

AGENCY FOR INTERNATIONAL DEVELOPMENT WASHINGTON, D. C. 20523 BIBLIOGRAPHIC INPUT SHEET	FOR AID USE ONLY
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1. SUBJECT CLASSIFICATION	A. PRIMARY Agriculture	AE30-0000-G690
	B. SECONDARY Development--Iran	

2. TITLE AND SUBTITLE
Planning for agricultural development, the Iranian experience

3. AUTHOR(S)
Gittinger, J.P.

4. DOCUMENT DATE 1965	5. NUMBER OF PAGES 135p.	6. ARC NUMBER ARC
---------------------------------	------------------------------------	-----------------------------

7. REFERENCE ORGANIZATION NAME AND ADDRESS
NPA

8. SUPPLEMENTARY NOTES (*Sponsoring Organization, Publishers, Availability*)

(In Planning experience ser.no.2)

9. ABSTRACT

10. CONTROL NUMBER PN-RAA-581	11. PRICE OF DOCUMENT
12. DESCRIPTORS Iran Planning	13. PROJECT NUMBER
	14. CONTRACT NUMBER Repas-9 Res.
	15. TYPE OF DOCUMENT

PLANNING
EXPERIENCE
SERIES
NO. 2

PLANNING FOR AGRICULTURAL DEVELOPMENT: THE IRANIAN EXPERIENCE

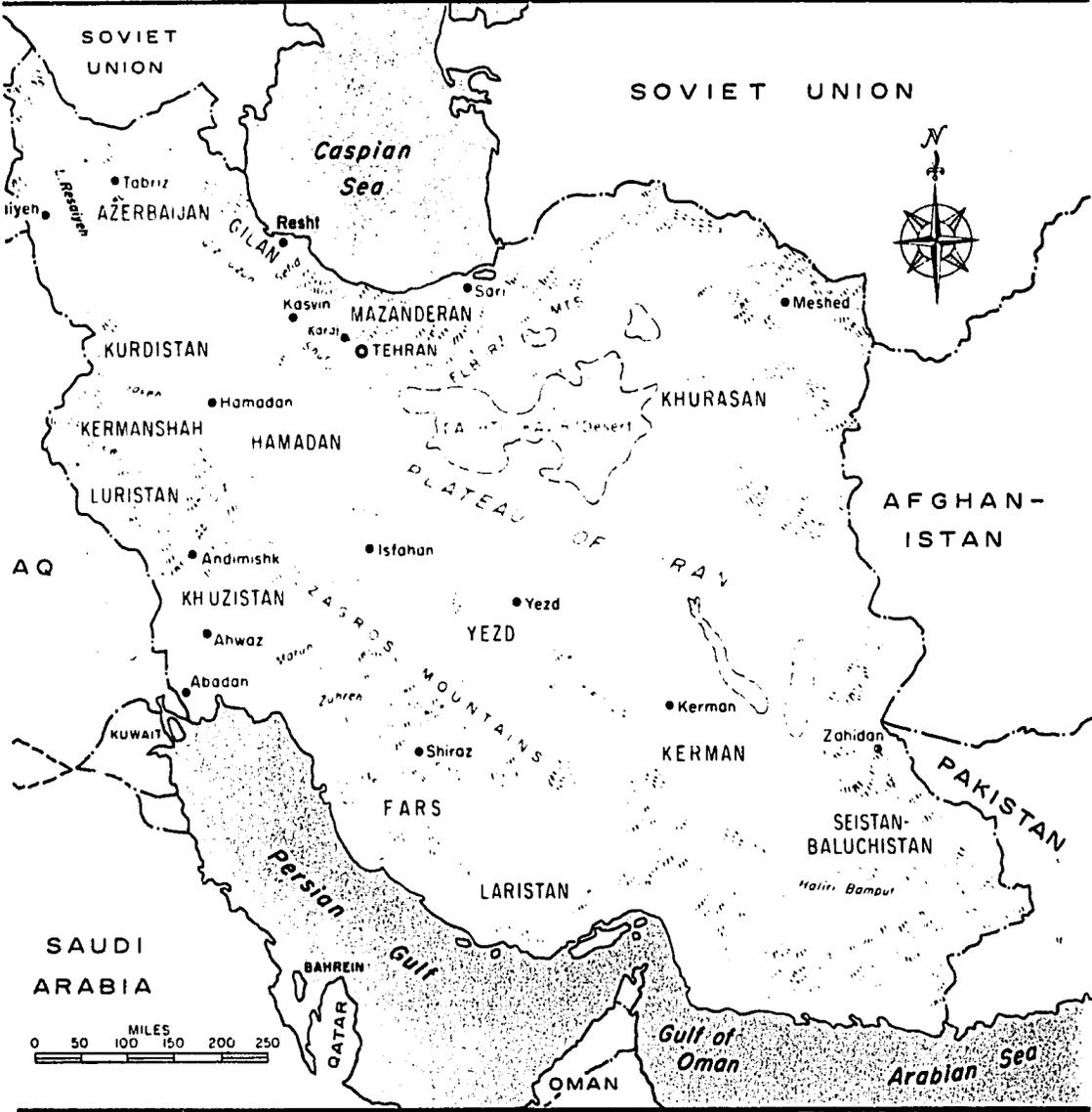
J. Price Gittinger



CENTER FOR DEVELOPMENT PLANNING

INTERNATIONAL DEVELOPMENT RESEARCH CENTER
WASHINGTON, D.C.

MAP OF IRAN



CENTER FOR DEVELOPMENT PLANNING

Planning Experience Series No. 2

**PLANNING FOR
AGRICULTURAL
DEVELOPMENT: THE
IRANIAN EXPERIENCE**

J. Price Gittinger

NATIONAL PLANNING ASSOCIATION

**Library of Congress
Catalog Card Number
65-27498**

**August 1965, \$2.00
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Foreword

This is the second publication of NPA's Center for Development Planning, and it is also the second monograph issued in the Center's *Planning Experience Series*. Publications in this series reflect the Center's interest in studying actual planning experience in developing countries. These studies are intended to survey critically the art of development planning, as it is practiced, to provide the background for and to complement the Center's more analytical work which will be published in the *Planning Methods Series*.

Development planning as a means of accelerating economic progress in less developed countries has frequently failed to bring effective techniques and policies to bear on the most difficult development problems. If development planning is to be strengthened, we must first learn what obstacles have prevented the current, widespread planning efforts in less developed countries from achieving more success. It is also essential that we learn the extent to which the difficulties—in data, in administrative capacity, and in planning methods—are qualitatively similar among less developed countries.

Our understanding of the problems associated with planning agricultural development is particularly meager. Despite the overwhelming importance of agriculture in the output of all less developed countries, students of development planning have tended to neglect the problems associated with promoting development of the agricultural sector. The misguided hope that less developed economies could be energized sufficiently by programs emphasizing industry and neglecting agriculture had been held widely in both theory and practice.

iv FOREWORD

It is only in recent years that development economists have begun to recognize, as a result of experience, that the agricultural sector must not be allowed to remain stagnant if growth momentum throughout the economy is to be attained. This study by J. Price Gittinger, Associate Director of the Center for Development Planning, is one of the first evaluations of the application of development planning as a means of overcoming the inertia implicit in the large, traditionally stagnant agricultural sector of the typical less developed country.

Gittinger's study reveals that in initiating planned agricultural development, planners are confronted by a large number of problems which arise from conditions typically found in less developed countries. Recognition of these problems is the first step in designing policies to surmount the obstacles that stand in the way of carrying out rational and potentially effective development programs for the agricultural sector. We learn that the "technical" obstacles, which include such common difficulties as inadequate data, meager understanding of conditions in the agricultural sector, and narrow administrative capacity, are subject to correction. In this sense, the following study has relevance for guiding the "planning for planning" that should precede comprehensive efforts to attack the problem of agricultural stagnation—a step less developed countries are now coming to recognize is essential for overall economic progress.

A final lesson of paramount importance emerges from the experience studied by Gittinger—a lesson the author chooses not to stress explicitly. This lesson is that a relatively favorable initial situation, in terms of economic resources and planning expertise, is not sufficient to promote rapid economic—or agricultural—development. The prime prerequisite is a national leadership willing and able to provide a strong thrust to the planning effort and to insure its continuity. Development planning in Iran—and in many other developed countries—has faltered as a result of its failure to achieve the status of a high priority national activity with strong backing from the top national authority.

DOUGLAS S. PAAUW, Director
Center for Development Planning

Contents

FOREWORD	iii
CONTENTS	v
TABLES	viii
PREFACE	ix
I. EFFECTIVE AGRICULTURAL PLANNING	3
Political Considerations	3
Providing a Framework for Action	4
Appraising Agriculture Realistically	5
Establishing Priorities and Achieving Balance	6
Plan Implementation	7
Adapting Plans to Cultural Values	7
Delegating Planning Responsibility	9
A Case for Planning	9
II. MOBILIZING KNOWLEDGE	12
Planning With Limited Data	12
Encouraging Relevant Research	14
Increasing Empirical Content	14
Social Science Research	15
Designing Research for Agricultural Development	17
Efficient Use of Research Workers	19
Education as a Force for Agricultural Development	20

vi CONTENTS

The Uses of Foreign Advisors	23
Do Planners Need Economics?	27
III. ADAPTING PLANNING TECHNIQUES TO DATA CAPABILITIES: AN EXAMPLE	29
<i>Estimating Demand for Food</i>	30
Theoretical Formulation	31
Increase in Urban Demand	35
Increase in Rural Demand	40
Increase in Total Demand	46
Comment on Rural Income Projection	47
<i>Estimating Rates of Growth</i>	50
IV. THE PLANNING FRAMEWORK	53
Planning Background	53
Organization for Agricultural Planning	55
<i>Stages in the Planning Process</i>	57
Critique of the Second Plan	57
Plan Frame	59
Project Preparation and Final Plan Statement	62
Interim "Tool-Up"	63
Perspective Planning	64
<i>Assumptions Underlying Agricultural Planning</i>	66
Comparative Advantage	66
Responsiveness of the Private Sector	68
Ability of the Government to Direct Resource Use	71
V. ISSUES OF PLAN DESIGN	72
Program Selection and Emphasis	72
Program Detail at the Plan Frame Stage	75
Costing and Budgeting Considerations	77

CONTENTS vii

Administrative Resources and Program Selection	80
Overconcentration on Central Administration	84
Political Constraints on Program Selection	86
VI. RELEVANCE OF IRAN'S EXPERIENCE	91
Agriculture Versus Industry	91
Factors Which Distinguish Iran's Experience	93
Social and Administrative Parallels	94
Planning With Limited Data	95
An Individual Approach to Common Development Problems	96
APPENDIX I. MAJOR FEATURES OF IRANIAN AGRI- CULTURE	99
APPENDIX II. IRANIAN AGRICULTURAL DEVELOP- MENT OBJECTIVES	106
BIBLIOGRAPHY	119
NPA OFFICERS AND BOARD OF TRUSTEES	123
NPA PUBLICATIONS POLICY	124

Tables

TABLE I.	Iranian Population Projections, 1956-1967	35
TABLE II.	Projected Increase in Urban Consumption of Farm Products in Iran, 1967 over 1958	36
TABLE III.	Computation of Income Elasticity for Bread	41
TABLE IV.	Projected Increase in Rural Consumption of Farm Products in Iran, 1967 over 1958	44
TABLE V.	Total Urban and Rural Consumption of Farm Products in Iran, 1958 and 1967	48
TABLE VI.	Rate of Growth, Wheat and Barley, Iran, 1950-1958	51

Preface

Agricultural planning is being used as a major tool to accelerate agricultural growth in Asia, Africa, and Latin America where, before economic and social objectives can be realized, low income, peasant agriculture must become more productive. The pages which follow recount how the agricultural portion of the third five year plan for Iran which began in September 1962 was prepared. The intent is to describe the planning process as it was carried out and to examine some of its implications. Perhaps others charged with similar planning responsibilities can benefit by comparing their own experiences with those of planners in Iran.

This recounting oversimplifies the planning process in Iran. In reality it was far more complex—program formulation, cost estimation, demand analysis, statements of objectives, data gathering, administration of current program responsibilities, drafting and redrafting, and continuous discussion of what was going on and what should be done next all overlapped and proceeded simultaneously. It should not be implied that there was a strict and orderly temporal planning sequence simply because events are presented in a more systematic fashion in this monograph than they in fact occurred. The planning process as described gains an unreal quality of orderliness from the subjective advantage of hindsight. Quandaries and false steps are largely omitted in the recounting.

Planning in Iran was the cooperative undertaking of a large group of people. It was my privilege to work with them from January 1960 to June 1961. During this time the emphasis was on preparing what was called the "plan frame"—the establishment of objectives, estimation of

x PREFACE

future demand, and formulation of programs in broad outline. For a variety of reasons the preparation of detailed projects was subsequently slowed down. This monograph concentrates primarily on the plan frame stage—for it was at that stage that planners were first confronted by the problems of agricultural planning and tried to grapple with them. When subsequent events departed from the intentions of the planning group, they are dealt with here only as they are directly relevant to the discussion of planning problems.

This monograph is limited to agricultural considerations, therefore the reader who wants to see Iranian agricultural planning in a broader context should consult two other discussions about planning in Iran. A short paper entitled "An Attempt at Planning in a Traditional State: Iran" has been written by P. Bjorn Olsen and P. Norregaard Rasmussen, two Danish economists who were members of the Harvard Advisory Group attached to the Plan Organization of Iran over the period from 1960 to mid-1962. A more detailed presentation and an excellent general view of the planning process as exemplified in Iran has been prepared by George B. Baldwin, who was an industrial economist with the Harvard Advisory Group from 1958 to 1961, and is now with the International Bank for Reconstruction and Development. Dr. Baldwin was kind enough to permit me to consult an early draft of his book. He also criticized a draft of this monograph, from which I have greatly benefitted.

For the convenience of readers not familiar with Iran, all dates have been converted to the Gregorian calendar, and all money values expressed in terms of United States dollars converted at the rate of Rials 75.75 = US\$1.00, the rate at the time the third plan was being prepared.

I wish to acknowledge my debt to all those with whom I worked in the Plan Organization and its Division of Economic Affairs, and in the various agricultural agencies. Many of them will recognize their influence on my thinking in what follows. In particular, I wish to express my appreciation to my colleagues in the Agriculture Section during most of my stay in Iran: Dr. Farhad Ghahreman, head of the Section; Engineer Mohammed B. Kamaly; and Engineer Nasser Motamedi. While I was in Iran I was attached to the Harvard Advisory Group and drew heavily on the knowledge of its members about Iran, economics, and the practicalities of administration.

No attempt has been made to avoid an expression of viewpoint. For that reason I hasten to point out that these are my personal views,

PREFACE xi

and any errors of fact or omission mine alone. No implication is intended that the views expressed represent those of the Government of Iran, the Plan Organization, nor the National Planning Association.

**J.P.G.
Washington, D.C.
August 1965**

**Planning for Agricultural
Development:
The Iranian Experience**

J. Price Gittinger

I. Effective Agricultural Planning

Every modern nation where progress toward a "just and prosperous society" is limited by low income agriculture now undertakes national agricultural planning of one sort or another. Examination of the planning effort in Iran as a case study of specific problems and specific approaches, supplemented by observation elsewhere, points up some broader elements of effective agricultural planning.

Political Considerations

Agricultural planning is basically a political process. This is so even if the mechanics of planning are carried out in a nonpolitical manner by social scientists. Whatever the impatience with politics, it is still true that this *is* the means by which the consensus of a society is reached and expressed, whether the political process works itself out through press reports, parliamentary debates, or thousands of discussions in family get-togethers and small social events. Agricultural planning is only an ivory tower exercise without political discussion. If planning is to be effective, it must take into account the realities of rural life, the technical potentials, and the limits of agricultural growth. Indeed, failure to stimulate widespread discussion of their plans is a common weakness of planners.

Active political concern with agricultural planning will focus the attention of politicians and the society they represent on agricultural problems and increase general awareness of the needs, problems, and costs—in money and cultural values—of agricultural change. Only if discussion and personal concern can be stimulated at many levels can national consensus on objectives and programs followed by

4 AGRICULTURAL DEVELOPMENT

action be expected. Without this consensus, planned agricultural development cannot take place.

Preparation of a development plan provides the occasion for high-level political leaders concerned about economic development to exchange views with the nation's agricultural leaders and scientists. Technically sound development programs which fail to take political realities into account are doomed. By the same token, "political" plans which ignore the technical facts of physical science and economics are unlikely to accelerate agricultural progress.

An agricultural planning group may participate in the political process in another important manner. Sometimes it may have to serve as the only responsible, progressive rural spokesman functioning at the center of policy formulation until the appearance of independent farm organizations and more influential legislators representing the people of rural areas.

Providing a Framework for Action

In reality, effective agricultural "planners" do not exist. They are rather conveners, recorders, and questioners whose function it is to provide the framework within which farmers, scientists, government administrators, and political leaders can survey national needs and prepare appropriate programs. The responsibility of the planning group is to articulate national agricultural policy in a form useful for planning, to make the aggregative economic estimates, to be a catalyst for agricultural planning within the regular administrative organization, to assure widespread political and technical consultation and participation, and to perform an integrating and recording function.

Agricultural planning can define problems, focus attention on critical points where change is needed if progress is to come, and formulate means of attacking obstacles. An agricultural planning group rarely originates ideas. More commonly, it looks for half formed concepts or partly coordinated action programs from which a good plan can be built and sets down their elements in more specific terms. The group should seek out reticent scientists and encourage them to turn their thinking toward development problems. Local and national government officials must be consulted, and considerable time should be spent in fields and villages trying to gauge the aspirations and attitudes of farmers. The planning group will then compare the ideas of farmers, scientists, and industrial producers with one another, with past performance, with the aspirations of the nation, and with

available resources. It will try to spot faulty thinking and focus attention on growth programs—such as agricultural extension—which may be underemphasized.

Good planning puts goals and potential growth possibilities in a straightforward, concrete form which is amenable to discussion and national action. Responsible agricultural planning will clarify problems; it will show inherent contradictions in goals and try to resolve them.

Appraising Agriculture Realistically

Agricultural planning should add realism to the nation's discussion of agricultural growth. It can bring the "economic" aspect into the thinking about agriculture—a pattern of conscious analysis and balance among alternatives—and direct the choice to those alternatives which most efficiently further national objectives. This will make it easier for planners to resist the persuasive blandishments of special pleaders for one cause or another when these seem overbalancing in a national context. Administrative agencies, asked to coordinate and balance their programs, will thereby come to understand the limitations the others face in providing supporting services.

Agricultural planners have a "myth-shattering" responsibility. It is surprisingly easy for unrealistic and partial concepts about agriculture to creep into national patterns of thought. Much attention is devoted to analysis of these "myths" in this monograph. For example, there is the question of the efficiency of tractors versus draft animals in a situation where underemployment is prevalent and the production of "fuel"—that is, feed—for draft animals can be a supplementary income-earning activity for farmers instead of for oil companies. There is the myth that one or two large dams would be better than hundreds of smaller ones and the failure to assess either the relative cost per hectare or the total area which could be improved. There is the assertion that farmers are backward or stupid. And, finally, there are overly optimistic statements about future production based on yield figures from experiment station plots rather than on field trials under local conditions.

Agricultural planning can encourage a careful consideration of the "environment" within which agricultural development must proceed. It can investigate and relate to agricultural growth estimates of future food demand, industrial crop demand, population growth, shifts in age composition of the population, changes in diet preferences, and export-import trends.

6 AGRICULTURAL DEVELOPMENT

Establishing Priorities and Achieving Balance

Agricultural planning groups have an important function in establishing priorities and achieving balance. They must compare and balance as best they can the targets, resources, and emphases among programs; interrelationships and interdependence of programs; and priorities of what to go forward with and what to postpone until more resources are available or until the political climate is more favorable. Balance must be achieved between immediate, quick-return projects and longer-term, more slowly maturing programs. Planners must balance regional distribution of programs not only in terms of economic efficiency but also in terms of political reality and human problems.

Agricultural planners can keep an eye on the incentive structure to be sure that proposed programs are attractive enough so that farmers will be willing, and can afford to undertake certain changes. One difficulty may come in the common proposal to keep food prices low for the benefit of politically conscious urban residents and to encourage industrial development. Production programs framed where this policy is in effect may founder because farmers lack incentive to increase their output or to market their crops.

Responsible planners will also see that institutional weaknesses are constantly brought up in the national discussion about agricultural development. Perhaps more than others, central planning groups should be able to see the adverse effects of oppressive tenure systems, uncontrolled forest grazing, indiscriminate shifting agriculture, inadequate rural schools, poor credit channels, and the like. In some instances, planning groups may be able to propose effective programs which will gain wide support. In other instances—tenure changes being among the most prominent—those who are responsible for the political processes must take the lead, and planners can only make realistic proposals after a suitable political climate has been created.

Agricultural planning can provide a basis for the effective use of outside technical and economic assistance, both from United Nations agencies and from individual foreign nations. Aid-donor nations and agencies are increasingly requiring integrated plans before they will continue or increase their assistance programs. At the same time, foreign aid resources are too limited to meet the needs of the growing nations, so each nation must assure itself that it is making the most effective use of all the foreign resources that do become available.

Moreover, the nation which has a well conceived plan to use foreign aid will be most likely to receive a larger share.

Plan Implementation

Although agricultural planning can be a powerful tool for increasing progress in low income agriculture, it can only be applied effectively when its limits are carefully respected. The most important limit, an obvious but frequently neglected one, is capacity for plan implementation. However intricate formulation of agricultural plans may be, implementation is infinitely more difficult. Effective goal and target setting depend on skillful political leadership, but even more political sophistication is required for putting plans into action. Implementation relies primarily on people, either on their own farms or firms or in various groups and agencies. Realistic political leaders will recognize this, and skillful planners will ease the problem by preparing plans that are attainable even if slightly ambitious, that respect the limits of administrative capacity as well as other resources, and that avoid internal contradictions.

Similarly, agricultural planning does not solve problems of agricultural development—it only provides a means for choosing a rational, coordinated approach to these problems. Such obstacles as low agricultural labor productivity, low yields, and high population densities in rural areas will be prevalent far longer than will a few plans. But planning *can* provide a nation and its leaders with an effective means of attacking these problems at the least cost and with the greatest dispatch.

Adapting Plans to Cultural Values

Agricultural planning cannot be used to effect extensive changes in cultural values. Some changes can be introduced by skillful planning and national effort, but these changes will occur slowly; and the deeper the cultural values, the less likely they are to respond to efforts to change them. People are reluctant to change their diets even if it can be demonstrated that they would have more calories or better nutrition from other foods. Religious convictions that impede changes in agricultural technology rarely respond to exhortation. Preferences for large families in rural areas will persist for decades. The patterns of personality formation set deep in the way of life of the society and transmitted to each new child in the earliest years of his life will resist change over generations. The realistic agricultural

8 AGRICULTURAL DEVELOPMENT

planner must take into consideration that these cultural traits, like the facts of rainfall and temperature, place limits on the range of his choice. Attempts to alter them should be few and carefully designed so that they concern only the one trait seen as a critical obstacle to agricultural growth—a strong preference for rice as a food grain, for instance. A broad frontal attack on the values of rural people is to be avoided.

It is equally important for agricultural planners to recognize that certain qualities of societies that may appear as obstacles can be accommodated and minimized by appropriate, well-adjusted program formulation. In a society where farmers are comfortable in patterns of traditional authoritarianism, an extension activity which depends heavily on direct instruction to change practices may be effective. In contrast, programs which stress permissiveness and alternatives may hold no appeal for these farmers but instead only serve to make them feel they are awash in a sea of indeterminate ideas. Where cultural traits of a society do not give cultivators much experience with the hypothetical fitting together of elements, it is desirable to avoid introducing complex horticultural practices. In a society where production integration is difficult, new crop variety that can only perform if fertilizer is applied in a timely manner may actually produce less under field conditions than a variety with less potential which will, however, still produce in the absence of fertilizer. As farmers (and administrators) become more accustomed to thinking about alternative hypothetical combinations, agricultural plans can become more complex and proposed innovations more interrelated.

Agricultural planners have learned that they cannot count on immediate acceptance of any program they propose. The cultural factors noted above may retard acceptance, but even where no cultural obstacle exists, the risk margin of the small farmer in low-income agriculture is such that few farmers dare accept a practice until its value is well established locally. Seen in terms of the farmer's risks, such reluctance, far from being a phenomenon of blind ignorance, is fully rational. Those responsible for estimating the rate at which practices will be accepted must recognize these limitations. Most agricultural planning overestimates the speed at which new recommendations can be adopted. It frequently fails to recognize the need for local demonstration and the inevitable organizational difficulties inherent in any program encouraging widespread change in cultivation practices.

