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ROLE OF ECONOMIC ANALYSIS IN THE PLANNING AND POLICY FORMULATION PROCESS

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ROLE OF ECONOMIC ANALYSIS IN THE PLANNING AND POLICY FORMULATION PROCESS

by

George E. Rossmiller*

Introduction

Planning and policy formulation are legitimate and necessary functions of any government. Korea has been committed to formal government planning for a number of years as evidenced by the fact that you are now operating from your third five-year plan, and are presently involved in development of your fourth five-year plan. One need not spend much time talking with any of you in this room to ascertain that you are also very much committed to and involved in decision making concerned with planning, policy formulation, program development and project execution. And you represent a substantial portion of the government decision makers upon whose shoulders fall the burden of making the decisions which shape the direction and rate of future development in the Korean agricultural sector.

During the course of this workshop we will be discussing in some detail and demonstrating at some length how the past, present and future work of the KASS team can assist you in making those important and necessary decisions. We will be talking about the approach, the technology, and the methodology which has been developed by the KASS team for economic analysis and as a tool to be used by you for more effective and efficient decision making.

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*Paper presented at the Korean Agricultural Sector Study (KASS) Decision Maker Workshop, Seoul, Korea, 6 - 9 August, 1973. George E. Rossmiller is Associate Professor of Agricultural Economics, Michigan State University, and former Field Project Director of the Korean Agricultural Sector Study Team (Aug. 1971 - June 1973).

It is important at this early point in the workshop that we fully understand each other as to the nature of the decision making process in which you engage every day; what we mean by the economic-analytical tools that can be useful as you perform your decision making role; and what we should know about the components which make up the economic analysis tools--namely, a body of theoretical concepts, a set of methodologies by which the theoretical concepts can be applied, and a sound, accurate, and adequate data base with which to use the theory and methodology in providing the economic analysis of the consequences of various planning and policy decisions. Hopefully, during this session we can set the stage for the discussion and demonstration of the theoretical base and the methodological formulation of the economic analysis tool which has been put together (even though in its present rather crude form) by the KASS team over the past two years.

The Decision Making Process in Planning and Policy Formulation

A broad objective of governmental planning is to solve immediate problems, to avert contemplated future problems, and to confront issues which left unattended may become problems. With this objective in mind it will be instructive for us to view the process by which decision makers go about solving problems or confronting issues. A schematic diagram of such a decision making process is presented as Figure I.

The first step in any decision making process is the recognition that a problem or issue exists. Once recognized the problem or issue must be defined in terms allowing for observation and analysis. In this

