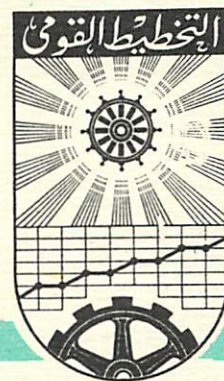


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Information And Regional Development
Planning

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Introduction

"It is obvious that if a country wants economic development, it must first know what it has to deal with. The obvious first step is a natural resources inventory."

Such a statement is often read in the economic development and planning literature. Such a statement is very often interpreted, especially by development planning administrators, to mean a "complete" description of resources endowed in the country (or the region) which is a monstrous job that requires the diversion of effort and talent from far more important tasks from the total development point of view. It can be argued that just a better knowledge of resources, or some particular studies about some resources, might prove to be more valuable to the attainment of the development goals.

In this paper it is argued that it is better to provide an analysis to make it possible for a government year by year to get closer to the "best" information budget for that year. The "best" for that matter changes as time goes on because the demand for more information and its pay-off changes with the passage of time as a result of population, technological knowledge and natural resources changes.

At this point it is relevant to state that societies differ widely in the extent to which they are able to influence development and the way this development is carried out. Some societies depend on the government

for pursuing the course of development. Some others may react to merely governmental signaling for courses of development actions; and other societies may not react at all except by coercion with much less results attained.

As a result of the differences between societies in influencing and carrying out development, and as a result of the differences of ideology pursued, different strategies for attaining information -- let alone its use -- exist in the different countries. At one end of the scale one finds that the generation of information is left to the individual ability and capacity. At the other end one finds the government or the controlling agency generating, collecting, or developing a whole array of comprehensive inventory of information about all the aspects concerned with human activities.

The problem then is to seek a solution for a given country or a region to develop the information necessary for development to take place and for that matter in the most economical way.

Resources and Regional Development

It should be noted that no particular type of natural resources is essential to a high level of regional income or to regional economic progress. The regional endowment of natural resources need not exercise a determining influence on the course of its income over time if it is able to trade. With a substantial quantity of capital and labor -- including human capital-- services and with the existence of a social system favorable to systematic improvement of production practices, the necessary factors for economic development will be in existence.

It is to be noted that access to natural resources and not the regional endowment of natural resources is the important factor in the economic process. This access can be attained through trade with the other regions or the rest of the world with a different or more favorable natural endowment.

However, because of the various barriers to international trade and its requirement of rapid adjustment to changes outside the local influence, the more variety of resources (natural and otherwise) the region will have the better.¹ Resources should be regarded as part of the capital stock of a region which render productive services depending on both their quantity and quality. However, for these resources to render their productive services additional outlays have to take place. Hence, it is proper to think about resources as partly finished capital goods. Part of these

1. It is obvious that these trade barriers are greatly minimized (or reduced) between the various regions of the same country.

outlays would be made as current expenditure along with the release of services of these resources; and the other part would be made as investment. Part of this investment expenditure would be necessary to find out where the resource is, how much of it is there, and what characteristics it has. If the previous discussion is valid, hence it is obvious that investment in information should be subject to the same criteria governing the rate of investment in any type of capital goods. According to the opportunity cost thesis the question should always be whether the streams of services or products associated with the investment opportunity are worth more than the outlays so associated. This becomes more clear if one recognizes that investment in any particular project involves foregoing the opportunity of making other investments which could have yielded a future surplus over their outlays. This productivity is generally measured by the percentage rate of return on investment. To assure that the investment is not using funds that could yield more elsewhere, the investment should yield surplus over outlays covered with interest. To do this one should accumulate or discount both revenues and outlays to the same point in time using the rate of return in the economy at large as the discount rate. If a surplus of revenues over costs exist, this indicates that this investment in information is yielding at least as much as other investments in general. However, the existence of a surplus does not show that the investment opportunity is yielding as much as possible. This can be assured by comparing all the other investment opportunities that exist and determining the best

alternatives.¹ Product and outlays should include all real products and costs valued in money terms even though it might be difficult to value them, and this valuation should be undertaken on a social basis that might differ from private valuation in some cases (like monopoly situations). This task of numerical evaluation is difficult, and sometimes impossible; nevertheless this model should always be the guide and approximations should be undertaken at the practical possible minimum to get the results as close to real as possible.