Delegating Planning Responsibility

Agricultural planning—and agricultural planners—cannot do everything. In many societies, planning groups tend to attempt to centralize decision making and action programs beyond the limits of their influence. There is a general need for greater delegation of responsibility. Local officials often can plan more realistically within an established framework of national production targets than can the central planning group. Unless groups outside the planning organization can be brought to feel that the plan is in some sense “ours” instead of “theirs,” they will exert little effort to implement the plan. Planning groups would do well to keep constantly in mind that agriculture is an enormously variable production process requiring minute local adjustments within rather narrow timing tolerances. Generally farmers make such local adjustments and time decisions better than anyone else. They should be given rational alternatives for increased production, suitable production requisites, and dependable market outlets. Most central planning would do well to concentrate on efforts to improve these factors of rural production environment. This approach avoids the danger of stifling individual initiative and private sector development efforts through overplanning.

Good planning is expensive. Hence, the planning group is responsible for planning efficient, realistic activities in line with the goals and motivations of the nation. Agricultural planning cannot be done in isolation nor can it be turned over to outsiders. Although foreign experts can make a substantial contribution, agricultural planning is unlikely to be effective if it is simply entrusted to the equivalent of a group of consulting engineers.

Responsible agricultural planners will keep in mind at all times—even in the midst of a hectic and highly bureaucratic atmosphere—that agricultural development only occurs as individual cultivators decide to change their traditional practices. This will not happen in the absence of locally tested alternatives, dependable supplies, effective market outlets, and suitable rewards. Agricultural development does not occur in the capital city but far away on a myriad of individual farms.

A Case for Planning

Finally, there is one question which nags every planner: Is planning useful if the plan is not implemented? Even as the third

10 AGRICULTURAL DEVELOPMENT

plan was being prepared in Iran, a broad current of skepticism about the usefulness of planning was expressed by the participating agricultural technicians. Some doubted that the plan would ever be implemented to any significant extent. Others were dubious that the intended comprehensiveness of the plan could be maintained. Recent developments in Iran have tended to substantiate some of these criticisms. In this, Iran is far from unique. A prominent American economist closely associated with the Iranian planning effort has commented, "the record shows . . . that the espousal of planning, from country to country, is more eloquent than its execution."¹

Those who worked most directly on the agricultural plan felt that it offered the best available course for future agricultural development policy in Iran. Even so, discouragement beset the Agriculture Section at times. Staff members would ask what sense there was in planning when they knew that the agricultural plan would probably be subject to substantial modification in application. Despite these misgivings, there can be little doubt that the preparation of the plan was a useful exercise in Iran. Certainly this is true as far as plan programs, representing careful, responsible analysis by a broad range of specialists and carefully fitted to national needs, are put into operation. Some are almost certain to be implemented in substantially the same form as conceived, although perhaps in different magnitude.

More important, the process of the plan preparation has made a contribution to the improvement of agricultural policy formulation in Iran and thus to more rapid agricultural development. The discipline of evaluating probable demand, making realistic estimates about the effects of alternative program approaches on increasing production, focusing on the low productivity of agriculture, choosing programs that will maximize increases in production from the limited resources available; the very act of gathering a range of technical and economic experts, Iranian and foreign, to concentrate on program planning over a five-year and longer period—all these have already made a contribution to Iranian policy formulation.

For those directly involved, it is perhaps lamentable that the plan frame² has been substantially modified. Yet from the outset realis-

¹ Edward S. Mason, "The Planning of Development," *The Scientific American*, Vol. 209, No. 3 (September, 1963), p. 243.

² The term "plan frame" refers to the first generalized statement of the proposed Iranian third plan. Only after the plan frame had received Cabinet approval could the individual agencies begin preparing the detailed projects which together with the plan frame, eventually constituted the final third plan. For a more detailed discussion of this planning stage, see p. 59.

tic assessment indicated the plan frame would have to be constantly modified as time progressed, and provision was included in the planning process for annual reviews and rephrasing of the program. Regrettably, this activity proceeded with less organization and at an earlier period than had been hoped, but the value of the planning process itself in Iran should not be questioned.

The immediate revision of the plan, even before it was well underway, may perhaps serve as a warning to others in the future. Agricultural planners should not attach too much importance to a piece of paper and must always remember that the uses of agricultural planning are broad and subtle.

II. Mobilizing Knowledge

A first and basic problem in agricultural planning is the mobilization of knowledge for more effective and systematic agricultural development programs. Planning groups are continuously concerned about where to find the data on which to base program formulation, how to identify and encourage high priority research, how to organize the hierarchy of educational institutions to put greater knowledge into the hands of farmers and government officials, and what kinds of formal academic training are most relevant for those engaged in planning. The experience gained by Iranian planners confronting these problems and the adjustments they made for inadequate data are discussed in this and the following chapter.

Planning With Limited Data

In Iran planning was viewed as a pragmatic, problem-solving activity, and so no apology was made for inadequate data or for making broad first assumptions about Iranian agriculture. More precise statistics would have been useful, and provision to obtain better data was included in the plan proposals, but the importance of precise data can be overrated.

Planners are much more than merely data collectors. Planning, after all, is concerned with future activities. The ability to realize targets depends on setting the right programs in motion and being relatively sure they are scaled correctly to meet the nation's foreseeable needs. For this purpose precise figures are desirable, but in fact production figures only need be sufficiently accurate to avoid choosing the wrong scale.

The most important "statistical" source is the knowledge of seasoned, realistic specialists both within and outside the government. No amount of statistics will provide all the data needed in planning. It is essential that planners make full use of a reasoned, professional assessment of the situation by those who "know the country." Production statistics for wheat down to the last ton are hardly a substitute for experienced judgment about what can be done to expand planting of improved varieties.

The neat, ordered rows of statistics in the Iranian plan are in fact, misleading. They are an attempt to order the information which was gathered and to compare magnitudes. To one unfamiliar with the mechanics of planning, the figures may give an erroneous impression of accuracy. They are the best that were available. They represent what appears reasonable to those most familiar with Iran. The columns total. But it is well to remember that the figures are not precise and that the plan is not an unchanging monument. The objective of planning is not to develop such a rigid framework that everything *must* happen in the way the plan foretells; that is clearly impossible. Even an accurate plan is no good if it lacks flexibility. In Iran, it can be fairly said that the inadequacy of the statistical base imposed flexibility on the plan.

What is important is not precision for precision's sake but whether the programs and their magnitude are adapted to the particular stage of the country's agricultural development. Wheat production figures in Iran may be 25 percent or more in error, but estimates of demand and a reasoned assessment of production possibilities showed that the vigorous program recommended could meet the nation's demand. The more accurate the figures, the more assurance one has that the programs and magnitudes are suitable. But in Iran and most other low income countries the major problems are obvious, and precision of program design is less important than getting on with the job ahead. As an official of the International Bank for Reconstruction and Development (IBRD) put it in conversation: "Merely to complain about lack of good data is basically not to know how to plan."

The penalty for the pragmatic, administrative approach used was that unending assumptions about data had to be made. Production figures for various commodities were reported—with qualifications, to be sure—even though real survey estimates were lacking. A reading of Chapter III will demonstrate what enormous assumptions were

14 AGRICULTURAL DEVELOPMENT

necessary to estimate future demand for food crops. Many of the programs in the plan frame rested on data that were no more than informed guesses. Certainly these guesses were better than none; most were unavoidable. But it is also true that the relevance of the plan would have been enhanced by better statistics. Iran, in comparison with other nations of similar size and stage of development, would appear to be particularly lacking in statistics suitable for planning. In the absence of suitable time series, it was impossible to estimate with more than a very general degree of accuracy what recent trends of production had been. Further, it will be impossible to evaluate the achievements of the third plan and what progress has been made toward reaching targets adequately until more accurate statistical reporting for agriculture becomes available.

Encouraging Relevant Research

Production statistics are not the only data used by planning groups. In Iran other kinds of information about the structure of agriculture were even scarcer. The gaps in knowledge were huge. There were no studies about individual farms which could be used to help farmers improve their cropping systems and to help planners make program recommendations realistic in terms of economic incentive. Relatively little was known about the physical responses of major crops to fertilizer under local conditions or about marketing channels for the major crops. Only vague, generalized reports existed about the agricultural activities of tribal groups. This left the planners little basis on which to recommend improvements.

The whole agricultural policy of the country will be improved when there is a body of research on rural sociology built up from field studies, when there are suitable studies of whole villages as economic and social units, and when more is known about the relationship of Iranian character and culture to the political and economic life of the nation. Of course, all this must come slowly; even the richest countries have little enough information. The point is not so much that research data were lacking in Iran, but rather that a start needed to be made and the importance of research more widely recognized.

Increasing Empirical Content

A planning group inherently tends to be skeptical of information because so much it receives is contradictory. Therefore, it should be

among the first to press for empirical testing and on-the-spot investigation. Too often theoretical statements are incorporated into national planning without suitable empirical testing. One finds untested beliefs that yields can be enormously increased, that vast tracts of very fertile land await development, that farmers are not price responsive, that farmers must be coerced into change because they are irredeemably conservative, and the like.

Agricultural development will naturally require a wide range of biological research. When asked about a program recommendation, almost the first thing an agricultural technician in Iran would say was that too little was known about crop responses. For example, there is a need for more fertilizer trials, more variety testing, more pasture rejuvenation research, and more livestock breeding. The agricultural planning group is in a good position to appreciate and support expansion of this agricultural research in agricultural colleges and ministerial agencies. The group has the power to make certain that physical and biological research in agriculture focuses on immediate, relevant problems. It can insist on incorporating widespread field trials so that program formulation can be based on the actual results of new techniques under local conditions in farmers' fields.

Social Science Research

The need for biological research in agriculture is widely recognized, and the planning group can help formulate suitable programs. On the other hand, the importance of social science research in low income agriculture is less obvious and less widely understood, although for effective planning the need may be even more acute. Here the planning group has a major role to play in encouraging relevant research.

The kind of social science research needed for direct use in the planning process includes, among others, demand estimates, demographic projections, and evaluations of future trends of terms of trade. Much of it will have to be done by the agricultural planning group itself or by a separate research section of the central planning organization. One kind of internal "research" simply involves gathering and reading previous reports dealing with the policy or program currently being worked on. Too often even this obvious starting point for information gathering is omitted. It would certainly have been better in Iran had prepared background papers, summaries of existing research, and comparisons of alternatives been available. The

16 AGRICULTURAL DEVELOPMENT

pressure of other work and limited staff facilities restricted the research effort of the Plan Organization.

Evaluation studies are another form of research likely to involve the planning group directly, though, when possible, they are better undertaken by the action agencies responsible for program operation. These agencies are not apt to criticize their own programs harshly, yet the deficiencies they themselves identify will be those they are most likely to overcome. Outside evaluation may only harden resistance to program changes. In Iran, for example, the Agriculture Section felt that certain operating procedures of the Agricultural Bank needed to be carefully evaluated and revised if the development funds allocated to agricultural credit were to be most effectively administered. The Bank's leadership was in complete agreement. It was decided, however, that if the evaluation were carried out by the Bank staff itself any changes needed would be more likely to be willingly adopted by the staff. Hence, in the plan frame provision was included for the Bank to make an internal evaluation.

There will be instances when the planning group, suspecting a program is not so effective as it should be, feels that the operating agency will not make a suitably objective internal evaluation. In such cases the planning group itself may want to undertake the evaluation. Also, broader studies about the progress of plan implementation probably will fall logically within the scope of the planning group itself. The program review which preceded the formulation of the third plan in Iran was essential to understanding the progress of the second plan and to acquiring the information necessary to avoid repeating second plan errors.

The agricultural planning group—indeed, any planning group—probably should not attempt to undertake much social science research of a more penetrating nature. The pressure of day-to-day operations and constant deadlines are not conducive to the maintenance of a sustained research effort. Most of the research of the planning group must itself be very operational in nature and rely almost wholly on secondary data. It seeks answers on which to base decisions next week or within only a slightly longer period. Most of it is more usefully regarded as fact finding and subjective evaluation rather than as research.

On the other hand, the agricultural planning group can be one of the most active "consumers" of more thorough social science research because, by its very nature, the planning process deals with

the unknown and the unfamiliar. Planning groups can clearly see the usefulness of a broad range of research and often are able to do something effective about getting research under way. Instead of attempting such research on its own, the planning group often serves several of its purposes better by encouraging research in agricultural colleges, in ministerial research sections, and in research institutes. The planning group wants research which is independent from its own point of view as a check on its own evaluations. It desires the kind of long-term research that never seems possible in the midst of the planning context. Growth of research competence in the nation is a goal of the planning group. It can achieve this by making direct grants to other agencies for specific research projects and by including continuing development programs for research institutions in the plan allocations.

Designing Research for Agricultural Development

The planning group will want to help work out priorities with research administrators. Few groups know so well the relative urgency of competing research needs for national development, both in the physical and biological sciences and in the social sciences, or will be so keenly aware of the need to work out a balance among research possibilities. But beyond that, the agricultural planning group will probably want to limit its part to helping design the research and helping assure sufficient funds.

Social science research commissioned by the agricultural planning group will range from purely descriptive to highly technical analytical research. Outside research groups would probably be best suited to undertake more detailed research because they can accomplish more than can the planning group in its limited time. Possible areas of study might include projections of present trends of food demand, population growth and changes in age structure, and future terms of trade. Planning groups will be among the most avid readers of research reports on such topics as farm management, land use surveys, nutritional levels by income, price responsiveness of farmers, incentive structure, farmers' sources of production information, supply and marketing response of subsistence farmers, influence of cultural patterns on levels of production and rates of innovation, comparisons of domestic agriculture with that in similar nations, ranges of efficiency of agricultural production within localities, and many, many more. In countries where there is a modern plantation sector side

18 AGRICULTURAL DEVELOPMENT

by side with traditional cultivation, research needs may have added dimensions in terms of export markets, returns on invested capital, labor relations, and the like.

Not all the social science research critical to effective agricultural planning falls within the realm of agricultural economics or even the kind of research commonly found in agricultural colleges. Demography, sociology, anthropology, and social psychology—disciplines too rarely found in agricultural colleges—all are important to deepening understanding of how farmers operate and what is necessary if they are to be able to make the progress the nation desires. A planning group can encourage interdisciplinary research and joint projects between the specialists in agricultural fields and experts in other social science disciplines who very often pay scant attention to agricultural development problems.

In the early stages, much social science research is necessarily descriptive in nature, but descriptive studies should become more analytical as research methods become more precise and as more descriptive material becomes available. The first farm management study may merely be an accounting of costs and receipts, but the next can include budget studies of the most profitable alternative enterprise combinations. After that should emerge research that uses the most advanced and sophisticated techniques.

Limited resources may preclude undertaking nationwide studies. Nevertheless, research results from selected areas can be extremely valuable. In many instances a careful village study is more useful than a superficial national survey, especially when the national work must be based on questionable secondary data or on such a small sample as to be of questionable validity. On the other hand, purposeful selection of the sample within a village may miss significant elements of the economic structure being studied which a properly drawn sample would pinpoint.

Exploratory studies or pioneering efforts need not lack statistical sophistication. Indeed, low income countries probably have the most need for advanced and sophisticated statistical techniques since all possible information must be squeezed from each dollar expended. Careful statistical design will permit much more efficient research; but mere sophisticated technique does not mean research sophistication. Most development economists can recall research projects which employed advanced techniques but used so much hypothetical data that the studies were rendered useless for practical purposes.

Social science research must be adapted to the individual needs of the country. Foreign trained research workers may command useful tools, but often their work is of limited relevance because it is patterned too closely after that of their colleagues abroad who live in countries with entirely different agriculture structures. Planning groups can help work out research designs which are relevant to current agricultural problems, but which still take advantage of advanced techniques for the development of the nation's agriculture. Studies by foreigners themselves can provide a valuable supplement—although hardly more than a supplement—to domestic research. Foreign research workers will bring outside viewpoints and techniques to bear in their research. Their different insights will provide a valuable perspective for national scholars.

Research should not be allowed to become merely an exercise to prove preconceived normative values. For example, there may be a number of historical and intellectual reasons which have led a nation to commit itself to an economic structure where increasing proportions of activity are undertaken through cooperatives. Yet research should not be skewed in order to prove that traditional middlemen are only parasites. Even if research shows that traditional marketing methods are economically more efficient than new cooperatives, the planning group may, for a number of reasons, decide to place continued emphasis on cooperative buildup. Great stress has already been laid on the reality that planning is a political process and that noneconomic considerations will be important and may be decisive. But research twisted to bolster such decisions wastes precious research resources and clouds the objective reporting of research from which the political process should proceed. Research is commissioned not to prove but to improve.

Efficient Use of Research Workers

In cooperating with research agencies, the planning group will be reminded constantly of the scarcity of good social science researchers but some planning groups fail to draw the obvious conclusion about making good use of them. Rarely is it desirable for university or research institute scientists to do short term evaluations of programs, although this is one of the kinds of research they are most frequently asked to undertake. The university research worker's time is better reserved for longer term and more technical research. Neither should expert research workers be asked to do routine or clerical work.

20 AGRICULTURAL DEVELOPMENT

Programs and direct grants for financing research should include ample clerical assistance. More resources than realized are wasted by forcing Ph.D.'s to do their own typing and letter writing. The planning group will want to use its influence to help secure salaries adequate to attract and retain research personnel and to permit them to concentrate their efforts on research. Suitable facilities and adequate libraries should be made available.

Finally, the temptation to siphon off the most capable social scientists, either into the work of planning or into a planning agency research section, should be resisted. It is true that some are necessary if the central planning organization is to be able to work well. On the other hand, to rob the universities of their best social scientists will rob the nation of the future skills of the students who would otherwise be taught by university research workers. Similarly, the independent research which university staff alone can carry out would be lost.

The Iranian plan frame contained modest program recommendations designed to help accelerate both physical and social science research in agriculture and to improve the collection of agricultural statistics. The only regret was that more could not be done.

Education as a Force for Agricultural Development

If agricultural administration, research, and techniques of cultivation are to improve, formal education for those concerned with agriculture must be strengthened. As in many low income countries, in Iran there has been a great upsurge of interest in education over the past two decades. Anti-illiteracy campaigns have been launched and new colleges founded. Even so, much remains to be done before education can be the force for agricultural development everyone hopes it will become.

Within the Division of Economic Affairs, responsibility for educational planning rested with the Social Affairs Section, but cooperation with the Agriculture Section was close when the problems dealt with agriculture.¹ University education was the level on which the Agriculture Section worked most directly. Most of the ranking technical staff who would, as their careers progressed, become the nation's agricultural administrators and research specialists were expected to

¹ George B. Baldwin discusses manpower planning for the Iranian third plan in "Iran's Experience with Manpower Planning: Concepts, Techniques, and Lessons," *Manpower and Education: Country Studies in Economic Development*, Frederick Harbison and Charles A. Myers, eds. (New York: McGraw-Hill Book Company, 1965), pp. 140-172.

come from the established college of agriculture at Karaj and a new institution far to the south near Ahwaz. Many of these will have to receive graduate training abroad.

A national manpower survey in 1959 had dealt with the need for better qualified agricultural administrators, but the skill classification was so broad that it rendered the survey of little use in educational planning for agriculture. A manpower conference sponsored by the Plan Organization as part of the general review of the second plan supplied better information about skill breakdown. Estimates were largely made by the simple process of gathering together the knowledgeable people and asking them how many new agriculturally trained men would be needed during the plan period. In the absence of specific projects, their estimates were, at best, very general. As the plan frame was prepared, it was possible partially to refine these estimates, but they remained only educated guesses. The problem was somewhat simplified because almost no college educated agriculturalists in Iran were employed in nongovernment agricultural capacities. The pattern was not expected to change appreciably during the plan period. On the basis of the estimate emerging from the manpower conference and verified by the plan frame, the facilities for college training already in existence were judged to be almost adequate to meet the nation's anticipated needs during the third plan. There was no need to emphasize agriculture at the three proposed new provincial universities. Instead, it was decided to concentrate less on expansion—the dominant theme during the second plan—and more on curriculum upgrading.

The national agricultural college at Karaj, 20 miles west of Tehran, had recently been substantially expanded and modernized. Its faculty and administration hoped during the plan period to improve the quality of instruction and to increase the integration of teaching, research, and extension to make certain the college remained at the frontier of agricultural problems. There were questions of what to teach and how to develop curricula suitable for students from largely urban backgrounds who were likely eventually to find employment in government administration. There were problems of finding staff and funds to permit the faculty to undertake meaningful research. In addition, there were questions of curriculum revision which would suit Iranian conditions and at the same time encourage a problem-solving orientation. Fortunately, real progress was being made in all these directions. The new agricultural college just beginning at Ahwaz was

22 AGRICULTURAL DEVELOPMENT

tackling similar problems with emphasis on the hot, arid conditions prevailing in its region.

Secondary schools must provide specialists at the next level. A continuing flow of medium-level administrators is needed by such agencies as the Agricultural Extension Service, the Agricultural Bank, and the Community Development Administration. These must either be trained in the regular secondary schools and given additional vocational training by the agency which hires them or they must attend the specialized agricultural high schools.

Estimates of the number of people with secondary level education who would be needed in agriculture during the plan period were largely based on the plan frame and were derived principally by adding up the anticipated program requirements as best they could be foreseen. Thus, it was possible to get some picture of how many additional extension agents, agricultural credit administrators, community development workers, and the like would be needed. Again, these estimates were based principally on the numbers of people who would be absorbed by government programs. Only a general allowance was made for those few expected to enter the private sector.

The system of secondary level vocational agricultural high schools had not been overly successful in Iran. Originally, it had been intended that some of the students would become cultivators, but in actuality most students subsequently found positions in urban areas or with government agencies. The quality of instruction was sometimes questioned. Since the schools were not controlled by the Ministry of Agriculture, Ministry officials were skeptical about their usefulness in training middle-level administrative personnel. The education plan included provision for improving these schools, but how best to approach this problem remains unresolved.

The third focus of concern about education for agricultural development was the rural primary education structure. It was hoped that these institutions could provide increasing numbers of cultivators with education adequate to enable them to gain substantial information from the printed page, keep better accounts, and generally be more receptive to the innovations so critical for agricultural development. Serious problems of teacher training and text preparation exist. Even so, this appears to be a promising area for future efforts. If village children can learn to read by using material about improved agricultural techniques, they will at the same time be developing a lifetime habit of turning to the printed page for advances in technology, and the

groundwork will be laid for much more rapid agricultural progress. Too little is known generally about the relation of primary education to agricultural progress, and Iran is no exception. But the direction is certainly correct and needs greater emphasis in the future.

Foreign technical assistance programs have made a critical contribution to the improvement of agricultural education in Iran. Without these programs the substantial progress of the last decade—especially at the university level—would have been impossible. One of the most successful is the United States bilateral assistance program which has supplied a team of advisors and a number of buildings for the national agricultural college. It has, moreover, continuously supported the college and its needs within government councils wherever possible. The Near East Foundation has been instrumental in establishing a secondary level institution for training community development workers and has helped build up the new agricultural college at Ahwaz. UNESCO has helped with technical assistance for primary education and has made a valuable effort to introduce more rational planning into educational administration. Through the interest and help of these agencies it has been possible to expand and upgrade Iran's educational system for that cadre of trained administrators without whom there can be no agricultural development.

The Uses of Foreign Advisors

Iranian planners had at their disposal a large group of foreign advisors, ranging from UN and FAO technical specialists in crop production to advisors in almost every field of institutional development. Many countries have these foreign advisors, supplied through various international and bilateral agencies, and the role they play is one that may profitably be considered dispassionately.

Of course, professional competence is the obvious *sine qua non*. But this kind of competence is probably better when it is not too highly specialized. The problems to be dealt with in rural development are hardly limited to the kind of frontier problems of economics that dominate professional journals. Quite a broad range of skills should be asked of a foreign advisor. In agricultural economics, because a planning group is often asked to judge rather technical program proposals, an advisor should have acquaintance with technical agriculture. Foreign advisors in rural development should not be regarded only as walking encyclopedias about economic techniques, and their talents should be used in other ways as well.

The foreigner should be used to provide an outside viewpoint. Sometimes this will be erroneous and need correction, but it can often contain elements of objectivity essential for evaluating programs and policies. Most countries have myths about agriculture which are difficult to shake within the environment of the society itself. The foreigner is often less burdened with myths, at least about *other* countries. In Iran, as an example, when asked about the division of wheat between landowner and tenant, nearly every technician would respond by naming the traditional equal division among land, water, draft power, seed, and cultivation labor. "However," the informant would invariably proceed, "in my village . . ." and then he would continue to describe a different local arrangement. As a result, foreigners became convinced that there was a very wide range of practices, warranting much more research to provide the basis for tenure improvement.

Frequently local administrators have difficulty in seeing their problems in perspective. An outsider can point out that agricultural development under the most favorable of circumstances can hardly show more than bare beginnings within the span of a five year plan, and many low income countries start with such handicaps that a longer time horizon must be envisaged. Innovation in agriculture often seems painfully slow. Yet in Iran within the last few decades cotton production had increased two and a half times. Sugar beets had been introduced and cultivation expanded until by 1962 it had reached some 45,000 hectares and was expected nearly to double in the next five years.