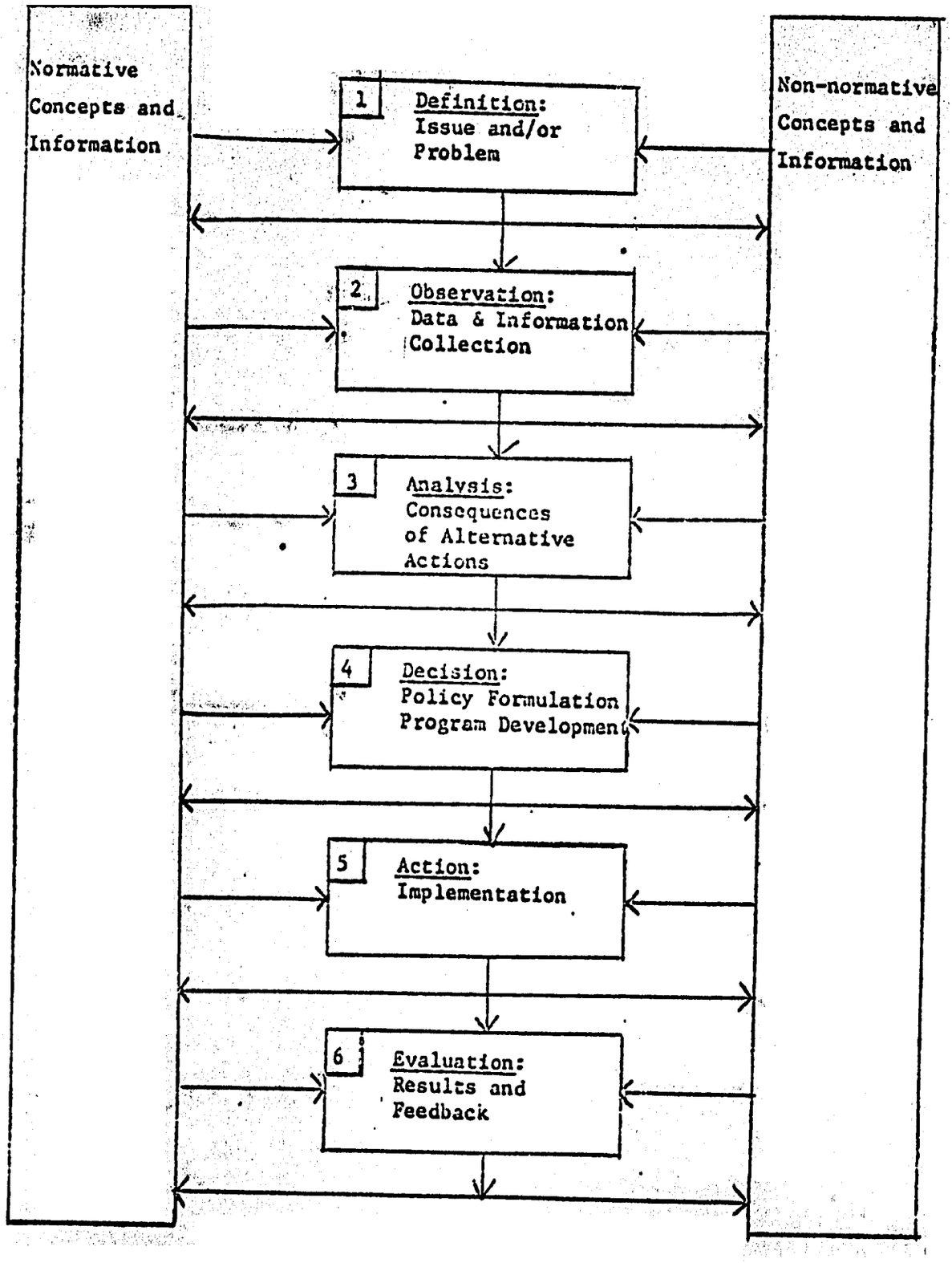

Figure 1. The decision-making process.

step care must be taken to define the problem in terms of root causes, not in terms of symptoms. For example, inflation or low-farm income may be perceived as problems when in fact they are only symptoms of the more basic and treatable problems. Inflation may be caused by the cost of production factors rising faster than their increase in productivity or an excess demand for goods and services, or by some combination of a host of factors. Low-farm incomes can be the result of low prices, or low yields, or inadequate resources held by each individual farmer. Once the real problems or issues are defined the decision making process moves into the observation phase. As part of the observation phase, the decision maker or his analysts must determine the theoretical basis he will use for the forthcoming analysis, the methodology appropriate to the analytical task, and he must identify and collect the data and information appropriate for the analysis. Thus, in the observation phase he formulates the analytical model using the theoretical and methodological constructs available and then brings to bear the data and information he has collected in order to parameterize that model. He is then ready for the analysis phase of the process.

The analysis phase begins with the decision maker and/or his staff determining the range of potential courses of action which may be relevant and useful in solving the problem. That is, an array of alternatives and potential policy actions are determined and specified. The analysis phase continues as the collected data and information is applied through the model to determine the probable consequences of the alternative policies or courses of action towards solution of the problem or issue as defined.

On the basis of such analysis the choice is finally made upon the course of action which will in fact be followed. As this decision is made the result is in the form of a policy formulation, a plan or a developed program. The action phase of the decision making process is then ready to begin.

Once action is undertaken the decision maker must stand ready to accept responsibility for the consequences brought about by the action. This total process is continuous and iterative in that the results of the decisions and actions must be constantly evaluated. Issues must be redefined, observations extended, analysis reappraised, and decisions and actions adjusted accordingly in the light of new experience, new knowledge and changing conditions.

Turning again to Figure I you will note that six steps in the decision making process we have been describing are not only linked sequentially and iteratively among themselves but also to two different pools of concepts and information which are defined as normative and non-normative. Throughout the decision making process both normative and non-normative knowledge must be collected and used. Normative knowledge pertains to the goodness or badness of a condition, situation or thing. Normative concepts are necessary to define society's values--"what ought to be" or "what ought not to be"--and thus indicate what kinds of non-normative information is important and should be observed and analyzed. Non-normative knowledge is information about a condition, situation or thing not pertaining to its goodness or badness; that is, knowledge about "what is," "what has been" or "what will be." Simply

stated normative knowledge is knowledge about values while non-normative knowledge is knowledge about facts. It is important to note further that non-normative knowledge (facts) can be acquired about normative concepts (values).

