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THE EGYPTIAN MORE AND BETTER FOOD PROJECT: NUTRITION IN
INTEGRATED RURAL DEVELOPMENT

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THE EGYPTIAN MORE AND BETTER FOOD PROJECT: NUTRITION IN
INTEGRATED RURAL DEVELOPMENT

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The aim of this thesis is to examine the role of nutrition in Integrated Rural Development (IRD) strategies, both as a goal, and as a measure of their impact. The thesis explores the proposition that by orienting project resources explicitly towards improving the living conditions of the rural poor, nutritional objectives may increase the likelihood that the equity goals of IRD are met. Several studies have suggested that such considerations as who benefits from project resources, expressed in nutritional and socio-economic terms, and how those benefits accrue, may give IRD an orientation towards poverty alleviation it might otherwise have lacked.

To explore the proposition, the researcher spent three months in Cairo, Egypt at the National Research Center, studying the potential nutritional impact of the More and Better Food (MBF) Project. This project is one of the few IRD projects that has incorporated explicit nutritional objectives into project design and evaluation. It began in 1978 in two villages in Lower Egypt, and included a variety of agriculture-related income-generation components. The researcher reviewed project documents and background papers on

rural Egypt, and interviewed the various professionals involved in the project since its inception. She had however only limited opportunity for discussion with project participants, due to logistical and time constraints.

The findings suggest that if malnourished subgroups of the population are to benefit from an IRD project, components must be specifically designed to fit their needs. Information is therefore needed on their nutritional and socio-economic status, their main sources of livelihood, and their perception of their problems. The analysis also suggests that unless the processes set in motion by the project are self-sustaining, they will not have a long-term impact on nutritional status or on living conditions of the rural poor in general. A long-term impact depends on malnourished groups achieving greater access to productive resources and thus gaining more control over their lives.

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BIOGRAPHICAL SKETCH

Rebecca Miles Doan was born in 1955 in Bryn Mawr, Pennsylvania. She grew up in Venezuela, Northern France, and Tunisia, where her father worked for Firestone Tire and Rubber Company. She graduated from Harvard University in 1977 with a B.A. in History and Science. The topic of her thesis was an historical analysis of the rise of clinical medicine in the Byzantine and Islamic Empires.

She worked and travelled in the Middle East for three years after graduating from college. For a year, she taught in a private school on the West Bank of the Jordan, and for two years helped to administer the American Friends Service Committee Pre-School Project in the Gaza Strip. She then returned to the U.S. to work in Washington D.C. as an educational counselor for Palestinian fellowship students in the U.S.

In August 1981, she married Peter Doan and they both entered the Cornell Department of City and Regional Planning in September. Her program at Cornell focussed on policy and project analysis for international development, with a particular emphasis on social policy and nutrition. She completed the requirements for the degree and graduated in May 1983.

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Chapter I

INTRODUCTION

The More and Better Food Project, implemented to date in two Egyptian villages by the Egyptian National Research Center, embodies an innovative and promising approach to achieving the equity goals of Integrated Rural Development. The project design explicitly identifies the improvement of nutritional status as one of the main objectives of the agriculture-related components. The project rationale assumes that improved farm productivity in a broad sense will increase the real incomes of families dependent on agriculture which will in turn lead to an improvement in nutritional status. The latter is assumed to be brought about either through an enhanced ability to purchase food in the market, or through an increase in consumption of home grown produce. Nutrition is incorporated into the project both as a goal and a measure of development processes oriented towards the rural poor.

The objective of the present analysis is to assess the likelihood that the More and Better Food (MBF) Project, as designed and implemented, will have a positive impact on the populations of the two pilot villages, and to suggest ways to enhance its potential impact. It is based on the researcher's three-month stay at the National Research Center in Cairo in

the summer of 1982. There, she had the opportunity to interview many of the NRC scientists who have been involved in the project from its inception. She also met with the U.S. National Academy of Sciences (NAS) and the U.S. Agency for International Development (USAID) representatives who have supported and worked with the project over the years. Unfortunately, she had only limited opportunity to interview the intended beneficiaries of the project: the villagers in the two pilot areas, Omar Makram and Kafr el Khadra. Any further study of the impact of the MBF Project should include a more systematic investigation of the experiences and views of the villagers.

The analysis that follows therefore depends heavily on the impressions of NRC scientists, on studies of conditions in rural Egypt in general, and on reports of similar projects in other countries. It is not intended to be a definitive statement of the nutritional impact of the project. Indeed, since the project began only four years ago, it would be too early to expect a measurable impact on village living conditions. Instead, this assessment is intended to review the project rationale in light of experience to date, and to provide reinforcement for those self-sustaining processes which the project might set in motion to improve the status of the malnourished groups in the villages.

Following is a brief description of the project and of the main parameters of rural development in Egypt. These are

intended to set the stage for a conceptual discussion of nutrition in Integrated Rural Development (IRD) in Chapter 2, followed by an analysis of the nutritional considerations in the MBF Project in Chapter 3. Chapter 4 completes the discussion with suggestions for improving the contribution of the project to better nutrition for the village populations, and a summary of problems and opportunities for nutrition in IRD.

THE MORE AND BETTER FOOD PROJECT

The MBF Project has three main goals for its village-level activities: (1) to increase agricultural productivity, (2) to increase farm-related income-generation possibilities, and (3), to improve the nutritional status and general welfare of the village populations. The rationale implicit in the design assumes that families with increased income would purchase more food and thereby improve the nutritional status of members of the household. In addition, it assumes that increased agricultural productivity, in particular of food crop, livestock, or poultry production, or of food processing, would increase the total supply available for home consumption, thereby also increasing the opportunity for improved nutritional status without the mediation of the market.

The opportunity to implement this project arose in March 1977, as a part of the broader Applied Science and Technology

Program, funded by USAID. The Executive Committee of the More and Better Food Project decided to begin its work in two rural Egyptian villages: Omar Makram whose land was reclaimed thirty years ago from the Western Desert, and Kafr el Khadra, a traditional agricultural village in Menouieh Province in the Nile Delta region. Omar Makram is in an isolated area at a distance of 130 km. from Cairo, whereas Kafr el Khadra is only 50 km. away. The project design provided for interdisciplinary teams of NRC scientists to initially review the agricultural, nutritional, and socio-economic conditions in the two villages and recommend various sub-projects. To date, those implemented have included mainly field and vegetable crop activities as well as several demonstration centers aimed at providing increased food supply and/or income-generating opportunities for agricultural families.

The field and vegetable crop sub-components have involved at different times the main crops in the two villages: peanuts, wheat, and maize in Omar Makram, and maize in Kafr el Khadra, as well as experiments with growing tomatoes on stakes and wires, potatoes, onions and beans. In each case, the NRC entered into a cooperative agreement with several farmers to try out an improved "package" determined on the basis of research and discussion with the farmer. This usually included a new, high-yielding seed variety, new fertilizers and/or pesticides, as well as different cultivation techniques when these were appropriate. The NRC subsidized the costs

incurred by the first participating farmers, i.e. those taking the initial risk. Once a new technique had proven itself, the NRC continued to accept new participants in the project but did not subsidize them. The NRC did however continue to procure inputs unavailable locally, and to advise farmers as they tried the new methods.

The sub-projects involving demonstration centers were of a different nature. Model apiaries, poultry confinement areas, and dairy processing centers were set up in both villages. In Kafr el Knadra, a center for raising silk worms, a traditional activity that had almost died out, was also established. Each center was centrally located, and provided training and assistance to any villager who requested it. In some cases, the NRC provided loans to help the producers get started. Therefore, many villagers potentially had access to project benefits in the way of information and training, and a smaller number actually received subsidized inputs over the experimental period.

Which sub-projects were implemented mainly depended on the organizational ability of the NRC teams and their success in identifying with the farmers, a problem to which a solution could be found. Once interest in the project was confirmed and the initial agreement defined, a Principal Investigator and his research team submitted their proposal to the More and Better Food Executive Committee. Subprojects were therefore implemented at different intervals, depending on the interest

of the villagers , the availability of funds, and the ability of the scientists to effectively organize any sub-project. The Project faced many logistical difficulties trying to run projects in the two villages, from the NRC in Cairo. The poor road conditions, and the lack of NRC facilities -- office, field testing sites, guest house -- in the rural areas, all presented obstacles. Unlike the Nutrition Institute of the Ministry of Health or the Irrigation Research Institute of the Ministry of Agriculture, the NRC does not have established linkages with the governorate-level infrastructure such as the extension service, the health clinics, or regional research centers. Building effective working relationships with government officials at the local and national levels was therefore an integral part of project activity.

Despite the difficulties and constraints, the project has, over the past four years, offered technical assistance to several hundred agricultural producers in the two villages. To date sub-projects have sought to deal mainly with the first two goals of the project: increasing food production and helping to build income-generating opportunities in the villages. The third goal, improving nutrition, has not yet been explicitly addressed in program implementation. Options for direct nutritional interventions have been considered and tested at various levels; thus far, the NRC has carried out small-scale interventions to combat some immediate health problems, and tested the acceptability of high-protein snacks

for school children. These activities have not been widely implemented since it is not clear that they are either the most appropriate or the most cost-effective uses for project funds. Research efforts, of which this one is a part, have been carried out to assess the nature of the nutritional problems in the villages, and to examine the likelihood that the income-generating projects will modify these conditions.

As will become apparent, the MBF Project is similar in design to other projects referred to as Integrated Rural Development projects. It differs primarily in that it attempts to incorporate an explicit concern for nutrition into a project that mainly stresses agricultural production and farm-related income generation. The MBF Project grows out of Egypt's long experience with rural development but represents the NRC's first attempt at pilot efforts in the rural areas. It reflects the NRC's growing concern for orienting its research agenda towards problems of relevance to the socio-economic development of Egypt. Indeed, over the past ten years, NRC managers have been increasingly concerned about the mainly academic nature of its scientific research. Not unlike their colleagues around the world, NRC scientists have tended to do research that would win them international recognition through articles published in international journals. This sort of incentive system brings into question the appropriate orientation of public research and raises the issue of whose demands it should be responsive to. NRC

managers have tried to reorient the reward system such that it is not only basic research publishable in journals that is recognized but also applied work of use to the nation.¹ The Applied Science and Technology Project of which MBF is a part, provided the NRC with the funding to support and reward applied research. It is funded by USAID and coordinated by the NAS.

MAIN PARAMETERS OF RURAL DEVELOPMENT IN EGYPT

Egypt has had a long history of policies and programs aimed at improving living conditions in the rural areas. With only 4% of total land area usable for agriculture, a population estimated to have doubled since 1947, and an alarming dependence on food imports, Egypt has consistently encouraged investment in food production. Unlike many other countries, it has also carried out redistributive policies along with programs to increase national productivity.

Indeed, the land reforms of 1952, the government support for agriculture through the cooperative movement, and the vast food subsidy programs, reflect the government's ongoing concern for social welfare and for protecting the incomes of small farmers. One writer suggests that the concern for the welfare of the rural areas comes from the fact that many

¹ For more information on the efforts of the NRC to orient its research towards national development issues, see Lewis, D. et al., The Technical Challenge of Development: Managing Research in Egypt (forthcoming), and Doan, P. L. End-User Participation in Research in Egypt (forthcoming).

policy-makers are themselves from the countryside.

A large proportion of the present technical, intellectual, and political leadership of Egypt consists of 'sons of the soil' without whose migration national political development would have suffered, and without whose pressures for rural land reform and development the villages of Egypt would have remained as ignored and ignorant as they have been for centuries.²

The redistributive policies also reflect the government's orientation towards central planning and a development strategy that requires the agricultural surplus to subsidize a nascent industrial sector. Rural development policies have therefore often been implemented to decrease the rate of rural-to-urban migration, to keep urban wages low, and to hold down domestic food prices. Direct government intervention in these areas has had and continues to have major implications for rural development in Egypt. A brief discussion of these in the introduction should help to clarify the issues to be raised in the context of the MBF Case Study in Chapter 3. The discussion will not attempt a thorough analysis of the Egyptian situation but rather will outline the major factors affecting food production and consumption in the rural areas. For greater detail, the interested reader should refer to the wealth of writings by Egyptian scholars and others, tracing the history of agricultural development, the impact of land reform policies and the cooperative movement, and present day rural development.³

² Abu Lughod (1972), p.317.

³ See Abdel-Fadil (1975), Radwan and Lee (1977), Harik (1979),

Egyptian farmers and their families have been employed for generations on the 4% of Egypt's land area that is cultivable, located in a narrow strip along the Nile and in the Nile Delta. This land is highly productive.

The soils are mostly riparian silts and clays of great depth, fertility, and uniformity. The topography is such that erosion is not a problem and land is well suited to irrigation. Abundant water of good quality flows down the Nile and is distributed to farms through a well-developed storage and distribution system... Such a mixture allows cropping intensities of 190 percent, with higher yields than many other countries, in a complex rotation of crops developed over many generations.*

It is not surprising then that Egypt is still so dependent on the agricultural sector. Within the agricultural sector, production is characterized by a majority of small land-holders and a minority of larger farmers.

About 85 percent of the farmers, using bullock and human labor, work their three feddans or less for both the marketplace and their own consumption. The other 15 percent use varying amounts of machine technology to produce single-purpose crops specifically for off-farm sale.⁵

Since 1952 when Nasser came to power, the government has introduced a variety of measures to overcome the problems of small-ness of land-holdings and poverty and to maintain farmers' incomes. At about the same time, the government began a food subsidy system as a means towards greater equality between rural and urban areas.

Ikram (1980), and Richards (1982).

* Ikram (1980), p. 169.

⁵ Ibid, p. 170.

Most writers agree that the land reforms of 1952 and the cooperative movement were successful in weakening the traditional power structure in the rural provinces, but only temporarily slowed the pace of fragmentation of land-holdings and rural poverty. In 1952, land-holdings in excess of 200 feddans, then 100 and then 50, were "requisitioned by the government for distribution to tenants in plots of at least two, and not more than five, feddans per family."⁶ Concurrently, the government initiated the multi-purpose cooperative system "which enabled groups of small farmers to pool their work on fragmented parcels of land and provided a reliable channel of credit from the banks."⁷ They provided seeds and fertilizer on credit, and were reimbursed by sale of the produce. Members were responsible for cultivating their private plots but the cooperative retained responsibility for pesticide spraying and sale of the produce.⁸ They were jointly run by officials from the Ministry of Agrarian Reform and at least initially, by a board elected by reform peasants. This reflected the views of Nasser, the country's leader from 1952 to 1970, that the bureaucracy and not the official political party should be relied on to implement national goals.⁹

⁶ Ikram (1980), p.211.

⁷ Ibid, p.212.

⁸ Harik (1972), p.295.

⁹ Ibid, p.301.

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The effects of government intervention in agriculture have been mixed. On the one hand, the cooperative system allowed fragmented land-holdings to be farmed in large, contiguous areas with machinery and services provided to groups of farmers. The experiment with consolidated crop rotation and application of pesticides, in particular to the cotton crop, had proved successful.¹⁰ In addition, land consolidation and the cooperative system at least initially, seems to have kept the fragmentation of land-holdings from having adverse effects on the economy.¹¹ Furthermore, public investment in agriculture has been considerable: the Aswan High Dam for example has allowed for intensification of farming.

However, the solutions of the 50's and 60's have created their own set of problems, only a few of which will be mentioned here. The cooperative system gave the government control over the agricultural surplus; the latter often left the rural areas to pay for economic development in other sectors. Furthermore, land reform only temporarily slowed the decrease in size of land-holdings and the poverty associated with small holdings. Inheritance customs and rapid population growth contributed to renewed fragmentation. Since the 1952 revolution, the population of Egypt has doubled. "In spite of increases in irrigated land area, improved cropping intensity, and gains from research, the pressure of population on a

¹⁰ Richards (1982), p.18.

¹¹ Harik (1972), p.310.

relatively fixed area of land already intensively farmed has resulted in declining per capita performance."¹² The inflexible and frequently conflicting price controls imposed by the government through the cooperatives, undermined the profitability of government-controlled crops (fruits and vegetables have not been thus far subjected to controls and so are currently among the few highly lucrative crops for farmers who have the capacity to market them); the heavy implicit taxation of agriculture that this represents has depressed rural incomes to perhaps half the level of urban incomes.¹³ Government control of agriculture has therefore worked to the disadvantage of the cultivators and has contributed to the decline in agricultural productivity.

The inability of the agricultural sector to keep up with the rising demand for food, coupled with sustained pressure on the urban areas due to high rates of rural-to-urban migration, have had major repercussions for the government's consumer subsidies program. As mentioned earlier, the Egyptian government maintains a vast subsidy program in order to ensure that the prices of essential commodities are kept at affordable levels for all. These subsidies are particularly crucial for the poor as a protection from major deprivation.¹⁴ Vast quantities of imported foods, along with goods procured

¹² Ikram (1980), p.172.

¹³ Ibid, p.205.

¹⁴ See Alderman (1982) for a comprehensive description of Egypt's food subsidy program and its effects.

from domestic producers, are distributed in the urban areas and in most rural areas, at subsidized prices. They include wheat bread, various qualities of wheat flour, meats, lentils, beans, rice, sugar, cooking oil and tea. The latter four are sold through a ration card system based on family size, whereas the former are sold at government cooperative stores. The subsidies represent a significant portion of many people's real incomes.

Although many analysts deplore the strain that such high levels of subsidies places on the national economy, it is not likely that the government will consider any major restructuring in the near future. Indeed, any attempts to eliminate the subsidies "could trigger major social tensions and lead to disturbances, as occurred in January 1977."¹⁵ At that time, mass riots occurred as a result of the government's attempts to reduce subsidy levels. Thus, the political investment in these programs is high, making them difficult to change. Nonetheless, the government is concerned about the fact that a large proportion of the subsidies are dependent on imported foods or food aid from the U.S. Therefore, one of its main priorities is to encourage greater food production within Egypt to reduce dependence on imports and increase food security.

¹⁵ Ikram (1980), p.50.