The foreigner, standing somewhat apart, can sometimes contribute a more unified view of agriculture. Technicians working closely with crop production may forget the interrelated quality of plant and livestock production. The foreigner can point out that a change in cropping pattern or cultivation techniques can affect not only the crop involved but the farmers' livestock enterprise and their personal lives as well.

The foreign advisor may be asked to evaluate new ideas, and in this role he is likely to contribute as an iconoclast, though not a cynic. For example, there was a tremendous emotional tug in Iran to reintroduce sugar cane, which had been grown at the time of Cyrus the Great. A careful examination of the problem, however, showed that beet production could be successfully carried on by individual peasant farmers while cane production would probably require large

plantations, with consequent unfortunate tenure effects. Sometimes the foreigner could make important points of this kind and incur the wrath of emotional criticism better than the Iranian technician.

The foreigner can also be used as a go-between or negotiator. Situations arising between two agencies which might be very difficult to resolve can sometimes be handled by allowing both to blame the foreigner—who, after all, was probably ignorant of the situation in the first place. At the same time, foreigners can be used to ask questions that would only cause problems were others to ask them. Sometimes both sides in an argument can supply the foreigner embarrassing questions for the other side, and the foreigner, because of the different psychological situation that surrounds him, can be used to ask these questions which everybody agrees need raising.

A related role which the foreign advisor may usefully fill may be termed "fall guy"—that is, to do things which his national colleagues, because of their position, simply cannot do. A national technician must continue to live in a country and to deal with his associates. The foreigner, on the other hand, expects to leave sooner or later and, in any event, looks to some outside agency for his next promotion.

A special function of this kind consists of promoting consensus by advancing positions that almost inevitably involve retreat. Sometimes the foreign advisor can make proposals which, though incomplete, might become the basis for a suitable compromise or middle ground. This is a recognized committee technique, but it is often difficult to use. In Iran the most clear-cut case came in the attempt to elaborate a tenure statement for inclusion in the plan frame in the absence of a settled national policy. Probably ten different drafts were prepared by the foreign advisors before a suitable one was finally evolved. If he stepped on someone's toes too hard, an advisor could always retreat behind the smoke screen of being a foreigner and not understanding the situation (and often enough this was true). Then no one had to bear the blame, and a new statement could be worked out. As a whole, this is one of the most important contributions the foreign advisor can make.

The pressing problems of day-to-day administration are often difficult to resist. The foreign advisor, less swept up in such immediate concerns, can concentrate on the longer view and on evaluating what effect immediate administrative decisions might have on long-term objectives. In Iran, the foreign advisors found themselves the advocates of long-term research, not just in agriculture but in a number

26 AGRICULTURAL DEVELOPMENT

of fields. Foreign advisors were the leading advocates of seed trials, development of census agencies, expansion of education systems, and reforestation. Iranian experts did not necessarily disagree nor fail to see the validity of the longer view; however, their energies were already severely taxed by their immediate responsibilities for action to relieve the problems at hand.

A real function of an advisor to a central planning agency is that of organizing foreign aid. Naturally this is not done in the absence of responsible officials, but with outside assistance coming through a number of agencies some kind of coordination is needed on the part of both the recipient and the donor. Since the foreigner often has had more experience in dealing with international agencies, he may know better how to prepare presentations and can thus reduce wastage of time.

Frequently the foreigner is better able to understand the need for research and its usefulness in the planning process than his national counterpart. For one thing, the man raised in the society has a "feel" for its structure and processes which at least gives him a sense of knowing what is going on and what the situation is. The foreigner, on the other hand, finds that he must gain this appreciation of the structure and workings of the society for himself in a more artificial—that is, more academic—manner. He must read the studies, inquire from knowledgeable people, and try to fit together the jigsaw puzzle for himself. In the process he will probably become aware of the general dearth of accurate, analytical information about agriculture in low income countries.

In Iran the facilities for research were severely limited. Understaffed statistics sections in government agencies were overburdened with just trying to keep up with routine material without undertaking further research. The Plan Organization was heavily involved with administrative duties. But there were beginnings to be made in research, and the foreign advisor could help see that they were, indeed, begun.

Perhaps most important of all, pressure toward progress and a development perspective was exerted by the very presence of foreign advisors. Many Iranians felt the need for rapid economic development, but often failed to realize the inherent problems and the hard choices which must be made. The foreign advisors provided a more balanced viewpoint on these problems. In effect, they became institutional allies of the better-trained, more progressive leaders in technical positions. Not only do foreigners provide or corroborate professional judgments

but they also help increase awareness by all leaders in the society that development is not costless—and that urgent tasks face the nation. As outsiders, they can sometimes make these points more forcefully without being suspected of presenting recommendations with hidden selfish motives.

Do Planners Need Economics?

Throughout this monograph great emphasis is placed on the importance of noneconomic factors in planning for agricultural development. The planning process is shown to rely heavily on techniques of administrative management. It might seem that agricultural planners require training in public administration, not agricultural economics.

The experience in Iran clearly showed the need for careful, rigorous training in economics for those concerned with agricultural planning. (It also demonstrated the need for solid grounding in agricultural production techniques if planning groups are to deal effectively with production specialists and evaluate their proposals.) Economics is sometimes said to be the science of maximizing returns from scarce resources. One of the most important contributions the planning group made was to inject considerations of maximization into discussions about program formulation. This might be termed "thinking economically"—that is, making certain that the greatest impact on production is realized from the scarce resources available, whether these be monetary, physical, or administrative. Examples of thinking economically about administrative resources are cited in the section devoted to program selection.² In Iran it was surprising how much attention had to be devoted to this concept in dealing with a broad range of administrators. As a habit of analysis it is central to planning.

Baldwin³ deals with another aspect of this same question: Are the tools of economics useful? He argues strongly that they were in the case of Iran, a contention which was true for the agricultural planning process as well as the broader front with which Baldwin is concerned. "There can be no disagreement about the central importance of economics for planning: that is what economics is about, the allocation of resources for the improvement of the human lot." He further points out that the skills needed in planning often are not the most sophisticated of economic techniques. He suggests not only that the less advanced

² For a more detailed discussion of administrative resources and program selection refer to Chapter V, "Issues of Plan Design," pp. 72-90.

³ George B. Baldwin. *Plan and Anti-Plan: An Account of Planning and Development in Iran* (forthcoming).

techniques are those most useful in economic planning—but also that they are essential. “When planners think they are relying mainly on common sense, judgment, and experience to the neglect of the formal techniques of their profession, they may be unduly apologetic,” he comments. Rather, “experience” amounts to assigning a decisive value to a crucial variable (such as administrative limitations) in lieu of carrying out a formal cost-benefit analysis. But the logical process is still there and necessary. Baldwin cites illustrative instances where formal economic analysis (although not always highly refined) was the basis for critical planning decisions. Planners made effective use of capital-output ratios, capital-employment ratios, cost-benefit analysis in irrigation, income elasticities, and partial input-output analysis. Experience in the Agriculture Section certainly substantiates Baldwin’s conclusion that it was important to recruit planners who had both common sense and a sound training in economic fundamentals. As he says, a good planning economist will realize that “the question of when common sense and judgment must be tested by more formal analysis is itself a matter of common sense and judgment.”

III. Adapting Planning Techniques to Data Capabilities: An Example

Comprehensive economic planning in Iran involved estimating the magnitude of many anticipated changes in the economy during the third plan. In Western European or North American countries, whole phalanxes of statisticians may be concerned with increasingly accurate estimates. In Iran, planners were forced to fall back upon less defined methods for economic projections because statistics were inadequate to support the application of more sophisticated techniques. Moreover, Iran did not have the skilled manpower to improve underlying data in a short period of time.

As in many societies with low income agriculture, statistics for planning the development of the agricultural sector were generally fragmentary. Given this situation, the minimum projections required for agricultural planning had to be derived from what limited data were available. This chapter describes the agricultural projection exercise in Iran as an example of adapting techniques to limited data capabilities in order to produce results that were useful as first approximations.

The agricultural planners in Iran, of course, benefitted from a division of labor. Estimates of the population growth rate, targets for overall increases in the gross national product, and other aggregate variables were not the primary responsibility of the agricultural economists. The two formal estimates about future economic behavior which did fall within the direct concern of the Agriculture Section were estimates of the future growth of demand for food, and estimates of rates of growth of agricultural production. The future demand for food had obvious usefulness in setting targets; the estimates of past agricultural production growth rates

were used as a basis for realistically assessing annual rates of growth necessary to meet plan targets. Both kinds of estimates were made without any computations more complicated than secondary school mathematics. While hindsight suggests improvements in the techniques outlined here, the methods actually used in Iran are presented without change. The discussion is intended not as an exposition in theoretical economics (for which there are better sources) but rather as a recounting of one method to emphasize practical problems faced where data are scarce and where there is a pressure of day-to-day working conditions and program deadlines.

Although the following paragraphs discuss the methods used in Iran, it should be noted that these may not be the most desirable approaches in other circumstances. In particular, the estimate of the urban demand for food was based on a recent cost of living survey taken in 1958 by the Bank Melli, the government owned bank. Iranians were fortunate that such a survey was available; but when this type of data is lacking, other means of estimation may be used. One approach would be simply to borrow elasticity figures from other countries judged to be similar in their levels of living and dietary habits. Indeed, in estimating rural food demand in Iran that is exactly what was done. Often demand estimates need only be very general to be useful. In some countries, it is obvious that even minimal agricultural programs over the next few years will severely strain available resources—both administrative and monetary. When this is the case, responsible program formulation requires only the assurance that programs are headed in the right direction and that some attention is paid to relative emphasis.

The techniques described below for projecting rural income contain several methodological flaws, and because of changes in plan targets, the projections of rural and urban incomes work out to be inconsistent with the final target growth rate for gross domestic product.¹ Because the intent here is to describe what actually was done in the Iranian planning experience, these errors and inconsistencies have not been corrected in this account. However, they have been analyzed in some detail in a comment at the end of this chapter.

Estimating Demand for Food

In Iran, the estimated future demand for food (including tobacco) was based on computations of income elasticities for food which were

¹ The author is indebted to Dr. Pierre Crosson of the Center for Development Planning whose perceptive criticism of this chapter greatly clarified the methodological comments.

used in combination with estimated increases in income and population. Much of the data were fragmentary, some data were interpolated from situations judged similar in other countries, and many assumptions were involved. Perhaps because of these considerations it may be interesting to examine in some detail the procedure involved. It should be noted that the following discussion is concerned with agricultural production for foodstuffs; industrial raw materials were estimated by working back from industrial growth targets.

Theoretical Formulation

The demand for food, in its simplest form, was taken to be the sum of the demand from city dwellers plus that from rural people. This major breakdown was chosen for two reasons: 1) the increase in rural income—and, hence, a part of the increase in rural demand—depends on the increase in urban demand; and 2) there were some survey data for urban consumption in Iran which could be drawn upon.

The method used in Iran to estimate future demand for food made two enormous assumptions: 1) that price relationships would remain unchanged throughout the third plan, and 2) that any increased demand for food could be met by increased domestic production. Only by assuming constant price relationships could any demand projection be made without embarking on a hazardous and fruitless attempt to estimate how prices might change and what the relationships would be at the end of the plan. Any other course would have involved assumptions of doubtful validity and computations of enormous complexity. The assumption about the possibility of increasing agricultural production was made not only because any other assumption would have been too complex to justify the time necessary to handle it but also because the results gave the information sought. This assumption amounts to a prediction of future consumption on the basis of what the Iranian people would like to have as their income and numbers increase. That physical and institutional limits might prevent realization of these wants was not the critical factor at this stage. The agricultural technicians and the farmers of Iran needed an indication of the magnitude of their task if they were to adopt the realistic goal of meeting the food wants of their compatriots.

A weakness of the method used to estimate increased demand for food in Iran is that it ignored the effect on rural income of increased production of nonfood crops and export crops; that is to say, in order to simplify calculation, agricultural production was taken to be entirely food production (including sugar and tobacco) for domestic consumption.

The estimate for increased urban demand for food is unaffected by this consideration. However, in estimating the increase in rural demand for food, one element in the determination—as discussed below—is the increase in rural income. Since rural income in Iran is virtually all agricultural, it does no harm to reality to assume rural income is equal to agricultural income. But agricultural income arises from four major sources: 1) agricultural products consumed directly, 2) urban food consumption, 3) nonfood industrial crop sales, and 4) export sales. In Iran, between 90 and 95 percent of all agricultural income arises from food production for rural and urban consumption. The error in computations of rural food demand, introduced by ignoring the effects of increased nonfood industrial crop production and exports, was judged to be not enough to overbalance the errors introduced by estimating farm prices of industrial and export crops nor the complications of calculation added. In other countries, where nonfood industrial crops are important, ignoring them might introduce a serious error into the calculations. (However, the method of estimating rural food demand used in Iran and presented here could easily be modified to include the estimated increase in rural income arising from nonfood and export crops and the effect of this increased income on rural food demand.)

The following discussion of how demand estimates were computed in Iran is illustrated at each step by aggregate money values. This is because the general approach is most clearly demonstrated in this manner. However, an estimate of the increased demand by individual crop category was really necessary in order to set crop production targets. For this reason, the tables are broken down by individual commodity groups and the general discussion occasionally digresses to deal with the application of the demand estimation procedure to a particular commodity group. Such particular application is not complicated, nor was it at all different in Iran from the method used to estimate overall aggregate food demand. All estimates were worked out in money terms at constant prices assuming the values estimated in 1958. They were then computed to percentage increase by the end of the plan. Applying these percentage increases to the physical production figures for the base period gave estimates of demand at the end of the third plan in physical terms. Since it was this application to estimating demand for various commodity groupings that was the objective of the demand estimates, it follows that it was desirable to work out the groupings so that they made sense from the standpoint of program formulation. One grouping for all meat, for example, would have been much less useful in Iran than the four groupings of mutton

and lamb; beef; poultry; and pork, game, and others. Fortunately in Iran the survey data available to the Division of Economic Affairs proved suitable for meaningful breakdowns among commodity groupings for most items. In some instances, however, more detailed breakdowns would have been desirable had they been available. For example, tea, coffee, and cocoa were all grouped together when the survey was taken, and only one demand estimate for the whole group could be calculated. But Iranian manual laborers and peasants drink almost no coffee and even less cocoa. Thus, it had to be assumed that the total demand for all three beverages was, in fact, the demand for tea alone and targets set accordingly. Somewhat more explicit information might have been useful had the survey been originally designed with the need in mind to which it was later applied.

Since the survey data on which the food demand projection relies were collected in 1958, the base year for the computations is 1958, not 1962 when the third plan period began.

The total urban demand for food in money terms at the end of the third plan in Iran was estimated as follows:

- (a) proportion of added per capita income spent for food (that is, income elasticity for food), multiplied by
- (b) proportionate increase in per capita income during the third plan, multiplied by
- (c) per capita expenditure for food at the beginning of the third plan, multiplied by
- (d) total urban population at the end of the plan.

Rural demand was estimated in the same manner, substituting the rural equivalents.

It is easier to express this statement in algebraic form which in this instance involves nothing more complicated than percentages.

Stated more formally, then, the total demand for food at the end of the plan period was determined according to the following formula:

$$(1) \begin{matrix} \text{total} \\ \text{demand} \end{matrix} D_{67} = \begin{matrix} \text{urban} \\ \text{demand} \end{matrix} \left(1 + e_u \frac{\Delta Y_u}{Y_u}\right) (C_{u58})(P_{u67}) + \begin{matrix} \text{rural} \\ \text{demand} \end{matrix} \left(1 + e_r \frac{\Delta Y_r}{Y_r}\right) (C_{r58})(P_{r67})$$

where

D_{67} = value of total demand for food in 1967 at the end of the plan period (thus becoming the basis for the third plan aggregate food production target).

- e_u = income elasticity of urban food consumption.
- e_r = income elasticity of rural food consumption.
- Y_u = per capita urban income, 1958.
- Y_r = per capita rural income, 1958.
- ΔY_u = increase in per capita urban income, 1958 to 1967.
- ΔY_r = increase in per capita rural income, 1958 to 1967.
- C_{u58} = value of per capita urban consumption of food in 1958.
- C_{r58} = value of per capita rural consumption of food in 1958.
- P_{u67} = urban population in 1967 at the end of the plan period.
- P_{r67} = rural population in 1967 at the end of the plan period.

Note that the element $e_u \frac{\Delta Y_u}{Y_u}$, which represents the income elasticity of demand for food multiplied by the proportionate increase in income, gives the proportionate increase in per capita food consumption.

Now the problem is to formulate an estimate for every item on the right-hand side of formula (1). This is done step by step below. The discussion is very closely keyed to the elements in formula (1), taking each expression in turn.

Since the estimate of both urban and rural food demand rests on a per capita estimate of expenditure made by the population, it is convenient to discuss first the population projections for Iran. This will give the population element in formula (1) in both the urban and rural parts of the total demand model, (P_{u67}) and (P_{r67}).

The total demand estimates for the urban population must allow not only for growth in food demand that accompanies an increase in income (as discussed below in detail), but also for the natural increase in population and for the growth of cities caused by the migration of rural people to urban areas. According to the census of 1956, of the 18.8 million total population, about 5.0 million lived in towns of 15,000 or more. This was taken to be the urban population and was the basis of the population projections. The Manpower Section, from its population analysis based on census data, estimated that the annual natural growth rate of the population was 2.5 percent per year. The net movement of population from the rural to the urban centers was projected at an annual rate of three per thousand of rural population. Both the natural increase rate and the rural-urban migration rate are fairly typical of countries with low income agriculture. Based on the census figures and these assumptions about population growth and migration, the urban population at the time the food demand projections were made in 1958 was estimated to be 5.34 million, and the urban population at the end of the plan in 1967 was pro-

jected to be 7.13 million, which is the value for (P_{u67}) in formula (1). Similarly, the rural population in 1958 was estimated at 14.41 million and at 17.53 million in 1967 (P_{r67}) in formula (1).² The population projections are given in Table I.

TABLE I. Iranian Population Projections, 1956-1967

(1) Year	(2) Urban Population	(3) Rural Population	(4) Rural-Urban Migration	(5) Total Population
1956 ^a	5,000,000	13,800,000	41,400	18,800,000
1957	5,166,400	14,103,600	42,311	19,270,000
1958	5,337,871	14,413,879	43,242	19,751,750
1959	5,514,560	14,730,984	44,193	20,245,544
1960	5,696,617	15,055,066	45,165	20,751,683
1961	5,884,197	15,386,278	46,159	21,270,475
1962	6,077,461	15,724,766	47,174	21,802,237
1963	6,276,572	16,070,721	48,212	22,347,293
1964	6,481,698	16,424,277	49,273	22,905,975
1965	6,693,014	16,785,611	50,357	23,478,625
1966	6,910,696	17,154,894	51,465	24,065,590
1967	7,134,928	17,532,301	52,597	24,667,229

^a Figures for 1956 are based on census data. Other figures are calculated according to assumptions discussed in the text. They are carried to the last whole number only for illustrative purposes.

Increase in Urban Demand

The estimates for food demand from urban consumers were based on the 1958 cost of living survey. This survey recorded food expenditures for a sample of about 1,000 families selected from 32 cities. The data were originally collected in order to estimate changes in the cost of living in the cities but were made available to the Division of Economic Affairs

² Because the rural-urban migration rate is a function of the rural population and thus changes each year, it was easiest to calculate the population figures in tabular form rather than by using an aggregate formula, although this could, of course, be done. This tabulation is given in Table I.

Because of differences in rounding, the final estimate of the urban population in Iran as used in the demand estimates was 7.13 million, although the complete tabulation as given for illustrative purposes in Table I would call for rounding to 7.14.

Of course, the population figures have been carried out as far as they are in Table I only for computational illustration. When presented, they were rounded, sometimes to the nearest hundred thousand but never to more than the nearest ten thousand.

TABLE II. Projected Increase in Urban Consumption of Farm Products in Iran, 1967 over 1958

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Commodity Group	Distribution of Urban Expenditure on Farm Products		Per Capita Expenditure	Income Elasticity Coefficients	Increase in Per Capita Consumption of Farm Products by 1967		Per Capita Consumption in 1967 [cols. 4 + 7] (rials)	Total Urban Consumption 1967 [col. 8 × population] (millions of rials)	Increase in Urban Demand, 1967 vs. 1958 (percent)
	(percent)	(millions of rials)	1958 (rials)		(percent)	(rials)			
Milk and Butter	6.7	1,340	251	0.51	15.6	39	290	2,063	54
Cheese	1.9	380	71	0.63	19.2	14	85	606	59
Eggs	1.6	320	60	0.77	23.5	14	74	528	65
Flour	2.2	440	82	0.36	11.0	9	91	649	48
Rice	8.8	1,760	330	0.70	21.4	71	401	2,858	62
Bread	14.7	2,940	551	0.22	6.7	37	588	4,192	43
Mutton and Lamb	11.5	2,300	431	0.94	28.7	124	555	3,957	72
Beef and Veal	1.4	280	52	0.11	3.4	2	54	385	38

Pork, Game and Others ^a	0	0	0	0	0	0	0	0	0
Poultry	1.6	320	60	1.14	34.8	21	81	577	80
Fish	1.0	200	37	0.82	25.0	9	46	328	64
Fats and Oil	10.1	2,020	378	0.74	22.6	85	463	3,301	63
Sugar, Syrup, Candy, etc.	8.5	1,700	318	0.41	12.5	40	358	2,552	50
Fruit (fresh) and Juice	3.6	720	135	1.34	40.9	55	190	1,355	88
Vegetables (fresh)	9.1	1,820	341	0.65	19.8	67	408	2,909	60
Fruit (canned) ^a	0.1	20	4	0.03	0.9	0	4	29	45
Vegetables (canned) ^a	0.1	20	4	0.15	4.6	0	4	30	50
Fruit (dried) and Nuts	1.8	360	67	0.80	24.4	16	83	592	64
Pulses	3.0	600	112	0.45	13.7	15	127	905	51
Prepared and Semi- prepared Food	0.7	140	26	0.88	26.8	7	33	235	68
Tea, Coffee and Cocoa	5.9	1,180	221	0.19	5.8	13	234	1,668	41
Spices	1.6	320	60	0.63	19.2	11	71	506	58
Tobacco Products	4.1	820	154	0.44	13.4	21	175	1,248	52
Total	100.0	20,000	3,745	0.59	17.9	670	4,415	31,478	57

^a The very low consumption of pork and canned foods introduces apparent inconsistencies because of rounding.

and provided the basis from which to work. The results of the projection of demand for urban consumption of food are given in Table II.

The first series recorded is that in column 2, Table II, which simply gives the percentage distribution of urban expenditure on farm products. It is derived directly from the survey results.

The next step is to estimate the per capita urban expenditures on food in 1958 (C_{u58}). The total annual value of agricultural products in Iran was estimated to be in the neighborhood of 50 billion rials valued at farm prices and including, of course, the food consumed by farmers and their families themselves. About 40 percent, or 20 billion rials worth, of the total food produced was assumed to be eaten in urban areas, the balance in rural. The total value estimates and the estimate of the proportion of food consumed in urban areas were very rough, representing little more than a generally accepted guess by those familiar with Iranian agriculture. Since the estimates of projected demand were concerned with *relative* changes during the third plan, the broadly estimated values could be used. As for the proportion of food production consumed in urban areas, the estimate was simply taken as the best available in the absence of better market statistics. The urban consumption figures did, however, confirm in a general manner the value estimates and indicated the proportionate distribution of urban and rural consumption were of the right order of magnitude. Nonetheless, more reliable estimates of the proportionate distribution of food consumption between rural and urban consumers would have been very desirable.

Taking the urban population estimate of 5.34 million from Table I, the urban per capita expenditure for food was calculated as:

$$(2) \quad \frac{20,000,000,000}{5,340,000} = 3,745 = C_{u58}$$

From the survey data, the distribution of expenditure for each category was determined and the amount in rials of per capita expenditure calculated. This is recorded in column 4, Table II.

The next step—a critical one—is to calculate the elasticities of demand for food and for the urban population (e_u).³ In Iran, this was based

³ The income elasticity of demand for food can be expressed as follows:

$$\frac{\frac{\text{change in food consumption}}{\text{total food consumption}}}{\frac{\text{change in income}}{\text{total income}}} = \frac{\text{percent change in food consumption}}{\text{percent change in income}}$$

= coefficient of income elasticity

Stated verbally, the income elasticity of food demand shows the percentage change

on the divisions between income groups made in the cost of living survey. Table III illustrates how the income elasticity for bread was calculated. The data in columns (2) through (8) are based on the cost of living survey. They have been simplified here for purposes of illustration.

To estimate the proportionate increase in per capita income $\frac{\Delta Y_u}{Y_u}$, an assumption was made about annual rates of growth of income. This, of course, would depend on plan targets or some other projection. In the case of Iran, the assumption was that over the nine years from 1958 to 1967 a 3 percent annual rate of growth in urban per capita income would occur. This was computed with logs using the compound interest formula:

$$(3) \quad (1 + \text{rate of growth})^{\text{number of years}} = (1 + 0.03)^9 = 1.3048$$

giving an estimated increase in per capita income of 30.48 percent during the period.

