure will also have sufficient commonality between departments so that a central Treasury Board would be able to make comparisons between departments.

A sub-regional type of budgeting analysis fits in well with the political and administrative realities of Prince Edward Island. Many programs are currently, or shortly will be, administered on a sub-regional basis. Several departments have established regional offices for this purpose. Also, e ch area of the province will request and expect a share in the development aid. Such a division of the development plan projects between the various areas of the island will be most efficiently accomplished with a sub-regional analytical system.

The budgeting system has the further advantage of focusing on particular problems in particular areas. Even though P.E.I. is relatively small, it is not homogenous in its resource development problems. Estimates of the magnitude of these problems and the need for development are best made on a sub-regional basis where they will not be offset or obscured by the effects in other sub-regions. Each sub-region will receive emphasis on its problem areas, both within a particular natural resource sector and between natural resource sectors.

Possible Problems

The procedure, of course, is not without its problems. The analytical problems involved may be the most serious. In many cases, the analyst may not be able to accurately quantify needs, project effects, and other variables. Estimates, at least in qualitative terms, should be made where possible.

Introducing time into project analysis further complicates the budget decision process. Many projects require more than one year to achieve their full results. Budgeting decisions will have to be made on

a multi-year basis with project achievements projected into the future. Another problem is that of project lumpiness which occurs when a project has to be of a certain scale in order to achieve any benefits from it.

A fourth difficulty with an agency-oriented sub-regional type of analysis is that individual resource sector planners, because of their relatively narrow perspective, may have trouble appraising projects which overlap sectors. For example, an agricultural land adjustment project will have effects on the forestry and tourism sectors. The central budget authority should keep track of and make allowances for these overlaps.

Conclusions

Although the above procedure does not automatically answer all of the problems faced by the development plan administrator, it does provide a framework on which to handle budgeting decisions. Analysis is brought into the budgeting procedure and an attempt is made at relating inputs to outputs. To a large extent, the success or failure of any evaluation system depends on the attitudes and skills of those responsible for the system. Managers must become more concerned with objectives and targets. This may mean sacrificing long-established programs and abandoning certain client groups. The change will be difficult because of the many shifts in status and power which may occur. However, no budgeting or evaluation system can be any better than the attitudes and skills of those operating the system.

References

Canada. Department of Regional Economic Expansion. Development Plan for Prince Edward Island. Ottawa: Queen's Printer, 1969.

Churchman, C.W., and Schaipblatt, A.H. "PPB: How Can it be Implemented?" Public Administration Review, XXIX, No. 2 (March-April, 1969), 178-88.

Lovering, James et al. "A Macro Land Use Plan for P.E.I." Ottawa: Canada Department of Energy, Mines, and Resources, 1969. (Mimeographed).

McGuire, Martin C. "Program Analysis and Regional Economic Objectives," in U.S. Congress, Joint Economic Committee. The Analysis and Evaluation of Public Expenditures: The PPB System. Washington, D.C.: U.S. Government Printing Office, 1969, pp. 592-603.

Meyer, John R. "Regional Economics: A Survey". American Economic Review, LIII, No. 1 (March, 1963), 19-54.

Prince Edward Island. Office of the Premier. Policy Statement on Government Reorganization. Presented to the Legislative Assembly, June 24, 1970. Charlottetown: Queen's Printer, 1970.

Schick, Allen. "Systems Politics and Systems Budgeting." Public Administration Review, XXIX, No. 2 (March-April, 1969), 137-151.

Wildavsky, Aaron. "Rescuing Policy Analysis from P.P.B.S." Public Administration Review, XXIX, No. 2 (March-April 1969), 189-202.