Although agricultural policies in Egypt are set at the national level, implementation at the regional and local levels varies significantly. Indeed, not all areas are subject to the same crop rotations, nor are all subsidized foods equally available in all areas at all times. The MBF Project therefore has had to take into consideration the effect of government intervention in agriculture, and the extent to which the project beneficiaries depend on government subsidies since both are likely to influence production and consumption decisions at the household level. In addition, questions have arisen with regards to the effect of migration, remittances and fragmented land-holdings on income and employment patterns in the project areas. The literature suggests that employment rather than productive assets, may be the main source of income given the rapidly growing population and a fixed supply of arable land.¹⁶ As will be discussed at greater length in Chapter 3, given its small scale and the flexibility of its design, the MBF Project has been able to effectively overcome some of the constraints to increased production for small farmers; other obstacles however are more difficult for an isolated project to rise above.

As will become apparent in Chapter 2, although the national context is unique, the MBF Project has many elements in common with Integrated Rural Development projects in general: an emphasis on the agricultural sector including non-farm sources

¹⁶ Radwan (1977), p.56.

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of income, as well as a comprehensive approach to improving rural living conditions. It also shares many of the difficulties faced in implementing a multi-disciplinary project oriented towards benefitting small producers. It differs primarily in that it incorporates the special interests and orientation of the implementing institution: an explicit concern for nutrition, an emphasis on research, and an organizational structure based in Cairo rather than in the field.

It is the innovative idea of including nutrition as the main component addressing rural living conditions, that is of interest in this thesis. Therefore, Chapter 2 introduces the theoretical guidelines for including nutritional considerations in Integrated Rural Development, beginning with an analysis of the IRD concept as it appears in the literature, and culminating in a discussion of how nutrition might contribute to the success of IRD strategies in reaching their stated objectives. It combines concerns both for appropriate action and for reflection through data collection and analysis, such that larger problems and potential structural obstacles, such as those discussed in this chapter, are not overlooked.

Chapter II

NUTRITION IN INTEGRATED RURAL DEVELOPMENT: AN APPROACH TO EQUITABLE CHANGE

INTRODUCTION

Integrated Rural Development is a concept that has intrigued experts from a variety of disciplines and perspectives as they search for alternatives to the growth policies characteristic of the first half of this century.¹⁷ The result is a very colorful, innovative but disjointed array of projects, all referred to at some point or another as Integrated Rural Development (IRD). The More and Better Food Project then is but one of many, sharing with others some of the core elements of IRD, but incorporating an innovative approach: the integration of nutritional considerations.

As background for the detailed analysis of the More and Better Food Project in Chapter 3, Chapter 2 introduces in the first section the three core elements of an IRD strategy: the simultaneous attack on the causes of rural poverty, a coherent rationale for design and evaluation, and an overall objective of reaching the rural poor. It points out that integration refers both to a characteristic of project design and

¹⁷ For analysis of the experience of donor agencies in IRD see the USAID study Development Information on IRD (1978), and USAID (1980); for a critical perspective, see DeJanvry (1981) especially pp.224-252.

organizational structure. The first section goes on to review the main controversies that enliven debates on IRD: Basic Needs vs. Structural Change, Simple vs. Comprehensive, Small vs. Large, New vs. Old, Blueprint vs. Process.¹⁸

The second section of Chapter 2 addresses the question often asked of people associated with the More and Better Food Project: why nutrition? Both the advantages and disadvantages of a focus on nutrition are addressed in the second part of the chapter. The reader is then left with some reflections on how theory and experience to date might guide the incorporation of nutritional considerations into a project such as MBF which is explicitly oriented towards the rural poor.

IRD: A CONTROVERSIAL CONCEPT

Integration of Design and Evaluation

IRD grew out of a major shift in development theory beginning in the mid-1960's. John Conen, in his article entitled "Integrated Rural Development: Clearing Out the Underbrush", briefly summarizes the transition.

Widespread acceptance was given to the view that for many less developed countries agriculture can be the major engine for growth... and increased recognition was extended to arguments that small scale farms can play a major role in agriculture-led development... Moscher's pragmatic conception of the interrelated components necessary to create a progressive rural structure, and new theoretical guidelines developed by social scientists and donor

¹⁸ The latter four labels have been borrowed from USAID (1980).

policy-makers for making the rural sector a key to development, have led to the emergence of complex, well-funded programmatic efforts in the countryside, the most visible of which tend to be labelled "integrated rural development" projects.¹⁹

Since then, a great variety of IRD projects and programs were tried, all of which addressed a set of issues left out of previous growth-oriented sectoral strategies. IRD projects have ranged from area-wide government programs to village-level projects, from large, multiple-component projects to small, simple ones, from efforts dominated by physical infrastructure to those stressing local participation and control. These have given rise to a variety of working definitions.

There is little agreement in the literature as to the meaning of the concept Integrated Rural Development or as to its operationalization. The lack of conceptual clarity has meant that IRD models embody widely divergent development philosophies, although all share a common orientation towards agriculture and towards the rural poor. As the concept gained the attention of development agencies, "academics promoting increased emphasis on the rural poor were supported by politicians and policy-makers who were aware of the revolutionary potential of poor peasants."²⁰ This basic philosophical difference permeates most discussions of IRD and ensures that "experts" are often talking past each other.

¹⁹ Cohen (1980), p.197.

²⁰ Ibid, p.200.

For the purposes of an overview of IRD such as this one, it seems useful to adopt a comprehensive but general definition of the concept -- one around which there is consensus in the literature -- and then turn to a discussion of the controversies surrounding specific aspects of IRD design and implementation. In the following pages, Integrated Rural Development will therefore be defined as the process of combining multiple development services into a coherent effort to improve the living conditions of rural populations.²¹ This definition highlights the core elements of most IRD strategies: (a) that IRD includes project components simultaneously addressing the various causes of rural poverty; (b) that these components are combined according to a coherent rationale whereby the whole is expected to have a greater impact than the sum of the parts; (c) that the main goal of IRD is to improve the economic and social conditions of the poorest among those who seek a livelihood in the rural areas.

Causal vs. Supportive Linkages

In theory, these three factors provide the basis for achieving integration of project design and evaluation, i.e. for providing a rationale whereby each subcomponent or a strategy enhances the impact of the other, and all are supportive of the final objective: improving living conditions in the rural areas. The United Nations Department of Economic and Social

²¹ USAID, (1980).

Affairs suggests two models for IRD projects, one representing a design whose subcomponents are all linearly related, and the other representing a design with two program objectives that are mutually supportive but not linked.

An example of the first model is the IRD project that was run by the Chilalo Agricultural Development Unit in Ethiopia (1968); it was designed to increase the incomes of small producers and motivate "the local people to assume increased responsibility for the development work by helping them to learn to help themselves, in order to make development a self-sustaining process."²² It may be modelled as shown in Figure 1 since it assumes that greater participation of small producers in the development process through the formation of cooperatives (a), leads to improved productivity (b) which in turn causes their incomes to increase (c). Increased incomes then directly affect rural living conditions (d). The model suggests that (a), (b), and (c) are causally linked to (d), i.e. that greater participation, through the influence of higher productivity and incomes, is the main determinant of living conditions. In other words, the relationship is expected to be linear.

Short-run direct interventions are not included in this model. The final outcome is to improve rural living conditions, as measured by an increase in real income, an improvement in people's access to services, and an increase in

²² United Nations Dept. of Economic and Social Affairs (1978).

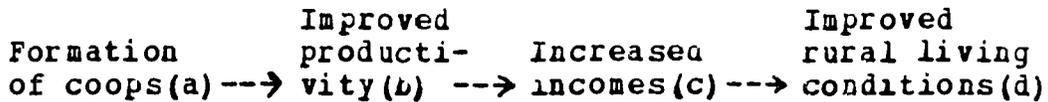


Figure 1: Causal Linkage IRD Model

Source: Adapted from UN (1978), p.4.

their ability to provide for their basic needs. "Basic needs" is usually defined to include two components.

First, they include certain minimum requirements of a family for private consumption: adequate food, shelter, and clothing are obviously included, as would be certain household equipment and furniture. Second, they include essential services provided by and for the community at large, such as safe drinking water, sanitation, public transport, and health and educational facilities.²³

In this model, the project is designed to provide the means whereby a family may enjoy a minimum level of requirements as referred to in the first component of the definition. The next model reflects projects that are designed to directly provide for community-level services, also a component of basic needs.

The Matourkou program in Upper Volta provides a good illustration of the Supportive Linkage model; it included the continual direct provision of services such as health and

²³ ILO (1976), p.32.

education to maintain adequate levels of living. It incorporated two program objectives: raising farm and off-farm productivity and providing for community-level basic needs. The productivity and basic needs objectives were mutually supportive rather than causal, because they were the outcome of two different processes: one was self-sustaining whereas the other required the ongoing delivery of goods and services. The project components causing the two outcomes were functionally separate. Technical assistance for improved cultivation (a), training of extension workers (b), and the establishment of demonstration centers for livestock breeding (c), were all designed to increase agricultural productivity while health and educational assistance (d) was designed to directly provide for the basic needs of the population. The model might appear as in Figure 2 shown below.

Implicit in the model is the assumption that the two program objectives, if implemented simultaneously, will be mutually reinforcing. This sort of strategy attempts to meet both short and long-run objectives. Since it assumes that improved living conditions are necessary for development, the provision of basic needs is built into the model as a parallel component to the production-oriented components.

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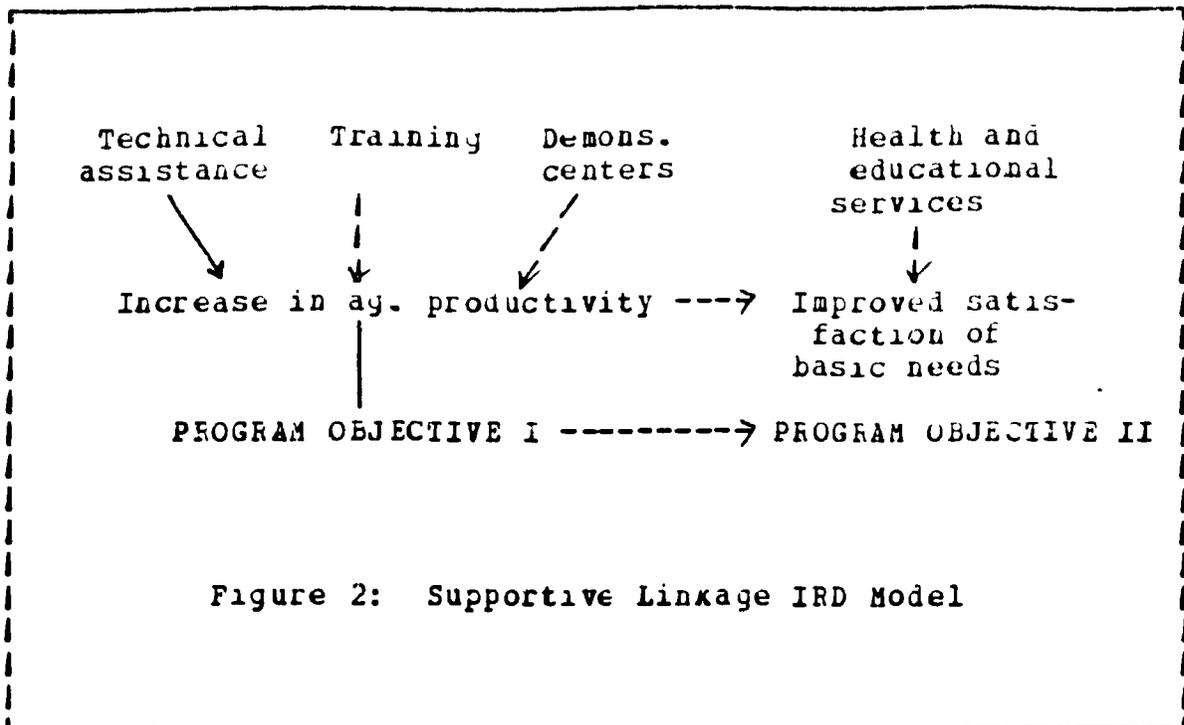


Figure 2: Supportive Linkage IRD Model

Source: Adapted from UN 1978, p.4.

Integration of the Implementation Process

Integration must not only characterize project design but also the implementation process. A good project design does not guarantee that the poor will be brought into the development process. The desired impact depends heavily on a successful project implementation, just as an effective implementation process depends on a sound project design. Integration therefore also refers to the structure of the organization actually in charge of the particular IRD effort in question: the level at which decisions are made, the lines of accountability, the degree of coordination, and the degree of local participation and control.

The clear definition of the terms "integration" and "coordination" provided by a Development Alternatives Inc. (DAI) study, help to separate out the various levels of organization crucial to a successful implementation of IRD.

Integration denotes structure and implies comprehensiveness (a multi-sectoral focus) and control (direct lines of authority). Coordination on the other hand, describes the type of managerial behavior required to produce the results visualized by the designers of an integrated project. The word itself provides a clue to the behavior it describes: "co-" suggests joint or shared activities, while "-ordination" implies the ranking or the establishment of priorities. Establishing priorities includes consideration of the timing, type, quality and services produced. It also includes the distribution of implementation responsibility. The joint effort refers to sharing resources and information to guarantee the needed mix of goods and services.²⁴

In an integrated organization, people from different disciplines are all accountable to the same project manager who ensures the appropriateness of the opportunities being offered to the participating populations.

Effective integration and coordination appear to be crucial determinants of project success. Indeed, most IRD projects involve at least two institutions and often more; these may be ministries, universities, research institutes, or local organizations from a wide variety of sectors. Many times, the fragmentation of the public sector and the sharp division of responsibility among different parts create a major stumbling block to IRD.

²⁴ USAID (1980), pp. 28, 31.

Moreover, many of the activities promoted by IRD strategists, namely a meaningful redistribution of resources, run counter to vested interests. For example, land reform inevitably involves taking from the more wealthy and giving to the resource-poor. It is not surprising then that in many countries there is strong political resistance to a full-scale land reform. And yet land reform may be the key to the ability of the small farmers to make use of the improved technologies introduced by IRD strategies. In a slightly different way, promoting participation by those without power in decision-making processes also runs counter to the perceived interests of those in power. To promote participation through existing institutions is likely to evoke resistance, but is also crucial to the effectiveness of efforts to assist low-income farmers in gaining access to productive resources.

Furthermore, researchers from most of the pure and applied sciences and at least recently, all of the social sciences, are usually involved in any IRD project. Sometimes the researchers are actually located in different places or institutions: government departments, universities, research institutes, and scattered field situations.

The researchers involved, like their colleagues throughout the world, have territorial tendencies, are independent of mind, resent a directing authority, and are partly motivated by a desire for professional recognition and advancement quite largely through publications which lead to acclaim by their peers, preferably on an international

level.²⁵

It therefore becomes difficult to achieve enough communication and common ground so that experience can feedback into ongoing project management, and adjustments in project processes can be made that will help achieve project goals more effectively.

These difficulties and others contribute to the controversies surrounding discussions of IRD implementation. Is it enough to provide adequate levels of basic needs or must a meaningful change be brought about in the structure of resource allocation before IRD efforts can be successful in improving living conditions over the long term? Is comprehensiveness necessarily an asset for IRD projects? Must IRD projects be large to be effective? Should IRD projects work through established institutions or should new ones with more autonomy be set up? Should a project design outline in detail the project processes or should more flexibility be built in? As experience accumulates, the relative advantages of different approaches become more clear.

Basic Needs vs. Structural Change

Although there is general agreement in the literature as to the objective of improving the living conditions of the rural poor, there is little consensus as to the underlying goal of such a strategy. Is it merely to keep the rural masses satisfied or to meaningfully integrate them into the

²⁵ Chambers (1974), p. 130.

development process? For an agency such as the World Bank, the fulfillment of basic needs is perceived to be a necessary ingredient for national development, rather than a way for people to gain greater control over productive resources.

Rural development recognizes ... that improved food supplies and nutrition, together with basic services such as health and education, cannot only directly improve the physical well-being and quality-of-life of the rural poor, but can also indirectly enhance their productivity and their ability to contribute to the national economy.²⁶

Indeed, the World Bank is mainly concerned with "the modernization and monetization of rural society, and its transition from traditional isolation to integration with the national economy."²⁷

There seemed to be evidence to show that an orientation towards smallholders would actually benefit national economic development by increasing productivity and increasing the effective demand for food and other goods. Indeed, USAID for one, found that capital-intensive growth-oriented strategies did not produce optimal growth because income effects tended to favor the wealthy, food production was less than optimal, employment creation was limited and the potential effective demand for food and other basic products was inhibited. They therefore assumed that under appropriate conditions of organization and access to credit, technology and the market, such as those envisioned in IRD strategies, small farm units

²⁶ World Bank (1975), p.3.

²⁷ Ibid, p.3.

would be more productive per acre than large farm units, and investment in high yield labor-intensive farming would be more productive than capital-intensive farming. According to this rationale, development strategies oriented to the small producers would redress the inequalities in income distribution by enabling the poor to create their own wealth.²⁸

Although some proponents of this view acknowledge that such redistributive policies as land and credit reform would facilitate the improvement of rural welfare, they assume "effective land tenure and credit reforms, an increase in government-peasant dialogue, and greater participation by and benefits for small producers and landless laborers,"²⁹ but do not explicitly advocate them. It is generally assumed that local or international agencies carrying out IRD projects are not in a position to influence policies which affect the overall redistribution of national resources. Therefore, although much has been written about the importance of institutional reform in the rural areas, a true shift in resources and power towards the poor has often been assumed but seldom achieved.

The opposing view, such as that held by De Janvry, considers the transformation of the rural power structure as the ultimate goal of IRD. He warns against a basic needs

²⁸ USAID (1978), p.75.

²⁹ Ibid (1978), p.9.

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approach "whereby minimum income levels have to be ensured for all via the distribution of public amenities while growth is stimulated."³⁰ With the latter approach, there is the danger that the provision of basic needs will become merely a palliative to satisfy the rural poor.