The percentage growth in per capita expenditure for each commodity group and for all food was calculated by multiplying the percentage change in per capita income during the period (that is, 30.48 percent) by the relevant coefficient of income elasticity. The percentage increase in per capita consumption of bread, for example, was calculated as:

$$(4) \quad \begin{array}{l} \text{percent increase} \\ \text{in consumption} \end{array} = \left(\begin{array}{l} \text{percent change} \\ \text{in income} \end{array} \right) \left(\begin{array}{l} \text{coefficient of} \\ \text{income elasticity} \end{array} \right)$$

$$\begin{array}{l} = \\ 0.067 \end{array} \quad \begin{array}{l} \left(\frac{\Delta Y_u}{Y_u} \right) \\ = (.3048) \end{array} \quad \begin{array}{l} (\text{*bread}) \\ (0.22) \end{array}$$

This is recorded in column 5, (row 6), Table II.

The increased money spent per capita for each commodity group and for all food was then computed by multiplying the 1958 rial expenditure by the percent increase in consumption. Using bread as an example again, the increase in rials per capita spent for bread is simply the per capita expenditure for bread in 1958 from column 4 (row 5), Table II, multiplied by the percentage increase in per capita consumption in column 6, (row 6), Table II:

in food demand for each one percent change in income. Of course, as their incomes increase, people eat more, but probably not proportionately as much more as the proportionate increase in income. Thus, if the income of the average Iranian city resident increases 10 percent, the amount of food he consumes will increase 6 percent—that is, proportionately less than the increase in his income.

40 AGRICULTURAL DEVELOPMENT

$$(5) \quad (551)(0.067) = 37$$

This is tabulated in column 7, (row 6), Table II.

By adding the estimated per capita increase for each category of expenditure to the per capita expenditure in 1958, the total per capita expenditure at the end of the plan is obtained. Thus the value of the per capita consumption of bread in 1967 is:

$$(6) \quad 551 + 37 = 588$$

This is shown in column 8, (row 6), Table II.

The per capita urban consumption for each category multiplied by the urban population in 1967 from Table I gives the total urban consumption in 1967. For bread, the urban consumption was derived by multiplying the estimated per capita expenditure in 1967 of 588 rials by the urban population estimate of 7.13 million, giving the total consumption estimate of 4.192 million rials given in column 9, (row 6), Table II.

The percentage increase in demand in 1967 as compared with 1958 for each commodity group and for all food is given in column 10, Table II. This is, of course, the percentage increase of column 9, Table II, over column 3, Table II.

Increase in Rural Demand

The second major component of food demand in the model expressed by formula (1) is the rural demand for food. The population estimates called for in this formula are recorded in Table I. Rural income elasticities for food might have been estimated from survey data in a manner parallel to that for urban income elasticities but, unfortunately, suitable survey data were not available in Iran, so comparable elasticities from other countries had to be substituted. The major difference in estimating the rural demand for food as opposed to the urban demand is that the growth of rural income is itself a function of the urban demand for food. This means that the estimate for projecting increased rural income must be arrived at by a different means.

Returning now to the model for rural demand given in formula (1), two of the major elements in that model can be determined quickly. The rural population in 1967 (P_{r67}) is recorded in Table I as 17.53 million. The second major element easily determined is the rural per capita consumption of food in 1958, the year for which the calculation was made. As discussed earlier, of the total food production of 50 billion rials, rural con-

TABLE III. Computation of Income Elasticity for Bread*

(1) Class	(2) Weight	(3) Income Range (rials)	(4) Average Income within Class (rials)	(5) Percent Total Income Spent for Food	(6) Amount Spent for Food (rials)	(7) Percent of Food Budget Spent for Bread	(8) Amount Spent for Bread (rials)	(9) Coefficient of Income Elasticity for Bread ^b
I	3	5,000 to 7,499	5,500	68.4	3,564	15.1	538] — 0.22
II	1	7,500 to 9,999	8,000	54.4	4,352	13.6	592	
Weighted Average	—	—	6,125	61.2	3,749	14.7	551	

* These data have been simplified to facilitate illustration.
^b Computed as follows:

$$\frac{\frac{\text{change in bread consumption}}{\text{total bread consumption}}}{\frac{\text{change in income}}{\text{total income}}} = \frac{\frac{54}{538}}{\frac{2,500}{5,500}} = 0.22$$

Note that the coefficient of income elasticity indicates the relationship that obtains when a change *between levels* occurs. To indicate this, the figure in column 9 is written between the lines which give the data for Classes I and II.

sumption was estimated at 60 percent, or 30 billion rials. Rural population in 1958 as given in Table I was 14.41 million. By division:

$$(7) \quad \frac{30,000,000,000}{14,410,000} = 2,082 = C_{r58}$$

This is recorded in the last row of column 4, Table IV. The absence of survey data made it impossible to determine directly the per capita expenditure on the various different categories of food. However, it was assumed that the rural population probably had food habits very much like the 5,000 to 7,499 rial (US\$67 to US\$100) category of the urban population, a great many of whom were raised in rural areas and had recently migrated to urban areas. This distribution by category of food is presented in percentage and monetary terms in columns 2 and 4, Table IV.

The third major element that remains to be estimated in the rural demand model in formula (1) is the percentage increase in rural food demand. This was done by multiplying the income elasticity for food (e_r) by the percentage increase in per capita rural income $\frac{\Delta Y_r}{Y_r}$. These two elements were estimated by a different method for rural areas than the method used for urban areas which was outlined in the previous section.

Lacking suitable survey data, there was no way to estimate rural income elasticities directly, so planners resorted to international comparison. The per capita income of the rural population of Iran lies about midway between that of the rural population of India and that of South Italy. United Nations and FAO publications reported that income elasticity for food in rural India is about 0.87 and in South Italy about 0.74. Since rural Iran is neither as poor as rural India nor as rich as rural South Italy, it was assumed that the income elasticity for rural Iranians was 0.8, which, thus, is the value used for e_r in formula (1). From these same publications were determined the estimates for income elasticities for individual categories given in column 5, Table IV. Since the categories were not always the same, this required some substantial fitting.

The problem remained of determining the increase in rural per capita incomes during the third plan. For urban consumption, the assumption had been made that per capita incomes would increase at 3 percent per year as a result of economic development. But agricultural income is taken as being food produced for consumption at home plus the income from food sold to urban dwellers (plus nonfood agricultural products exported or sold as industrial raw materials as discussed earlier). If urban food demand increases and is met by added food production, part of any increased production (and hence rural income) will be con-

sumed by farmers. Thus, it is necessary to estimate how much production will be needed to satisfy both the urban demand for food and the increased rural demand which will arise from increased incomes earned producing additional food for the urban population.

Now, as was discussed earlier, the total value of agricultural products on the farm was approximately 50 billion rials. Of this, it was estimated that some 20 billion rials worth was consumed in the urban areas, and the remaining 30 billion rials worth consumed by the farm families themselves. (On this point more accurate estimates of the value of food products consumed in urban and rural areas would have improved the analysis.) Thus, on the average:

$$(8) \quad \frac{\text{rural consumption}}{\text{rural income}} = \frac{30}{50} = 0.6$$

or about 60 percent of total farm income is consumed directly by rural people themselves. In more formal economic terminology, this is the average propensity to consume food.

It was known that of any increased income in the rural sector, the proportionate increase in expenditure on food would be only 0.8. That is, as discussed above, the income elasticity for food in the rural sector was estimated to be 0.8. As farm production—and hence farm income—rises, instead of 60 percent of the *increase* going to farm consumption, only eight-tenths of 60 percent would go to increased farm consumption and the rest of the increase would be sold off the farm. Thus, as farm production rises to meet urban demand, it can be estimated that the added farm consumption will be only $0.60 \times 0.8 = 0.48$, or that only 48 percent of the *increase* itself will be eaten on the farm. In more formal terms, this is to say that the marginal propensity to consume is 0.48.

Armed with this information, it was then possible to go back to the estimates of urban demand in Table II and work out how much added farm production would be necessary if farmers were to sell enough off the farm to meet the wants of the city dwellers. From the last row in column 3, Table II, it was known that the total 1958 urban consumption of food was 20 billion rials, while the 1967 urban consumption given in the last row in column 9, Table II, was estimated at 31.5 billion rials, or an increase of 11.5 billion rials for urban consumption. It is thus necessary to find out how much total farm production must rise if there is to be 11.5 billion rials worth of food sold off farms for urban consumption. From the analysis given earlier, it is known that 48 percent of any increase will be consumed by the farmers. Thus, 52 percent of any increase will be

TABLE IV. Projected Increase in Rural Consumption of Farm Products in Iran, 1967 over 1958

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Commodity Group	Distribution of Rural Expenditure on Farm Products	(millions of rials)	Per Capita Expenditure 1958 (rials)	Income Elasticity Coefficients	Increase in Per Capita Consumption of Farm Products by 1967		Per Capita Consumption in 1967 [cols. 4 + 7] (rials)	Total Rural Consumption 1967 [col. 8 × population] (millions of rials)	Increase in Rural Demand 1967 vs 1958 (percent)
	(percent)				(percent)	(rials)			
Milk and Butter	6.9	1,800	125	0.90	16.8	21	146	2,561	42
Cheese	1.7	510	35	0.85	15.8	5	40	702	38
Eggs	1.7	510	35	0.85	15.8	5	40	702	38
Flour	2.0	600	42	0.36	6.7	3	45	789	32
Rice	9.9	2,970	206	0.90	16.8	35	241	4,227	42
Bread	12.7	3,810	264	0.36	6.7	18	282	4,945	30
Mutton and Lamb	11.2	3,360	233	1.40	26.0	60	293	5,139	53
Beef and Veal	1.3	390	27	1.37	25.5	7	34	596	53

Pork, Game and Others ^a	0	3	0	1.37	25.5	0	0	4	33
Poultry	1.6	480	33	1.37	25.5	8	41	719	50
Fish	0.8	240	17	1.16	21.6	4	21	368	53
Fats and Oil	12.0	3,600	250	0.81	15.1	38	288	5,052	40
Sugar, Syrup, Candy, etc.	8.4	2,520	175	1.05	19.5	34	209	3,665	45
Fruit (fresh) and Juice	3.6	1,080	75	0.66	12.3	9	84	1,473	37
Vegetables (fresh)	9.1	2,720	189	0.66	12.3	23	212	3,720	36
Fruit (canned)	1.8	535	38	0.03	0.6	2	40	702	31
Vegetables (canned) ^a	0	12	1	0.16	3.0	0	1	18	50
Fruit (dried) and Nuts	1.4	420	29	0.66	12.3	4	33	579	38
Pulses	3.4	1,020	71	0.66	12.3	9	80	1,402	37
Prepared and Semi-prepared Food	0.5	150	10	0.81	15.1	1	11	193	29
Tea, Coffee, and Cocoa	5.6	1,680	117	0.25	4.7	5	122	2,140	27
Spices	1.3	390	27	0.70	13.0	3	30	525	35
Tobacco Products	4.0	1,200	82	1.04	19.4	16	99	1,735	19
Total	100.0	30,000	2,082 ^b	0.80	14.9	310	2,392	41,956	40

^a The very low consumption of pork and canned vegetables introduces apparent inconsistencies because of rounding.

^b Does not total because of rounding.

sold. If, therefore, urban consumption is to rise by 11.5 billion rials, the total increase in farm production required is:

$$(9) \quad \frac{11.5 \text{ billion}}{0.52} = 22.12 \text{ billion}$$

Thus it is known that the total increase in farm production must amount to 22.12 billion rials in value if 11.5 billion rials worth is to appear on the market for urban consumers. Hence, the total increase in rural income between the base year of the estimate and the end of the plan is 22.12 billion rials.

The model for estimating demand in formula (1) is based on the change in per capita income, so that the global increase in farm income must be reduced to a per capita basis. This is most easily done by comparing the proportionate increase in production and, hence, income between 1958 and 1967, with the proportionate increase in population during the same period as given in Table I. This gives the proportionate increase in per capita income:

$$(10) \quad \frac{\frac{50 + 22.12}{50}}{\frac{17.53}{14.41}} = \frac{1.4424}{1.2165} = 1.186$$

showing that the per capita rural income at the end of the plan period will be 1.186 times as great as that at the time of the estimate, or that there will be an 18.6 percent increase in per capita income in nine years, very nearly the equivalent of 2 percent per year. Thus, 0.186 is the value of $\frac{\Delta Y_r}{Y_r}$ to be substituted into formula (1).

Increase in Total Demand

Recalling formula (1) and substituting:

	total demand	urban demand	rural demand
(11a)	$D_{67} = \left(1 + e_u \frac{\Delta Y_u}{Y_u}\right)(C_{u68})(P_{u67}) + \left(1 + e_r \frac{\Delta Y_r}{Y_r}\right)(C_{r68})(P_{r67})$		
(11b)	$= [1 + (.59)(.3048)][3745][7,130,000]$ $\quad \quad \quad + [1 + (.8)(.186)][2082][17,530,000]$		
(11c)	$= 31,503,697,089 + 41,928,282,048$		
(11d)	$= 73,431,979,137$		

Or, aggregate urban demand for food at the end of the plan period was estimated at 31.504 billion rials, aggregate rural demand estimated at 41.928 billion rials, and total demand at 73.432 billion rials. These totals are shown in column 9, Table II; column 9, Table IV; and column 3, Table V. The aggregate figures as calculated for illustrative purposes here vary slightly from the totals given in Tables II, IV, and V. This is because in the preparation of the estimates of increased demand for the individual commodity groups, rounding introduced some variation. Since the usefulness of the demand figures in Iran was for formulation of commodity programs, the aggregate totals were made to conform after rounding for individual commodities had been completed. In order to make the presentation in this monograph consistent with the plan figures as actually used in Iran, the figures as published by the Division of Economic Affairs have been retained.

Table V gives the final results in terms of the total value of various categories of food needed at the end of the third plan and the percentage increase needed between 1958 and 1967. Applying these percentage increases to the production figures for 1958, the Agriculture Section was able to estimate the demand, at constant prices, for food products at the end of the third plan.

One point may require clarification. With the assumption of constant prices and given the rates of population growth above, the rate of rural per capita income as calculated would increase about 2 percent per year. However, in practice it did not appear feasible that production could rise fast enough during the plan period to meet demand at *constant* prices, and the food targets were, in fact, set at more modest levels. It was, therefore, expected that food prices would rise relative to other prices. This would have the effect of tipping the terms of trade in favor of agricultural producers and cause the rate of rural per capita income to grow more rapidly than these demand computations indicate. It was also noted earlier that it was proposed to change the price policy to reduce what was, in effect, a forced transfer of income to the urban sector by artificially depressing the wheat price. These two factors were expected to be enough to make the resulting rate of growth of per capita income more rapid in the rural sector than in the urban, which was in fact an announced objective of the plan.⁴

Comment on Rural Income Projection

The above projection of the increase in farm production (and income) is derived from projections of increased urban and rural food consump-

⁴ For a detailed discussion of Iranian plan objectives, see Appendix II.

TABLE V. Total Urban and Rural Consumption of Farm Products in Iran, 1958 and 1967

(1) Commodity Group	(2) 1958 (millions of rials)	(3) 1967 (millions of rials)	(4) Percent Increase
Milk and Butter	3,140	4,629	47
Cheese	890	1,308	47
Eggs	830	1,230	48
Flour	1,040	1,438	38
Rice	4,730	7,085	50
Bread	6,750	9,138	35
Mutton and Lamb	5,660	9,096	61
Beef and Veal	670	981	46
Pork, Game, and others	0	0	0
Poultry	800	1,296	62
Fish	440	696	58
Fats and Oil	5,620	8,353	49
Sugar, Syrup, Candy, etc.	4,220	6,217	47
Fruit (fresh) and juice	1,800	2,828	57
Vegetables (fresh)	4,550	6,629	46
Fruit (canned)	560	731	31
Vegetables (canned)	32	48	50
Fruit (dried) and Nuts	780	1,171	50
Pulses	1,620	2,307	42
Prepared and Semiprepared Food	290	428	48
Tea, Coffee, and Cocoa	2,860	3,808	33
Spices	710	1,031	45
Tobacco Products	2,020	2,983	48
Total	50,000 ^a	73,431	47

^a Does not total due to rounding.

tion. However, the projection of rural food consumption is based on a relation between the *per capita* rural marginal propensity to consume and the change in *total* rural income. Algebraically, the relations used to project the change in rural income can be expressed as follows:

$$(12) \quad \Delta Y_r = \Delta C_u + \frac{\Delta C_r}{\Delta Y_r} \Delta Y_r$$

where

$\Delta Y'_r$ = change in *total* rural income.

$\Delta C'_u$ = change in *total* urban food consumption.

$\frac{\Delta C'_r}{\Delta Y'_r}$ = the *per capita* rural marginal propensity to consume food.

The second term on the right-hand side of equation (12) yields a correct estimate of the change in total rural food consumption only if rural population is constant.⁵ If rural population increases, however, equation (12) will understate the increase in rural food consumption and income, the amount of the understatement, other things equal, depending on the amount of the increase in population. In the present case, the rural population is projected to increase from 14.41 million in 1958 to 17.53 million in 1967 (see Table I). Given these figures, the estimates of total rural food consumption and income in 1958, and the projected increase in urban food consumption of 11.5 billion rials, then the correct projected increase in rural income is 24.6 billion rials.⁶ This compares with the projected increase of 22.12 billion rials given above.

The derivation of projected total demand for food on page 46 is redundant since by assumption it is precisely equal to rural income, and projected rural income already had been derived.

⁵ The correct formula for the increase in total rural food consumption in the present case is:

$$(13) \quad \Delta C'_r = P_{r67} \frac{C'_{r58}}{P_{r58}} + P_{r67} \left[\frac{\Delta C'_r}{\Delta Y'_r} \left(\frac{Y'_{r67}}{P_{r67}} - \frac{Y'_{r58}}{P_{r58}} \right) \right] - C'_{r58}$$

where

$\Delta C'_r$ = the change in total rural food consumption from 1958 to 1967.

P_{r67} = rural population in 1967.

P_{r58} = rural population in 1958.

C'_{r58} = total rural food consumption in 1958.

Y'_{r58} = total rural income in 1958.

Y'_{r67} = total rural income in 1967.

$\frac{\Delta C'_r}{\Delta Y'_r}$ = the rural per capita marginal propensity to consume food.

If $P_{r67} = P_{r58}$, this expression reduces to:

$$(13a) \quad \Delta C'_r = \frac{\Delta C'_r}{\Delta Y'_r} (Y'_{r67} - Y'_{r58})$$

which is the relation for increased rural food consumption in equation (12).

⁶ This calculation is based on the assumption expressed in equation (12) that the increase in rural income is the sum of the increase in urban food consumption plus the increase in rural food consumption. The projected increase in rural food consumption is derived from equation (13).

Estimating Rates of Growth

After the production targets were set, it was of interest to know what annual rate of growth would be needed if production in Iran were to reach the target by the end of the plan and to compare this rate of growth with the past rate of growth. Both rates of growth were simply calculated using logarithms.

To estimate future annual rates of growth, the compound interest formula was used. In Iran, wheat production in 1962 at the beginning of the plan period was estimated at 3 million tons; the target for the end of the plan was 3.8 million tons. The rate of growth was estimated using the formula:

$$(14) \quad P_{62}(1+r)^n = P_{67}$$

where

P_{62} = production in 1962

P_{67} = production in 1967

r = annual rate of growth

n = number of years

Converting to logs and working through the arithmetic,

$$(15) \quad \log(1+r) = \frac{0.1026738}{5} = 0.0205348$$

The antilog of 0.0205348 = 1.0484, so that the annual rate of growth for wheat to meet the plan target must be 4.8 percent per year.

The procedure for calculating past annual rates of growth in Iran relied on the least squares method of computing a line of regression. (The procedure, which uses only simple algebra, is explained in any standard introductory statistics text.) However, this method, in its simple form, gives only a straight line, while what is wanted is a curve which is more realistic for agriculture. Advantage may be taken of the fact that agricultural production usually grows by the same proportion each year (such as the 4.8 percent per year given above), which is to say that agricultural production tends to grow logarithmically. By applying the least squares method to the *logs* of the actual production there is available a simple computational device to calculate a logarithmic curve. An example of the calculation for the rate of growth for wheat and barley in Iran is given in Table VI.

Once the growth rates for individual commodities have been calculated, it is of interest to calculate the rates of growth for agriculture as a whole, and on a per capita basis. In Iran, this was done by using indices

TABLE VI. Rate of Growth, Wheat and Barley, Iran, 1950-1958

(1) Year	(2) Production (tons)	(3) Log Amount (y)	(4) x	(5) xy	(6) x ²
1950	2,800,000	6.447 1580	0	0	0
1951	2,520,000	6.401 4005	1	6.401 4005	1
1952	2,897,000	6.461 9485	2	12.923 8970	4
1953	2,945,000	6.469 0853	3	19.407 2559	9
1954	2,924,000	6.465 9774	4	25.863 9096	16
1955	3,180,000	6.502 4271	5	32.512 1350	25
1956	3,130,000	6.495 5443	6	38.973 2658	36
1957	3,800,000	6.579 7836	7	46.058 4852	49
1958	3,650,000	6.562 2929	8	52.498 3432	64
		$\Sigma y = 58.385\ 6176$	$\Sigma x = 36$	$\Sigma xy = 234.638\ 6922$	$\Sigma x^2 = 204$

The logarithmic time trend in the growth of production is found by solving the least squares equation

$$\log Y = \log a + \log (1 + b)X$$

for $\log (1 + b)$. Since Y is annual production and X is time in years, b is the average annual percentage rate of growth in production. In the present case, $\log (1 + b) = 0.018\ 2218$. The anti-log is 1.0429, indicating an annual average growth rate of 4.3 percent.

based on price weights. The price used represented the average postwar value of a metric ton of each agricultural commodity at a comparable stage in the marketing channel. The individual commodity price was expressed proportionately to the price of a ton of wheat when wheat was given a weight of 100. Thus, a metric ton of barley with a price weight of 65 is equal in value to .65 of a ton of wheat, and so on for each crop.

To obtain the agricultural production indices, the production of each commodity was multiplied by the price weight and the resulting aggregates were summed. The total aggregate for a given year was then divided by the aggregate for the base period (taken as the forecast level in 1962 at the beginning of the plan) to obtain the index. Rates of growth were calculated exactly as outlined above, using index numbers in place of the production figures. The per capita indices were obtained by dividing indices of total agricultural production by the population indices. The same procedure as that for the agricultural indices was used for calculating the food production indices, omitting such nonfood crops as wool, cotton, and tobacco. In computing the indices, forage crops were not included, as it was assumed they would all be fed to animals and thus to include them would amount to double counting.

IV. The Planning Framework

Fundamental problems are inevitably raised in the course of establishing a planning process as an organic part of any society. Important issues that were moot during the period covered in this study are discussed in this and the following chapter. At each stage of the process, problems arose that appeared to be symptomatic of a serious effort to come to grips with these basic issues. The planning framework itself was in the process of change while Iran's third plan was being prepared. This chapter describes the institutional and organizational setting within which agricultural planning took place and what forces induced changes. Major assumptions under which planners operated are also discussed. In the next chapter, we turn to a discussion of the issues which affected choice of programs comprising the agricultural plan.

Planning Background

Within the bounds set by the conditions of Iranian agriculture and the objectives of rural development,¹ those responsible for agricultural planning set out to frame a realistic set of agricultural programs which could reasonably be expected to advance progress toward the development objectives. Formalized planning has existed in Iran since the end of the Second World War, although the third plan is the first "comprehensive" plan. Soon after the war, a program for Iran's "reconstruction and development" was presented to the

¹ The plan objectives are discussed in Appendix II.

Cabinet. It was a general plan for government expenditure. A consortium of foreign consulting engineers was engaged to develop concrete individual projects.² These preliminary steps led to the founding of the Plan Organization early in 1949. Established by legislative authority, the Plan Organization was substantially independent of regular government ministries and had financial allocations apart from the regular budget. Despite its name, it bore no resemblance to the usual central planning agency. It was intended to be an independent action agency able to execute capital investment projects without the delays, inadequacies, and political orientation of the normal government ministries.

The new agency had just begun to operate when the transfer of the oil industry to national ownership in 1951 interrupted the flow of oil revenue for capital investment. With the resumption of oil payments in 1954, it was decided that a new development plan should be worked out to fit the altered circumstances. Under the remarkable direction of a vigorous and dedicated administrator, the Plan Organization embarked on the second seven-year development plan in 1955. The second plan, like the first, was primarily a grouping of government capital investment projects, mainly executed by foreign contractors of the Plan Organization's own staff of specialists and foreign consultants. Plan financing came from an 80 percent allocation of the oil revenue.

