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PROJECT DEVELOPMENT AND EVALUATION IN AGRICULTURE

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I. Introduction: The Project format and Agricultural Development

Once a broad strategy for agricultural development consistent with national social and economic objectives is laid out, the problem of agricultural investment often revolves around exactly how to use the resources available to best effect. A common form of using resources is to organize a project. The better prepared and analyzed the project the more likely it can be implemented on time and that it will make a substantial contribution to increased farmer welfare and national income.

As administrators and policy makers in agriculture, I would expect that each of you will want to have a clear idea of just which kinds of agricultural investments you should insist your staff prepare in project form and an idea of what the measures they utilize mean. I doubt you need to master in detail the techniques of analysis.

II. Projects in the World Bank

By way of digression before launching directly into a discussion of projects perhaps you would be interested in the use of projects as a basis for agricultural lending by the World Bank where I am normally to be found conducting courses on the techniques of project analysis for people from your Governments. The Bank generally requires that loans for agricultural investment be made on the basis of an agreed project. The Bank makes both its regular loans, currently at 7 $\frac{1}{4}$ percent interest with a maturity of about 20 years depending on the project, and what we term grants made through our subsidiary, the International Development Association, which entails a 3/4 of 1 percent annual service charge, no interest, and 50 years to repay the capital. It makes no difference, however, if the project is to be financed from regular Bank funds or on concessional terms through IDA. All

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projects must meet the same criteria of economic and other effectiveness; "soft" loans are intended to help countries experiencing balance of payments problems as development proceeds; they are not intended to cover up for "soft" projects.

In the year ending last June 30, the Bank approved agricultural loans or grants for a total of 35 projects in 27 member developing countries totaling US \$419.2 million. Of this, the largest amount was for 10 livestock loans totaling US \$131.2 million, and the second largest amount was for 5 agricultural credit projects totaling US \$108.1 million. The remainder of the loans were for irrigation, general agricultural production and settlement projects, or for agroindustries. This level of lending made the World Bank the largest single source of international capital transfer for agriculture.

It may be noted that the Bank over the last 5 years has placed substantially greater emphasis on agriculture, greatly increasing its lending in this field. This has been in response to a growing feeling on the part of our members that without rapid agricultural development, national social and economic development objectives cannot be attained.

III. The Objective of Project Analysis

Briefly, it should be kept in mind that the objective of project analysis is to provide a tool for better decision making about investments. Please be very clear about this: the project analysis does not make the decision. The present state of the analytical techniques is too blunt a tool for that purpose, and, in any event, in the end every investment decision must be an amalgam of both economic and noneconomic considerations. What good project analysis does is to give us an estimate of the wealth-creating capacities of alternative investments and to lay out the project in such a way that we can have a better chance of implementing it well and on time. Project analysis will also give us an idea of the cost of choosing a "second best" project for noneconomic considerations. You as decision makers can then determine subjectively if the trade-offs are worth it.

IV. What is a Project?

Generally when we are thinking of an agricultural project, we are thinking of an investment activity where we expend capital resources to create a producing asset from which we can expect to realize benefits over an extended period of time. Often, projects are a specific part of a larger, less precisely defined "program." Normally a project will have an area of geographic concentration, a specific clientele group, a well-defined time sequence of investment and production activities, a specific group of activities which we want to finance, and a group of benefits which we can identify and estimate values for. Hopefully, your projects will have been subjected to an analysis of their economic and financial results.

In project evaluations undertaken by government agencies, it is important the analysis be undertaken from each of two complementary points of view. The first is what we call the economic analysis and many call the social analysis. This entails looking at the project from the standpoint of all resources utilized in the economy whoever contributes them, whether government or private. This analysis, among other things, will give an economic rate of return which is a measure of the wealth-creating capacity of the project for the whole society. In making this analysis, it may sometimes be appropriate to use "shadow prices" -- that is, prices which better reflect the true value of the item in question than do market prices. An example might be the price of labor where a wage would be paid to unemployed unskilled agricultural labor were they employed on a project. The true "cost" of hiring such laborers to the society may be close to zero because unemployed agricultural laborers are presently producing very little and transferring them to a project requires us to give up very little present production. The economic analysis must also adjust for taxes and subsidies because these are "transfer" payments and make market prices inaccurate reflections of the true cost to the society as a whole of costs and benefits.

A second point of view from which agricultural projects should be analyzed is what we term the financial, but which is sometimes referred to as private. In this instance, market prices are always used. We look to see if the farmer's income will be sufficient to induce him to participate, to see if borrowers will have sufficient cash income to be able to meet their loan repayment obligations, and determine what the rate of return to the capital contributed by each participant will be. From the financial analysis we can form a judgment if there are sufficient incentives, if there are windfall profits, and whether the project participants will have properly timed financial flows to enable them to participate.