[A basic needs approach] should be understood as an effort to achieve the structural changes needed to reconcile growth and distribution and to make the satisfaction of basic needs the essential purpose of economic growth. As growth occurs and personal incomes increase, basic needs are continuously redefined beyond mere subsistence and are met in accordance with the rising productivity of labor.³¹

DeJanvry therefore promotes programs that are instruments of social change, that are conducted by peasants and raise their class consciousness rather than merely programs for the diffusion of technology.³²

Few IRD projects actually emphasize rural transformation. John Cohen points out that if it was agreed that such an emphasis was essential, "it would exclude many of the more well known IRD projects, primarily because they lack the programmatic components necessary to promote social change in an explicit way."³³ He concludes however that it is possible to promote improvements in the productivity and income of the rural poor without considering the ultimate effect on political and economic institutions. Indeed, there is some

³⁰ DeJanvry (1981), p.264.

³¹ Ibid, p.264.

³² Ibid, p.268.

³³ Cohen (1980), p.204.

evidence that progress can be made in meeting basic needs in this way but the results will most often be specific to an individual project or program.³⁴

Simple vs. Comprehensive

Some analysts feel that simplicity is the key to the success of IRD whereas others claim that a comprehensive approach, although more difficult to implement, is more likely to provide a long-term solution to the root causes of poverty. The former claim that simple projects are more appropriate for resource-scarce rural areas; they do not require high-cost technology and outside experts and therefore have a greater chance of fostering beneficiary participation. Proponents of this view suggest that by attempting to do too much too quickly, high expectations are often raised and then disappointed.³⁵ Chambers in particular warns against the assumption that integration and coordination are automatic benefits. Unconnected projects, he claims, may be best implemented in an unconnected fashion in order to avoid the potential waste and inequity when scarce resources are concentrated in one area. Chambers pushes the point further and suggests that "even when projects are connected, the costs as well as the benefits of whatever procedures are proposed for relating them together have to be weighed in assessing

³⁴ See discussion in Mason et al. (forthcoming), pp. I.21-25D.

³⁵ See summary of this position in USAID (1980), p.39.

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whether they would better continue independently."³⁶

Opponents of the "simple is optimal" school contend that the simultaneous implementation of mutually-supportive or functionally-related project components leads to a more effective and more equitable development process.

Since there is an intricate web of constraints which suppresses rural development, solutions must focus on the entire web rather than just individual strands... Ignoring any one strand can negate the entire effort and may even cause damages that result in conditions worse than the original situation.³⁷

Whether simple or comprehensive is the better approach probably depends a great deal on the area in consideration and the nature of the problem to be solved. However, since the negative side effects may be more important than the intended positive effects,³⁸ it is suggested that a willingness to deal with the complexity of rural areas at the design stage, at least decreases the chances for destructive impacts. In project implementation it is then crucial to narrow down to those components that are functionally related and supportive of the same overall goals.

One of the keys to the effectiveness of a more complex IRD strategy is an understanding of the dynamics of rural poverty such that an accurate assessment can be made of its causes. In addition, such an understanding would help identify those

³⁶ Chambers, p.25.

³⁷ USAID (1980), p.40.

³⁸ USAID (1980), p.173; also mentioned in Chambers(1974), p.122.

factors, if any, open to change, and the appropriate mix of goods and services . The United Nations Department of Economic and Social Affairs describes this level of integration as follows:

Development programmes and the strategies from which they are derived, can be said to be integrated if they take full account of the close interrelationship between economic and social factors and the interdependence between the various sectoral subprocesses of development in: (a) analyzing the existing impediments to socio-economic change and progress; (b) formulating development goals and objectives; and (c) planning practical measures needed for promoting developmental change. Owing to their multi-faceted approach to development analysis and planning, integrated development programmes typically comprise several sectoral project components designed to be mutually supportive and/or functionally interrelated.³⁹

True integration in the project design and evaluation therefore depends on a conceptualization of the determinants of rural poverty in all of their complexity, and theoretical guidelines on which to base trade-offs and the setting of priorities for the subcomponents.

Small vs. Large

The argument for smallness is similar to that for simplicity. "Just as simple programs are more fitted to areas with low absorptive capacity, so too, programs with small budgets may be more easily absorbed by rural government structures and user associations."⁴⁰ Proponents of large programs however

³⁹ UN(1978), pp.2-3.

⁴⁰ USAID (1980), p.41.

argue that small projects are not efficient enough in reaching large numbers of people.

Those who support small projects claim that they are more likely to provide the flexibility and localized knowledge to successfully adapt technologies to complex environments. Small efforts often include several cycles of testing, evaluation and modification before deciding on replicating or abandoning the project. They are also more likely to be flexible enough to allow meaningful participation by potential beneficiaries.

Proponents of large programs on the other hand, touch on issues of budget, area and administrative hierarchy. First, operations with small budgets are seen as administratively inefficient, "since the bureaucratic energy required to plan, approve, and implement multiple low cost projects exceeds that needed to launch a few high cost ones."⁴¹ Large programs are more visible and therefore more likely to get political support. In addition, some have argued, the pilot project experimental approach may require such an intense human and financial effort, that even if it is determined that the project should be replicated, it will not be possible to do so. IRD pilot projects are particularly vulnerable to this difficulty because of their emphasis on adapting technologies to local conditions. IRD pilot projects usually require concentrated human and financial inputs to adapt technical

⁴¹ USAID (1980), p.41.

packages to a number of areas, encourage participation in decision-making by local producers and to organize, manage and train human resources so that the project becomes self-sustaining. One writer warns that such intensity can probably not be sustained at a national or even a regional level, and that such projects are often too costly and too demanding of trained manpower to be effectively replicated.⁴²

Secondly, projects must be large enough to encompass the crucial rural-urban links and to take into consideration such factors as migration, transportation, revenue-generation and resource transfers between marketing centers and intermediate cities.⁴³ And thirdly, those advocating larger programs favor "national or subnational agencies with a broad enough coverage to encompass the important areas."⁴⁴ If the area targeted for I&D does not correspond to administrative boundaries, then new agencies, focussing for example on a river basin, may be warranted.⁴⁵

The evidence is not yet in to determine whether small or large programs are more effective. If the latter can be made to work, they will undoubtedly reach more people, but it may be impossible to reach low-income producers except through small-scale participatory efforts at the village level.

⁴² Ruttan in USAID (1978), p.10

⁴³ USAID (1980), p.42.

⁴⁴ Ibid, p.42.

⁴⁵ Ibid, p.42.

New vs. Old

There seems to be an ongoing debate as to the trade-offs between setting up new, autonomous organizations to run IRD -- thus creating dependency on a temporary institution -- and relying on existing agencies that are tied up in power struggles and inefficiencies, but have the potential for coordinating an IRD effort over the long term. The main argument of those who support creating new organizations to implement IRD is that "cumbersome bureaucracies can make it very difficult to deliver services to rural inhabitants or to obtain their participation in program decisions or benefits."⁴⁶ Since many IRD projects are heavily weighted towards the agricultural sector, direct contact between extension workers and small farmers is usually the main vehicle for information dissemination. In some areas, this approach has been a major obstacle to achieving rural equity because of the "tendency for extension workers, whether in agriculture, health, home economics or community development, to concentrate their attention on those who were already better off."⁴⁷ In agriculture in many countries, it was official policy to seek out innovators and let them set the example for others. While this approach may have been justified under some circumstances, "it did tend to widen the gap between the 'progressive' farmers and the rest", since it

⁴⁶ Ibid, p.37.

⁴⁷ Chambers (1974), p.79.

is the first ones to innovate who gain the highest profit margins. Moreover, Chambers claims,

It legitimated what the extension worker was anyway inclined to do: to associate with and reciprocate services with those who were better off, who were more prepared to adopt new practices, who had resources and power and who could bestow benefits. [Extension workers] are powerfully locked in socially and economically with those who are already better off. It is also professionally natural for them to concentrate on those who have cash crops, if it is only for cash crops that they have advice or services to offer. They also often need to have a number of docile good farmers who are prepared to allow demonstrations on their farms, and to be on show to visiting dignitaries. The extension worker is caught in an administrative, social and economic network in which he trades his resources (loans, subsidized equipment, privileged access to inputs, information) for reciprocal benefits which he is most likely to secure from the richer member of the community.⁴⁸

Proponents of side-stepping permanent agencies or local organizations are both interested in supporting the participation of rural people and in reinforcing donor control over the project.⁴⁹

Opponents of this model support the use of existing governmental bodies to implement rural development programs. They focus on "the need to build local capabilities so that development can become a self-sustaining enterprise."⁵⁰ They reject the introduction of new agencies because they are temporary, they divert scarce resources from existing institutions thereby weakening them, and they perpetuate a

⁴⁸ Ibid, p.80.

⁴⁹ USAID (1980), p.37.

⁵⁰ Ibid, p.38.

dependence on outsiders.⁵¹

Admittedly, the difficulties of working through the government extension service are many in most countries. It may be however, the only way to ensure the self-sustainability of the benefits of a given change in the agricultural sector, mainly because farmers, in most countries, depend on the support of a variety of government agencies: credit institutions, agencies providing subsidized inputs, marketing cooperatives, extension services. Thus, it has been argued that IRD projects should include a commitment to building the organizational capacity to carry on once the project itself is terminated. The challenge for project managers working in cooperation with the agricultural extension service for example seems to be in reorienting their training and routines such that they may help the "invisible and disadvantaged" people who most need their assistance.

More conventional training is probably not a solution to the problem of reaching the poor since it generally stresses the skills that can best be exercised with more progressive farmers.⁵² Some general recommendations regarding how best to reach small producers have been made in the literature, only a few of which will be mentioned here because of their relevance to later discussions. It has been suggested that "if organizational units are based on clients with common economic

⁵¹ This section draws on USAID (1980), pp.37-38.

⁵² Chambers (1974), p.83.

interests, rather than geographic interests, they will be more effective at delivering services."⁵³ For example, if one agricultural extension team could concentrate on small holders with scattered plots while a second team could serve farmers with larger holdings and the possibility to grow for the market, the conflicting demands on the extension team would be minimized and the needs of the poor better served. Furthermore, if the agricultural extension service included more women, or increased their outreach to women farmers in particular, they would reach a group of agricultural producers who have often been by-passed. Indeed, there is some evidence to show that, at least in Africa, as more men migrate to the cities to find work, women are taking over the management of farms. These female-headed households are not yet recognized in many areas by the institutions they depend on.⁵⁴

Another management technique which may increase the accountability of extension workers to less well-off farmers is one that phases out regular services to farmers and concentrates attention on "those who are at an adoption or capital threshold and who are then increasingly left on their own."⁵⁵ Since in many IRD projects, the welfare benefits depend on the adoption of new technology by low-income farmers, such a system would increase the likelihood of the

⁵³ USAID (1980), p.58.

⁵⁴ Bahemuka (1976); see also Staudt (1976).

⁵⁵ Chambers (1974), p.82

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project having a positive effect on general living conditions.

It seems that working through existing structures, whether governmental or non-governmental, agencies or cooperatives, is more likely to increase the potential for self-sustaining development. Such an approach depends heavily on the meaningful participation of potential beneficiaries in project decision-making, and on training project staff in organization and outreach skills.

Blueprint vs. Process

In the past, a rural development project design was regarded as a blueprint to be followed by those implementing the project. It was perceived to be an authoritative document, laying out what was possible given the available information and the circumstances of the project. The design also functioned as a negotiating instrument and a basis for accountability. The advantages of this approach were several. First, when technologies were tried and certain, a blueprint approach improved the likelihood of successful, efficient implementation. Secondly, if the design was carefully developed and all alternatives weighed, it allowed donor agencies to make the best choices in allocating their scarce resources. And thirdly, when designs were elaborated in detail, it was easier to hold management accountable for the proper spending of project resources.⁵⁶

⁵⁶ USAID (1980), p.43.

Many situations facing development practitioners today however, do not have tried and certain solutions. Therefore, it has been argued that a more flexible, 'process' approach is more appropriate for IRD. The blueprint approach may have been successful for large-scale infrastructure projects, but has not been as effective for IRD programs. Although a technology may appear to be appropriate in one environment, it may be found to be completely inappropriate in another, for economic, political, social or ecological reasons. Furthermore, conditions may change during the life of the project; a rigid design may then prevent management from responding effectively and re-orienting the project accordingly.

Too often it is assumed that only local adaptation of knowledge is needed to make new technological packages available for use by small producers in the villages. There is a growing literature suggesting that this is not so and exploring such questions as why peasants insist on inter-cropping despite the advice of "experts", why they do not give up scattered plots, and what their marketing constraints are. For example, in reviewing several IRD projects in Latin America, DeJanvry noted one project in which access to credit was the real bottleneck to farmer adoption, not the availability or knowledge of the new technology. The agricultural research institute, CIMMYT, that was running the project, withdrew its support when it recognized that the

problem was not one needing research, but rather institutional change.⁵⁷ Researchers in general need to become more familiar with the environment in which innovation is to take place. Several ways have been suggested for achieving such an understanding: a systems approach to farm-related research,⁵⁸ the use of field trials to bridge the gap between research stations and the farmer, more effective communication between research and extension staff, and a deliberate policy that would require research staff to spend substantial periods in the field.⁵⁹

A better understanding of a rural household's decision-making parameters is also crucial in helping to shape a dissemination process that reaches the most risk-averse farmer. Indeed the increased element of risk involved in adopting new technologies promoted under an IRD project, is often mentioned as a factor limiting the widespread success of the strategy.

While new technology may significantly increase output and net income, the risks inevitably go up -- not only because of increased cash and labor commitments, but also because of the small farmer's increased dependence on alien institutions or individuals (input suppliers, extensionists, marketers) over which he has no control.⁶⁰

⁵⁷ DeJanvry (1981), p.248.

⁵⁸ See Gilbert, E.H., D.W. Norman, and F.E. Winch (1979).

⁵⁹ Chambers (1974), p.133.

⁶⁰ USAID (1978), p.107.

Because their resource base is not sufficient to make technological change economically meaningful, peasants may adopt recommended packages only partially, settling for levels of factor use slightly better than the traditional levels but far from what they might achieve.⁶¹ Or perhaps of greater concern, is the fact that low-income farmers may resort to self-exploitation of family labor within the farm to offset the higher production costs implicit in many new technological packages.⁶² In either case, the goal of achieving increased rural welfare is distorted by a lack of understanding of the decision-making parameters of the low-income farmer.

The achievement of project goals may also be inhibited by a lack of consideration to peasants' off-farm sources of income. Indeed, in the three IKD projects in Latin America studied by DeJanvry, he found that the assumption that increasing agricultural yields was the key to alleviating rural poverty, was ill-founded. "The bulk of the rural poor" he reports, "control a resource base that is so small and of such poor quality that agriculture can only ensure a fraction of subsistence needs."⁶³ They depend heavily on money wages derived from non-farming activities. Therefore, employment availability and wage levels are more important determinants of welfare for these farmers than is agricultural

⁶¹ DeJanvry (1981), p.250.

⁶² Ibid, p.228.

⁶³ Ibid, p.242.

productivity.⁶⁴ DeJanvry's findings point to the importance of advocating, in many circumstances, more non-farm opportunities and better rural wages.

Therefore, to better address the complexity of IRD, some development analysts promote what is referred to as a "process model". Such an approach incorporates a learning-oriented perspective and a capacity-building view of rural development, based on a clear recognition of the uncertainty of social technologies and the complexity of rural environments. Uma Lele for example acknowledges that IRD programs should be a part of an ongoing, dynamic process. She suggests however, that there is a necessary sequence which is more-or-less generalizable. A minimum level of institutional development must precede mass participation if the latter is to be effective. She suggests that the first phase be an institution-building one, the second one include service delivery such as potable water supply and health clinics; the latter should not be implemented however until there is an effective demand for them, and until there is a local capacity to manage them.⁶⁵

Another approach, proposed by Honadle et al., includes the following general characteristics:

1. A design broken into discrete phases :

⁶⁴ Ibid, p.246.

⁶⁵ Lele (1976).

2. A large amount of short-term technical assistance ;
3. An emphasis on action-oriented training among both staff and beneficiaries;
4. A use of temporary task forces ;
5. A reward system consistent with a learning orientation;
6. An applied research component ;
7. A learning component, such as a rolling regional plan; and
8. A redesign orientation, such as periodic revision of project organization, project objectives and job descriptions of project personnel.⁶⁶

Process approaches have the potential for greater flexibility and therefore for adapting to the realities of reaching subsets of the target population. They also have the potential for more meaningful involvement by local people in project decision-making and implementation. This appears to be a key determinant of project success. A team of consultants from DAI found that "those development projects which took the time and effort necessary to build an active and cooperating role for small farmers were significantly more successful than those projects which followed more traditional (externally-dominated) development approaches."⁶⁷ Some projects have used small farmers as para-professionals to help in teaching new husbandry practices to other farmers; this has

⁶⁶ USAID (1980), pp.44-45.

⁶⁷ USAID (1978), p.101.

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proved to be a cost-effective way to spread new technology.⁶⁸

Experience with such approaches is not yet very extensive but holds great promise, in particular for dealing with the many conditions affecting the connection between delivery of goods and services, and increasing welfare. "Each linkage in the sequence of objectives is only an intention -- numerous conditions affect them and some critical factors must be identified and managed if resources are to lead to welfare."⁶⁹ Figure 3 illustrates the process. Obviously, not all conditions affecting project objectives can be managed, but at least if the constraints can be identified, those open to change may be worked with.