Problems of fiscal control and organizational efficiency became increasingly critical during the second plan. This led to the establishment of an Economic Bureau, later the Division of Economic Affairs, in 1958. A staff of highly competent, young Iranian economists—many newly returned from graduate study abroad—was recruited for the Division. Through a grant from the Ford Foundation to Harvard University, a team of economic advisors drawn from Europe and North America was attached to the Division. This group remained on the scene until September 1962.

At first, the main responsibility of the Division was to improve organization and tighten budget controls within the Plan Organization. In mid-1959 the Division was assigned formal responsibility for preparing the third five-year plan to begin when the second plan

² Throughout this study, a "project" is taken as the smallest unit of development activity while a "program" is a group of related projects. The government farms, which are the second stage of wheat seed multiplication, would be considered a project, while improved seed or even increased wheat production would be a program. Clearly the line of distinction cannot be rigidly defined.

ended in September 1962. The third plan was actually to continue until March 1968, a period of five and a half years. The extra six months allows the planning period to be phased with the Iranian calendar. Agricultural targets were set for the crop year 1967.

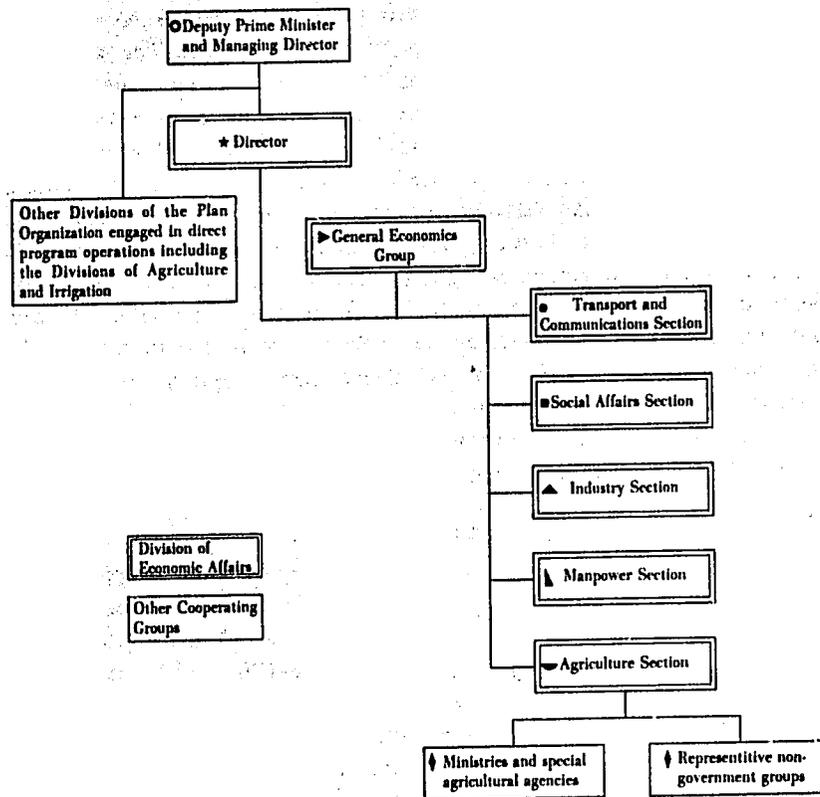
In its directive, the Cabinet notified the Division that the scope of the third plan was to be much broader than those preceding. Planning was to take account of Iran's entire resource structure. Policies which could harness both public and private activities to achieve national development goals were to be included. However, detailed estimates were not made for all economic activities. It was only intended that consideration be given to creating conditions within which private activities could move most rapidly to promote economic and social development. The role of the Plan Organization in direct execution of government programs was to be reduced and increasing responsibility assigned to normal government agencies.

Organization for Agricultural Planning

When the Division of Economic Affairs assumed responsibility for the third plan, the aim was to complete review of the second plan and work out a tentative statement of the third plan—called the plan frame—for Cabinet approval by mid-1961. The next twelve months were to be devoted to careful preparation of detailed projects which would give administrative and budgetary substance to the generalized statements of the plan frame. National fiscal and monetary policies were to be designed and administrative changes proposed. Concurrently with its third plan efforts, the Division was to continue its broad range of activities concerned with implementing the second plan.

The Division consisted of a General Economics Group, which also coordinated the planning effort, and five sections concerned with particular sectors of the economy. The General Economics Group bore three responsibilities—general economic analysis, policy formulation, and review and integration of sector plans. To it fell the task of estimating gross national product, balance of payments, ordinary government expenditure and revenues, and similar national aggregate indicators. It articulated national economic development objectives, established target rates of growth, and integrated sectoral proposals into the final plan. To encourage coordination of sector plans, the group exercised a general administrative function of establishing deadlines and criticizing the programs submitted for individual sectors.

PLAN ORGANIZATION CHART



FUNCTIONS AFFECTING AGRICULTURAL PLANNING

- Cabinet-level coordination and overall policy direction
- ★ General direction
- ▶ (1) General economic analysis and policy formulation; (2) organization; (3) review and integration
- Feeder roads and rural communications
- Agricultural education and community development
- ▲ Food processing, industries using agricultural raw materials, fisheries
- ▲ Workforce and population estimates
- ☐ All agricultural planning except as noted
- ♦ Technical preparation of commodity and institutional projects and programs

Figure 1. Organization for Agriculture Planning in Iran

The other Division sections were responsible for preparing plans for particular sectors of the economy. Thus, the Agriculture Section was charged with planning for the agriculture of Iran during the third plan. Responsibility was somewhat arbitrarily divided between these sections. The Agriculture Section was accountable for all planning of crop and livestock production and marketing, irrigation, supporting services such as agricultural extension and agricultural credit, and changes in land tenure. Road planning to serve agriculture was the task of the Transport and Communications Section. Agricultural education—both elementary and higher—came under the Social Affairs Section. The Industry Section decided the course for agricultural processing industries such as sugar and vegetable oil refining, cotton ginning, and fisheries.

Clearly, close coordination of overlapping sector programs was essential, and long hours were spent working out interrelated targets. In the case of cotton textiles, for example, the Industry Section evaluated the probable demand for the product and the probable investment which might be generated. Domestic demand in terms of raw cotton was then computed. To this was added an evaluation of export and import possibilities. Production specialists were asked to estimate potential increases in cotton production and to work out a suitable schedule for supporting services. An evaluation of price changes was made. When production estimates for industrial raw materials indicated that inadequate domestic supplies would be forthcoming, the Industry Section either revised its target or programmed foreign exchange for imports.

Stages in the Planning Process

The planning process in Iran consisted of three major stages. First there was a careful examination and critique of the second plan. Then a generalized statement or plan frame, was written. Finally, detailed projects and cost estimates were to be prepared. These, together with the policy sections of the plan frame were to constitute the third plan.

Critique of the Second Plan

Critique and analysis of the second plan agriculture program occupied 18 months. There were budget examinations, field trips, and consultations with technical specialists. Work began in mid-

1958, and the manuscript of 175 double-spaced pages was finished toward the end of 1960. The summarized program review of the second plan appeared in March 1960, under the title *Review of the Second Seven Year Plan Program of Iran*. Fifteen of the book's pages were devoted to agriculture.

The second plan program in agriculture was characterized by heavy investments in large scale multipurpose river development projects. The most important of these was in Khuzestan far to the south near the Persian Gulf. Another was in the northwest, on a river known as the Sefid Rud which flows through the Elborz mountains northward to the Caspian Sea. Yet a third, about 30 miles west of Tehran at Keraj, was begun as an irrigation project but later converted to supply domestic water for the capital. Some US\$325 million, or 18 percent of the total second plan budget, was expected to be absorbed by these large dams and associated irrigation schemes by the end of the second plan. Even then, only the smallest dam would be finished. In contrast, all other agricultural programs together were expected to be allocated US\$75 million, or about 6.5 percent of the total second plan expenditure. The second plan was more a central government capital investment program for irrigation than an agricultural plan. The result, stated the program review, was "a spotty and uncoordinated approach to agricultural development."

The low physical and labor productivity in Iranian agriculture underlined the seriousness of the problem and the need for alternatives providing quicker and greater returns from investment. The program review showed clearly that improved productivity was requisite to an effective irrigation economy. "It is doubtful, for example, whether any other country in the world squanders so much of its natural and human resources on the production of one ton of wheat per irrigated hectare of land," reported the program review. It also criticized "investment without operation and maintenance" resulting from heavy emphasis on irrigation structures and a lack of coordination between different operation agencies. Separation of capital investment activities (in the Plan Organization) from operation (in the Ministry of Agriculture) was criticized. Finally, the program review emphasized that "agricultural progress depends on institutional as much as technological changes." Greater concentration on changes in the land tenure structure and more effective marketing and credit were recommended.

Sweeping though these criticisms were, few Iranians took general exception. As preparation of the third plan began, Iranian agricultural technicians were agreed that a change in emphasis was needed. The problem was not what should be the general emphasis of future agricultural programs but rather which ones would work and how best to balance them.

Plan Frame

The next stage was the preparation of the *Third Plan Frame for Agriculture*. This document included the whole agricultural plan, lacking only the detailed project statements and cost estimates. It included the agreed policy recommendations, the aggregative economic analysis, the detailed program targets, the general statements of programs, and the rough allocations of development funds. The plan frame was to be submitted to the Cabinet as the Plan Organization's recommendation for the scope and form of the third plan. Since careful liaison with the Cabinet was to be maintained, no major changes in the fabric of the plan outlined or challenges about the validity of the analysis and policy recommendations were anticipated. After being modified to meet Cabinet criticism, the plan frame would be filled in with detailed projects and accompanying cost estimates to become the third plan.

Preparation of the plan frame occupied the Agriculture Section from early spring 1960 to June 1961. In its third and final draft, it appeared as a document of 234 typewritten double-spaced pages including 38 tables. Two initial steps in preparation of the plan frame involved determining major policies and studying future demand for agricultural commodities, as described in Chapter III. The major policy guidelines stemmed from the analysis of Iranian agriculture and the second plan as reported in the program review. Policy discussions continued well into the actual framing of the commodity programs. The only major difference of opinion which arose concerned land tenure changes.

With the policy formulation under way and the demand estimates in hand, responsible government administrators began to work out specific programs. The Plan Organization's own Division of Agriculture was responsible for implementing Plan Organization agricultural programs and for matters of technical agriculture in the preparation of the third plan. A similar responsibility for water resources fell to the Plan Organization's Irrigation Division. Several of the country's

most able technicians were employed in these Divisions. The Ministry of Agriculture; the Agricultural Bank; the semiautonomous agencies concerned with irrigation, forestry, and machinery imports; and the colleges of agriculture and veterinary medicine all had staffs of competent agricultural technicians who participated in program formulation. Multilateral and bilateral technical assistance agencies had foreign agricultural experts who could help with planning. The Plan Organization's own Technical Bureau was staffed with foreign specialists—including two agricultural technicians.

The minister heading each agricultural agency was asked to designate primary responsibility for planning to the ranking technical specialists. Often several different agencies had a say about a particular commodity grouping or institutional change, and representatives of all concerned participated in planning. Considering the tradition of separateness common in Iranian administration, surprisingly little difficulty was encountered in securing cooperation from the technicians. Even those openly skeptical about planning were willing to help. Similarly very few "jurisdictional" disputes over planning responsibilities arose between the operating agencies and the Agriculture Section. In part this was because the Section consciously set out to accommodate the views of the technical specialists to the fullest extent possible and to see that all who participated in planning were aware of national objectives.

A broad range of individuals were involved in the planning process. In the absence of adequate data (and it is unlikely that any country has "adequate" data), an informed judgment by skilled professionals familiar with the field is irreplaceable. The realism and accuracy of the plan rested on these specialists outside the planning group. The Iranian administrators who had a voice in planning were some of the same men who would later be implementing the proposed program. Because they were involved at every stage—from the first to the last—key administrators shaped programs which were suited to national needs and which they could fully support and feel were their own.

During preparation of the plan frame, at least a hundred government agricultural technicians and foreign consultants participated in meetings dealing with agricultural programming. A conscious effort was made to break down all hint of formalism in these meetings, which were usually roundtable discussions. No one was regarded as strictly an organization spokesman, interested only in expounding

his agency's viewpoint. Instead, substantial effort was devoted to working out a program upon which there could be widespread technical agreement. The plan was not the product of a single agency; rather, it was viewed as a national document.

The series of meetings dealing with a proposed program always began with the Plan Organization Agriculture Section outlining the general approach to planning. The national social and economic objectives were explained and related to agricultural programs. The agricultural objectives were discussed in general terms. Those in charge of planning strove to involve more regular ministerial and special agency technicians in program formulation than there had been previously. The contrast in scale and comprehensiveness between the third plan and the earlier plans was stressed. The proposed shift from capital-intensive programs to programs which would increase production and productivity was explained. Emphasis was given to shifting program execution from the Plan Organization to the regular operating agencies and to reshaping the whole government budget in the light of the plan. The demand projections and estimates of past rates of growth were outlined.

This done, the planners had disposed of their major tasks. The Agriculture Section then turned to the ministerial technicians to work out suitable targets and programs. The staff of the Agriculture Section largely served as informal chairmen who questioned the feasibility of the proposals and who reconciled differences. Program formulation really depended on the technicians. It was their responsibility to hammer out realistic programs which could meet national goals. In this process, the Agriculture Section avoided taking a prominent overt role. Groups of technicians first turned their attention to the question of production estimates. No general series of production statistics based on field surveys was available, although a newly established statistics service had recently begun to collect data. Statistics on production and area were collected from those administrative units which possessed the most detailed individual commodity studies. Such estimates as could be obtained were used, and no program was ignored simply because data were unreliable.

Then came discussions of the prospects for introducing new or improved technology. Careful consideration was given to how rapidly cultivators would be willing to accept innovations and what proportion of the farmers in the five year period of the plan could be expected to adopt a recommended practice. Attention was paid to

such factors as the complexity of new techniques, the rate at which fertilizer and seed supplies could be made available on the farm, and the rapidity with which marketing structures could be improved and gain the farmers' confidence. In the light of such considerations, production targets were set. For perennial crops, the time lags from planting to maturity were taken into account in setting targets. It was up to the commodity specialists to estimate how rapidly production could reasonably be expected to expand and to set reasonable, but ambitious, commodity targets. These projections were included in the plan discussion for each commodity and were summarized in an introductory table. When realistic targets indicated production of a commodity was unlikely to meet demand, an estimate was made of the demand gap—that is, the amount by which the plan target fell short of the projected demand at constant prices. Finally, problems of institutional improvements, staff training, and the costing of the programs were discussed in these special *ad hoc* groups.

The Agriculture Section retained full authority. This authority never had to be arbitrarily invoked to resolve a difference of opinion between operating agency administrators and the planning group. An atmosphere of compromise prevailed because great importance was attached to having programs which the administrators could honestly encourage and which accurately reflected their informed judgments.³

Project Preparation and Final Plan Statement

Following Cabinet approval, each operating agency prepared detailed projects within the general program laid down by the plan frame. These projects, together with material from the plan frame, would then become the final statement of the third plan. It was hoped that the scale of consultation could be extended far beyond

³ George B. Baldwin aptly characterizes this process of planning in Iran as "top down, bottom up," in *Plan and Anti-Plan, An Account of Economic Development in Iran* (forthcoming). He emphasizes the continuous fitting procedure by which national objectives were articulated and applied to programs while at the same time disparate programs growing from the intimate knowledge of individual specialists were being formulated. Neither the top down nor bottom up direction had logical priority nor in practice preceded the other. Rather, there was a continuous process of fitting into the national development picture the various projects and sector programs agreed upon by informed specialists. Meanwhile, national objectives and aggregate economic analyses were repeatedly examined in order to derive from them particular programs for particular fields of endeavor. These two directions of approach to planning must constantly be compared and correlated. To use one to the exclusion of the other, though perhaps possible in theory, would have been hopeless in practice in Iran.

the central government to provincial government units and to representative groups of farmers. Unfortunately, there was actually little local consultation for the plan frame because of time and personnel shortages.

By the time the plan period began, the projects still were not as thoroughly prepared as had been anticipated. The relatively detailed nature of the entire plan frame meant, however, that the generalized direction of government development activities during the third plan was well known in the government and widely agreed upon. The ministries concerned with agriculture lacked detailed project statements but had sufficiently detailed general program proposals to occupy fully the available financial and administrative resources for the first year or two of the plan. It was intended that, as the third plan continued, the Agriculture Section would undertake annual reviews to evaluate progress toward goals and to determine the obstacles to implementation being faced by operating agencies. Out of these reviews, conducted jointly with the responsible administrators, were expected to come proposals for modifying and rephrasing plan programs to accommodate current conditions. The Agriculture Section also planned to undertake a series of economic studies in preparation for the fourth plan.

Interim "Tool-Up"

Once the projects and programs for the plan frame were settled upon, Iranian agricultural planners immediately began working out a set of recommendations for interim "tooling-up" programs. The whole planning process rested to a great extent on these preparatory measures. This groundwork was essential if implementation of plan programs were to begin on schedule and proceed at the pace proposed. In one sense, the tooling-up programs amounted to taking advantage of the momentum generated by the planning process to get a head start on the legislative changes and the training programs needed to carry out the third plan. It was just as important for the Agriculture Section to scan the horizon to identify tooling-up measures as to work out the programs for the plan period.

Ample lead time was needed for many of the agriculture projects proposed for the third plan before they could be ready for implementation. It was intended that the year between publication of the plan frame and the beginning of the plan should not go unused. Considerable prodding would be necessary if the required new legislation were

to be drafted and approved. New administrative rules had to be worked out and agreement secured. Surveys and field studies were needed to know where to begin development programs. Training programs could not be neglected if personnel were to be available to begin carrying out programs on schedule. It would take time to arrange for consultants from FAO and other agencies, include them in the country program, and establish them at their duty posts. All of these activities are critical to carrying out development programs and necessarily come before field programs can be mounted. Many of them can be undertaken beforehand if it is agreed that they will be needed regardless of the exact magnitude of the final plan.

Broad sections of Iranian life were expected to be affected by the recommended legislative and administrative measures. The details of these changes were to be worked out carefully by the entire Division of Economic Affairs in the light of all plan needs and were to be presented as a whole for Cabinet action. The Agriculture Section had to ascertain whether the proposed changes met the needs of the agricultural development plan. It was then up to the Cabinet to initiate legislation or make the appropriate administrative shifts. Most new legislation concerned with agriculture was proposed either to implement the recommendations of the program review or to prepare the way for programs contained in the plan frame. It centered around land tenure, irrigation districts, zoning for water control, land taxes, and liberalization of basic laws establishing agricultural agencies. Much of the existing institutional framework was considered too restrictive for effective administration of proposed third plan programs.

Although the need for tooling-up measures was widely recognized, little was accomplished. Even with adequate financing available, the delays caused by administrative red tape, disagreement on the exact information to be sought in surveys, and sheer inertia, effectively blocked most of the tooling-up effort. Only a few well-placed administrators sympathetic to the objectives of agricultural planning were able to mount interim programs. Several of these did prepare projects—mostly for training—and began readying their agencies for increased responsibilities during the third plan period.

Perspective Planning

Clearly, to confine thinking about agricultural development in Iran to an arbitrary five year program would not have been realistic.

Institutional and biological limitations meant some programs inevitably would take longer to mature. The acceleration of agricultural production, which can be encouraged by proper planning, was of more concern than the happenings of the arbitrary plan period. In planning there is some danger that targets will be seen as ends in themselves instead of as indicators to provide standards for evaluating growth in agricultural production capacity during the plan.

On the other hand, to attempt to formulate a plan for a period much longer than five years would have meant a rapid decline in the realism of the planning process. Further, some concrete period of time is clearly preferable to a general discussion only in terms of an indefinite time span. If growth is to be accelerated, a program of action longer than a single year and with definite targets is a useful device. But a period of much more than five years in Iran would have been quite unreal for planning. This is true both because problems of predicting economic variables increase markedly as the horizon recedes and also because serious problems arise when formulating detailed programs which continue far into the future. The Division of Economic Affairs already judged that the seven year period of the first two plans had been too long. Yet it was felt that a period of much less than five years would be too short to give adequate perspective to program formulation. Hence, a five year period was settled upon, sanctioned partly by the knowledge that it was already a popular length for plans in developing countries.

To provide a longer time horizon for judging programs, serious consideration was given to undertaking a perspective plan. This was to include projections in rough outline of population growth, demand increases, agricultural production growth, and other economic indicators for a 15 or 20 year period and proposals for generalized programs to achieve continuing growth and meet the needs foreseen. A brief attempt at a 20-year perspective plan was made by the General Economics Group, but the data proved too generalized to be useful. A lack of time prevented refinement of the estimates. In the future, it is anticipated that the Division of Economic Affairs will work out long-term perspectives to aid in preparing five-year plans.

It is quite possible that more attention should have been devoted to long-term problems of agriculture in preparing plan frame programs. In the absence of better projections of production growth and of demand, it can only be conjectured whether the magnitude of investment devoted to long-term programs was anywhere near the

optimum. However, in many instances administrative limitations would have prevented larger investment in long-term programs even if more perspective planning had been done.

Although little formalized perspective planning was done in Iran, some long-range programs were included in the plan frame. These called for fairly large investments even though almost no returns were expected during the plan period itself. The barley seed improvement program involved a buildup in foundation stocks which would scarcely influence production for consumption until the year following the completion of the plan. The recommendation that farmers be helped to plant olive trees looked forward 30 years. Survey and research programs, pilot programs in range improvement, and educational activities also had a much longer horizon than the plan period itself. All of this is clearly implied in any responsible agricultural program but might have been worked out more realistically had long-term projections been available.⁴

Assumptions Underlying Agricultural Planning

Proper plan formulation requires an understanding of the underlying assumptions on which planning efforts will be based. Three in particular seem to have had considerable impact on agricultural planning activities in Iran.

Comparative Advantage

The first of these underlying assumptions became clear when the question of whether to focus attention on increasing certain agricultural exports or to concentrate on expanding food production came up for debate. As the advantages of increasing exports versus increasing import-replacing crops were discussed, it became evident that in Iran the comparative advantage lay with increasing production for domestic consumption. The importance attached to the production objective in the third plan reflects this comparative advantage. It

⁴ Elsewhere, the lack of a broad long-term program of range and pasture improvement is discussed. The plan frame might have served a better educational function had a more explicit program for range improvement been included, despite the judgment that institutional conditions were not yet ripe for effective action. Similar reasoning could be applied to soil conservation, which was largely ignored. It was believed that a frontal approach had little chance of success, while improvements in irrigation practice made primarily for production purposes might, as a side effect, have soil conservation benefits. Later plans, it was felt, could deal explicitly with the problem of soil conservation.

implies that, by and large, it is more advantageous to produce the food and fibers that Iran will need during the plan than to import them or to face higher prices. This assumption was made on the basis of the costs of production in Iran as compared with world markets and upon the "opportunity costs" of labor if increased production was not taken as an objective. Opportunity costs were taken to mean the loss in income which occurs when a productive asset is not used for its most productive alternative.

In the case of those major food commodities in which Iran is now largely self-sufficient, the comparative advantage of domestic production arises not only from comparative costs of production with due allowance for costs of transportation, but also from the opportunity cost of resources that would be left idle if production were not expanded. For instance, say it had been determined to import wheat from Australia rather than to increase Iranian production. Given the projected labor force in agriculture, this action might have led to either increasing underemployment or unemployment as agricultural land and labor productivity rose following the introduction of new techniques. It might also have necessitated bypassing an opportunity to increase the income of people engaged in agriculture which could be realized from the application of new techniques. Despite the cheaper prices of certain imported commodities, a decision to import larger quantities and reduce Iranian production in the absence of alternative agricultural or nonagricultural opportunities might lead to an opportunity cost expressed in increased underemployment or unemployment in agriculture. This would force the true cost of the imported goods higher than that of local production.

In the case of agricultural commodities now imported in substantial quantity, the comparative advantage of domestic production arises because production of import-replacing crops can be increased more economically than exports can be expanded. Much of the present import bill for agricultural commodities could be reduced (or its future expansion held down) by replacing imports with locally produced crops—especially sugar, tea, and vegetable oil. This is economically more efficient than placing heavy emphasis on export crops only to be faced with a domestic gap for agricultural products which must be filled by imports more expensive than the export benefits. With different resource endowments, other low income countries might find it more economic to increase export crop production and to import food grains.

Seen from the standpoint of export crops, the same general reasoning applies, but in reverse. Prospects for increased agricultural exports were not bright. Because pastures are already overgrazed, sheep and goat populations can only expand moderately. Consequently, wool and carpet exports cannot be expected to grow significantly. Rising quality standards in the international market and increasing supplies relative to demand raise barriers to expanding dried fruit exports. The long-term export market outlook for Iranian cotton is not encouraging. This did not lead to a third plan policy of reducing agricultural exports. Indeed, the plan frame calls for a modest expansion in exports of cotton and dried fruit. But the nation was not justified in placing major emphasis on expansion of any of the major agricultural exports. More net foreign exchange benefit can be gained by concentrating instead on import-replacing crops. That is to say, comparative advantage lies in increasing production for domestic use and holding down imports.