It is now in order to state that in many developing countries of the world the issue of import saving has developed to be of great importance. This arises from the general belief that if a country (or a region) imports a great deal of a certain product, it should devote much effort to increase its output of that product or its substitutes for that will be of more benefit to them as they will "save" imports. However, planning administrators (particularly regional planners) should always keep in mind that saving imports is not in itself the fundamental economic objective. Saving imports would only be of benefit in so far as it contributes to the size, growth, and distribution of the real income in their regions and/or their countries.

So far as the size of income is concerned, it will pay to undertake an action that saves imports only if the value of the additional locally

1. This is as close as one can get in such a generalized study.

produced goods(or service) is greater than the value of the products (or services) foregone by devoting more of the productive resources to that purpose. It is here that our model should be applied as the guideline in allocating funds for information concerning these import saving practices.

To add one concept that is usually misused, by regional administrators, is the term "requirements". These requirements from the various resources are usually calculated by using sophisticated techniques necessarily incorporating flat assumptions, in many cases borrowed, about many things in the future that are yet beyond prediction. It should be noted that meeting requirements should not be thought of as matching domestic outputs to domestic demands. This balance can be achieved through trade between the various regions of the country (or through international trade). Hence, the production of any particular product should depend on the whole range of productive opportunities and the competing demands for their services. This leads to the simple deduction that a crude way to allocate funds for obtaining information about exploiting resources is to start out by getting information about those lines of exploitation that have been experiencing success in the recent past.

Types of Information

In many instances regional planners allocate much time, effort, and funds to acquire information about the resource endowment of their regions. However, the goal of acquiring information should not be directed toward finding out everything about these resources, rather, the goal should be to acquire only the information necessary to make efficient use of them in production.

A basic conceptual tool of economics is the production function, or the relation between the combination of inputs that enters into the production process and the outputs to be acquired from this production process.¹ This production function reflects the relation between inputs and outputs according to a certain state of information about production processes. However, with technological advancement, this stock of information changes, hence changing this production function. Although, the production function is a necessary factor for production making, it is not a sufficient one. Selection between the various production possibilities should be made on the basis of cost in that the choice should be made for the method (or combination of methods) rendering the same output with the least cost combination of inputs (*ceteris paribus*). It should be noted that the change of prices of the productive services of either the inputs or the outputs would change this best combination; and also the change in the stock of knowledge may do the same. Outlays made to develop information should be treated as the outlays on any other input if such information

1. Usually presented in this mathematical form:

$$\begin{array}{ccc} x, y, z & \text{---} & = f(a, b, c, \text{---}) \\ \text{outputs} & & \text{inputs} \end{array}$$

would be used within the already established stock of knowledge of production functions.¹ However, this type of information should be distinguished from another type in which information is developed to change the stock of knowledge or the production function. This latter type should be treated as a public good in which the production of knowledge is the final product that benefits any user without reducing its quantity for others.²

To emphasize, it should always be remembered that information development has to be made at a certain cost. This information can be classified into two categories, the first of which is the type that can only be developed with the passage of time, and the second is the type that can be developed almost independently of time. Examples of the first type of information are the cases of river flows, and climatology. For this type of information the collection of data is characterized by the numbers of years of data associated with a certain stream of outlays which cannot be compressed in time to achieve more rapid accumulation of data. For the type of information nearly independent of time, as in soil surveys, the cost of gathering data is less closely related to the passage of time; however, it is not completely independent because if the information is developed very quickly, total cost may be higher than if more time is taken.³

To develop too much or too little information can be of serious consequences. First, there is the cost of developing information which, despite its seemingly

-
1. E.g., geological studies for locating oil in the desert for exploitation by a certain firm.
 2. E.g., research, censuses, and surveys undertaken by a regional planning body or any other organization for purposes other than private exploitation rights.
 3. Up to the point in time when interest on outlays may cause total cost to rise as the period is extended.

small proportion relative to total investment can be quite high taking the alternative opportunity thesis into consideration. Second, the plant¹ may be of the wrong size or scope with the consequent losses of excess capacity, taking full advantage of economic potential or from damage and destruction. Third, the unnecessary delay in reaping the flow of net income that could otherwise be had.

To deal with the problem of how much information should be accumulated it is important to note that sometimes certain amounts of information "must" be known before any decision could be made. At any given moment, investment opportunities of various types exist. Some of these opportunities can be thought of as relatively simple with respect to their properties as in the case of investment in land. The other type does involve a complex of characteristics that must be considered together for purposes of evaluation as in the case of regional economic development projects.