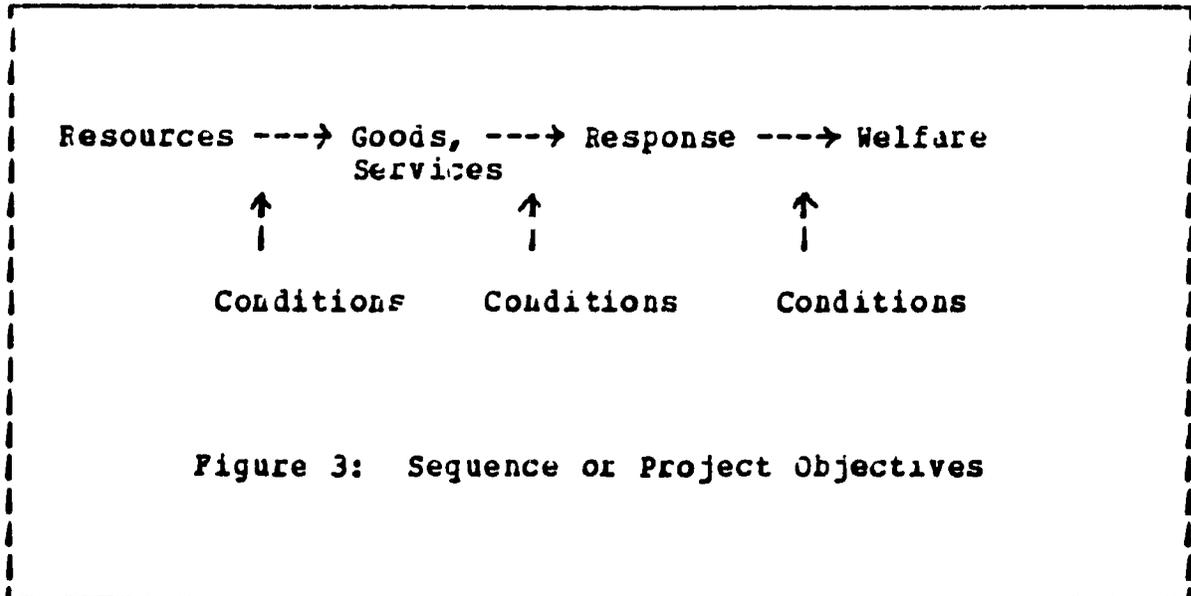


Figure 3: Sequence of Project Objectives

Source: USAID (1960), p.19.

⁶⁸ Ibid, p.17.

⁶⁹ USAID (1980), p.22.

WHY NUTRITION IN THE MORE AND BETTER FOOD PROJECT?

In some respects, the MBF Project is similar to a small-scale, agriculturally-oriented IRD project that stresses a close working relationship between researcher and farmer as they adapt new technologies to the local conditions. In other respects, the project is quite innovative. Firstly, it identifies nutrition as the overall, long-term goal of the project; indeed nutritional status clearly reflects the living conditions of groups of people and therefore rural welfare in general. Secondly, the main components of the program expected to influence nutrition, are not traditional nutrition interventions (e.g. programs that give out supplementary foods, or provide information) but income and employment-generation projects. Direct nutrition interventions were only considered in the project as a means of remedying certain micronutrient deficiencies. The appropriate model might therefore appear as a slight variation of Figure 2 described earlier. Rather than two supportive but separate program objectives, the MBF Project identifies two objectives that are causally linked: raising incomes and improving nutritional status. A variety of project components, some of which are functionally interrelated and some of which are not, were designed to raise incomes; small-scale nutrition interventions were included to directly affect nutritional status. The model might appear as in Figure 4 below.

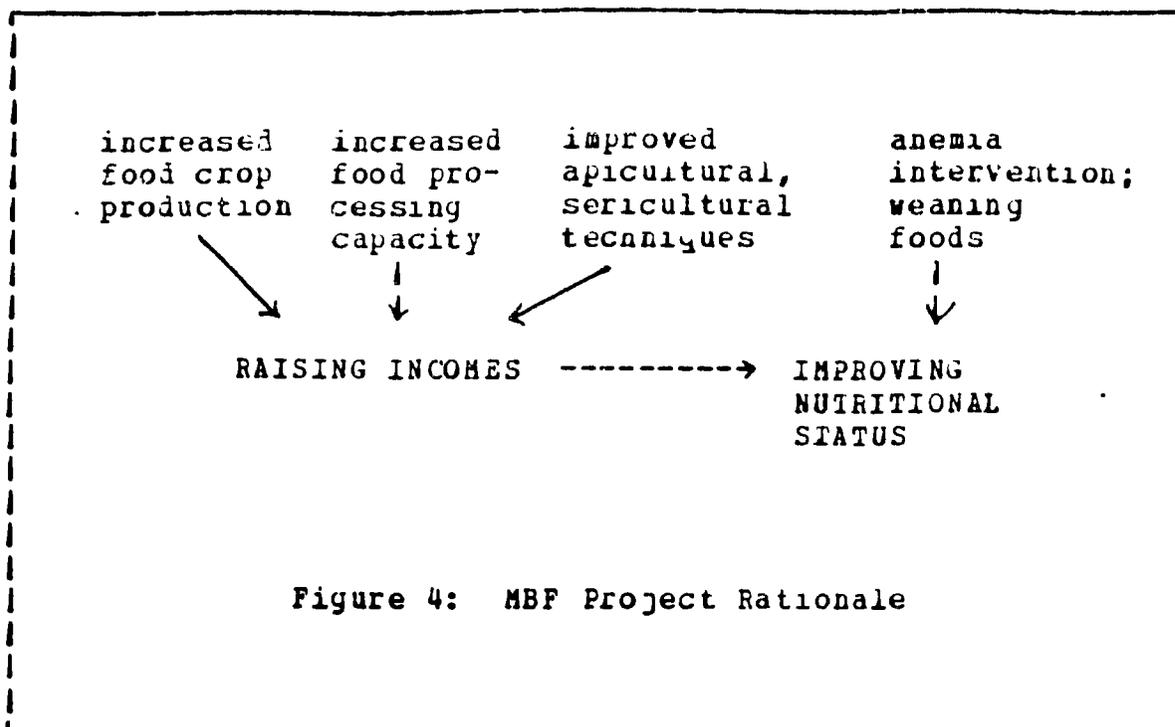


Figure 4: MBF Project Rationale

There is a growing body of literature which supports the More and Better Food Project rationale. It has been argued by some that nutritional status is a reliable indicator of the impact of agricultural and rural development on general welfare.⁷⁰ In particular, it may be a relatively efficient and effective way to measure the side-effects, both positive and negative, that inevitably accompany IRD efforts. The information gained may then be fed back into planning and management processes such that the needs of the poor are better met.

⁷⁰ See Mason et al. (forthcoming), Pinstrup-Andersen (1981), and FAO papers on the subject.

The same literature also suggests that strategies such as IRD that promote the integration of income-generation and welfare concerns, may be the best way to attack the root cause of malnutrition: poverty. These ideas have seldom actually been incorporated into IRD programs or projects; the MBF Project is therefore somewhat of a pioneer effort. Outlined below are some of the theoretical propositions and lessons from experience related to incorporating nutritional status as a measure of development and as a goal for development. These will provide the framework for assessing the potential impact of the MEF Project on nutrition.

An Indicator of Change in Household Welfare

Measures of nutritional status can be useful in planning for IRD, and in evaluating the impact of IRD. It has been argued that if data collection is being considered, the nutritional status of the child is a relatively easy, reliable measure of household nutritional status.⁷¹ This is not to say however that there are no ambiguities. Indeed, as will be discussed below, there are many different factors relevant to integrated rural development projects, which contribute to a determination of nutritional status: health, sanitation, purchasing power, food supply, as well as intra-household factors. These relationships are not yet well understood, but it is clear that nutritional status, compared to other

⁷¹ Mason (1983), pp. 15-16.

measures of welfare, is relatively quantifiable and clearly reflects the living conditions of groups of people.

The most widely used measures of nutritional status as an indicator of socio-economic status, are anthropometric measures of a young child's weight, height and age. Various ratios of these measures, as well as measures of head circumference, arm circumference, and triceps skinfold, reflect both chronic and acute, past and present, malnutrition, as indicated in Table 1 below.

<u>Measure</u>	<u>Significance</u>
Weight for Age	Reflects growth: both stature and fatness
Height for Age	Reflects growth: long-term measure of nutritional status
Weight for Height	Reflects fatness: current nutritional status
Head circumference	Reflects growth up to age 3
Arm circumference	Reflects growth and fatness
Triceps skinfold	Reflects fatness

Source: Dewey (1980), Table 1.

Children aged 2-4 are most often surveyed because they are most susceptible to malnutrition and indices of their growth can therefore be easily measured as a reflection of

nutritional condition.⁷² In conjunction with other key household socio-economic and environmental indicators, the nutritional status of the child can provide a useful summary of a household's situation which may then be applied to identifying the nature of the nutritional problem and its socio-economic determinants.⁷³ Indeed, if the children, who are particularly vulnerable to malnutrition, in a certain household are healthy, then it is reasonable to assume that the household is doing fairly well. If however the children are found to be malnourished, there is reason to question that household's welfare. It may be a problem of access to food, either specific to the child or for the household in general; it may be a problem of poor sanitation or a lack of availability of food.

The indicators suggested for inclusion in a series are measures of quality-of-life such as indicators of the nutritional status of children, infant and child mortality indicators, housing and possessions (to measure wealth and environment), and sanitation (water supply and toilet facilities).⁷⁴ It has been argued that a series of indicators is more effective in pointing out a problem than one indicator alone. A group of people showing high prevalence of child

⁷² Dewey (1980).

⁷³ Food consumption measures could also be used if available, but the difficulties of obtaining adequate recalls make such figures less reliable than measures of a child's weight and height.

⁷⁴ Mason (1983), p.15.

malnutrition, high infant mortality, poor housing and so on, is clearly in need of assistance. If the indicators are not consistent with one another, then a different sort of problem is evidenced.⁷⁵ It is argued that this kind of functional classification flags a particular socio-economic group for attention by development project managers.

Furthermore, nutritional status, along with a few other key indicators of level-of-living such as food expenditure patterns, housing quality, water source and sanitation, might also be effective as a measure of the impact of IRD projects on communities. Too often such projects are only evaluated in terms of their physical and financial progress in delivering services to the intended recipients. In IRD projects this may involve simple questions to a reasonable number of farmers and a review of whether the project is participatory enough and sensitive enough to local conditions. Such appraisals tend to involve rapid and relatively inexpensive reviews of project processes and problems but do not try to evaluate the overall impacts on the local residents and on levels of poverty.⁷⁶

An assessment of potential impact at different points in the project may however be essential to avoid negative effects of IRD on nutritional status. Indeed, as will be discussed below, agricultural and rural development projects do not necessarily lead to improved nutritional status or improved

⁷⁵ Ibid, p.16.

⁷⁶ Young (1982), p.292.

general welfare. For example, a few studies have suggested that a change to cash cropping is often accompanied by increased malnutrition due mainly to the decrease in food grown for home consumption and to the timing of cash receipts.⁷⁷ Clearly an assessment of nutritional impact should anticipate such negative side effects, incorporate some way to measure them into the evaluation plan, and suggest ways in which the design might be changed to avoid the recurrence of similar problems.

It has been suggested that an adaptation of one of the quasi-experimental designs described by Cook and Campbell (1979) might be an effective framework for incorporating nutritional considerations into IRD projects. Which design was chosen would depend on the objectives of the evaluation and the resources to be put towards its implementation. The issues involved have been well covered elsewhere in all of their complexity so will not be discussed here.⁷⁸ Suffice it

⁷⁷ See Dewey (1980) and (1981); Fleuret and Fleuret (1980).

⁷⁸ The principles of quasi-experimental designs are laid out by Cook and Campbell (1979). The various designs incorporate ways to explore causal relationships between project and outcome variables, and control for rival outcomes, in cases where randomization, the establishment of control groups, and manipulation of the "treatment", are not possible. Due to the many unanticipated side effects accompanying IRD projects, some experts have suggested supplementing the various forms of quasi-experimental survey designs with causality-oriented case studies, assuming the resources are available to carry them out (see Casley and Lury (1982), p.29; Chambers (1974), p.122).

See Habicht, Kason, and Tabatabai (forthcoming) for detailed discussion of research design and methods of analysis specific to projects with a focus on nutrition.

to say that a carefully designed evaluation, planned at the beginning of the project, can be extremely useful to project managers as they seek to learn from experience the ways in which IRD may be guided to improve rural living conditions.

A Focus on Poverty Alleviation in IRD

The advantages of a focus on nutrition in IRD are several. When addressing the lack of success of many IRD projects in reaching the poor, designing and managing for nutritional concerns might clarify the overall objectives of the project, particularly in terms of determining who should and will benefit from it and how these benefits will accrue. A focus on the nutritional impact of an IRD project, in the planning, implementation and evaluation phases, might provide multi-disciplinary teams with the common goal they often seem to lack, and a common set of criteria by which to measure ultimate success. Such an approach would presumably hold project managers accountable for the positive, or at least non-negative effect of their activity on the nutritional status of the community. This would give the project a practical poverty orientation it might not otherwise have had.

When addressing the problem of malnutrition, broader development efforts may be the best way to achieve a long-term solution to the problem of the world's malnourished people. Although direct intervention programs may be effective in reducing micronutrient deficiencies, they tend to be costly

and require continual disbursements of funds to maintain their effectiveness, and they seldom significantly address the main cause of malnutrition: poverty. In contrast, agricultural and rural development programs aimed at income and employment generation can be self-sustaining. They have the potential of reducing poverty if correctly designed and implemented, and at least in principle reduce the need for direct intervention. At least, a focus on nutrition might help to avoid the possible negative effects of rural development on the poor.

It should be noted however that this kind of approach per se does not guarantee that the implicit redistributive goals of IRD are met. A study of the dynamics and determinants of malnutrition in a given area would provide the information necessary to identify the poor and diagnose the problems open to intervention, but only political will on the part of those with power to re-allocate resources will ensure that the redistributive goals are actually met.

Integrating Nutritional Considerations into IRD

In order to effectively integrate nutritional considerations into IRD, two factors are essential. First, there must be a consensus on the part of project managers as to what is meant by the objective of improving nutritional status, i.e. what problem do they hope to solve. Is it closing the "protein gap"? increasing the consumption of leafy vegetables? delivering nutrition education and health

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services? providing enough calories to the household? or is it changing the parameters of poverty? And secondly, data must be obtained at high levels of disaggregation such that the nutritional problems and their determinants, as well as the main socio-economic groups affected, may be identified.

A concern for consensus is not a trivial matter. Looking at nutrition as an indicator of equitable development requires that "experts" step outside narrow disciplinary perspectives and look at the total picture, i.e. the way in which nutrition affects and is affected by processes occurring in other sectors or within households. It also requires rejecting some propositions that had been widely accepted in the past. For example, in the MBF Project, the role that nutrition is expected to play is not clear although nutritional objectives are explicitly stated in project documents. In informal discussions with the researcher, it became clear that there is no consensus on what problem is to be solved.

Many of the agriculturalists involved in the project, if they had thought about the issue at all, expressed the futility of expecting increased incomes to improve nutrition; they generally felt that people would not spend the increased income on food, but rather would buy luxuries that they covet. Others, more familiar with nutrition, saw agriculture's only role in improving nutritional status as increasing the available supply of protein-rich foods, or foods rich in a particular deficient mineral. Likewise, many nutritionists

saw little hope that agricultural projects would improve nutrition; their more traditional nutrition and pediatrics training led them to focus almost exclusively on mothers and their children -- the group considered to be the most at risk of malnutrition -- and from a health/curative point of view.

All of these views can be argued to be either erroneous or incomplete. In response to the first concern, it should be noted that economists have consistently shown that low-income households will spend some proportion of increased income on food.⁷⁹ As for emphasis only on protein-rich food, or only on curative responses to malnutrition, there have been a variety of studies recently that strongly advocate a broader view of the problem.⁸⁰ As mentioned earlier, it is more and more widely accepted that malnutrition is a symptom of poverty and can only be solved in the long run by attacking the root causes of poverty: inequitable allocation of resources. For a consensus to emerge, a multi-disciplinary view needs to be taken, and the rationale linking nutrition to other project processes needs to be clearly spelled out.

In addition, in order for a focus on nutrition to lead to a greater understanding of the environment in which the project is intervening, there must be a commitment on the part of the management to set aside resources for fairly detailed data collection, from either primary or secondary sources. Indeed,

⁷⁹ See discussion of Engel's Law in any beginning micro-economic textbook.

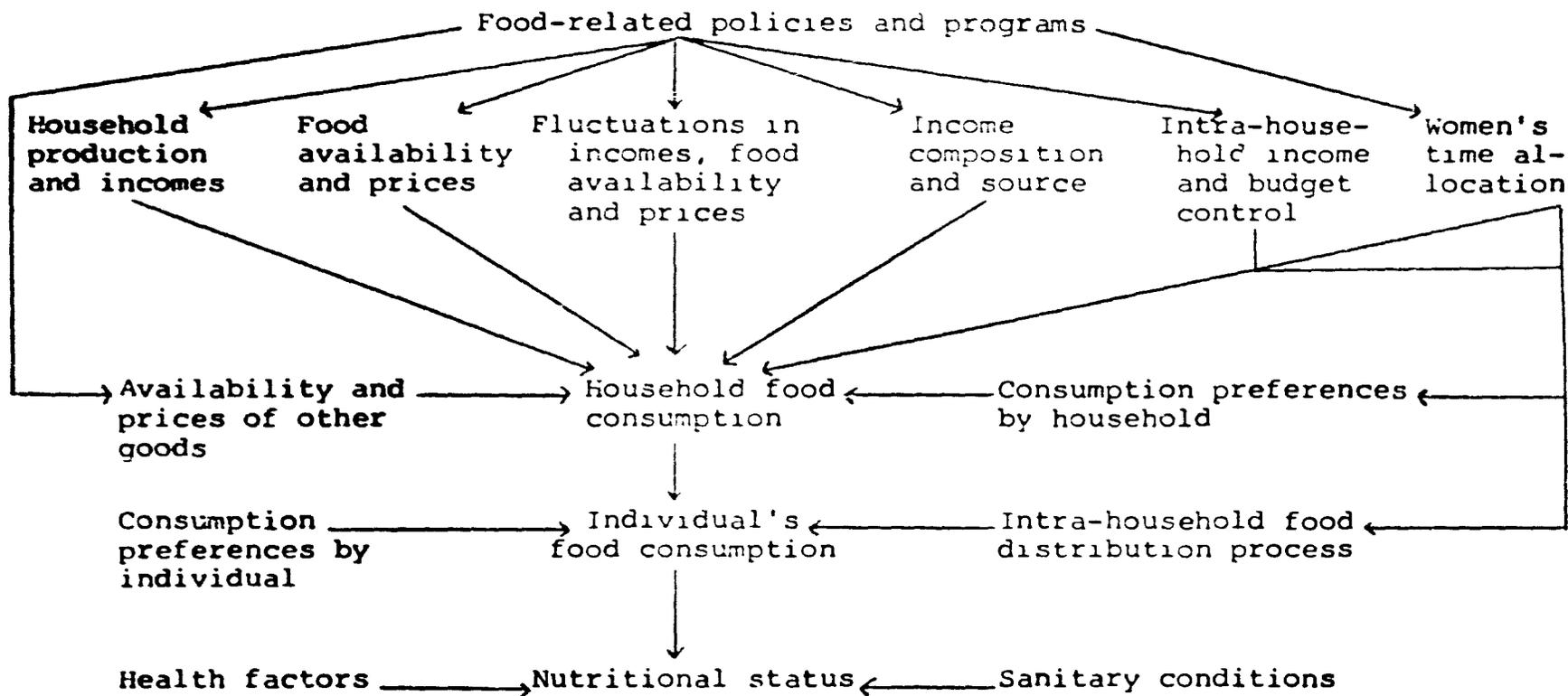
⁸⁰ See for example Murdock (1980) and Berg (1981).

the influences on nutritional status are many. The analytic framework laid out by Per Pinstrup-Andersen of the International Food Policy Research Institute (IFPRI) describes the various means by which increased income might affect nutrition. A positive nutritional impact would be expected to come about if increased incomes led to increased food intake by members of the household. However, Pinstrup-Andersen also stresses the other influences that intervene in the relationship between income and nutritional status. Such factors as access to markets, source of household income, an individual's health status, as well as various intra-household factors such as control of the household budget, tastes and preferences of individuals within the household, and allocation of the woman's time,⁸¹ may influence the nutritional status of household members such that the improvement expected due to increased incomes is not evident. The schematic overview illustrated in Figure 5 shows the relationships which have been found to be important in determining nutritional status.