Responsiveness of the Private Sector

Underlying many plan programs was an assumption that individuals would be willing to invest in agriculture if they had suitable information, if stocks of equipment and supplies were available, and if there were adequate economic incentives. This was justified on two grounds. In the first place, nearly all the increase in agricultural output and efficiency occurring in Iran during the last decade had been a result of private effort. Government investment programs were only beginning to pay tangible dividends as planning was undertaken for the third plan. It is reasonable to expect that this private effort will continue, especially if the terms of trade move in favor of agriculture as is expected. Secondly, recent Iranian agricultural experience indicated an increasing willingness among peasant farmers to adopt new techniques and to increase their investment in agriculture.

Almost all the proposed production programs relied heavily on the readiness of peasant farmers to adopt new techniques. When the plan was framed, there was reason to be optimistic. For example, in 1960 only a small quantity of improved wheat seed was produced. Yet peasants traveled long distances to Tehran just to buy the improved seed, and they kept coming long after the supply had been exhausted. In another project the Horticulture Department distributed imported seed of improved vegetable varieties in an area not far

from the Persian Gulf. Growers were so impressed by the results that virtually none of the improved varieties appeared for sale in the local markets—almost all of it was saved for seed. In the vicinity of Lake Resaiyeh in northwestern Iran peasant producers and local processors agreed to split the difference which the foreign market will pay for better quality dried fruit, with salutary effects on both groups' income. Although such instances of responsiveness are at best only indicative they seemed to support a program assumption that, given the proper environment and the necessary credit, small farmers would be receptive to new techniques. However, the assumption that the readiness to adopt new practices will be expressed rapidly enough to meet the nation's agricultural development objectives seems justified only if the government can do its part.

It was thought that during the previous plans there had been a net transfer of private capital out of agriculture, although it was impossible to make even a rough estimate of the magnitude of this transfer. The reasons for the transfer are varied and by no means wholly detrimental to the overall economic development of the country. Most of this capital movement appears to have been from landlord-owned villages. Often it has taken the form of allowing capital assets in the village to depreciate rather than allocate any returns to maintenance and new investment. The prestige of landownership and the security it traditionally has offered have kept land prices relatively high in relation to returns. As a result, it has been roughly estimated—though with inadequate empirical research as a basis—that at present prices many villages south of the Elborz yield only about 7 percent per year to the owner. Many landlords have much more attractive opportunities outside agriculture. The increasing Westernization of Iranian life and concentration of political and economic power in Tehran have reduced the prestige of landownership among families with commercial interests. In addition, political trends over the past two decades have been clearly pointing to a land redistribution program similar to the one now underway. Many landowners feared that this might come at substantial cost to them unless they were able to transfer their capital out of agriculture.

The land reform calls for peasants to purchase their land over a period of years on terms, but the government will never be fully reimbursed for the compensation it has promised landlords. This will reduce the flow of capital out of agriculture for land payments and may spread the burden more widely in the society. The government is

70 AGRICULTURAL DEVELOPMENT

also proposing to sell some of the manufacturing enterprises it owns in return for payment in the form of the bonds issued to former landowners. This, too, may spread the burden of the land transfer and may also help improve management in these industries.

While Iran's large absentee landowners appear responsible for most capital transfers out of agriculture, there is evidence that the owner-operators have been increasing their investment. In recent years the amount of their investment, however, has not been enough to reverse the net flow of capital out of agriculture caused by absentee landlords. Still, the Agriculture Section felt that individual private farmers would invest under the proper conditions and framed plan programs directed toward fostering these conditions.

Many kinds of private investment in agriculture had occurred during the years of the second plan. The expansion of wheat cultivation was one. Urban entrepreneurs financed and promoted the growth of poultry production for meat. Elsewhere, small cultivators dug shallow wells, pumped with simple diesel engines. Thousands of peasants had undertaken improvements on their holdings, investing primarily their own labor. On the whole, this private investment in Iran was much more efficiently administered than government investment and the benefit returned much more directly to the individuals involved.

Taking its cue from this pattern of investment, the Agriculture Section favored programs which would encourage small tenants and owner-operators to step up their own investment of similar kinds. Government-directed credit was to be structured in order to enable small farmers to increase their investment. Fertilizer distribution was to be greatly extended. Small hand tools for orchards and small pumps were to be favored, as were small-scale irrigation schemes which depended on private initiative. In program areas other than agriculture, grants for materials were to be directed to permit villagers to build their own roads and schools. It was felt that through such programs the effectiveness of government efforts could be greatly increased, while individual initiative would be stimulated and local participation increased.

Although an effort was made to estimate the general order of magnitude, it was not possible to quantify how much private investment could be induced during the plan period. In any event, it seemed likely that private investment could at least equal that of the government if the proper conditions were created.

Ability of the Government to Direct Resource Use

A plan implies an assumption that the government, as an agency of the people, can identify objectives for agricultural development and manage resources so that more progress toward these objectives can be realized. Without a plan, planners are confined to identifying objectives and all action is left to private individuals. Obviously, it was the judgment of the Division of Economic Affairs that there was some scope for centrally initiated action in Iran. But it behooves those responsible to recognize that they are not omniscient and to keep programs simple, relying on individual incentive within a framework of national objectives.

v. Issues of Plan Design

During the third plan formulation stage a number of important issues emerged concerning the approach to the planning process and the selection of techniques for framing an effective plan. These issues are discussed here, since they are likely to be typical of the central problems encountered in the course of broadening a planning effort from a collection of projects to a more integrated approach.

Program Selection and Emphasis

Although a large number of agricultural technicians in Iran participated in program formulation, the Agriculture Section and the Division of Economic Affairs were largely responsible for the selection and emphasis of programs included in the third plan. Articulation of national economic development objectives was the formal responsibility of the Division of Economic Affairs. In accordance with this responsibility, a conscious effort was made in the Agriculture Section to relate program selection to national objectives. It is true, however, that a rather broad range of objectives probably would have led to formulation of much the same group of agricultural programs.

The particular interpretations made by the Agriculture Section about the cultural and economic values of Iranian society no doubt played a part in program selection. Thus, the plan takes a substantial step in the direction of more equal income distribution within agriculture. The plan does not anticipate a radical change in the structure of agriculture from the Iranian ideal as it was understood. Large-scale cultivation was not favored, but peasant farmers were encouraged.

Certainly the program review had a major influence both upon the selection of programs and upon their form. The final selection of programs and the form in which they were cast clearly reflected the strongly stated conclusion that third plan agriculture programs should emphasize increased productivity of existing resources. In this, however, the Agriculture Section was only accepting the nearly unanimous viewpoint of the best agricultural technicians.

Since there was little restraint on funds for agricultural development, there was little emphasis in the preparation of the plan frame on making a formal choice between alternative agricultural programs on the basis of the comparative return per rial expended. An exception was the case of large-scale irrigation projects. Here a rough benefit-cost ratio was calculated. From it, the conclusion was drawn that returns from big dams would be far less than from any anticipated program to increase productivity or from small-scale irrigation projects. In more formal terms, relaxing the financial limitations on agricultural programming amounted to an assumption by the General Economics Group that, with the exception of river development, the incremental capital-output ratio for investment in agriculture would always be lower, within the limit of effective administration, than the ratio in other sectors. Under Iranian conditions of scarce and imprecise data, it is doubtful if anything more than the most gross results could have been realized by devoting more effort to computing benefit-cost ratios, capital-output ratios and similar formal analyses. Such measurements could have been useful only for making choices where the disparity of returns was already so large that the need for computation would be practically eliminated. It may be noted, in passing, that low capital-output ratios do not necessarily mean high benefit-cost ratios, since benefit-cost ratios include costs other than capital, but given the available data in Iran and the rather wide differences in rates of returns between sectors and between projects, it was not judged useful to press this distinction further. Also, it may be noted that the comparatively severe formal limitations of the capital-output ratio as a choice criterion did not substantially affect the decision making process because of the wide differences in returns between many programs. In no case was formal capital-output analysis the determining criterion for choice between programs.

The plan frame contains proposals for a wide range of different agricultural programs. Only infrequently was an entire program—say irrigation or seed improvement—completely excluded from the agri-

cultural plan in favor of some other program competing for the same resources. Even though little of this kind of complete exclusion or absolute choice between programs was exercised, it cannot be implied that the planning function was reduced. The value of planning in agriculture lies in determining the major emphases in approach, scaling the programs to financial and administrative resources and to demand, balancing the scale among programs, narrowing programs to improve efficiency, and phasing projects.

The decision to include a broad range of agricultural programs in the plan frame cannot merely be attributed to the fact that there was adequate financing. Rather, the range of programs was dictated by several related technical and administrative considerations. Most important was the highly complementary nature of agricultural production. The bounds of any one program are quickly reached—say increased yields from planting improved varieties of wheat—unless a complementary program also advances—say, seed multiplication or credit for fertilizer. Even between less closely related programs complementarities exist. There are substantial gains to be realized by integrating livestock and crop enterprises. The demand for raw materials expresses a form of complementarity between agriculture and industry. Although many agricultural raw materials might have been imported, there was no reason, given the human and physical resources of Iran, not to try to meet raw material demands. This complementary nature of agricultural production prompted the decision to undertake a broad group of production and institutional improvement programs. But within each program the focus was narrow in the hope of realizing more rapid progress.

The pattern of demand itself set a form of technical limit to the exclusion of programs from the plan frame. Since most Iranian agricultural production was to be used for food crops and demand was growing for a broad group of foods, there was good reason to increase production, if possible, of a number of foods. Narrow concentration on wheat alone, for example, would not only have run into limits of complementarity, but would have failed to meet the obvious broad character of demand growth. In the absence of considerations such as the fear of famine, there was little justification for overintensification of only one or two programs.

A form of more rigorous program selection was undertaken to determine what was called the "core" program. For this, a quick recasting was made to see what would happen to sectoral allocations

and how program emphasis would vary were only 80 percent of the total third plan development allocation to become available. This was to be done on the basis of the whole plan, not just for agriculture alone. In order to provide intersectoral balance, core allocations for agriculture were made by the General Economics Group, based on the recommendations of the Agriculture Section. As a preliminary to working out the core program, the Agriculture Section was asked to prepare a program which would cost only 80 percent of the allocation assumed in the plan frame. Major cutbacks were achieved by prolonging large-scale irrigation programs and by reducing the allocation for small-scale surface schemes. The rest came from shaving several programs where the plan frame allocation assumed a generous estimate of administrative capacity. The only program entirely eliminated was local grain storage. When the General Economics Group worked out the core program for the whole third plan frame, it decided that it would be necessary only to prolong the irrigation construction and to reduce the small-scale surface schemes. It retained the full allocation for programs designed to increase productivity. In effect, this was to reaffirm that even at the 80 percent level the incremental capital-output ratio for programs to increase productivity within agriculture was still lower (up to the limit of absorptive capacity) than large-scale irrigation or most other programs in the development plan.

In a few instances, purely technical or administrative limitations, rather than considerations of balance or competition for scarce resources, led to a complete elimination of broad action programs from the plan frame. In the case of forestry, it was concluded, after consultation with Iranian specialists and other foreign advisors, that the personnel simply did not exist and none could possibly be trained to undertake a reasonable, sustained-yield forestry program during the plan period. As a result, the plan frame program limits itself almost entirely to the training of personnel in the hope that, by the time the next plan is in operation, there will be enough personnel to undertake an effective conservation program.

Program Detail at the Plan Frame Stage

The slowdown of project preparation after the plan frame had been published constituted a major weakness of the planning process in Iran. The delay was due partly to a change in government policy about the emphasis of Iran's development activities, and partly to fiscal and foreign exchange problems. Moreover, there were growing

doubts about the effectiveness of planning which relied heavily on the activities of the centrally-located planning group.

It is interesting to speculate whether at the plan frame stage another approach might have helped avoid the slowdown. One criticism of the plan frame was that it was more nearly a plan than a frame. This was especially true for agriculture. Possibly this stage should have been confined to setting out such broad policy guidelines as the emphasis on greater productivity or the shift to extension and credit. This might have given the technical services and other agencies more opportunity for initiative in program and project formulation. In the process, more planning momentum might have been generated.

By delaying detailed program formulation until the final plan stage, another advantage might have accrued. Time saved in the preparation of the plan frame could have been devoted to working out projects in more detail and costing them more accurately. With a longer time in which to work, more local involvement might have been possible. Even in retrospect it is impossible to judge whether this approach might have been more effective. The Agriculture Section originally contemplated such a procedure, but gave up the idea. Theoretically, the Agriculture Section was merely to work out guidelines; in practice it found itself being drawn further and further into program preparation. A general policy has little planning use until the specifics are added. What is a realistic target for wheat production or livestock numbers? How well does the scale of one program fit with another? Will trained manpower be available? How much money will be needed? When these questions are resolved, a definite program has already emerged. The plan frame stage could not be precisely defined by the Agriculture Section before it was better informed about potentials and obstacles. Lacking, therefore, formal directives during the plan frame stage, various operating agencies pressed for fuller program formulation.

The implication might be drawn from this discussion that no plan frame is needed. Why not go from a review of past plans directly to detailed program and project formulation for the final plan statement? Experience in Iran shows why the plan frame was a very useful stage in the planning process. The plan frame gave an opportunity for careful consideration of program alternatives, detailed evaluations of resource availabilities, and examination of future potentials without the necessity for proceeding hurriedly to detailed project formulation and preparation of annual budgets. It provided an opportunity to carefully work

through the whole plan proposal. After it had been subjected to widespread review and criticism, there was time for revisions and changes to be made. Many groups were afforded an opportunity to think about what the planning process involved and what the objectives of overall economic and agricultural development really are. Without the deadline of the plan frame and the definite point in the planning process it represented, program formulation probably would not have begun in earnest early enough to encourage careful criticism and revision. If the Iranian planners had proceeded directly to the final plan statement, it seems unlikely that program formulation would have been substantially more complete. The limited time would have forced immediate concentration on project formulation in detail. The net result would probably have been a less well thought out approach to planning for agricultural development.

Costing and Budgeting Considerations

Iran's decision to draw up detailed programs at the plan frame stage meant that several crucial problems had to be tackled within a relatively short time period. There could be no delay between the enunciation of the general objectives for agriculture and the initiation of the plan formulation stage. It was essential for the framework to be completed on schedule, so that it could be used in the writing of the final plan.

When planners entered the framing stage, costing and budgeting problems were among the first they took under consideration. The process of making cost estimates began almost immediately. Painstaking evaluations of total government revenue, possibilities for borrowing from abroad, future foreign investment, costs for maintaining services, and the like, were prepared by the General Economics Group. As a result of these studies, the volume of resources available for development was carefully estimated.

For purposes of planning, the accounting convention of "development expenditures" versus "continuing" and "nondevelopment" expenditures was adopted. Development expenditures were defined as new investments during the plan period plus associated increases in administrative costs. Continuing costs were the ongoing costs of development programs at the level anticipated at the beginning of the plan. Nondevelopment expenditures were the costs for such essential, but nondevelopment, activities as maintenance, police, courts, and the armed forces. By these definitions, a new dam or additional investment

in a partially completed dam was considered a development expenditure. So, also, were funds for the increase of the Agricultural Bank capitalization or the expansion of the Agricultural Extension Service. On the other hand, the level of expenditures at the beginning of the plan for agricultural extension would be considered a continuing cost and did not appear in the development allocations. Such a distinction was useful for many purposes, but did result in an artificial division of the total budget foreseen for the plan period for many agricultural agencies. In project preparation, the agencies would have to break down their proposed expenditures to show that amount which represented the level of expenditure as of the beginning of the plan, and then show separately those new aspects of the project which represented additional development expenditures.

Cost estimates were prepared in three successively more accurate approximations. First, a gross sectoral allocation was made by the General Economics Group and checked hurriedly by the Agriculture Section to determine if the rough order of magnitude matched. Next, more accurate and detailed, but still rough, cost approximations were made as the individual agriculture programs were prepared. These were the cost estimates which appeared in the plan frame. The third approximation was intended to be the much more carefully prepared cost estimates broken down on a year by year basis. These were to be worked out at the project stage and presented in the final plan.

After evaluating the second plan, the preliminary judgment of the General Economics Group was that past development expenditures for agriculture, excluding those for large-scale irrigation schemes, had been far too small. Furthermore, demand for agricultural products seemed likely to grow more rapidly than production could be increased. Since the general approach recommended by the Agriculture Section was to concentrate on institutional development—which is inevitably slow—it seemed unlikely that agriculture could profitably expend a development allocation substantially in excess of the resources that were expected to be available. The immediate criterion for the elaboration of the agricultural plan, therefore, was to develop all programs which promised quick and positive improvements in agricultural productivity. Later, a reexamination could be made if it appeared that the number of good agricultural projects which could actually be implemented would threaten to overburden the development budget or require an excessive proportion of total development funds for agriculture.

With agriculture's share thus derived in the General Economics Group's intersectoral allocation, the Agriculture Section made a quick breakdown into major programs with gross estimates of cost roughly estimated by agency administrators. The estimate took no more than a week. This gross agriculture program was then compared with the initial sectoral allocation. As it happened, the preliminary figure from the intersectoral allocation prepared by the General Economics Group was of approximately the same order as the rough program estimates prepared by the Agriculture Section, providing no new major dam construction were undertaken. With this preliminary assurance that there was no obvious discrepancy between availability of funds and the absorptive capacity of the agriculture sector, the real process of detailed planning leading to the plan frame began.

The early assumption that the absorptive capacity of agriculture would not be great enough to overbalance the whole plan was not contradicted when the cost estimates for the plan frame had been worked out. The investment proposed for agriculture in the plan frame is US\$483 million through the plan period, about 19 percent of total proposed development expenditure. This was thought to represent approximately the upper limit of absorptive capacity unless new large scale irrigation works were undertaken. Agriculture's share of almost one fifth of the total was not judged too large in view of the importance of agriculture in the total economy, despite the fact that only 6.5 percent of the development budget had been allocated to agriculture—excluding large-scale irrigation—during the second plan. In the third plan, US\$86 million, or about one-fifth of the total agriculture budget, was programmed for continuing work on large-scale irrigation projects begun in the second plan.

Cost estimates for individual agricultural programs in the plan frame were presented for the plan period as a whole. Only the roughest approximation to total cost estimates was made. In general, costs were estimated on the basis of total requirement within the plan period for facilities, supplies, salaries, and personnel training. In only a few instances were the program totals based on yearly costings.

It was anticipated that a much more stringent cost estimation procedure would be followed at the project stage. Administrative agencies were to be asked to prepare project proposals with cost estimates presented in substantial detail. Costs were to be divided between development expenditures and continuing expenditures, and broken down by years. Foreign exchange requirements were to be

shown on a yearly basis to provide data from which balance of payments projections could be worked out. From the approved project proposals were to be aggregated the agricultural programs and the overall plan costings. The annual cost estimates of the approved new projects plus the carry-over costs from the second plan's projects would become the annual budgets for development agencies, subject to modifications in the light of plan programs. Substantial time was devoted to discussions of this costing procedure and to the elaboration of suitable forms for project proposals which would include the required detail.

Of course, it would have been impossible to establish definitely the annual cost estimates and thus the annual budgets for the full five years of the plan when it was initially being written. An annual plan is to be prepared each year. For this, the Division of Economic Affairs will review the progress of each project and prepare revised annual programs and cost estimates. These can then be incorporated into the annual budgets presented by development agencies.

There can hardly be any doubt that the costing procedure of the plan frame was only partly successful. It would seem likely that closer attention to costing problems at an earlier stage in the planning process would have been useful, despite the practical problems involved. By devoting more attention to the program costs as the planning procedure progressed, a wider agreement on suitable costs might have been reached. Yet earlier attention to the costing process could only be expected to lay a groundwork for a better cost estimate at the project stage. Until more concrete projects are available than were included in the plan frame, it must be expected that many program decisions will be made on the basis of certain large assumptions. Indeed, it is questionable, even at the project stage, that there will be general agreement about the validity of the cost estimates. What could be gained by earlier attention to costs would be more widespread agreement about assumptions and increasing precision about certain identifiable costs.

Administrative Resources and Program Selection

The decision to adopt a broad range of agricultural programs in Iran was influenced not only by technical factors, but also by certain important administrative considerations. If, instead, narrow concentration on a few programs had been advocated, this would have resulted in inefficient use of scarce administrative resources. Government agen-

cies were already in existence at the time for virtually every program in Iran's plan frame. To have planned on the basis of substantial transferability of administrators among government agencies would have been unrealistic. Had many of the administrators been transferred out of their fields, their technical education would have been wasted. A cotton expert is of little more use than a manual laborer if he is transferred to animal disease control. Even those administrators without technical backgrounds cannot be readily transferred. There is a strong resistance to reducing an agency once it has been established. Extreme reorganization of government agencies might only serve to build up enough opposition to the agricultural plan to wreck its implementation—and have little if any output advantage because of technical complementarity. In many instances, if a program already underway were halted, the net result would not be to free resources for a more promising program, but only to discontinue the use of some scarce administrative ability.

Finally, for many economic, sociological, and political reasons, it was judged impossible to foretell with any certainty which program would be successful. In this way heavy emphasis was avoided on any one program which might falter or disappear with serious consequences for related programs. Already, the Agriculture Section felt, the stress given to extension and credit was so great that there was a risk of a severe setback should either program fail to live up to its promise. Therefore, it was not recommended that any commodity or institutional program should be abolished in the plan frame. Only in the instance of large-scale irrigation and of credit for large power implements was an ongoing program not encouraged to expand to the limits of its administrative resources.

The resulting plan lacked the dramatic emphasis which might have been given by singling out one or two major programs. But, given the stage of development in Iran, such single-minded concentration did not seem desirable. Indeed, a major criticism of the second plan had been overconcentration on large-scale, multipurpose river development.

While there was almost no exclusion of broad program areas, a form of emphasis had to be selected within each area. Since administrative capacity was generally the limiting factor, it was here that the Agriculture Section was most often forced to make choices between alternative approaches. Something like a principle involved: choose the program which for comparable output depends least on administration.

Knowing what opportunities to increase productivity in their fields were waiting to be exploited, technicians had a tendency to propose overly ambitious targets and to suggest that they could expand their administrative structures more rapidly than realistic appraisal seemed to imply. Frequently it was the task of the Agriculture Section to check this optimism. Objective criteria for evaluating technical proposals in these cases were almost nonexistent. What, in practice, was usually done was that the administrative proposals were carefully examined and questions were raised if they seemed too optimistic. Generally, agreement was fairly easily reached on a more moderate target and rate of administrative expansion.

Operating agencies were consistently encouraged to concentrate use of scarce administrative talent where it could be most effective in increasing production. Many understood exactly what the Agriculture Section had in mind and had already shaped their programs accordingly. But some agencies initially proposed extremely diversified programs. Such a case was the animal disease control program. When first asked for proposals, the responsible officials, all highly trained veterinarians, responded with little more than a list of the known diseases afflicting Iranian livestock—a shockingly long list to the laymen in the Agriculture Section. Clearly, no program could hope to make immediate progress in controlling all these diseases. But as discussion turned to mutton production, for example, it became clear that perhaps as much as two-thirds of the meat loss attributable to disease came from just two parasites. One of these could be controlled by a dip and the other by administration of a capsule by the shepherds themselves. Clearly this pointed the way to the most effective use of the limited number of veterinarians and field technicians who could be assigned to disease control among sheep.

The credit program provides another example of a program deriving much of its form from the principle of economizing administrative talent. Rapid expansion of multipurpose cooperatives was not encouraged. Experience had shown that the administrative problems of simple credit cooperatives were only slowly being overcome while the few multipurpose cooperatives had largely collapsed. Thus, with full concurrence of the Agricultural Bank, the plan frame concentrated on establishing the more simply administered credit cooperatives. Later, it was hoped that credit cooperatives could slowly expand their functions. It was suggested that they should be permitted to undertake only one additional function beyond credit during the plan period—

generally distribution of fertilizer to be lent in kind to borrowers. A similar group of considerations lay behind the decision not to encourage a program of supervised credit beyond the modest screening of applicants carried out by credit cooperatives.

The question of whether to emphasize agricultural extension or to encourage a growing community development program took many hours of careful examination. In the end, it was decided that the extension program should be designated for expansion. Meanwhile, the community development program was encouraged to concentrate on improving the quality of its administrative services without marked expansion. There were two major reasons for this decision. First, there was the need to transmit production information more rapidly and effectively to cultivators. It was felt that the direct approach of extension would be better than the multipurpose approach of community development. Further, it was held, some community development projects for local improvement had foundered because villagers lacked disposable income. It was felt that if cultivators could be encouraged to increase their production and to build up a confidence that they would be able to continue to increase, even modestly, their incomes in the future, they would be more willing to support programs of community improvement. A second reason lying behind the choice of the extension approach was that of organization. Both extension and community development were fairly new arrivals on the scene; both were supported heavily by bilateral American economic and technical assistance. Community development had been assigned, because of its multipurpose approach, to the Minister of the Interior, where it had little relation to other Ministry functions. In contrast, the extension service had been organized within the Ministry of Agriculture, where it supplemented long established functions in a field of endeavor the Ministry accepted as its own. It was felt, therefore, that the extension service had a better chance to operate effectively within the government, and become an established government service. The approach may have been a little too successful. During 1962, the extension service was largely diverted from its production-increasing responsibility to a land tenure responsibility primarily because it was a field service at the disposal of the Minister of Agriculture.