The project format is appropriate for a wide variety of agricultural investments. The World Bank, for example, has lent for projects for irrigation, livestock, agricultural credit, land settlement, agricultural roads, forestry, seed production, grain storage, agricultural education, and agroindustries, among others.

In the World Bank, it is commonly said that we like to look at six aspects of a project: technical, commercial, organizational, managerial and administrative, financial, and economic. One could think of many other ways to list their elements, but the point would always be the same--that a careful, comprehensive review of the proposed investment should be broad-gauged and will involve the services of a whole team of specialists. Again, in Bank practice we like to identify our "project cycle" as involving identification of potential projects, preparation of the project analysis taking into account all aspects, appraisal

(which is where the Bank takes an independent look at the proposal), and implementation. Again, one could divide this process in any number of different ways, but the net effect would always be to give much the same sequence of stages.

V. Comparing Costs with Benefits

A major part of a project analysis (although by no means the only part) is to compare the costs of the project with its expected benefits.

Costs in projects are usually easier to identify than benefits. In agriculture they include goods and services used in the project, labor, the net value of production foregone, and the costs of land. Benefits are trickier both to identify and to value. In agriculture they include increased output both of commercial products and of products consumed by the farm family (most important as a benefit, and often overlooked!), quality improvement, transportation to markets, storage, grading and processing, losses avoided (such as protecting crops from insect damage by spraying), and cost reduction. These generally would be seen as direct benefits; many economists also try to value secondary benefits, but in general I feel it is better to include all the benefits which can be identified as direct benefits and not to value secondary benefits, at least in most agricultural projects in developing countries. Note that there may well be some intangible benefits which cannot be valued in money terms but which can be very important. Providing employment opportunities in rural areas might be an example. (Incidentally, there may be intangible costs, too: building an irrigation dam at a scenic location would be an example).

The next step is to compare the costs with the benefits to see whether the project is economically and financially justifiable. In doing this, it is important to take account of the different times at which costs and benefits may be realized. This is generally done through the use of discounting, a simple procedure which reduces all future values to their present worth. The principle is obvious: a bird in hand is worth two in the bush. One hundred dollars today is preferable to one hundred dollars ten years in the future. One then compares the present worth of the costs with the present worth of the benefits. There are three general measures to do this. The first is the benefit-cost ratio, simply the ratio of the present worth of the benefits divided by the present worth of the costs. Providing you know the appropriate interest rate to use to do the discounting (not always easy to determine), if the benefits are greater than the cost, then the project is justified, and the project with the largest benefit-cost ratio should be taken up first. Benefit-cost ratios have been used mostly for water resource type projects. A second measure is the net present worth. For this, one merely subtracts the present worth of the cost stream from the present worth of the benefit stream. If there

is a positive amount remaining, the project is worth undertaking given that you have chosen the correct interest rate for discounting. The third method is known as the internal rate of return. This is the one which the World Bank generally uses. The internal rate of return is that interest rate which will just make the benefit-cost ratio equal 1. The internal rate of return is a percentage figure which represents the average earning capacity of all resources engaged in the project over its lifetime. It is a good measure in part because it is easily understood--it is exactly comparable to, say, the yield of a savings account where there is a rate of return on the capital stated in percentage terms.

Once the measure comparing the costs to the benefits is completed, project should be compared with alternatives to determine if there are ways which the same resources could be used to create new wealth at a faster pace. Then, given that the noneconomic considerations are similar for each of the alternatives, the Government will want to proceed first with the project with the greatest economic rate of return--that is, the project which most rapidly build's the national income.

As policy makers, you will want to be sure the analyst has undertaken several "sensitivity" analyses. That is, he should test the effect on the benefit-cost ratio, net present worth, or internal rate of return of a change in one or another of the assumptions underlying the project analysis. In agriculture, you should expect most projects to be tested for sensitivity to changes in assumptions about prices, delays in implementation, cost overruns, and yields. Special situations will call for special sensitivity tests, varying with the project under consideration.

VI. Summary and Conclusions

This sketches in outline what an agricultural administrator should expect from those responsible for project analysis. Most agricultural investments probably should be cast in the project form, if for no other reason than that this forces all the relevant technicians to think carefully about the who, what, when, where, why, and how of the project. By comparing the relative wealth-creating capacity of alternative projects the administrator is better able to choose that mix of investments which will most rapidly advance the welfare of the farmers and the nation as a whole.

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NOTE: Mr. Gittinger has offered a copy of the text Economic Analysis of Agricultural Projects used in the Economic Development Institute to those participants in the Agricultural Policy Seminar who may be interested in more detail about the analytical techniques. If you would like a copy, please make your wishes known to Mrs. Van Haeften.

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