For a variety of reasons, increased incomes may not lead to increased household food consumption. Firstly, nutrition is only one consideration entering into household decision-making. Needs other than nutritional ones may receive higher priority: non-nutritious foods may be preferred or non-foods may be purchased. Secondly, the

⁸¹ Pinstrup-Andersen (1981).

Figure 5. SCHEMATIC OVERVIEW OF THE PRINCIPAL LINKS BETWEEN FOOD-RELATED POLICIES AND PROGRAMS, AND NUTRITION



Source: Adapted from Pinstруп-Andersen (1982), p.5.

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individual's food consumption depends on the distribution of food within the household, which depends in turn on who controls the income. What is a rational choice for the head of household may not be the best one for other members. For example, for social or economic reasons, the men or working members of the household may be given priority with respect to food distribution. Therefore, if the distribution of food within the household worsens, the nutritional status of the child may not improve even though increased incomes has made more food available to the household as a whole.

Thirdly, the spending and consumption patterns may depend on the source and composition of the income. If income sources change, a shift towards or away from subsistence farming, or a change in frequency and/or regularity of income flows,⁸² may cause a worsening of the household's nutritional status and particularly that of the children. The importance of looking at both men's and women's income has often been overlooked due to the assumption made by traditional economic analysis that a household is a single, unified decision-making unit. For example, Jane Guyer observes that in the African context, "the impact of conditions in the national and regional economies on indigenous domestic structures can only be understood when the structural positions and economic

⁸² See Devey (1980) and (1981); Fleuret and Fleuret (1980).

interests of both men and women are equally represented in the data collected."⁸³ She points out that only with information disaggregated by sex is it possible to see the conflicting interests, and the separate spheres of decision-making. Several studies have suggested that the income controlled by women goes toward maintaining the level of nutrition and standard of living in the household.⁸⁴ It might therefore be expected that greater income-generation opportunities for women would have a more immediate impact on the nutritional status of household members. Consideration would however need to be given to the allocation of the woman's time and the possible changes due to technologies introduced.

Thirdly, one of the main intervening factors and one that influences the nutritional status of the individual directly, is poor sanitation and the resulting health problems. The synergism between malnutrition and infection seriously weakens the child and inhibits proper absorption and utilization of the food ingested. Indeed "the simultaneous presence of both malnutrition and infection will result in an interaction with consequences for the host more serious than the additive effect of the two working independently. Infections make malnutrition worse and poor nutrition increases the severity of infectious diseases."⁸⁵ If poor sanitation is widespread in

⁸³ Guyer (1980).

⁸⁴ See for example Guyer (1980) and Tinker (1979).

⁸⁵ Latham (1975), p. 561.

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an area being considered for IRD, a component designed to improve the quality of the water supply and sanitation system would be appropriate, in conjunction with other components, or if irrigation schemes are being considered, information would be needed on the prevalence of water-borne diseases and their transmission.⁸⁶

And finally, the diagram also points out several factors operating at the regional or national level, that affect the nutritional status of rural households: seasonal or irregular fluctuations in food prices, wages earned by the malnourished, and food supply. Policies which affect these fluctuations: pricing policies, storage and transportation of commodities, foreign trade, and crop insurance policies, may significantly influence nutritional status.

CONCLUSION

The concept of IRD, although still somewhat general, has been more carefully specified through experience such that implementation mechanisms are at least better understood. However, many IRD designs still seem to lack a focal point around which to build the project rationale, and a clear sense of how the equity goals will be achieved.

Based on experience to date, the success of a comprehensive approach in meeting its goals seems to depend on an implementation process explicitly geared towards the small

⁸⁶ Mason (1983), p.23.

producers, the landless, or other resource-poor groups. An effective format might include an extension component oriented towards working with certain socio-economic groups to overcome their production and income-generation constraints. An effective implementation arrangement should also allow for a central project decision-making position close to the actual project activity such that meaningful participation by potential project beneficiaries is possible. Secondly, the success of a comprehensive approach seems also to depend on a project rationale that makes sense from a theoretical point of view and clearly lays out the transformations that must occur in order for the living conditions of the poor to improve. It is important that there be a consensus among all those involved in project management, to do something about reaching the resource-poor. This includes providing common standards with respect to the goal of improving living conditions, by which performance in all project activities is measured.

It is argued that nutritional status as a part of a series of quality-of-life indicators could be both an effective planning tool and a yardstick on which to measure project impact on participating communities. The theoretical construct that can be built around nutritional status would provide guidelines as to identifying the malnourished groups, assessing those factors that influence their poverty and are open to intervention, selecting the appropriate timing and mix of goods and services, designing for beneficiary response and achieving self-sustainability of development efforts.

There are however certain constraints to effectively integrating nutritional considerations in IRD, that need to be overcome. First, although substantive research is beginning to accumulate, there is still a lack of understanding of the exact relationship between nutritional status and other determinants of poverty; the degree to which they are sensitive to socio-economic changes also remains unclear. Continued research is needed to substantiate the basis for effective policy recommendations in the area of nutrition in IRD.

Secondly, although reliable measures of nutritional status are easier to obtain than measures of income, they nonetheless may involve a larger data collection effort than can be justified by the use to which the data would be put. Part of the need for such extensive data collection is due to the lack of work on the subject to date and the need to convince others of the validity of the conceptualization. Indeed, nutrition is still seen by many to be exclusively concerned with the health of mothers and children. It is therefore not easy to build a project around nutrition as a goal of development.

Regardless of whether nutrition is being looked at or not, obtaining a meaningful picture of the dynamics of poverty in a given area requires a significant amount of data.

There are many advantages to facing the dynamics of productivity and poverty in all of their complexity, not least

of which is that ultimate success is more likely. But the intermediate pathways are only partly known; to fill in the gaps is the challenge of ongoing and future IRD programs.

Chapter III

THE MORE AND BETTER FOOD PROJECT: A CASE STUDY

INTRODUCTION

The objective of the case study presented in this chapter is to analyze the More and Better Food (MBF) Project achievements to date in light of their potential impact on the nutritional status of the village populations. An assessment of the impact of the MBF Project at this point represents not a definitive statement but rather an opportunity to review, in light of experience to date, the project rationale, and to reinforce those self-sustaining processes that may be set in motion to improve the status of the malnourished groups in the villages.

The assessment reflects the views of the author and is based on information made available to her during her stay at the National Research Center (NRC) in Cairo, from June to August 1982. The assessment suffers from limited information on the views of participant and non-participant village producers. Material in this discussion has been shaped primarily by discussions with the NRC staff. They shared openly their communications with participating farmers. Other information on the participant farmer's point of view was obtained from a series of group interviews, discussions with

agricultural cooperative officials , and a tour of project activities in Omar Makram. In Kafr el Khadra where the project was no longer very active, only informal discussions with villagers were possible. Any further study of the impact of the MBF Project on the two villages should include a more systematic investigation of the experiences and views of the villagers.

The project-specific goals of the MBF Project are two-fold: to increase village productivity, both on and off-farm, and to improve village nutritional status. The specific subcomponents that have been implemented involve a variety of activities. The NEC introduced technical packages to improve several field and vegetable crops: wheat, maize, peanuts, tomatoes, potatoes, onions, and broad beans. They set up demonstration centers to train villagers in bee-keeping, sericulture, and dairy processing. One NEC team built model poultry confinement areas and provided assistance to villagers who wanted to build their own.

Implicit in the overall design is an assumption that these improvements will influence living conditions in the village by increasing the food supply in the market and raising the incomes and levels of home consumption of the participating producers. The improved living conditions are assumed to include an improvement in the nutritional status of the project villagers. Thus, the goals of the More and Better Food (MBF) Project and the assumptions implicit in its design

reflect to some extent the primary characteristics of Integrated Rural Development (IRD) strategies: (1) a coherent approach, (2) the delivery of multiple development services, and (3) a focus on improving the general living conditions of the rural poor. They also reflect the institutional objectives and limitations of the NRC, its principal implementing agency.

The objectives that the NRC as an institution is pursuing through the MBF Project relate to the role the NRC sees itself playing in Egyptian socio-economic development. These institutional objectives may be summarized as follows.

1. The development of NRC managerial capacity to respond to multi-disciplinary and multi-institutional projects;
2. The provision of opportunities for staff to participate in applied research and to receive recognition for their achievements.
3. The demonstration to potential end-users of research, in this case the farmers, that science and technology can be pressed into service to meet their needs.
4. The investigation of impacts associated with integrated food production programs and the development of the NRC's capacity to conduct IRD programs.⁸⁷

Indeed, to date, an important constraint on applied research at the NRC has been its lack of adequate field support facilities to reduce the physical and psychological distance

⁸⁷ MBF Project correspondence (November 1982).

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between its staff and the people they are trying to assist. Involvement in the MBF Project represents a first step towards achieving a greater responsiveness on the part of the scientific community to the needs of Egypt's rural inhabitants.

Trade-offs between these two sets of goals for the MBF Project are reflected in the design components discussed in Chapter 2. First, the NRC chose for the project a comprehensive approach to rural development, including agricultural and non-farm activities as well as a nutritional objective. Although such an approach is probably more effective than a single-sector project, it is more difficult to implement because the interrelationships between sectors are not always well understood.

Second, the project was designed to be tested on a small scale because of the NRC's limited resources, then expanded if it proved successful. The small scale was also intended to foster an environment conducive to meaningful participation by potential beneficiaries. The trade-off in this case is that a small project concentrates resources in one area and reaches only a limited number of people.

Thirdly, the NRC chose to administer the project itself, rather than to work through an existing institution, private or public. The advantage of such an arrangement is that the NRC has direct control over the project so can guide it in the way that it feels is best. The disadvantage is that project

innovations may be abandoned when the NRC terminates its involvement because the project never "belonged to" the village community.

And finally, the NRC chose a learning process approach rather than a "blueprint" in order to allow itself flexibility in incorporating lessons from experience as they were learned. Given the lack of experience with incorporating nutrition into IRD, the learning process approach was probably the best way to ensure that both productivity and equity goals were met. Each of these trade-offs will be further discussed below.

Chapter 3 proceeds to analyze the underlying assumptions of the project and their reasonableness in light of project experience to date. It begins with a description of the two pilot villages and of the basis for their selection. Two sections then follow. One outlines the assumptions implicit in the project design and implementation. The second assesses their validity in terms of the equity goal of the project -- improving nutritional status -- given the available information on the two village environments and the constraints under which the NRC functions.

TWO DIFFERENT PROJECT ENVIRONMENTS

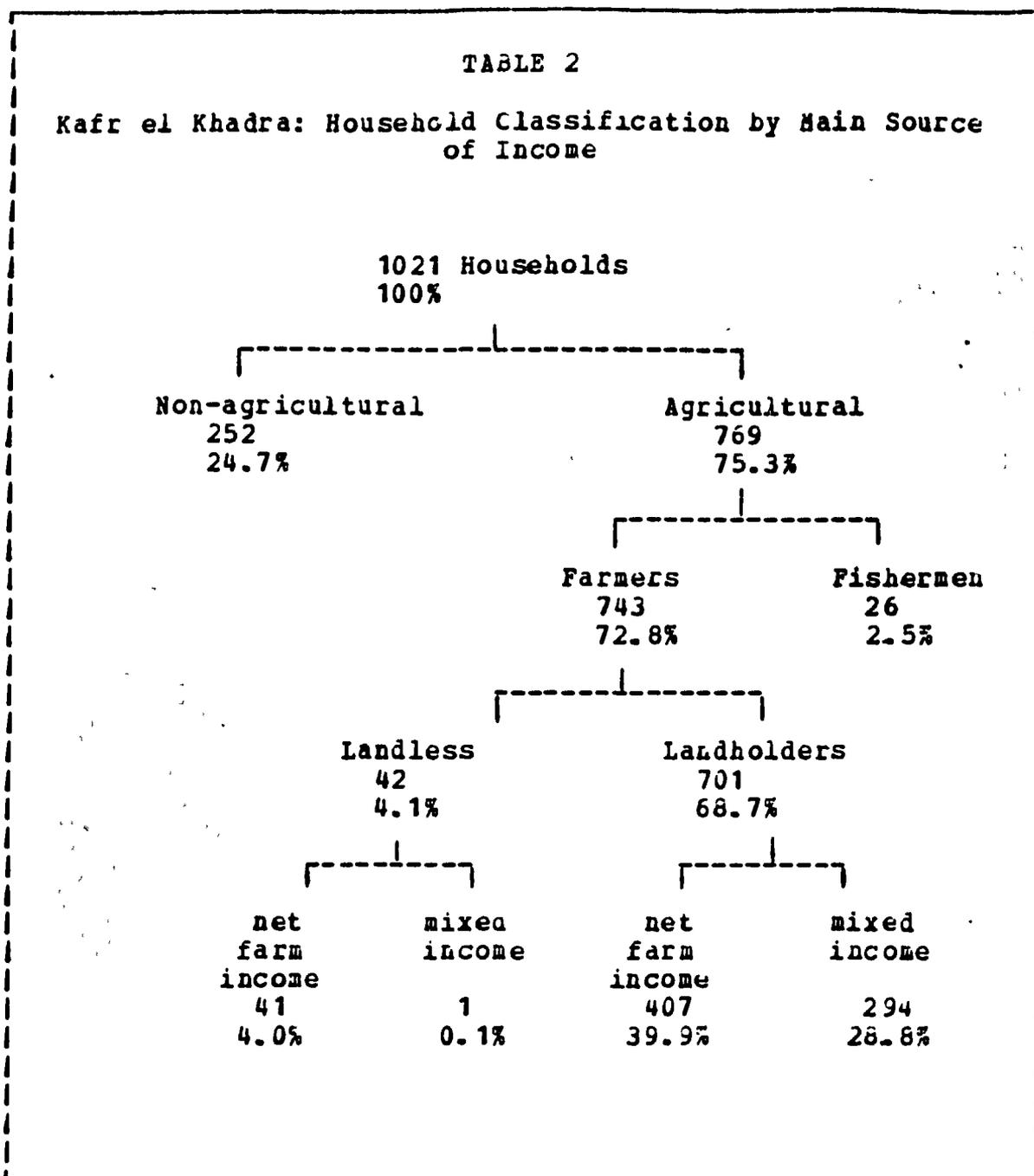
At the beginning of the More and Better Food Project, the Executive Committee decided to choose two villages whose inhabitants relied mainly on agriculture for a living, but that were in other respects as different as possible. One was

selected from the traditional Delta area, and the other from the reclaimed desert lands. Practical considerations such as accessibility by road, availability of a minimum level of social services and public utilities, helped to limit the choices. The most important consideration was an expression by village leaders of a willingness to participate in the NRC project. The two villages selected, Omar Makram and Kafr el Khadra, met these requirements. As shown in tables 2 and 3, both have significant agricultural subcommunities. Within the subcommunities however, the reliance on agriculture as a main source of income varies.