Where administrative resources are seriously limited, as in Iran, support of a program often amounts to support of a few key administrators. Yet past experience in Iran clearly warned that such individuals might very well be shifted to meet one of the chronic, person-

84 AGRICULTURAL DEVELOPMENT

nel shortage crises that plague a country where development efforts are active and trained personnel few. Even as the third plan began, some key administrators no longer held the positions from which it was hoped they could exert decisive influence. The likelihood that this would happen was recognized by the Agriculture Section. But there appears to be no alternative. A nation—and even more, a government—is people. It is only right and natural that competent people should be promoted and given wider responsibilities. If their promotion robs a key program of their daily attention, this is only to be expected. Ideally, programs would be formulated which would not rely on particular individuals. Ideally, administrators would build agencies which would have a cohesiveness that would persist in the absence of any few individuals. But in Iran the scarcity of competent people, coupled with a cultural tendency to identify programs very closely with individuals, meant that the ideals of administration were sometimes not met.

Recognition of this problem gave the Agriculture Section additional reason to support a broad range of promising programs where productivity increases could be most expected to appear. Frequently these were programs built by a small group of dedicated individuals. But if these individuals were moved, it was argued, even though their programs might suffer, it was quite likely that they might continue to be effective. Some new administrators would be just as capable as their predecessors after they had learned their new jobs. If hopes were not realized and a program faltered because of a lack of capable administrative personnel, it could only be counted as one of the inevitable hazards of planning.

Overconcentration on Central Administration

If the second plan could be criticized as having concentrated too narrowly on bricks and mortar, the third plan can be criticized as being primarily a program for central government administration—there was too little regional planning. The planning process failed to involve a broad range of local and regional administrators, farm leaders, and people from commercial firms. There was a tendency to frame programs as if they were work schedules for a central government agency in Tehran instead of attempts to induce changes in farmers' fields. Too little attention was paid to such broad questions as the willingness of farmers to accept programs or how to develop local enthusiasm for implementation.

The programs, as they appear in the plan frame, are largely "administrative" plans. The concentration is on central government activities, even when they are only an intermediate step to encouraging farmers to increase their production. It was hoped that when project formulation was undertaken much more attention could be devoted to the place of local governments in the execution of the national program.

One drawback of the plan frame's central focus was that the program tended to be rather unimaginative. Regional and local participation might have led to variations in approach, more suited to the individual conditions of Iran. Because the programs as stated were national in character, there was little suggestion that local experimentation and modification in program implementation would be welcomed. There was even a tendency to distrust the variations that local administrators and groups might be inclined to inject into the program. Perhaps more regional consultation would have reduced this concern of government planners.

Only central government administrators and technicians participated to any substantial extent in the planning. Though the Division of Economic Affairs made an effort to extend popular participation in its planning, personnel shortages and other obstacles prevented anything more. Trying to reach out from Tehran proved extremely difficult. Distances are long and regional consultation is time consuming. Local officials would have required a detailed explanation of the new planning approach and assurances that it would not rob them of their responsibility and influence. One or two visits to each regional center probably would not have produced the response necessary. Yet that is all that could be considered by the Agriculture Section.

Had it been possible to involve more local government officials and farmers' representatives, perhaps they would have felt a greater sense of participation and hence have been more inclined to cooperate enthusiastically. This might have led to a more realistic plan frame, especially in terms of its regional appropriateness and its estimates concerning rates of implementation. As it was, it is doubtful whether many local government officials knew what the plan frame covered. Certainly, most ordinary farmers were not even aware of its existence.

A problem arises about farmer participation that probably cannot be resolved. It is easy to say that peasant farmers should participate, but there is a real question as to whether or not this was possible. A farmer who cannot read, has no radio, inherently distrusts govern-

ment officials, and hesitates to speak candidly for fear of angering his landlord, can hardly be an effective participant in a planning process. On the other hand, to assume there is farmer participation if the planning group consults primarily large landowners living in Tehran or provincial urban centers is only to court self-delusion. Until effective farm organizations develop which can represent rural interests adequately, planners will probably have to rely mainly on local government officials and extension and community development agents to report farmers' views. But there are two other means of communication which were inadequately utilized in Iran. Agricultural planners should, perhaps, allot more time than any other planning group to field trips. Visiting farmers in their fields and homes enables planners to gain an insight into what the average cultivator regards as his opportunities and problems. Agricultural colleges and research institutes also should be encouraged to undertake long-term research in an attempt to better understand farmers' values and aspirations.

Political Constraints on Program Selection

Overconcentration on central administration resulted in the virtual exclusion of local representatives from influential planning circles and thereby constituted a serious weakness in the third plan. Yet an attempt was made to anticipate the local cultivator's reaction to the plan because it was realized that certain programs would require major shifts in public attitude before they could be effectively implemented. Thus, a major consideration at the program selection and formulation stage became whether or not a proposed program necessitated a change in political policy or public opinion regarding social and economic institutions.

Several of the most serious obstacles to agricultural development in Iran cannot be surmounted until there are certain major shifts in policy. Land tenure and pasture overgrazing were examples. Although the Plan Organization could initiate some major policy shifts—the commitment to comprehensive national planning being one example—no central planning group can propose technical programs without considering the political environment in which they must be implemented. Careful evaluation of the major policy shifts which may occur or might be accepted if recommended is one aspect of the political dimension of planning.

Still, most changes in policy cannot be foreseen adequately. Sometimes it may even hurt the planning cause to discuss possible

changes freely. Yet the whole objective of planning is to induce change, and change inevitably occurs at some cost to some group in the society, even though that same group may also be a major beneficiary. Resistance to change and hence resistance to planning may build up to a point where a particular program cannot be implemented. At the extreme, the whole planning effort may be destroyed by a coalition of disparate interests united only in their opposition to the planning group's proposed changes. Aware of this danger, and realizing that skillful planning involves a big element of guessing the possible, the Agriculture Section's programs in the plan frame for land tenure and pasture improvement were rather conservative. Considering the temper of society and its leaders, there seemed a reasonable possibility for implementation of these programs in the modest form contemplated. It is no reflection on the Agriculture Section—and is quite a credit to Iran—to note that the guess about land tenure change could hardly have been farther from what has subsequently happened.

When the plan frame program was being prepared, the seriousness of land tenure as an obstacle to agricultural development was clearly recognized. The plan frame itself began the tenure improvement discussion by noting that land tenure was "one of the most important obstacles to realizing the third plan agricultural development objectives." Many hours of internal discussion had been devoted to the tenure program. Among the younger group of technically trained Iranians, including several whose families had extensive land holdings, there was a general feeling that a sweeping land reform was needed and should be included in the plan frame. Others, realizing that such a major national program could only be initiated and carried out at the highest levels of the government, argued against inclusion of a broad land reform recommendation. They reasoned that, apart perhaps from the distribution of the Crown lands belonging to the Shah's personal estate, past performance in implementing land reform in Iran had not been conspicuously successful. Even advocates of land reform agreed that a sweeping recommendation might promote serious opposition to the whole plan concept without really accomplishing much in the way of land reform. There was concensus, however, that dramatic changes in the land tenure structure had to come before too much longer; the dynamics of Iranian modernization demanded it. In this spirit, the Agriculture Section proposed a program which called for continuation of the ongoing tenure improvement activities, including distribution of the last remaining part of the Crown lands. A change

in the regulations affecting *vaghf* land (land held in entailed religious trust) to increase the incentives of tenant farmers was proposed. Also recommended was a program of mapping and title settlement which could pave the way for efficient administration of a major land redistribution program later.

The Agriculture Section reckoned without Dr. Hassan Arsanjani. This dedicated, hard-driving man was appointed Minister of Agriculture only weeks before the plan frame was due to appear, and well after the major program discussions had been completed. Although he announced his intention to vigorously implement the land reform law and extend its provisions, the initial tendency was to discount his statements. However, within weeks after he took office Dr. Arsanjani presided over the first major transfer of privately-owned land, and within three years he and his successor had pushed through redistribution of all those villages owned by landlords whose holdings lie in more than one village.

The failure to anticipate this shift in national policy was costly for the agricultural planning group. Most of the initiative for agricultural development shifted to the office of the Minister where there was a single-minded focus on land redistribution. Considerations of productivity increase and coordination with other agencies were assigned relatively less emphasis. There can certainly be no objection to the Minister of Agriculture taking the lead in pressing for agricultural development. It is just unfortunate that the timing was such that the planning effort of the Agriculture Section could not take advantage of the new Minister's dynamism and the renewed vigor he infused into the ministerial agencies. Had such a development been foreseen, the plan frame might have been significantly different. The emphasis would have been on services needed to help new owners maintain and increase their levels of productivity and on coordination of land redistribution with other development activities.

Unhappily, the planning group was more justified in its pessimism about changes in government policy and public opinion which would permit an effective start to overcoming problems of pastureland management. Iranian pastures are seriously overgrazed. One reason for this is the growth of village population and the consequent increase in the number of farmers grazing sheep and goats. Moreover, there is virtually no control over the number of animals which may be grazed, nor where they may be put out to pasture. Grazing rights are held in common. In some areas, villages—although not individuals—have

vaguely defined pasture rights, but these are hardly exclusive and impossible to enforce. If a village or a large landlord were to stop grazing some area, reseed it, and permit it to regenerate, those responsible soon would find outside sheep and goats grazing on the area supposedly "resting." A regeneration program would require clearly defined pasture rights and police action to enforce those rights—politically an unpalatable task. There was no indication that such drastic changes in the traditional approach to grazing rights was likely to be forthcoming. As a result, the only pasture improvement program included in the plan frame was a pilot program in dam watersheds. Here a desire to protect the investment in the dam created a different institutional climate.

In another case involving pastureland management, political policy influenced selection more overtly. The nomadic tribespeople who inhabit the highlands of Iran effectively use remote mountain and desert pastures to make a critical contribution to the national output of badly needed meat and animal products. Their continued use of these pastures is now threatened by the inroads of expanded tractor-powered wheat cultivation. Should extension of the area planted to wheat cut off the centuries-old pastureways along which herders move their animals from winter pasture in the desert to summer pasture in the high mountains, the implications for meat production would be serious. Furthermore, the growing number of tribal livestock—often of poor quality—is putting increasing pressure on pastureland, leading to familiar problems of overgrazing. Too little attention has been devoted to these growing dangers.

The constraint on planning improvements lay in the Iranian government's traditional concern about the threat posed to internal security by tribal groups. Local administration in tribal areas is a responsibility of military officials. Their overriding concern with security prevented the Agriculture Section from planning more effectively for nomadic livestock. The military policy inhibited research workers from carrying out thorough investigations. Because of lack of data and the skepticism that any implementation of projects would be permitted, the livestock program for nomadic herds was stated only in broadest outline. A disease control program calling for livestock dips along the pastureways was proposed. It was hoped this would not only contribute to increased production, but also call the attention of government administrators to encroachments on these pastureways. But the very serious conservation problems arising from increasingly

more intensive grazing on a shrinking area of pastureland were not handled adequately. Programs to improve the quality of the livestock herds, and hence the efficiency of pasture use, were postponed. There is increasing recognition among agricultural officials of the pressing nature of tribal agriculture problems, but only as confidence in internal security grows can they be dealt with.

There were other problems of major policy affecting many programs besides agriculture. These, too, demanded consideration and the crystallization of operation assumptions on which to plan. Internal rivalries within the government and between influential individuals were an ever present concern. There was the major assumption that the government as a whole was able and willing to administer its fiscal and monetary programs to make the resources available for the plan. It was left to the planning group to gauge the depth of national commitment to long-term, continued development efforts at the expense of such alternatives as welfare programs and luxury imports.

As these considerations imply, realistic appraisal of whether or not a program was administratively and politically feasible played a major part in program selection. No general rule was useful; each case had to be decided on its merits. Once a program was judged to be technically sound and economically desirable, the decision on whether or not it should be included rested on the planning group's evaluation of many intangible factors.

VI. Relevance of Iran's Experience

What is there about the Iranian experience in agricultural planning that might be useful to other countries? Economic and social development is intensely national in its quality, and for that reason the transferability of the Iranian experience must of necessity be limited. But at the same time, there are parallels which carry over to other nations challenged with the problems of low income agriculture.

Agriculture Versus Industry

Agriculture deserves an important place in the planning effort of developing countries; yet because many governments are overly concerned with industrial growth, they have failed to place adequate emphasis on agricultural planning as a part of the national planning effort or to realize the critical relationships between agricultural growth and overall economic development.¹ More recently, the poor performance of agriculture and its drag on economic development has forced greater attention to be paid to agriculture.² The preceding chapters emphasize that in Iran, too, the earlier planning efforts failed to include sufficient emphasis on agriculture. Most of that attention which was paid to the problem in Iran centered around construction of large dams, largely by foreign contractors.

¹ Bruce F. Johnston and John W. Mellor, "Role of Agriculture in Economic Development," *American Economic Review*, Vol. 51, No. 4 (September 1961), pp. 566-93.

² Douglas S. Paauw discusses agricultural planning in the ECAFE Region in *Development Planning in Asia* (National Planning Association Publication: Planning Experience Series No. 1; Washington, D. C., 1965).

92 AGRICULTURAL DEVELOPMENT

The most obvious reason for agriculture's importance in national economic planning is its sheer dominance. In most less developed nations it is the major industry and the major source of livelihood. Iran is no exception. About 70 percent of the population is engaged in agriculture. Moreover, around 40 to 50 percent of the gross national product is generated by agriculture.

Once the decision to accelerate development through conscious efforts has been made, agriculture can be a source of relatively inexpensive, yet important gains. Increased supplies of food and fiber are among the first needs of a nation where per capita income is increasing, and an expanding agriculture can supply a wide variety of raw materials. Compared with the investment costs of achieving increases in many industrial activities, increased agricultural output is relatively inexpensive. For some considerable range of per capita income increases, the income elasticity of demand for food and a number of other agricultural products is likely to be high. If supplies are insufficient, either a problem of inflation arises or there is pressure to use scarce foreign exchange to import food. In most instances, foreign exchange could better be used for imports of capital goods. While it is true that agriculture is an export earner in many countries, this was not the case in Iran. Another aspect, not to be overlooked, is that import substitution, as population and per capita income grow, is an equally important means of conserving critical foreign exchange. The latter was a major concern of agricultural planning in Iran.

Because agriculture is a major industry in most developing countries and relatively inexpensive in terms of capital compared to other development activities, agricultural growth can provide a source of savings which may be mobilized by various devices for industrialization. The Japanese experience, where heavy taxation was consciously used to transfer resources, is the classic example. More recently, direct taxation has proved difficult in many countries because of its political and administrative ramifications, but other techniques have been devised. A common approach is to establish marketing organizations which pay domestic producers less than the international market price and use the resulting gain for nonagricultural purposes. These devices require the same discipline as other development activities, and they must be used with caution to avoid the disincentive effects that may be associated with any form of forced savings.

Eventually, the agricultural sector will supply the additional labor required for industrialization. In Iran, as in most developing countries,

this was not an immediate concern—indeed the planners' problem is more likely to be finding suitable employment for the spontaneous increase in urban population than finding means of encouraging labor transfer. For the present, most countries feel that they have achieved substantial success if nonagricultural employment opportunities can expand rapidly enough to absorb population growth while postponing the question of reducing the absolute numbers employed in agriculture. At the time of the formulation of the third plan in Iran, considerations such as these led to emphasis on increased total agricultural production and to productivity increases achieved largely by devices other than labor-saving innovation.

Factors Which Distinguish Iran's Experience

Obviously, the Iranian experience is not universally applicable because other nations will have different physical endowments. Iran is a nation capable of producing its own food supply, but as it has limited arable land relative to food needs Iran can scarcely depend on the export of food crops for its industrialization. Fortunately, it has a large and dependable foreign exchange earner in its oil industry. Agricultural planners could concern themselves primarily with a closed system largely unaffected by foreign trade.

The nation's dependence on irrigation also distinguishes the Iranian experience. Yet large areas of the world are dependent on some sort of water control system even where natural rainfall is high. Although the dimensions of the problem may differ, the problems introduced by the demand for huge and expensive water control systems are not uncommon.

To the outsider, Iran appears to suffer less from overpopulation than many low income countries, but this impression is somewhat misleading. One staff member of the Agriculture Section estimated that the number of rural people earning their living off "equivalent" land was many times higher than that in North America and nearly as high as that in the Egyptian delta. The validity of this calculation rests on an estimate of relative fertility of soil. Though there may be reason to doubt the precision of the analysis, there is no question that the number of people who must depend on the limited amount of arable soil in Iran is surprisingly high relative to the country's resources.

How, then, is the Iranian experience similar to that in other countries?

On the physical side, it is easy to concentrate too much on the differences and forget the underlying similarities. Many other nations share such problems as low soil fertility, climatic limitations, high population pressure on arable land, and poor nutrition.

Social and Administrative Parallels

There are a number of social and administrative parallels, and these may be even more instructive than the physical ones. Iran shares with virtually every other low income nation a modern concern to accelerate development and a sense of urgency underlies the generally expressed desire to speed up economic growth. At the same time it is hoped this can be done in the *Iranian* way—which means preserving certain valued qualities of the society while acquiring those new ones from other societies which may serve to enrich the social structure of the nation. The difficulty is that there is no widespread agreement on how this can best be accomplished. All that can be done is to try many different activities and approaches. Future economic historians will identify those that succeed as characteristically Iranian—peculiarly suited to the physical and social context of the nation—and will wonder why the planning group could not see them all along. Whichever path the Iranians follow, it will certainly be different from the historical path of other nations. Even at the outset Iran is consciously departing from the experience of others. The feeling that improvement in social welfare should come simultaneously with growth in the national income is one example of such a departure from the historical pattern of Western Europe and North America that many other nations share.

A firm national resolve to use planning as a tool and to accept the costs as well as the benefits is still lacking in Iran. In prospect the costs do not loom large, while the benefits of accelerated and balanced growth are highly valued. But implementation puts a different face on things. The national discipline which plan implementation demands is not easy. Conflicts always appear when economic policy is put into practice, and development programs inevitably bring frustrations which may too readily be relieved by blaming others for internal shortcomings.

Planning, in theory, is neat and orderly; in the real world it is not. Troublesome administrative problems are the continual *bête noire* of countries trying to achieve more rapid growth. There are too few agricultural technicians, too few extension agents, too few agricul-

tural economists, too few people in the bureaucratic structure who know enough about planning to participate effectively. Coordination is very difficult to achieve, either between services or between the center and the regions. The government, farmers, and commercial interests need to establish effective, mutual working relationships. Because planning is by nature a political process but the mechanics are undertaken by highly trained technicians, an inherent stress is introduced that can never be adequately resolved; it can only be contained. Certainly agricultural planning groups in Iran were confronted by the universal problem of wanting to initiate major national policy changes while at the same time finding themselves unable to keep on top of those changes which did occur.

Planning With Limited Data

The Iranian case illustrates how planning groups must grapple with limited knowledge when studying how to induce growth in low income agriculture. Far too little is known about the processes of agricultural growth. What sketchy information is available is more physical and technical than economic in nature. Each country must learn for itself about these physical and technical attributes of its own agriculture, even though borrowed technology can give a long head start. Much less is known about the economic and social processes of agricultural growth. The real obstacle to rapid agriculture development is not financial resources or even technological knowledge but limited ability to put these resources to good use. Again and again in Iran it can be seen that program expansion is dependent upon the willingness of farmers to accept change and the ability of the government to administer nationwide programs effectively. The tendency is to attempt to transfer foreign institutions. Although there is really little choice of doing otherwise, it should not be surprising to find that these institutions often do not fit satisfactorily, even after substantial alteration. Far more information is needed about the impact of cultural influences and education on agricultural progress, about farmers' motivations and values, about the effect of risk and uncertainty on the rate of adoption of new practices, and about how farmers gain information. Even the more common aspects of the rural social sciences have been inadequately studied—the structure of individual farm enterprises, the leadership patterns in villages, the pattern and structure of credit, and the market channels. Agricultural planners in Iran had to work in the virtual absence of this kind

of knowledge about agricultural growth. Planners from many other nations confront similar data problems.

An Individual Approach to Common Development Problems

Rural conditions in Iran closely resemble those in many other low income countries, and the agricultural plan, as it was finally worked out, also bears substantial affinity in gross outline to plans proposed elsewhere. Similarly, those associated with the planning process found their experiences comparable to those of their colleagues in other low income countries: there were many of the same obstacles, many of the same frustrations, and many of the same heady satisfactions that come from working at a critical focal point of progress.

But if the underlying physical, institutional, and cultural challenges have a broad overlap of similarity, each country must learn for itself how these challenges are to be identified and the means by which valid national objectives are to be realized without destroying the national cultural heritage. Not only must each plan be tailor-made, but also each planning approach must be adapted to the institutional framework of the particular society. Perhaps this discussion of the Iranian experience has provided some useful hints.

APPENDIXES

APPENDIX I: Major Features of Iranian Agriculture

Local Cultivation in an Extensive Setting

The families engaged in agricultural production in Iran in 1961 were estimated to number about 2.5 million.¹ They lived in some 45,000 villages concentrated along the Caspian Sea, scattered across the Azerbaijan Plateau, or strung along the littorals fringing the mountain ranges. Nomadic tribes follow their herds from high summer pastures to the edge of the desert in the winter. Most of these people are illiterate. Very few are familiar with efficient methods or tools of production.

These peasant farmers harvested crops on some 2 million hectares of irrigated land and some 4 million hectares of dry land. The cropland is part of a complex fallow system covering some 18 million hectares, or about 11 percent of the total area of the country. Pastures account for perhaps another 20 million hectares, or 12 percent. The rest of the country is made up of either scorching deserts or inaccessible mountains.

On the dry land, Iranian cultivators produced about 3 million tons of wheat, and about 1 million tons of barley. Together with

¹This descriptive material is drawn from the *Review of the Second Five Year Plan Program* (Tehran: Plan Organization, 1960), and from *Third Plan Frame for Agriculture* (Tehran: Plan Organization, 1961).

500,000 tons of irrigated rice, these grain crops accounted for about 36 percent of the value of agricultural production. Another 36 percent came from animal products nearly two-thirds of which was from milk. Shepherds tended 40 million sheep and goats. There were about 500,000 cattle. Fruit and nut orchards contributed 16 percent of the value of agricultural production, and most of the remaining 12 percent is accounted for by cotton, vegetables and melons, pulses, sugar beets, and tobacco. Thus, the total value of all agricultural products marketed and consumed by cultivator households came to some US\$650.

Iran, like most low income countries, has a high income elasticity for food; that is, a high proportion of any increase in income is spent for food. (The concept of income elasticity is discussed in more detail in connection with the estimates of future demand for food in Chapter III.) High income elasticity, combined with the population increases, means that the country can expect a very rapid growth in food demand as economic development progresses. In Iran the income elasticity of urban consumers is estimated to be 1.34 for fresh fruit, .94 for mutton and lamb, and about .74 for fats and oils. The practical implication of these high elasticities is that in the decade between 1958 and 1967, total urban and rural demand, at constant prices and assuming a 6 percent annual increase in gross national product, is expected to grow 57 percent for fresh fruit, 61 percent for mutton and lamb, and 49 percent for fats and oils.

The Importance of Agriculture in Foreign Trade

Oil is Iran's major foreign exchange earner. Of the 1960 foreign exchange earnings of US\$431.2 million, oil accounted for US\$335.5 million. Of the nonoil exports of US\$95.7 million, agriculture, including handmade wool carpets, accounted for about three-fourths. The wool and animal by-products accounted for 15 to 20 percent of the total nonoil exports. If Iran's famous carpets are added, between 30 and 40 percent of the nonoil exports depend on wool. Raw cotton accounted for 20 percent. The most important remaining agricultural export, dried fruit and nuts, contributed another 20 percent. Thus agricultural products accounted for 70 to 80 percent of the nonoil exports, or 16 to 18 percent of total exports. While this contribution is important, it is clear that agriculture is not the key industry generating foreign exchange for economic development.

During the five years prior to 1960, neither the quantity nor the composition of agricultural exports changed significantly. However, as incomes rise, domestic consumption of these products can be expected to grow and pressure on export supplies to increase unless there is a corresponding expansion of production.