Investment programs should always be thought of and decided upon in terms of their present values.² This process should be undertaken annually considering the avenues of outlays and revenues for next year and into the future and in the meantime comparing the avenues of spending. The decision should then be favoring that investment and manner of spending that yields the highest present value. As a result of these outlays (on information and others), the stock of knowledge will change with the probable result of changing the present value of these investment opportunities. Theoretically, the sum of these new present values as of the end of the year will equal the

1. In the economic sense.

2. I.e., the resultant of the discounted value of revenues and outlays over the productive life of the program.

sum of the present values at the beginning of the year plus interest plus outlays made within the year minus any revenues received, ceteris paribus, i.e., $PV_1 = PV_0 + r PV_0 - (R_1 - C_1)^*$. This relation will also hold true in a perfect competitive market with perfect information. However, in reality perfect information for all concerned is a rare event (if at all). So, the market present value of the investment program will deviate from the theoretical one. With the change in the stock of information offered by the annual evaluation process this deviation gap will tend to become smaller. According to Hirfendahl, the standard deviation of these changes in present value divided by the investment during the year could be used as an indicator of the state of information about this particular investment opportunity; the standard deviation being negatively correlated with the state of information. With the passage of time adjustments and scanning of investments should take place shifting outlays toward investments with a higher present value and a lower standard deviation. According to this process a gradual change in the stock of information have taken place and a gradual movement toward a "better" stock of knowledge occurred with the final result of more accurate decisions taken (from the pure economic point of view).

All this adds up to stressing that for purposes of regional (or national) development this process should be adopted to ensure the exploitation of "good"

* PV_1 . . . present value as of the end of year.

PV_0 . . . present value at the beginning of the year.

rPV_0 . . . interest on the present value at the beginning of the year.

R_1 . . . revenues received.

C_1 . . . outlays

See Orris Hirfendahl, Information on Natural Resources and Economic Development: Draft paper (Resources for the Future, Inc., Washington, D. C.; and Latin American Institute for Economic and Social Planning, Santiago, Chile.) November 1966. p. IV-24.

investment opportunities at all stages of information. Investment in each line (industrial, natural resources, trade, services, . . . etc.) should be adjusted to yield the same marginal return. It also points out to the economic dangers and penalties of the mass gathering of information that either has no economic significance (at least at the time being and in the near future) or about such investment opportunities with zero present value before and after the investment information. Presently in many parts of the world information coverage coefficients are thought of as prestige or national status symbols. This way of looking at the information coverage is not helping the development of the concerned regions or countries. Rather the decision to expand (or contract) information producing activities should be based on detailed data concerning the present state of information. In so doing, the evaluation process should be employed to determine the net returns to be expected from additional expenditure to develop information. This will depend not only on the physical opportunities that will be utilized (or more efficiently utilized) by better information but also it depends on the capacity to use and apply the information. Hence, it will be of greater benefit for a developing country to develop both its information and administration (capacity) simultaneously because of their complementarity rather than just massing information with the hope of its use in the future. In this manner a rough guide for allocating funds for purposes of acquiring information would be related to the regional (or national) income or more closely related to the rate of gross investment.

Once more it should be stressed that the evaluation of net returns should be calculated in the social sense as costs and benefits might very well differ from those incurred by a private unit. This implies that governmental infrastructure and programs resulting from this regional activity be imputed

as costs as they could be employed to produce real product elsewhere. Generally speaking, data should be gathered just to the extent that will help investment decisions in the years immediately ahead to aid in the economic development process.

However, all the necessary information to solve a specified list of problems cannot be collected because of the necessity to economize. This is partly because the solution depends on past gathered information and partly because it pays only to acquire the information necessary to reach an acceptable solution.

To achieve this economization, numerical estimates of the value of expanding or contracting the information gathering program should be undertaken (however difficult), at least to insure against misallocation of funds. In addition experience and personal judgment should be applied in making decisions concerning marginal changes in information stock and their benefits. To facilitate and increase the probability of success of these judgments an organizational pattern employing specialization concepts must exist, where the specialists are constrained to work within the system of decision making and where the goal of such a system is the adjustment to the needs of entities utilizing the information.

It is in order now to affirm that the problems of economization in each field must be worked out by the experts in that field working together with the utilizer of the information. In addition it must be clearly understood that the problems, nature, and needs of each region or a country are so varied from one another that no one general list of important information could be constructed as a guideline for data collection. Furthermore, one cannot generalize in connection to regional development per se, rather for each region the specialists in each field working together with the planning personnel