In the study of the Korean agricultural sector, for example, a considerable amount of time was spent by the KASS team in acquiring normative knowledge about Korean agriculture and its environment and a whole chapter of the project report, (Rossmiller, et al, 1972) entitled "Values and Public Choices for Korean Agriculture," was devoted to a discussion of these findings. This normative knowledge was acquired through continuous and substantive interaction with Republic of Korea decision makers at various levels and in various agencies (many of you were involved in this process) as well as through a thorough review of existing policies and programs which included how they were operationalized and administered.

The analysis of three alternative agriculture sector development strategies and the recommended development strategy found in the Korean agricultural sector study are based on a synthesis of the normative knowledge with the non-normative knowledge gained during the study. The non-normative knowledge pertains to the future demands on the sector, an inventory of resources available, institutional and physical constraints, and the economic and socio-political environment within which the agricultural sector functions. Thus, it is clear that normative knowledge and non-normative knowledge are the two supports upon which the decision making process rests, the absence of either of which causes the process to fail.

The Use of Models in Decision Making

Planning for social and economic development in the agricultural sector, or for that matter in any sector of the economy or society, like any planning for the future, is a process fraught with uncertainty. In the development planning or policy formulation process the decision maker must have knowledge about the current normative and non-normative states of the socio-economic system and he must also have some way of projecting how that system will respond normatively and non-normatively in the future to alternative government policy instruments and other external stimuli. Unfortunately, it is safe to say that we will never have perfect knowledge about the current state of reality nor about future events. Having to settle for less than perfect knowledge means we must deal with uncertainty.

In spite of the uncertainty inherent in planning and policy formulation, policy makers responsible for social and economic development must make decisions (even no decision is in fact a decision to do nothing). And in making those decisions they need as much information (imperfect as it may be) as they can get concerning the possible future consequences of alternative courses of action.

In arriving at a decision for action (steps 4 and 5 in Figure I) the decision maker must put the relevant data and information he has collected (step 2 in Figure I) into a logic framework from which through analysis inferences can be drawn as to the important consequences of alternative courses of action (step 3 in Figure I). This logic framework--no matter how simple or complex, informal or formal--

can be regarded as a model. In projecting consequences of alternative courses of action models are used almost universally since experimentation directly on the system may be too costly, too dangerous or physically impossible.

Each of us, in both our professional and private lives, uses models consciously or unconsciously, expressly or implied whenever we must make a decision. For example, each of you obviously made the decision that you would be present at this workshop this morning. You undoubtedly had alternate places where you could be, and different things that you could be doing. By taking the information that you had about this workshop and the information you had about the other possible activities at you disposal you went through, probably, a very informal process of projecting the consequences of engaging in the various activities you identified as being open to you, and for your own reasons decided to be here. Further, once that decision was made you then had to decide when and by what route you would arrive at this meeting place. Again your decision and ultimate course of action were the result of your very informally going through a process similar to that described in Figure I. You undoubtedly assimilated information such as the time and place of this workshop, alternate traffic routes, likely density of traffic on each of those routes, relative merits of the scenery enroute, the influence of the particular weather this morning on traffic conditions and scenery, and a host of other variables into your own particular logic framework from which you were able to project the consequences of departing at a certain time and following each route to this workshop. The consequences may

have been in the form of the pleasure you would receive from following the more scenic routes versus your frustrations from heavy traffic congestion. The route also had to be consistent with the amount of time you were willing to spend to get here. The logic framework you used to finally make the decision upon your departure time and your routing was every bit as much of a model as the Bank of Korea's input/output model of the Korean economy or the KASS model of the agricultural sector. Models typically range from intuitive mental images (analogous to your model for arriving at this workshop), to written verbal descriptions, to complex computerized, mathematical models of the system. And more than one type of model may be used to provide information for any one decision. For example, a computerized, mathematical model may be used to make projections of economic variables while projections of political variables may be made with a mental model.

Government decision makers have traditionally made decisions and solved problems based upon analysis using informal model conceptualizations, making projections with intuitive-mental constructs or simple paper and pencil calculations. The government decision maker with such informal models uses data and information from a variety of sources including opinion and judgment of knowledgeable men and is usually concerned with the attainment of multiple-desirable consequences and the avoidance of multiple-undesirable consequences.

As the need for more complex and sophisticated economic analysis became evident to government decision makers, professional economists began building more complex models of reality based upon economic theory and using mathematical and econometric representations

of relationships to formalize the logic framework. Complex model building and mathematical representation became much more feasible as electronic computers arrived on the scene with the ability to perform extremely rapid calculations and to keep track of literally thousands of variables and their interrelationships.