Iran is practically self-sufficient in food production, with the significant exception of those complementary components of the national drink—sugar and tea. In 1960, of total imports amounting to US\$549.6 million, sugar accounted for US\$30.2 million, or 5.5 percent, and tea US\$16.4 million, or 3.9 percent. Edible fat, the other important food import, was valued at US\$9.9 million, or 1.5 percent of the total. The only remaining import bearing on agricultural production, textiles, amounted to US\$50.9 million, or about 9.3 percent of total imports. The level of these imports had remained about the same since 1955, but they represented a smaller proportion of total imports than formerly due to the rise in the volume of capital goods and non-durable imports. By the end of the third plan in 1968, tea imports are expected to fall as domestic production expands. Sugar production, however, is merely expected to keep pace with demand, so that imports will remain at about the same level. The rapidly increasing demand for edible fats will mainly have to be met by almost doubling present imports, since neither livestock production nor oilseed output can be expected to expand rapidly enough to supply the demand for cooking oil.

Iranian Cultivators

Perhaps as much as 75 percent of the total population of Iran is rural, although not quite such a high proportion is engaged directly in agriculture. On the average, each cultivator's family earns a gross annual income of around US\$250, or roughly a per capita income of US\$50. Most of the income is in kind. Birth rates are high, labor productivity is extremely low, and underemployment widespread. The number of people involved in agriculture is high relative to the intensity of cultivation possible with the techniques known and available to Iranian farmers.

The generally poor and unimaginative management of agricultural enterprises is intimately related to low labor productivity. Suitable new techniques are often slow to be adopted. Sometimes they are unknown, but often they are thought to be simply too much trouble and to re-

quire too much change in traditional ways. (Experience in Iran would indicate a wider range of variation in efficiency of resource use among neighboring farmers than Schultz² indicates.)

Present yields are low, but with proper techniques the potential exists for vastly higher yields. Improved varieties of wheat and rice now available can increase yields 25 percent over present varieties without changing any cultivation technique. It is quite possible that wheat yields in Iran could rise from the present average of 750 kilograms per hectare to over 900 kilograms per hectare by the simple introduction of better varieties. Commercial orange production averages about 5 tons per hectare, yet trials show that the average commercial yield could be increased five times to 25 tons per hectare through better management, fertilizer, and timely spraying. The average milk cow now produces around 800 kilograms of milk per year. If dairymen were to improve their management and increase the use of artificial insemination, calves dropped by the existing cows could be expected upon maturity to produce twice the present amount of milk.

Iranian cultivators have an extremely narrow risk margin. Because their incomes are generally so close to subsistence level, they are far more ready to discount new techniques than Western European or North American farmers. In countries where farmers have a higher average income, they can afford, say, a 10 percent drop if some new technique proves unsuccessful. But a peasant farmer living at the margin of subsistence must often trade the possibility of increased income for the assurance of at least a continued minimum.

Water is the all-pervading problem, and so tenure changes, new cropping patterns, and virtually all crop expansion programs are tied into irrigation. By means of dams, pumps, or the unique Iranian *ghanat* system of underground channels, water is brought from water-bearing strata in the mountains to the cultivated land on the alluvial fans.

Institutional Obstacles

After close examination of Iranian agriculture, one is likely to agree with most Iranian and foreign technicians that Iran's agricultural problems are more institutional—sociological, political, and administrative—than technological or matters of textbook economics. This is characteristic of most low income countries. Despite weaknesses in

² T. W. Schultz. *Transforming Traditional Agriculture*. New Haven: Yale University Press, 1964.

the research structure, far more technology is known than is used. The problems now are how to make this new technology available to the farmer in a form he can use, and how to create an economic environment which makes it possible to adopt innovations. This means new institutional programs—credit, extension services, and land tenure changes.

In the past, land tenure has been the dominant institutional obstacle. In 1961, some 200,000 landlords owned a good deal more than half the cultivated acreage. The inhibiting effects of this tenure structure on agricultural progress are obvious: few of the absentee owners took a personal interest in improving management of their holdings, and consequently there was little incentive for tenants to increase their output. The practice of physically sharing the crops further discouraged introduction of new techniques. If a holding were shifted to livestock production, how would the harvest from irrigated pasture be divided? An ambitious land transfer program undertaken with determined vigor in mid-1961 is changing this picture and should open the way for more rapid introduction of new techniques in the future.

Two other institutional problems, rather more peculiarly Iranian in their nature, impede agricultural progress. One is the "livestock-pasture-feed" complex. Over the centuries, a land use pattern has grown up that gives the vast, arid plateau to grazing, and reserves the scanty alluvial fans at the base of the mountains for crops. Arable land was irrigated where water supplies made it possible; dry land cereals were grown where irrigation was impossible. With changes brought by population growth and new technology, this no longer is as clear-cut a choice as it once was. Today the best land use pattern in the country would be both to set aside some cropland for the production of fodder for livestock and to regulate grazing. But the Iranian farmer now has a deeply embedded feeling that he is entitled to receive all the fodder he needs as a free good in the form of natural pasture growing on public grazing land. Thus, despite heavy livestock losses on depleted pasture each winter, there has been little expansion of fodder acreage.

A second peculiar institutional problem relates to the traditional use of irrigation water and the manner in which it is distributed. Custom rigorously defines water rights. Codified law only follows existing practice for the most part. The normal practice is to permit each individual farmer to have the flow from a ditch for some specified

104 AGRICULTURAL DEVELOPMENT

time period. Should he fail to take it then, he loses all claim to it. Farmers have thus developed a system of flood irrigation which enables them to accept large amounts of water whenever available. Agronomically, this system wastes water and is inefficient. More modern practice would call for ditch irrigation, storage in small dams, and redesigned weirs to measure water more accurately. Such a system would permit introduction of water storage, distribution of water over a broader area, and irrigation according to crop needs. But tradition plus the fear that others will take undue advantage of any change inhibit introduction of new water handling techniques.

Several institutional obstacles to agricultural progress are found on the "government" side. There has been a tendency to "starve" agriculture in terms of government investment except for large dams. Also, there has been a shortage of agricultural research. At the time the plan program in agriculture was being formulated, not a single farm management study had been made and not one rural sociologist was working in the country. A similar statement can be made for other fields of agriculture, although there were real beginnings in the biological aspects of agricultural research.

The most serious governmental limitation is a weak administrative tradition, as evident in agriculture as elsewhere. Improving administrative efficiency is a difficult task, but it must be undertaken if program implementation is to be effective. In agriculture, the faults of this administrative tradition are compounded by urban oriented administrators. Since few rural areas have schools adequate to qualify students to be government employees, the majority of administrators come from the cities. Among lower level employees, low salaries and the weak administrative tradition make problems of establishing impartial, honest administration very difficult. Improvement of administration will not be easy, though it is generally recognized that administrative reforms are needed.

In recent years there appears to have been substantial transfer of capital out of agriculture, mostly by absentee landlords. On the other hand, there is evidence to indicate that small owners have been increasing their investment in production requisites and light irrigation machinery. Furthermore, where favorable price relationships and political environment prevail, there has been substantial investment financed by urban-owned capital. This trend is illustrated by such enterprises as tractor cultivation of wheat on dry land and commercial poultry production for urban consumption.

Opportunities for Change

Despite the many seemingly insurmountable obstacles, there is reason to be hopeful about the prospects for Iranian agriculture. In the countryside the feeling is that change *ought* to come and that it *must* come. The land reform is introducing a climate of change. The psychological groundwork is thus laid for introducing new techniques and crops as more information becomes available to cultivators and a suitable economic and institutional environment is created. Capital for agricultural and industrial uses coming from oil revenues is adequate, so there is no need to emphasize increased agricultural exports to earn foreign exchange. Agricultural development can be directed toward the much simpler problem of increasing food and raw material production for domestic consumers and producing crops that replace commodities now imported.

The responsiveness shown by some parts of agriculture is encouraging. A rapid acceptance of cotton and shallow well pumps by peasant farmers shows the Iranian cultivator is receptive to new techniques and indicates that far-reaching changes can occur when circumstances are right.

One rather unusual opportunity exists now to expand wheat production cheaply by extending the tractor cultivated lands in certain areas where such crops are otherwise uneconomic for peasant cultivators who must depend on draft animals. Although this offers an important potential, it also opens the way to serious soil erosion. There could also be unfavorable employment effects if tractor cultivation were widely extended from presently submarginal land to land now cultivated by tenant farmers using draft animals.

APPENDIX II: Iranian Agricultural Development Objectives

The objectives of agricultural development in Iran during the third plan period naturally influenced the character of the general agricultural development program and provided the test for each program. The objectives for agriculture were derived, in turn, from the overall national objectives of economic and social development for the country, established with Cabinet approval.

National Development Objectives

Briefly, the national development objectives were (1) to achieve a sustained annual rate of growth of 6 percent in gross national product while maintaining reasonable price stability; (2) to create an optimum number of employment opportunities; and (3) to promote a more equitable distribution of income. These national objectives were established outside the agricultural planning group, but corresponded with the views of government administrators responsible for the growth of agriculture. The objectives for the agriculture plan followed from these national objectives. The national goals governed the general form of the agricultural objectives and thus the development program, established the broad limits of the agricultural program, and had major influence on the relative emphasis within the agricultural program.

Agricultural Development Objectives

Given the national objectives and constraints imposed upon agriculture by the cultural and physical environment, three major national agricultural development objectives were established: (1) to increase production at a pace adequate to provide the food and industrial raw materials from agriculture needed by the nation to support a 6 percent annual growth in the gross national product while maintaining reasonable price stability; (2) to improve the levels of living of rural people; and (3) to achieve more equitable income distribution within agriculture.

Listed in order of priority, these objectives amount almost to a restatement of the national development goals, but are phrased in such a manner as to be applicable to agriculture.

It is noteworthy that employment considerations were not taken to be an important objective in planning the agricultural program. Rather, greater productivity was stressed and little attempt was made to increase employment opportunities. On the other hand, the agricultural program placed more emphasis on raising the living standards of the rural population than did the overall national development program.

When planning is used as a tool to accelerate economic growth, it is important to maintain a reasonable balance among the objectives as the program proceeds. Each objective might, therefore, be qualified by a statement like "to the extent desirable." Social and economic objectives have an element of incompatibility between them. A program, such as making credit available to increase the area under tractor cultivation, may be an effective device to advance agriculture toward its first objective of increased production. At the same time, it may further concentrate wealth in the hands of a few large operators, and thus conflict with the objective of more equitable income distribution. Such conflicts posed some of the most difficult problems in working out the agricultural program. They were either resolved, or a balance between progress toward one objective versus progress toward another reached, by appeal to the national objectives and to the relative emphasis placed upon them in the national context.

Of course, most programs contributed to more than one objective. Thus, the agricultural credit program was intended to do more than just help increase total production, although that was the dominant consideration. Credit cooperatives were emphasized in an at-

tempt to improve income distribution within agriculture by placing government-controlled credit in the hands of small owner-operators and tenants. To this end, changes in loan procedures and regulations were recommended. Virtually every program had a similar multiple purpose which contributed to the particular form proposed.

Increasing Production

The first objective—that of increasing agricultural production fast enough to meet the nation's needs—was also the most important.

The demand projections for agricultural commodities set the dimensions of this objective and gave it an operational meaning. From these projections it was possible to estimate the quantities of various commodities needed by the nation if the gross national product were to grow at a rate of 6 percent. In this manner the agricultural production objective was derived and integrated with the national development objectives. The individual programs were developed by first determining the range of alternative approaches which would permit reaching the production objective as defined by the demand projections. Then those alternatives were chosen which would reach this objective (or as nearly as administrative and physical limits permitted) and yet at the same time promote improved levels of living and more equitable income distribution. The form of the plan frame reflected the primary importance attached to achieving the production objective. It was organized on a commodity-by-commodity basis with supporting programs placed close to the commodities with which they were most directly concerned.

Greater agricultural production was to be achieved primarily through increases in the productivity of existing agricultural resources—labor, land, and capital. It was decided, for instance, to raise wheat output by increasing the area planted with improved seed rather than by building large dams to extend the irrigated area. Rising productivity not only will increase the quantity of agricultural products available to the nation; it will also help improve rural levels of living, especially when coupled with the anticipated migration out of agriculture. The concentration on extension and credit in contrast to the reduced emphasis on river development also illustrates this orientation toward increasing productivity of existing resources. The number of local extension agents was expected to double by the end of the plan. The lending capacity of the Agricultural Bank was planned to expand more than three times.

How this focus on increasing productivity will affect income distribution cannot easily be foreseen. The programs in the plan frame were designed with the hope that increased labor productivity would result in a more equitable distribution of income. But institutional impediments reduce the effect of rising productivity of land, and increases in capital productivity may outstrip those of labor productivity and actually lead to a worsened income distribution.

In preparing plan programs, great stress was laid on making available to individuals the resources, information, and factors of production they needed if they were to increase their own output and to raise their own incomes.

Finally, a land tenure program envisioned a landlord-tenant relationship where rights would be more clearly defined and less subject to arbitrary change on short notice at the will of the landowner. The broad land transfer program now under way goes well beyond what was thought politically feasible in the early stages of plan preparation. With more widespread peasant ownership and greater security of tenure, it would be reasonable to expect that individual peasant farmers would have the incentive to reorganize their factors of production and their enterprise combinations to realize substantial increases in production and productivity.

Improving Rural Living Standards

The second objective of agricultural development was to improve the level of living of the rural people. Standards are expected to be raised principally through increasing rural income by increasing rural productivity. It is also anticipated that the agricultural extension service will be effective in helping rural people adopt simple, low-cost changes in their household practices which can improve their health and home environment.

During the plan period the prices of agricultural commodities were expected to rise relative to other commodities produced and sold in the society. However, it was believed that the price increase would not jeopardize the reasonable price stability included as part of the growth objective. That is to say, it was anticipated that the terms of trade for agriculture would become somewhat more favorable during the plan period than they had been in the immediate past. Several factors were expected to contribute to this. First, the 6 percent growth in the gross national product planned for the nation as a whole was a somewhat faster rate than the anticipated growth of

agricultural production of 4.1 percent per year. Given the elasticities of demand for agricultural products and the anticipated national population increases, demand at constant prices was expected to exceed the production of agricultural products as a whole, and relative prices were thus expected to rise. Expected to contribute to a relative increase in rural incomes was the recommendation that the government abandon its policy of trying to hold wheat prices below market levels, a policy which benefitted the urban consumers at the expense of the rural sector. If other prices remain stable, this change would result in a rise in the price of wheat, putting domestic prices more nearly in line with the world market.

The production objectives, plus the expected tipping of the terms of trade in favor of agriculture, implied higher earned real incomes and improved levels of living for farmers—providing the growth in rural population does not more than offset the increase in production. Population analyses prepared by the Division of Economic Affairs indicated that there would be a net increase in rural areas during the plan period of about 5 to 7 percent. Total agricultural production in the same period was planned to rise 22 percent. Average income in agriculture, therefore, was expected to rise; and unless excessive transfer of capital out of agriculture occurs, average levels of living would also increase.

Living levels in rural areas were expected to improve as a result of general economy growth even apart from the anticipated gains in the agricultural sector. Total population was expected to grow at a rate of about 2.5 percent per year. If the gross national product increased at the expected rate of 6 percent per year, there would be a general increase in personal real income, allowing for even greater expenditure on foreign capital goods.

Finally, during the plan it was hoped to reduce or possibly reverse the flow of capital from agriculture to the other sectors. Several government agricultural programs were designed to increase investment in agriculture, notably the small-scale irrigation program and the agricultural credit program. The agricultural machinery program, the planned rise in the relative price of wheat making dryland cultivation more attractive, and a fertilizer program were also expected to help curtail capital flow from agriculture. To the extent that transfer of capital from agriculture is reduced, levels of living in agriculture may be expected to benefit. In agriculture, although there is some lag between increased capital investment (or decreased disinvestment)

and the results in terms of greater production, the gestation period is relatively short. In many programs increased investment will result in greater production within the first one to three years.

More Equitable Income Distribution Within Agriculture

The third objective of agricultural development in Iran was to facilitate more equitable income distribution within agriculture. No more than a start was expected to be made during the plan period.

One plan program to improve income distribution within agriculture was that of improving the land tenure structure. The land transfer program currently being implemented should make a substantial contribution to this objective. Land transfer will increase the immediate income of most former tenants because their payments for land purchase generally will be less than their former share payment. Once they complete their purchase payments, they will have the whole income stream from their new holdings. In addition, the land transfer program will both improve income distribution within agriculture by giving new owners greater incentive to increase their investment, and improve their productivity since all the increased income arising from their efforts will be their own. Not only will the level of living of former tenants be improved, but also their income relative to others engaged in agriculture. Thus, more equitable distribution will result.

The income distribution objective shaped several other programs. In the agricultural credit program, the maximum possible emphasis was put on credit to be distributed through cooperatives lending to small owner-operators and to tenants. The only limit was the ability of the Agricultural Bank to administer the program. The Agricultural Extension Service was judged important because it could reach small farmers and tenants in their villages and help them increase their efficiency and thus their incomes. In both instances, it was felt that the effect of the programs would be to increase the income of the small farmer and tenant relative to the large absentee owner.

There is, of course, a limit to the scope of such programs and the emphasis they deserve if adequate growth is the objective. For example, despite the stress laid upon expansion of agricultural credit through credit cooperatives, more actual money was programmed to be lent through the direct credit program than through cooperatives. Even this, however, may have some effect on improving the distribution of income in agriculture. The past history of the credit program

112 AGRICULTURAL DEVELOPMENT

indicated that some 60 percent of the value of loans under the direct credit program was less than the equivalent of US\$1,300.

One device for achieving a more equitable income distribution during the plan period was intentionally avoided. Subsidies might easily have been used as a direct means to transfer wealth, but were not proposed for that purpose. Eventually, several subsidies were recommended—such as those to produce improved seed and administer public programs—but these were intended to encourage greater production, not equalize income distribution. It was expected that those subsidies would help increase general levels of living within agriculture, but have little impact upon the distribution of income.

Another approach to improved income distribution would have been to channel large amounts of agricultural credit and extension effort into the poorer regions of the country. This was not recommended; indeed, the opposite was advocated. In the better endowed regions of Iran (which are also the ones where the cultivators are relatively more prosperous), agricultural production potentials of several times the present output can be realized, but this will take the full efforts of the government's services for decades to come. In contrast, the poorer regions have very little to offer agriculturally. Some are hardly more than open desert with no possibility of irrigation by present techniques. Even a concentrated government effort there could have little impact on national agricultural production. In these areas, the proper approach is to accelerate movement out of agriculture at a more rapid pace than elsewhere in the country. Politically, this is a hard decision to make, but given Iran's desire for development and its limited resources, it appears logical and efficient.

Major Agricultural Policy Guidelines

A number of criteria guiding agriculture program choice could not be thought of as objectives, but rather as policy guidelines to be used when they would not conflict with more basic objectives.

Employment Effects

One of the social objectives of the third plan is to create more employment opportunities. This was not translated into a principal agricultural development objective. Studies based on population structure, growth, and migration patterns indicated that the number of

workers in agricultural occupations would increase about 7 percent by the end of the plan. This meant that there was no possibility of reducing underemployment in agriculture by reducing the number of workers. However, this rate of increase was not deemed large enough to force program choices which emphasized increased employment at the expense of greater production and higher levels of living.

Although employment opportunities have played a part in the selection of the program alternatives, emphasis has been placed on programs which increase labor productivity. It does not appear that, given the projected 22 percent growth of total production during the plan period, the rate of change in labor productivity in agriculture will be of such a magnitude that a worsening of the underemployment problem will result. Generally, program alternatives were chosen which would increase labor productivity by increasing the output from the same or more man-days. Programs emphasized such alternatives as better and more intensive cultivation, fertilizer application, and winter feeding of livestock. These program alternatives were expected to lead to increased labor productivity as a result of increasing output per man-day expended but, nonetheless, require more man-days per hectare or per holding.

The program choice most influenced by concern about employment involved large power equipment—primarily tractors and combines. Little additional dry land in Iran is economic to cultivate by the use of draft animals and traditional labor-intensive techniques. But there are great expanses of presently submarginal land which can be profitably cultivated with large power equipment. In recent years there has been a substantial government-subsidized credit program to finance import of large machines through dealers who agree to provide certain minimum servicing standards. This program met with a favorable response and resulted in a notable rise in imports and improved servicing. On the other hand, if too many tractors and combines are imported, there is the danger that some tenant farmers will be displaced from their present holdings. Already in 1962 there were cases where landowners were mechanically cultivating tracts of land formerly tilled by peasants. There was no evidence that yields from tractor cultivation were greater than those from traditional methods. Indeed, they may even have been somewhat less. But shifting to mechanical preparation was economic for the large landowner, provided he did not have to pay compensation to the displaced tenant. If there were adequate alternative employment op-

portunities for tenant farmers, displacement by tractor cultivation would have meant a net gain of efficiency in the society. But Iran was hard pressed as it was to find gainful employment for young men entering the workforce and for those peasants already migrating to urban areas. To add a large number of additional job seekers to the labor market because of a government-subsidized program of mechanical cultivation could only result in increased unemployment and unhappiness with no compensating gain in production. It was, therefore, decided to limit import of tractors and combines to that number necessary to meet the targets for the expanded small grain area. It was hoped that normal market incentives would operate to induce large cultivators to use their new machines to cultivate only new land, not to displace tenant farmers. Should this fail and serious unemployment arise because of too rapid displacement of peasant wheat cultivators, more direct controls would have to be devised.

Although the plan recommended limited imports of tractors and combines, widespread introduction of small power equipment was advocated. It was hoped that this equipment would encourage increased total production yet also reduce unemployment. Small power equipment—particularly sprayers—can greatly increase production and quality and at the same time often raise total labor requirements by adding new cultivation activities to the farm enterprise.

Market Intervention and Subsidy

Broad scale market intervention on either the product side or the factor side was not recommended in the agriculture program. The suggestion that the government should stop artificially depressing wheat prices to the benefit of urban consumers has been noted. A subsidy was recommended for wheat seed in the hope that this would increase its use. It was proposed to exchange improved seed for local wheat on a one-to-one basis and absorb the added production costs for the better seed. In addition, a subsidy was recommended to pay the internal transport costs for chemical fertilizers in the hope of exploiting what was assumed to be a rather high price elasticity of demand.¹ Not only can fertilizer increase yields, but it can serve as a spearhead for attitude changes toward other technological innovations.

¹ Unfortunately, there were no studies in Iran which could give concrete information about elasticity of demand for chemical fertilizers. The program was recommended on the basis of an analysis of field workers' reports.

A very substantial indirect subsidy to agriculture was recommended in the form of a low interest rate for government administered agricultural loans. The capitalization of the Agricultural Bank was an interest-free deposit from the central government. Without becoming enmeshed in trying to determine the "true" government interest rate, it can be noted that this money probably could have earned a greater return for the national treasury if placed elsewhere or used to reduce interest-bearing government debt. Agricultural Bank loans to farmers bore 6 percent annual interest. This nearly covered the cost of administering the loans. The true cost of loans to farmers would have been this 6 percent plus some additional amount for interest to be paid to the government. Rather than charge farmers this amount, it was decided to continue the present practice of making available the Bank capitalization interest-free.

Price control measures were not recommended because they would be virtually impossible to administer.

Export Versus Import-Replacing Crops

As a matter of policy, substantial emphasis was placed on expanding production of import-replacing crops but little on expanding export crops. The analysis behind this policy is discussed in the section devoted to comparative advantage.²

Shift to Small-Scale Irrigation Schemes

A review of previous agricultural development programs led to a shift in program emphasis to encourage small irrigation schemes rather than large-scale, multipurpose river development during the third plan. Small schemes include ghanats, shallow and deep wells, small diversion dams and small dams to store irrigation water or increase the rate of percolation and reduce runoff. The program required an intensification of survey activities to identify promising sites for irrigation development and provide the detailed data needed. A shift to small schemes also involves a great strengthening of the Iranian ability to administer irrigation projects. Large dams can economically be constructed almost as a foreign enclave by some international firm. Small

² For a discussion of the assumption that the comparative advantage in Iran lay with increasing production for domestic consumption rather than expanding production of export crops, see Chapter IV, pp. 66-68.

116 AGRICULTURAL DEVELOPMENT

dams and other small-scale irrigation arrangements require much greater local participation and much more effective administration.

Maintenance of Nutrition Standards

The nutrition policy of the third plan was to maintain present dietary levels but not to undertake programs to meet any conscious nutritional improvement objective. In Iran, there appeared to be virtually no malnutrition which arose from a preference for a poor diet composition. Instead, malnutrition, where it existed, could be attributed to insufficient total income and thus to an insufficient total quantity of food. It was anticipated that individual Iranians, as their income rose, would upgrade their diets by personal preference. Certainly the income elasticities for such foods as mutton, fruit, and dairy products support this hypothesis. The production and productivity programs designed primarily to achieve growth in food production are expected adequately to serve nutritional improvement needs.

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These items, some of which are referred to directly in this monograph, have been selected with an eye to their usefulness for the man who must actually be involved in agricultural planning. The professional academic will want to look elsewhere for more extensive and technical lists. This selection places emphasis on relevance, immediate practical usefulness, and style, since anyone engaged in planning will be far too busy to wade through as much dull economic prose as he probably should.

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