These two villages, in almost all respects, serve to represent two very different characteristic types of Egyptian villages. Omar Makram is fairly isolated from the Cairo metropolitan area. It is located in the Western Desert, 130 Km from the city, in South Tahrir Province which is sometimes considered part of the Beheira Governorate. Administratively it is under the supervision of the Ministry of Agrarian Reform and Land Reclamation, a ministry created in 1956 "to attend especially to the needs of cultivators receiving land from the government and to administer land reclamation projects."⁸⁸

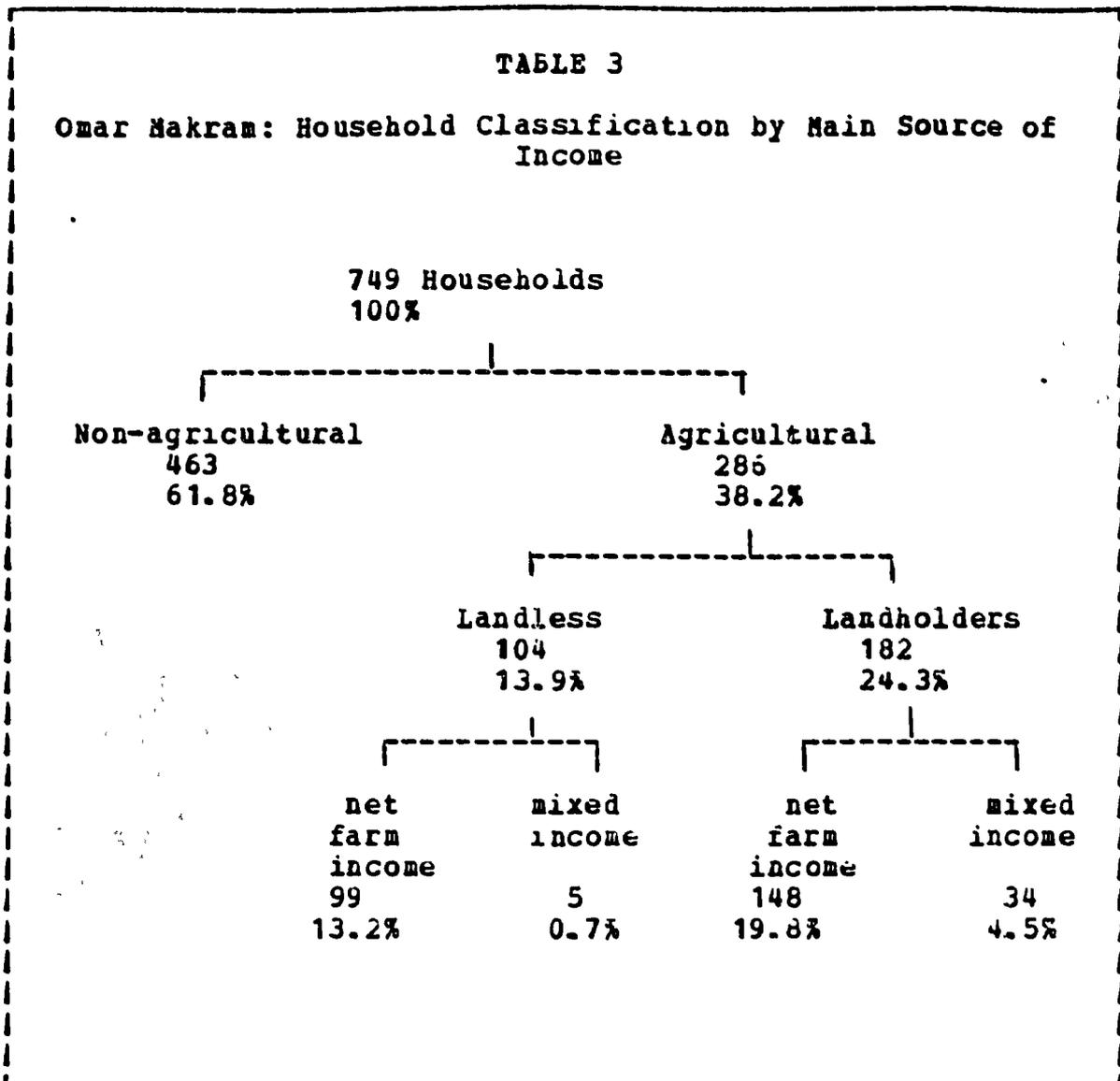
Kafr el Khadra on the other hand, is located in the densely populated Nile Delta only 50 Km from Cairo; it is administered by the Egyptian system of local government -- a two-track system including local representatives of the central

⁸⁸ Harik (1972), p.294.



Source: Adapted from NRC (1980a), Village Demographic Survey, p.8.

ministries as well as locally elected village officials -- and is a part of the Baghour District of Menoufieh Governorate.



Source: Adapted from NRC (1980a), Village Demographic Survey, p.37.

The two villages differ in physical environment , in administrative structure, and also in socio-economic profile.

Table 4 below provides an overview of the general socio-economic conditions in the two villages. A comparison of the two villages in terms of project-relevant variables then follows, to emphasize the main differences relevant to the MBF Project.

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TABLE 4

General Socio-economic Indicators

	OMAR MAKRAN -----	KAFR EL KHADRA -----
Total population	4,860	5,630
Average land-holding size	3-5fd.*	< 1fd.
Percent agric. households depend- ing on farm income only	86%	58%
Average children per household		
agric. households	4	4
non-agric. households	4	3
Annual per capita income	LE 149**	LE 208
Illiteracy rate	36.5%	36.2%
Infant mortality	93/thous.	112.6/thous.

* one feddan (fd.) is approximately equal to one acre

** 1 Egyptian pound (LE) = \$1.20.

Small Land-holdings and Non-farm Income

As can be seen in Table 4, the average land-holding size in Kafr el Knadra is less than one feddan. This is slightly less than the national average of under three feddans.⁸⁹ In Omar Makram, the average land-holding size is slightly above the national average. The difference between the two villages is due mainly to the fact that the people of Omar Makram are beneficiaries of a government resettlement scheme. As a part of the strategy, each farmer was allocated 5 feddans, a larger

⁸⁹ Ikram (1980), p.213.

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land-holding than most Egyptian farmers own in the traditional villages.

In an attempt to increase Egypt's cultivable land, since the 1960's the government has invested heavily in reclaiming land from the desert. The land was then sold at a low price to those willing to take on the challenge. The Ministry of Agrarian Reform and Land Reclamation provided these settlements with basic infrastructure including field irrigation systems for field crops. The World Bank found that "investment in extending irrigation and service infrastructure into marginal soils on the desert fringes had by mid-1976 added 0.9 million feddans of "new land" to the existing 5.6 million feddans of old land."⁹⁰

Omar Makram lies in one of the earliest land reclamation areas: Tahrir Province. It was first settled about 30 years ago. Each farmer was originally allocated separate parcels located in different parts of the village.⁹¹ Since then about 79 feddans have been auctioned off to others.⁹² As illustrated in Table 5 below, in Omar Makram, only eight families reported owning more than five feddans of land, and 39 reported working plots of less than 3 feddans; 22 out of the 39 were renting the land they cultivated. In contrast, only 1 family in Kafr ei Khadra reported having more than 5 feddans, 16 families had

⁹⁰ Ibid, p.171.

⁹¹ Interview with farmers and agricultural engineers at the Agricultural Cooperative.

⁹² NRC (1980c) MBF Project Progress Report (1979-80).

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3 to 5 feddans, 198 had 1 to 3, and the rest had less than 1 feddar.

Acreage	OMAR MAKRAM			KAFR EL KHADRA		
	own	rent	total	own	rent	total
less than 1	5	3	8	424	349	773
1-3	12	19	31	139	59	198
3-5	155	9	164	16	--	16
5-10	6	--	6	--	--	--
more than 10	2	--	2	1	--	1
TOTAL FAMILIES	180	21	211	580	408	988

Source: NRC (1980), Village Demographic Survey, pp.26 and 55.

Differential Reliance on Agricultural Income

For small-scale farmers such as those of Kafr el Khadra, the land reform of the 1950's only temporarily slowed the long-run increase in the smallness and poverty of farms. This was inevitable, given the inheritance customs that led to continual subdivision of the plots, and a farm population that

was growing faster than the farmed area.⁹³ With the average land-holding size in Kafr el Khadra of less than one feddan, it is not surprising that more people are taking jobs off the farm to supplement the family's income. The baseline survey found that only 58% of agricultural households in Kafr el Khadra depended solely on farm income (see Table 4). It is not surprising either to find that most of the children are either working in non-agricultural professions or are in school.⁹⁴

In contrast, the commitment to agriculture is strong in Omar Makram where 86% of the agricultural households depend solely on farm income (see Table 4), and 42% of the children help their fathers in the fields.⁹⁵ The field crop bias that the MBF Project has developed in practice therefore fits the needs of Omar Makram farmers better than it does those of the agricultural subcommunity in Kafr el Khadra.

Main Cropping Patterns and Production Quotas

Kafr el Khadra farmers practice a two-fold crop rotation: they plant maize in the summer and alternate between wheat and berseem (Egyptian clover used for animal fodder) in the winter. The use of machines is not widespread and few wage

⁹³ Ikram (1980), p.213.

⁹⁴ NRC (1980c) More and Better Food Project Progress Report (1979-1980).

⁹⁵ Ibid.

laborers are hired.⁹⁶ In addition, Kafr el Khadra is in the unusual position of being one of the only villages in Menoufieh Governorate with no crops subject to governmental cooperative marketing.⁹⁷ According to one of the NRC scientists, they achieved this privileged status through well-organized, political action several decades ago. As will be discussed later, this resistance to interference by outsiders, particularly if there is seen to be a government connection, appears to have affected the attitude of Kafr el Khadra farmers towards the MBF Project.

In contrast, Omar Makram's major crop, peanuts, is marketed in totality by the government through the agricultural cooperatives. Due to the different environment and the imposed government quotas, the cropping pattern in Omar Makram differs somewhat from that in Kafr el Khadra. Omar Makram farmers also alternate between wheat and berseem in the winter, but peanuts are the main summer crop; farmers only plant enough maize for home consumption. Agriculture in Omar Makram depends completely on the irrigation pump stations and their furrow-basin irrigation system. Machines for field management and threshing are widely used.⁹⁸ Omar Makram farmers appear to use more hired labor than those in Kafr el

⁹⁶ Ibid.

⁹⁷ NRC (1980b), Village Socio-Economic Baseline, Volume II, p.2.

⁹⁸ NRC (1980c) More and Better Food Project Progress Report (1979-1980).

Knadra, in particular for work in maize and peanuts.⁹⁹

Nutritional and Social Status

The series of indicators presented in Table 6 below illustrates at a glance the main differences in nutritional and social status between the two villages, with the national average given for reference when available.¹⁰⁰

As the table suggests, neither village has an alarmingly high prevalence of malnutrition; however, the differences between the two villages point out the different nature of the nutritional problems that are apparent. Kafr el Khadra has a higher infant mortality rate (IMR) and higher prevalence of acute malnutrition (wasting); whereas Omar Makram has a lower IMR and higher chronic malnutrition (stunting). The results of a small nutrition survey carried out in the villages suggest that the nutritional problems in Kafr el Khadra may be more closely related to infection, whereas those in Omar Makram have more to do with poor infant feeding practices.

In Kafr el Khadra, undernutrition was found to be more prevalent in children with a history of diarrhea. 22.2% of the children with a history of recent diarrhea and 30% of the

⁹⁹ NRC (1980b), Village Socio-Economic Baseline Volume II .

¹⁰⁰ For more detailed information on nutritional status in Egypt, see USAID/CDC Arab Republic of Egypt National Nutrition Survey, 1978 and 1980, and the Proceedings of the Workshop on Nutrition and Health in Egypt, Cairo, October 20-22, 1979; for more information on population in Egypt, see Some Issues in Population and Human Resource Development in Egypt, World Bank Document, 1981.

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Table 6. PROFILE OF NUTRITIONAL AND SOCIAL STATUS IN THE TWO VILLAGES

	Stunting 90% H/A (a)(b)	Wasting 80% W/H (a)(b)	Infant Mortality Rate (per thousand) (a)(b)	Poor dwellings (c)	Dwellings without latrines (c)	Dwellings without private water source (c)
Kafir el Khadra	12.3% n=146*	8.2% n=146	112.6 n=4,572	23.2% n=4,572	50 % n=4,572	86.2% n=4,572
Omar Makram	28.6 n=126	2.4 n=126	93.0 n=2,141	50.0 n=2,141	27.4 n=2,141	48.0 n=2,141
National Average	20.8	0.3	119.0	n.a.	n.a.	n.a.

* sample size

Sources: (a) Abdallah (1980).
 (b) NRC (1980), Village Demographic Survey.
 (c) USAID/CDC (1978, 1980).

children with a history of recent or recurrent diarrhea were undernourished. Since wasting is also fairly significant in Kafr el Khadra, the survey suggests that in that village, malnutrition may be more of a health problem than a problem of inadequate food intake.¹⁰¹

In Omar Makram, the occurrence of diarrhea among the children sampled was much lower; NRC nutritionists have hypothesized that this may be due to the fact that Omar Makram has better health services.¹⁰² They suggest that the higher prevalence of chronic malnutrition in Omar Makram may be due to poor infant feeding practices. Most of the children were still being breast-fed without proper supplementation up to two years of age.¹⁰³

The IMR in Kafr el Khadra is high compared to the national average, but it is even high compared to the 1974-1975 figure for Rural Lower Egypt: 103 per thousand.¹⁰⁴ This supports the hypothesis that Kafr el Khadra has a severe health problem, probably related to sanitation and the quality of water supply. Indeed, only 5.3 % of the Kafr el Khadra respondents reported having a private tap, 64.1 % use the public pump, 18.1 % reported using a public tap, 10.9 % have a private

¹⁰¹ Abdalla (1981).

¹⁰² Ibid, p.63.

¹⁰³ Ibid, p.52.

¹⁰⁴ World Bank Document (1981) p.71. This is significant because the IMR is higher for Upper Egypt which has a tendency to shift the national average for the worse.

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pump, and 2.3 % use the irrigation canals as a water source. In Omar Makram on the other hand, 41.9 % of the respondents reported having a private tap, 35.6 % use a public tap, 9.8 % have a private pump, and 13 % use the public pump.¹⁰⁵

Thus, clearly the two villages differ significantly on factors relevant to the project. As will be discussed below, these factors help to explain the different project experiences in the two villages to date.

UNDERLYING ASSUMPTIONS

Comprehensive Approach to the Food Issue

Rather than trying to simplify the national government's concept of food security, the NRC decided to address the issue in all of its complexity. This meant including components dealing with the supply of food crops and of foods and meats high in protein, activities promoting improved food processing methods in order to increase the villagers' ability to preserve and store food, and components increasing income and employment-generation opportunities such that food needs could better be met in the market. The design therefore included activities in all of these areas.

The components designed for field and vegetable crops involved advice on better cultivation practices and recommendations for a technical package including new seed varieties, new types of fertilizers and pesticides. The

¹⁰⁵ NRC (1980a), Village Demographic Survey.

poultry project, as mentioned before, introduced the idea of building a confinement area for chickens such that infections and nutrition could be better controlled; this made raising chickens for the market more attractive, thus providing an added source of income for farm families.¹⁰⁶ The dairy processing, apiary, and sericulture subprojects consisted of demonstration centers in which people were trained either to improve their production methods, or, in the case of sericulture, to pick up a traditional activity that had once been widely practiced (this was only in Kafr el Khadra).

The implicit assumption was that an increase in real incomes would accrue to village households as a result of project activities. The effect could be direct, such as a rise in cash income due to a greater proportion of production being available for marketing, or an increase in real income since more home production of food would reduce the amount a household must purchase in the market. The effect could also be indirect, such as a rise in income due to increased employment opportunities, or a decline in agricultural produce prices.

A comprehensive approach to the food security issue also meant dealing with the quality-of-life in rural areas. MBF Project designers chose to focus on nutrition as a component of quality-of-life because of its sensitivity to changes in food supply and income levels. To study the effect of the MBF

¹⁰⁶ Ali (1982).

Project activities on nutrition, a monitoring and evaluation system was proposed using indicators such as birthweights, anthropometric indices, IMR, infant feeding practices and hemoglobin concentration of pregnant women.¹⁰⁷ In addition, several direct intervention programs were also proposed: nutrition education, an infant feeding program, a school feeding program and a program to combat iron-deficiency.¹⁰⁸ It was expected that the latter would enhance the effect of the projects on nutrition by directly alleviating micronutrient deficiencies that were not likely to be solved by raising incomes.

As stated in an early project paper, "the overall approach and objective of this Project relies on the principle that improvement of nutritional conditions of a population affects productivity and raises health standards which is an important factor for raising the physical quality of life."¹⁰⁹ The design of the project therefore takes into consideration the social, economic, and health factors which interact to produce levels of welfare, and adopts at least in principle, a comprehensive approach to the problem.

¹⁰⁷ Galal (1980).

¹⁰⁸ NRC (1980c) MBF Project Progress Report (1979-80).

¹⁰⁹ Galal (1980), p. 5.

Forum for Learning on a Small Scale

As do many other IRD projects of an experimental nature, the MBF Project opted for the pilot project approach to allow for learning from experience and for close cooperation between researchers and farmers in adapting new technologies to local conditions. There appear to be two main reasons for taking this approach. Firstly, pilot projects lend themselves to more flexibility and therefore allow staff and participants to learn as the project unfolds. This seems to have been a particularly appropriate format for the More and Better Food Project since it represented for the NRC a first attempt at IFD, and since introducing nutritional considerations into an IRD project has seldom been tried.

Secondly, it was assumed that innovative research was the key to development in Egyptian rural areas. Since local adaptation and dissemination of new technologies are time-consuming and require a fair amount of detailed information-gathering, the NRC could not realistically consider large-scale IRD strategies given its limited staff, resources, and support facilities in the rural areas. NRC project leaders therefore chose to adopt an extension model, characterized by the close linkage between research and extension.¹¹⁰ The plan was to begin work in two villages, with the idea that if the model made sense, it would subsequently be applied to other villages. In the latter case, the NRC

¹¹⁰ De Janvry (1981), pp.250-251.

would seek to cooperate either with the governorate administration or a local university to complement its own resources.

Farmer Participation in Research

Implicit in the MBF Project is the assumption that if farmers themselves are brought into the project from the start, they are more likely to work with it and ensure its success. Therefore, in both Omar Makram and Kafr el Khadra, bringing the local people into project decision-making was a high priority. A general meeting was held to introduce the project, at which the mayor, local officials, and village inhabitants were present. During the course of the meeting, NRC project leaders described the philosophy of the project and suggested ways in which their expertise might benefit the villagers. After this formal communication, NRC teams of scientists were able to establish their own contacts and conduct studies of the local conditions.

NRC project managers also recognized that the villagers would be more receptive to the detailed information gathering activities of the project if they were given reason to believe that the NRC scientists truly intended to help them with their problems. Therefore, the NRC launched the project activities on two fronts from the start. While initial data collection was being carried out, several demonstration projects were started in both villages. They were chosen to be highly

visible and likely to increase farm or farm-related productivity. The stake-and-wire method of growing tomatoes was therefore chosen to get the project off to a good start. It was a technique which had gained widespread recognition in the Fayoum Governorate for its higher yields. At about the same time, NRC poultry specialists designed and set up a model confinement area to demonstrate improved poultry-raising techniques. By proving their ability in a few areas, NRC scientists hoped to stimulate greater cooperation among village producers.

ASSESSING THE REASONABLENESS OF PROJECT ASSUMPTIONS

Involving Village Producers: Successes and Failures

Starting on a small scale and managing the project autonomously have given the NRC greater control over processes that were left flexible by design, and allowed greater participation by village producers in the research process. Lines of accountability were clear: the NRC had overall decision-making and coordinating responsibilities. Indeed, it would have been difficult for the local agricultural cooperative officials, or any other extension service, to provide the integrating function for this multi-disciplinary project. But a concern for the self-sustainability of the processes set in motion by the project seems to have been left out. The design did not provide for a mechanism whereby the NRC could withdraw its involvement without thereby making it

difficult for producers to continue practicing the improved techniques.