But a model of whatever kind is an abstract representation of a system socio-economic or otherwise. It is abstract because it has not and cannot be the same as reality. Given the intended purpose for which the model will be used only characteristics of the system relevant to that purpose will be modeled and even these characteristics will only be modeled to the level of detail sufficient to the purpose for which the model is intended. Thus, assumptions and simplifications--what to put in the model, what to leave out, what to aggregate and how much to aggregate--are a necessary and inescapable part of modeling whether we are referring to a mental image or a computer program.

As professional economists began building more sophisticated and more complex computerized models they found it necessary to make more and more simplifying assumptions and in many cases to build optimizing models with single objective functions. Many of these models are applicable only for particular purposes and only in special circumstances; for example, where good data exists or where an objective function can be defined or where a particular structural form is justified. While these models are mathematically rigorous and can be statistically verified and validated they are very selective of the sources and types of data they will accept, where as decision makers most likely will rely on

a wide variety of data sources ranging from carefully controlled experiments to guesstimates. The most damaging problem with these models however is that taken individually they cannot provide decision makers with answers concerning the wide array of consequences to be expected from a specific course of action nor can they easily be adapted to an assessment of the consequences of several alternative courses of action, particularly if simultaneous changes in several policies and programs are involved. Thus, a credibility gap has developed between many government decision makers and their professional economic analysts with respect to the usefulness of these kinds of models.

The KASS Model

The KASS team over the past two years has taken a somewhat different approach to modeling the agricultural sector for economic analysis. Recognizing the seriousness of the credibility gap and with an increasing recognition that the problems of agricultural sector development is comprised of literally thousands of separate but interrelated problems agricultural planners and development economic analysts have been searching for new and better methods of attacking the problems of agricultural development. In the case of the Korean agricultural sector, for example, population and rising urban incomes are pressing against limited agricultural resources and the ability of traditional agriculture to increase and adapt food production to the demand. Food prices are high while farm incomes are low. Scarce foreign exchange is increasingly being used for the importation of food stuffs. More animal proteins are needed in the diet. Labor is rapidly moving out of agriculture and the rural to urban exodus quickens. Agriculture credit is in short supply and costly. Income

distribution is a problem within agriculture, within the urban sector, between sectors and among regions. Administrative and institutional problems in the agricultural establishment constrain the capacity of government to deal effectively with the problems of agricultural sector development. The list could go on and on but it is already long enough to illustrate the point that the problems are complex and interrelated and courses of action towards the solution of one is certain to create both desirable and undesirable consequences on many others.

In solving the problems of agricultural economic development therefore a broad perspective and a generalized analysis is required A formal conceptualization which takes account of the problems and the interrelationships of the total agricultural sector and its interactions with the rest of the economy is thus both a useful and necessary undertaking for agricultural planners and their economic analysts.

This is what the rest of this workshop will be about. The KASS team over the past two years has been building a comprehensive logic framework for understanding the problems of the Korean agricultural sector and for analyzing the socio-economic consequences of pursuing alternative development plans or policy formulations in the development of that sector through time. This comprehensive logic framework or model incorporates where appropriate the specialized models which have been developed and used by economists for years but in addition links them as a series of model components to better represent the total set of systems representing the agriculture sector as it operates within the total economy.

You as the key decision makers affecting the future direction of agricultural sector development in Korea play a key role in the development and use of the KASS model. It is only through continued and intense interaction between you and the KASS team that the KASS model can be conceptualized and developed along the lines necessary to help in making the decisions you must make. Furthermore, in order for you to effectively use the KASS model as a part of your decision making process you must know enough about it; its components, its assumptions and its data base, as well as the logic framework itself, to have confidence in its output. Throughout the rest of this workshop you, as potential users of the model should gain enough information to make you cognizant of the model's strengths and its limitations. We hope that through this process your confidence in the ability of the model to help you in your decision making will be realized. In addition and equally as important, we expect to learn from you the kinds of concerns that you as planners and policy makers have and the kind of issues you would like see analyzed by the KASS team in order that future model development can be even more relevant and useful to you.

The KASS team has only one objective--by testing with the model alternative plans and policy formulations and determining the economic consequences of those policies and plans through time, they expect to help you make better decisions for the future development of the Korean agricultural sector. In development decision making there is little latitude for error since the problems are many and the resources scarce. We think the KASS model can help you trim this margin

of error. Through the use of the KASS simulation model you can ask the "what if" type of question. What are likely to be the economic consequences of following a particular course of action? The resulting economic consequences of a simulated set of policies may well be disastrous--but not serious since the outcomes have been projected without having to be tested in reality.

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