Subproject Agreements with Farmers

Informal discussions with NRC scientists and national officials involved in overseeing the project, as well as interviews with farmers and village agricultural cooperative officials, suggest that an effective working relationship was achieved in most instances, between the village participants and those scientists who visited the project areas regularly. Agreements between the Project and village producers were worked out individually as interest was expressed and funding became available.

As knowledge and experience accumulated, from informal talks over coffee as well as from the more formal baseline studies, scientists were able to determine the main problems faced by farmers and choose the ones in which the NRC research capability could be of some assistance. Delicate negotiations then took place between the NRC project staff and the villagers, resembling a bargaining process in which each side looked out for its own interests. The scientists wanted the producers themselves to participate in the demonstration projects as much as possible in order to increase their stake in the success of the experiment. They insisted therefore, that the demonstrations take place on the farmer's land, or in his household, whenever possible. In return, the NRC provided

the farmer with a guarantee that he would not lose money as long as he followed the advice of the scientists.

Various oral agreements were reached between the NRC and the farmer, all of which represented some form of crop insurance. Some of the subsidies were provided as outright grants to the farmers, whereas others were given as loans. For example, the agreement reached with two farmers in Omar Makram stipulated that they would lease one half of a feddan each to the NRC for the tomato experiment. The farmers would care for the land according to NRC instructions, and the NRC would bear all of the expenses as well as pay rent, and would take all of the yield. (In Kafr el Khadra, the experiment had to be on government land the first year; but the second year, once the high yield had been demonstrated, a farmer agreed to cooperate with the project).

Similarly, in its first year, the peanut project provided the 35 producers with the cost of extra land preparation, as well as seeds of a new variety, and special fertilizers and pesticides. The maize, wheat and other vegetable crops projects reached similar agreements. The poultry project however, only subsidized the one-day-old chicks, the feed, and the antiseptics and vaccinations. The project then provided the producers a loan with which to buy the necessary equipment.

Subsequent expansion benefitted from the initial successes and increased trust between scientists and farmers. In 1962,

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there were 70 poultry producers in Omar Makram using the techniques introduced by the NRC, but only the first 12 had been subsidized. In Kafr el Khadra, there were 40. Likewise, the peanut project began with 35 participants in Omar Makram, all of whom received the subsidies. In 1982, there were 118 participants, even though only the highly specialized fertilizers and pesticides were being provided by the NRC.

Other teams reached a satisfactory agreement only after several attempts. The team working with broad beans originally agreed to pay for the seeds, pesticides, and fertilizers, in return for one third of the farmer's yield. However, due to a lack of communication and trust, this led to misunderstandings over the actual size of the yield. The scientists decided in the next season, to continue subsidizing inputs but not to claim any share of the crop. This ensured them the opportunity to accurately measure the yields and therefore increase the scientific validity of the experiments.

Cooperation with Local Agricultural Officials

Although it was originally thought that the participation of the farmers directly with the researchers was the key to effective implementation, it was soon realized that the cooperation of the agricultural cooperative officials, who lived and worked in the village, was also crucial to project success. The NRC therefore learned to rely on them to ensure effective ongoing communication between project participants

and NRC project managers. From one planting season to the next, different techniques and/or seed varieties were tried, adapted, and either accepted or rejected for future use. Several scientists, in cooperation with the agricultural cooperative workers, supervised the fields regularly during the growing season, but were also available for advice on crops not dealt with by the project, or for assistance to producers not participating in the project.

Such a concentrated effort was particularly useful in Omar Makram where agriculture faces many difficulties and unknowns. Indeed, in Omar Makram there has been widespread participation in the NRC projects, as indicated in Table 7 below.

To date, 118 farmers have participated in the peanut project, 200 in the small-scale dairy production project and 70 in the poultry project, to mention only the largest ones. It should be noted however, that there is probably significant overlap in these numbers of project participants. Indeed, it seems that many of the farmers who were willing to cooperate participated in all of the sub-components that they could.

TABLE 7

Number of Farmers in MBF Subprojects

	1979	1980	1981	1982
POULTRY				
Omar Makram	30	57	70	70
Kafr el Khadra	8	20	40	40
TOMATOES				
Omar Makram	2	1	0	0
Kafr el Khadra	1	1	0	0
MAIZE				
Omar Makram	--	3	60	11
Kafr el Khadra	--	1	4	N.A.
PEANUTS				
Omar Makram	--	--	35	118
Kafr el Khadra	(peanuts not grown)			
WHEAT				
Omar Makram	--	--	58	N.A.
Kafr el Khadra	(no wheat subproject)			

N.b. All of these figures represent those available to the researcher as of August 1982 so are subject to revision as new information is collected.

Less Cooperation in Kafr el Khadra

However, it soon became clear that the small-ness of the project and close communication between researchers and farmers did not guarantee success. According to NRC project managers, not many producers in Kafr el Khadra showed an interest in participating in the sub-projects, especially

those involving field crops (see Table 7). Some Kafr el Khadra producers benefitted from the MBF Project's subsidies of poultry confinement areas. Traditionally, small farmers had kept chickens as a side activity, raising them under poor conditions, and generally leaving their care to the women. The improvements introduced by the NRC: hanging feeders, gas stove for heating and lighting, semi-automatic drinkers, as well as training programs on feed formulation and vaccination, increased the production of chickens fourfold.¹¹¹ The project also allowed producers to raise poultry for the market, whereas previously, they raised chickens mainly for the eggs. But none of the other production-oriented projects seems to have addressed problems that are priorities for Kafr el Khadra producers.

When asked why they thought the farmers in Kafr el Khadra were often unwilling to participate in the field crop activities of the MBF Project, some project scientists responded that Kafr el Khadra farmers placed unreasonable demands on the project. For example, because it reminded them of earlier government attempts to consolidate their landholdings as a part of the land reform movement, Kafr el Khadra farmers were apparently not willing to accept the project on NRC terms. The NRC wheat team had insisted that they could not provide proper supervision of project activities unless the individual plots of the farmers were

¹¹¹ Ali (1982).

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consolidated in one area. Similarly, the maize team received full cooperation as long as the village council leader interceded but when the latter was away at the time of maize planting, few farmers proceeded to plant improved varieties.

Despite the small scale of the project and the close contact of scientists with the villagers, NRC staff were not always willing or able to accommodate the needs of the people they were trying to help. In part, this seemed to be because in general, the interest of scientists in rural development seldom goes beyond the research aspects of the project; indeed, some of the NRC scientists involved in the MBF Project seemed mostly interested in carrying out quality agricultural research to achieve optimal yields under the physical conditions characteristic of the two villages. Others were only interested in the lab work to be carried out at the NRC in support of the project.

Research May Not Be Key Constraint

A number of scientists however visited the villages regularly and assisted the villagers with all aspects of their production problems. As it turned out, much of the work involved facilitating institutional linkages for the farmers and other producers, and in training the agricultural extension workers and staff of the demonstration centers in how best to spread information on new techniques. These activities were ones for which the scientists were not

prepared and which the project had not anticipated in the design.

As will be discussed further in the next section, research may not be the main constraint to increasing productivity in the two villages. Farmers pointed out in interviews that the availability of the proper pesticides and fertilizers on a timely basis may be a problem in the long run since the new varieties recommended by the NRC are not currently available through the agricultural cooperatives. Egypt's system of agricultural cooperatives -- which are essentially government institutions controlling the supply of inputs and the marketing of outputs-- is not set up to be responsive to the unique needs of the different regions.

In addition,, although the demonstration centers were intended to create additional sources of income for farmers and landless workers, their impact appears to be fairly limited. NRC input into the centers was temporary; project assistance was mainly mobilized to set up the centers. It is unclear to what extent the communities are making use of them, or to what extent their organizational structure is effective in carrying out its mandate. This is something NRC project managers might want to follow up on since these demonstration centers are the only components which potentially address the needs of the landless laborers in the villages.

To date, the question of how to spread project benefits beyond the direct participants has not been systematically

addressed. If innovations are judged by other producers to be profitable then it may be reasonable to assume that an informal information exchange would take place among them to spread the new technologies. Whenever possible, the project demonstration plots or land and demonstration centers (apiaries, sericulture, dairy processing) were centrally located near a village thoroughfare. In addition, some of the sub-project managers prepared informational pamphlets to be distributed through the extension service.

However, not unexpectedly, the first farmers to cooperate with the scientists were also the more wealthy, progressive ones. As often happens in demonstration projects such as the ones in which the NRC is engaged, the main thrust of the effort was to gain visibility through clear, impressive successes. It was assumed that dissemination of the new techniques to the other village farmers then would occur without the need for further NRC input. Given this assumption, the best strategy was clearly to work with those farmers who were more wealthy and more educated. Presumably, these farmers would be more willing to take risks and more able to properly follow the advice of scientists. However, as will be discussed later, this strategy is inconsistent with the goal of improving the general living conditions and nutritional status of the village populations. If the goal of the project is to benefit the entire village, additional efforts may be necessary in order to encourage participation

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by those households that are found to be most needy. This may require that the NRC seek a cooperative agreement with a local organization or government agency that has better field support systems than does the NRC.

Project Impact on the Communities

The long-term impact of the project on village welfare, and on nutrition in particular, depends largely on three different factors. Firstly, appropriate improvements in self-sustainable income-generating opportunities must be achieved. Secondly, low-income groups need to be brought into the project. And thirdly, the income must be spent in such a way that all household members are actually better off. Each of these factors will be discussed in turn.

Self-sustainability

As mentioned earlier, the NRC seems to have come up with a variety of appropriate methods for increasing village income-generation opportunities, appropriate because they provide a simple technical solution to what seem to be technical problems: poor seed varieties, pests, low soil fertility. Appropriate, however, is a concept strongly bound by cultural and environmental factors. The constraints faced by Omar Makram and Kafr el Khaara producers may make the simplest technologies inappropriate unless some of the structural constraints they face are alleviated. Indeed,

several indications suggest that the main constraint to the increase in agricultural productivity may not be technical knowledge.

In Kafr el Khadra, the fact that many of the land-holdings are very small and scattered may explain the lack of cooperation on the part of Kafr el Khadra farmers. Theirs may have been a rational response given the fact that they depend mainly on off-farm sources of income and only work the land for subsistence needs. In addition, even for small farmers, one of the main constraints in the choice of cropping pattern is the production of animal fodder: berseem in the winter and maize in the summer.¹¹² The price of meat and dairy products on the market are still unregulated by the government so that livestock are given high priority in a household's distribution of resources. Because the average land-holding size in Kafr el Khadra is too small to provide subsistence for an agricultural family,¹¹³ it may therefore not be worth it to them to invest any further in agriculture. The farmers of Kafr el Khadra in general might be better perceived as wage earners as well as producers, since employment availability and wage levels may be more important determinants of their welfare than is agricultural productivity.¹¹⁴

¹¹² Maize stalks are used as animal fodder.

¹¹³ Ilya Harik writes that an agricultural family in Egypt needs at least 2-3 feddans, planted with traditional crops, to provide for its subsistence needs; see Harik (1979).

¹¹⁴ DeJanvry (1982), p.246.

In Omar Makram, knowledge of the optimal technology may not be the key constraint either. Apparently, institutional and environmental factors loom large. The logistical constraints of farming on land reclaimed from the desert are severe and may not warrant further investment in cultivation practices. In informal interviews with the researcher, Omar Makram farmers discussed the constraints they face. One of their main concerns was the rising cost of the inputs recommended by the NRC scientists. In 1981, the cost to the NRC per feddan of peanuts was about 33 Egyptian pounds (L.E.1= \$1.20); this included the increased cost of improved land preparation, and the cost of specialized pesticides and fertilizers not generally used by the farmers or provided by the agricultural cooperatives. In 1982, the farmers who were participating for the second season, by agreement with the project did so at their own expense; they claimed that in the second year of the project, the same package of technologies cost them about L.E.50 per feddan.

More importantly, some farmers are not sure that it is worth investing more in peanut production, even though the yields and returns are highly profitable if all goes well; too often they have lost a whole crop because the electricity that runs their irrigation pumps has been cut off for a period of days. The farmers' ability to continue using the improved technological package therefore depends on the relative cost of inputs, their availability in time for planting, and the reliability of the electrical system.

Farmers in both villages appear to be reluctant to adopt more labor-intensive technologies because the relative cost of agricultural wages in the Egyptian rural areas is high. This appears to be one of the main reasons for the rejection of the stake-and-wire method of growing tomatoes. Insofar as possible, all but the large farmers rely mainly on family labor, exchanging with neighbors if they have an urgent job to be done. In informal discussions with the researcher, farmers indicated that competition from job opportunities in the growing urban areas other than Cairo, and in other Arab countries, as well as availability of farmland in other Arab nations,¹¹⁵ has raised agricultural wages to unacceptably high levels. An Egyptian scholar points to two other reasons for the high wage levels, both of them having to do with the decline in labor availability.

The fragmentation of landholdings has reinforced the household mode of production and absorbed large numbers of workers who used to be available for hire during the peak seasons... By employing their women and children on their own farms, and by increasing their own numbers, small operators have drained the labor pool available in peak seasons and pushed labor wages up. To replace them, other farmers have to hire workers in the regular labor force at much higher wages, who are also often unavailable.¹¹⁶

¹¹⁵ The Christian Science Monitor reports that in Iraq, "to encourage private farming, Egyptian and Moroccan peasants are being given land grants to cultivate private plots in the Tigris and Euphrates Valley", 8/26/81.

¹¹⁶ Harik (1974), pp.72,75.

He also suggests that labor availability has decreased because more children are in school, and women and some children are putting more hours into animal husbandry.¹¹⁷

It is probable that all or these factors help to explain the high cost of labor faced by Omar Makram and Kafr el Khadra farmers. Since family labor is probably already fully employed, either on or off farm, farmers wishing to adopt improved but more labor-intensive technologies must be willing and able to pay hired labor.

Participation by Groups with Low Socio-economic Status

Assuming that appropriate techniques are found for increasing village productivity, and that they are widely adopted, it would be fair to assume that the village populations would be generally better off in economic terms. Benefits would accrue to malnourished households, i.e. to households with members at risk of or suffering from malnutrition, only to the extent that they adopted the new technologies. It is therefore worth identifying the target groups for the MBF Project in terms of socio-economic and nutritional status as a way of determining whether or not project benefits can accrue to those groups that have been found to be the worst off.

It is not easy to define target groups for an IRD project such as MBF. The activities were designed to serve as demonstrations of improved techniques and therefore involve

¹¹⁷ Ibid, p.72.

relatively few project participants , i.e. those that were subsidized. However, other producers may benefit by observing the new techniques being used by the participants themselves or by receiving training through some kind of an extension system. In a sense then, any villager engaging in the activity being improved becomes a part of the target group. According to this rationale, all of the land-holding families in Omar Makram are potential beneficiaries of the sub-projects involving field crops since all plant peanuts and at least some wheat and maize; 64 families might benefit from sub-projects dealing with vegetable crops.¹¹⁸

In Kafr el Khadra, the figures are larger because land-holdings are much smaller. About 672 of the 701 land-owners in that village stand to gain from field crop improvement projects. An activity involving vegetable crops would potentially benefit 53 farmers.¹¹⁹

As for the demonstration projects such as those dealing with poultry confinements, apiaries, and sericulture, their target group is the agricultural subcommunity as a whole in each village since they represent activities that could potentially provide a second source of household income for the landless and land-holders alike.

¹¹⁸ NRC (1980b), Village Socio-Economic Baseline, Volume I, p.58.

¹¹⁹ Ibid, p.29.

To find out the extent to which the target groups represent households vulnerable to malnutrition, a comparison can be made based on a socio-economic classification including food consumption as an indicator of nutritional status.

The figures in Table 8 for average per capita caloric intake, obtained by the NRC baseline survey, are probably not very reliable since they reflect the respondent's estimate of how much his family consumed of given foodstuffs during the previous twelve months. Therefore, they should not be read as absolutes but rather as general indicators of relative differences in food consumption between socio-economic groups. Indeed, these figures support the other findings of the socio-economic baseline. Table 8 classifies the populations of Omar Makram and Kafr el Khadra according to their socio-economic status and the average per capita daily caloric intake for that group. Those households whose main source of income is on-farm are referred to as "net agricultural income -- land-holders" or "net agricultural income -- landless"; those who also derive income from off-farm sources are referred to as "mixed agricultural income" groups. (See Tables 2 and 3 for a breakdown of the populations by main source of income).

Because of the field crop bias that has evolved in practice, it is the landless and fishermen who are least likely to benefit from the project unless they are able to take advantage of the activities of the demonstration centers.

TABLE 8
Socio-economic and Nutritional Classification of the Two Villages

AVERAGE PER CAPITA
DAILY CALORIC INTAKE

SOCIO-ECONOMIC STATUS	OMAR MAKRAM	KAFR EL KHADRA
Agric. sub-community		
net ag-landholders	2453 kcal/day	3299 kcal/day
mixed-landholders	3064	3135
net ag-landless	4212	----
mixed-landless	4664	2482
fishermen	----	1641
Non-agric. subcommunity		
non-subsidized	3370	3282
subsidized	2356	2907

Source: NRC (1980b), Village Socio-Economic Baseline, Vols. I and II.

Table 8 suggests however, that in Kafr el Khadra, it is these two groups that are worst off in terms of caloric consumption. They would also therefore be the ones most likely to show improvement if the project addressed their needs.

It could be argued that because the landless and the fishermen represent a small proportion of the total village population, 4.1% and 2.5% respectively, it is not worth developing subcomponents just for them. However, since even the project activities oriented towards landholders are not

meeting with much success in Kafr el Khadra, a completely different approach may be warranted. For example, the project might support existing small-scale rural industries or provide subsidies to new ones, as already suggested by several project managers for the new villages. The increase in incomes and employment for low-income groups would probably be more significant than can be expected through the project as it stands.

In contrast, the project appears to be targetted to the appropriate groups in Omar Makram since the land-holding households are the ones with the least adequate level of food consumption.¹²⁰ They are also the most likely to benefit from the NRC projects.

Talks with NRC scientists working in Omar Makram, the agricultural engineers in charge there, and some of the farmers, indicate that increases in yields of peanuts, poultry, potatoes and onions represent the most substantial cash gains to the farmers. All of these are assured a good market. Peanuts are sold at a fixed price (L.E.20 per ardab, 1 ardab is equal to 150 Kg) to the agricultural cooperative; vegetables and poultry are sold locally at good prices; farmers say they get 240 piastres (1000 piastres = L.E.1) per chicken; vegetables sell for about 20 to 25 piastres per Kg. Thus an increase in production of these foods would bring in cash that would help to cover the high costs of production

¹²⁰ The subsidized group is also poorly off but only represents 8% of the population.

characteristic of Omar Makram, as long as problems of input availability and electrical current cuts were not overwhelming. Furthermore, if the new technologies are widely adopted, the peanut project could potentially benefit a large group since it involves a crop which all Omar Makram farmers grow in the summer (many plant as much as two thirds of their land in peanuts).

The wheat project also has broad potential although the best and least-cost husbandry techniques for the particular village environments are still being researched. Since all farmers suffer heavy storage losses in wheat of up to 50%, they welcome new technologies. In the winter of 1981, the wheat project assisted 55 Omar Makram farmers. Increased wheat yields would not usually translate into an increase in cash income since most farmers in Kafr el Kuadra and Omar Makram do not sell wheat on the market. Most wheat is ground for bread baking or fed to livestock if it has begun to spoil in storage. Rather, higher yields would cause an increase in real incomes since it would reduce the amount of wheat that a household would need to purchase from the market.

NRC scientists are still experimenting with different maize seed varieties to find the one best adapted for local needs in Omar Makram. Maize serves a dual purpose: it is used in bread-baking, but also its stalks are the main source of livestock feed in the summer. If a suitable variety is found, the maize component may benefit a large number of farmers

since most farmers plant one third of their land in maize in the summer. Therefore, in Omar Makram, a majority of the agricultural sub-community could benefit from the project if the information reached them and institutional constraints were dealt with on a collective basis.¹²¹

Project Effect on Food Consumption and Nutrition

Although a rise in household real income would generally be expected to lead to an increase in food consumption, there are situations, such as those discussed in Chapter 2, in which no such change occurs or a deterioration may become evident. Situations in which negative effects may outweigh any benefits include those in which agricultural produce prices change as a result of the project, marketing patterns are changed, control over income is shifted, labor patterns are altered, or the vulnerability of a household, due to dependence on institutions and factors beyond its control, is increased. The following discussion examines each of these relative to the MBF Project.

It is unlikely that agricultural produce prices will change significantly as a result of project activities unless the vegetable crops improvements are widely adopted.¹²²

¹²¹ It has been estimated that the increased income to be derived from improvements due to the project is 30 L.E. per feddan for wheat, 174 L.E. per feddan for peanuts, and 121 L.E. per feddan for maize. See NRC (1980b), Village Socio-Economic Baseline, Vol. II.

¹²² Harik points out that fruits and vegetables are still exempt from government control and are therefore

Otherwise, the project is mainly dealing with crops whose price is controlled by the government (peanuts) and crops which are mainly kept for home consumption (wheat, maize).

However, improvements introduced by the project may significantly affect the producers' marketing pattern and therefore affect the likely impact of the project on household food consumption. It cannot be assumed that the additional produce will be kept for home consumption with only the excess being marketed, even if that was the traditional pattern.

For example, the study done by the NRC team of poultry specialists found that increased poultry production did not result in any increase in home consumption of chicken, but rather allowed the households to market chickens when they had not previously done so.¹²³ Indeed, producers may prefer to increase their cash income and keep less of their own produce. This could be because they prefer the bought commodity (for example, an Omar Makram farmer said in an interview that he bought flour and sold his wheat or used it for feed because his family prefers the taste of the purchased flour). It could also be that selling goods which command a high price on the market, such as vegetables and poultry, allows them to buy relatively more of a government-subsidized commodity such as wheat flour, lentils, or sugar. Producers may also prefer to

lucrative; see Harix (1979), p.29. Prices would therefore be expected to vary greatly according to supply and demand.

¹²³ Ali (1982).

sell their produce so that they may buy non-food items, or improve their living conditions. Increasing incomes therefore may or may not improve household food consumption, depending on outside factors as well as choices made by the person in the household who controls the additional income.¹²⁴

The effect of the project on food consumption may be complicated by a resulting change in labor patterns. Some of the new technologies being introduced by the NRC require additional labour, particularly in land preparation and in the application of fertilizers and pest controls. Since insofar as possible, farmers seem to avoid hiring labor it may be that family members are forced to spend more time in the fields at certain times of the year. The change in allocation of the woman's time in particular may adversely affect infant feeding practices and the nutritional status of the family as a whole.

Of concern too in the MBF Project, is the increased vulnerability of farmers in Omar Makram who, having invested more heavily into crop production, stand to lose much more in the case of events such as electrical failure that are beyond

¹²⁴ It may be that the change in poultry-raising methods and marketing represents a shift in control of income from women to men in Omar Makram and Kair el Khadra. Traditionally, women and children raised the poultry, mainly for the eggs; most eggs were kept for home consumption or bartered, and some were marketed. With the change to well-equipped confinement areas, households were able to raise poultry for the meat and sell them for good prices. It may be that raising poultry therefore becomes a man's job and that he gains control over the additional income. This might be worth exploring further since it has been found elsewhere that women are more likely to have food and nutrition as a priority for household expenditure (see Chapter 2).

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their control. If the farmer is likely to be more vulnerable because he is more dependent on irrigation, the new technology may cause his economic situation to deteriorate, thereby inhibiting any increase in food consumption for the household.

A variety of health and environmental factors may influence the nutritional status of individuals within the household such that an increase in food available to the household as a whole does not result in improved nutritional status. Indeed, the nutrition survey carried out in the two villages pointed to infection and infant weaning practices as factors that might inhibit the positive effect of increased incomes on nutritional status. In Kafr el Knadra, the high Infant Mortality Rate of 112.6 per thousand, and the relatively high prevalence of acute malnutrition, suggest that infection may be an important factor not taken into consideration by the project. Providing new income-generation opportunities for a broad range of villagers may increase living conditions for some, but will not improve the nutritional status of those whose problem is more health-related.

In addition, due to poor infant feeding practices, the nutritional status of children in Omar Makram in particular, but also to some extent in Kafr el Knadra, may deteriorate despite rising incomes and increased food availability to the household as a whole. In both villages, 90% of the children sampled were breast fed in the first year of life. 38% of the children in each village were receiving a food supplement by

the ages of 6 to 11 months. In Kafr el Khadra, 25% of the children between 16-17 months of age were still being breast-fed only, while 67% received a supplement. Of the children over 18 months of age, only 4 were still breast-feeding at all. In contrast, in Omar Makram, 42% of the 12-17-month-old babies were still being breast fed only, and 50% were breast feeding with supplement. Most of the children were not completely weaned until 2 years of age.¹²⁵ Therefore, even if the project has a positive effect on Omar Makram agricultural households by increasing their incomes, the change may not be reflected in measures of the child's nutritional status because of the stronger influence of infant feeding practices.

CONCLUSION

The success scientists were able to demonstrate in helping participating farmers to increase the yields of their main crops has gained recognition for the NRC and increased the demand for its services. Indeed, as discussed in Chapter 4, the NRC involvement in the Ministry of Agriculture Middle Egypt Project was a direct outgrowth of their experience in Omar Makram and Kafr el Khadra; in addition, one of the villages near Omar Makram has requested the assistance of the NRC in improving the productivity of their peanut fields. Furthermore, a core group of scientists -- both physical and

¹²⁵ Abdalla (1981), p.52.

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social -- have gained tremendously valuable experience through their work at the village level, including a better understanding of rural problems and opportunities as rural people themselves see them. This core group has already strengthened the MEC's capacity to design and manage IRD. Thus the institutional goals embodied in the MBF Project have been largely fulfilled.

But progress towards the equity goals remains unclear. The analysis in Chapter 2 suggests that if project innovations are widely disseminated in Omar Makram, it seems likely that farmers will obtain self-sustainable increases in real income. However, it also identifies several key constraints to widespread adoption of innovations. First, the agricultural cooperative system on which Omar Makram farmers depend, may not be flexible enough to accommodate the changes brought about by the MBF Project. Secondly, it is not clear that appropriate technologies, from the point of view of village producers, have indeed been found, except in the case of peanut production in Omar Makram.

In addition, whether this change is reflected in an improvement in nutritional status depends on several key factors such as the amount that is actually spent on food as opposed to other goods, the intra-household distribution of food, any changes that may have occurred in control over income or in labor patterns, as well as health and environmental factors that may inhibit the proper utilization of the food

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ingested by an individual household member. Increasing agricultural productivity in the village is a necessary but not sufficient condition for improving the nutritional status of land-holding families. More data would be necessary to identify which of these factors are most important in determining nutritional status in the Omar Makram context.

As for Kafr el Khadra, the More and Better Food Project as currently designed and implemented, will probably not affect the two groups whose nutritional status is the lowest: the landless and the fishermen. Consideration might therefore be given to adding other components oriented towards their needs. Furthermore, it seems that health and sanitary conditions are strong determinants of nutritional status in Kafr el Khadra and thus may inhibit improvements even if the project succeeds in raising incomes for a wide variety of villagers.

Assessing project impact in terms of nutrition as has been done above, is likely to paint a discouraging picture. IRD strategies are designed to set in motion processes that may not yield measurable changes in nutrition -- if at all -- for over ten years. During that time, changes may occur that will affect nutritional status, either positively or negatively. Even if all of the data were available for a comprehensive analysis, it would be difficult to show with any assurance that a project per se had a positive impact on nutritional status. The information about the other factors that influence nutritional status and living conditions may however

be equally important for management and evaluation decisions. This reinforces the importance of adopting a comprehensive approach to rural poverty; development strategies do not affect communities in isolation but rather complement the processes already at work. The findings of the analysis thus lend support to the process approach to IRD that allows for changes to be made in design and implementation as experience accumulates, and stresses the importance of ongoing monitoring such that information is available to assist decision-makers as the project progresses. Chapter 4 outlines the implications of the preceding analysis for nutrition in the MBF Project and for nutrition in IRD in general.

Chapter IV

IMPLICATIONS FOR NUTRITION IN THE MORE AND BETTER FOOD PROJECT

INTRODUCTION

An assessment mid-way through the project of its potential impact on nutrition can provide the opportunity to review the rationale for incorporating nutritional considerations, and to propose changes in project implementation that would enhance its impact on nutrition. This chapter therefore is oriented towards decisions that might be made to increase the likelihood that the project will achieve its equity goals. Indeed, the MBF Project goal of increasing the productivity of certain crops through demonstration efforts in the villages seems to have been achieved. Opportunities for the village as a whole however have been largely neglected.

Although nutritional objectives are explicitly stated in the More and Better Food (MBF) Project, the project design does not reflect a clear consensus on what form they should take. On the one hand, the design includes agriculture-related income and employment generation components under the assumption that these are most likely to provide a long-term solution to problems of malnutrition and poverty. On the other hand, the design includes direct interventions under the assumption that improving nutrition

means solving immediate health-related problems. Indeed, as mentioned earlier, anemia intervention trials have been carried out in Kair el Khadra through the health clinic with the help of a dedicated doctor and his staff. Discussions have taken place regarding the nutritious snacks program for elementary schools but a format has not yet been decided upon. In addition, the Nutritional Status Survey was conducted in both villages, but separately from the Village Socio-Economic Baseline Survey.

The inclusion of direct nutrition interventions such as the distribution of iron pills to anemic children and the promotion of nutritious snacks in schools represent a different way of achieving an improvement in nutritional status than that promoted by the agriculture-related subcomponents. Whereas the principle of the MBF Project is to introduce self-sustaining changes in the villagers' income-generation potential, direct nutrition interventions would require an ongoing commitment of personnel and finances. The implementation of such interventions would therefore require quite different organizational and financial arrangements than do the other project components.

These two approaches incorporate different, but not necessarily mutually exclusive ways of looking at nutritional problems as measured in young children. One looks at the problems in their own right, and the other looks at nutrition as an indicator of development. They can be complementary if

integration into the same project makes sense. For example, since it appears that sanitation is a crucial problem in Kafr el Khadra, and one that will probably inhibit any nutritional improvement through increased incomes and food consumption, it may be advisable to add on a component that deals directly with village sanitation. To complement this activity, the project might support existing small-scale rural industries or provide subsidies to new ones, in order to address the needs of some of those whose main source of income is non-farm.

Similarly, since infant feeding practices have been found to be one of the main causes of malnutrition in both Omar Makram and Kafr el Khadra, it might be highly effective to combine a nutrition education program with an income-generation project that helps women improve their productivity.¹²⁶ In the context of the two villages, NRC teams preferably of women, might introduce improvements in livestock and poultry-keeping that would improve the women's productivity without reducing their control over the produce. As they gain the means to better provide for their families and themselves, the women may be more receptive to advice on infant-feeding and nutrition in general.

The main difference between projects such as those just mentioned and those proposed in the MBF Project design, is that the former are intended to be merely catalysts for change in the processes that determine malnutrition. The latter

¹²⁶ See Hart (1975).

create a dependency on hand-outs and institutions which runs counter to the emphasis in IRD on self-sustaining development.

Project implementation has also not yet dealt systematically with reaching those households that are the worst off in nutritional and socio-economic terms. Part of the constraint is the lack of data relating nutrition to socio-economic status in the villages. This makes it difficult to identify those whom the project should reach and the problems they share. Part of the constraint is also the lack of an explicit strategy for disseminating information once initial experiments have proven successful. Indeed, no clear guidelines exist as to when the NRC has fulfilled its commitment to the villages: when productivity has increased for project participants (i.e. those involved in the experimental stages of the demonstration projects and receiving subsidies) or when they have benefitted the resource-poor groups.

If the equity goal of the project, i.e. the improvement of nutritional status as a proxy for village living conditions, is not explicitly planned for, it is unlikely that it will be met. Indeed, as suggested in Chapter 3, income due to project innovations may not be accruing in ways that favor nutritional improvement in the villages. New technologies may be increasing the vulnerability of producers to large losses. They may be decreasing women's control over production processes and thereby decreasing their role in family food

purchasing and consumption. Or the project may be increasing the gap between those with high real incomes and those with low incomes. Clearly, further consideration should be given to identifying the malnourished and determining those problems they have in common that the NRC can help to solve. The following discussion lays out several possible alternatives for improving nutrition and general living conditions in the villages.

DATA NEEDS FOR REACHING MALNOURISHED GROUPS

In order for project resources to help solve the problems of the malnourished groups, information is needed on who these people are and what their needs are. If a sample of Omar Makram and Kafr el Khadra households could be obtained and classified according to a series of nutritional status and socio-economic indicators, it would be possible to identify the vulnerable groups in terms relevant to the MBF Project. Socio-economic and nutritional considerations could then be integrated into the project design such that the components were tailored to the opportunities and constraints of these groups. For this type of analysis, an integrated data set is most effective, i.e. one that groups households according to a series of socio-economic classification variables and a series of nutrition and quality-of-life variables. Which ones are chosen would depend on the project and the environment in which it is being implemented.

To compare different groups of project beneficiaries for the purposes of improving targetting, it is useful to have a set of indicators that appropriately summarizes the nutritional status of the household. Food consumption indicators and/or anthropometric measurements using heights, weights, and age, are the ones most commonly used. Both have advantages and disadvantages when used separately, and are most reliable when used together. Indicators of food consumption are more sensitive than measures of nutritional status to changes in income, if they can be accurately measured. Indeed, there is a general relationship between income and food consumption which can be measured by the economic technique of income elasticities. These are based on the theory that an increase in income generally leads to some increase in food consumption. The proportion of the income increment spent on food depends on a variety of factors such as prices, tastes and preferences, and income control within the household. This proportion is reflected in a measure of income elasticity. Therefore, food consumption measures are easier to interpret in terms of changes in income.

The most common technique for collecting food consumption data is the twenty-four-hour recall. Estimates of domestic food production and food purchases through expenditure surveys may also be used as proxies for food consumption; repeated measures may be needed to get the appropriate recall

period.¹²⁷ Such data are difficult and expensive to collect, and are fairly unreliable.

Conversely, indicators of nutritional status such as weights and heights of children are easy to obtain but their relationship to income is not as well-understood as that of accurately measured food consumption data. In theory, the nutritional status of the child may serve as a proxy for the nutritional status of the household: if the child is well-fed then it is highly probable that the other members of the household are also well-nourished and fairly well-off in general. In contrast, a household in which there are malnourished children does not necessarily indicate that all members are malnourished since working members of the household will often be fed at the expense of others. However, the household probably has other problems: inadequate income, illiteracy, inadequate sanitation, all of which have been shown to contribute directly or indirectly to malnutrition. It is therefore preferable to supplement indicators of nutritional status with indicators either of food expenditure or food consumption.

To summarize, anthropometric measurements should probably be included since they are easy to collect and accurate, and, in conjunction with food expenditure data and indicators of socio-economic status, provide a good picture of the associations between nutrition and rural development. If the

¹²⁷ Casley and Lury (1982), p.43; see also pp.197-199.

resources are available, it is advisable to include measures of food consumption to help ascribe changes in nutritional status to changes in income.

For the purposes of MBF Project managers, it may be possible to use existing data to put together the kind or functional classification described above. The NRC has three main sources of information on Omar Makram and Kafr el Knadra that would be useful; these could be supplemented with data available in the clinics (birth and death registration, data on mothers, on immunizations), the agricultural cooperatives, and other local government institutions. The first NRC source is a summary of the census survey taken of the two villages by an NRC team in 1980; it includes a series of demographic indicators for all village households and institutional profiles of the villages.¹²⁸ The second is the NRC Village Socio-Economic Baseline, a sample survey using a Proportional Stratified Clustered (Nested) Random Sampling Design.¹²⁹ The strata used were defined by the household's main source of income, its land-holding size and family size. The report includes a wide variety of information on the farming systems in the two villages: data on cropping patterns, livestock production, household food industry, farm profitability, as well as information for the village in general on household characteristics and conditions, and food consumption. The

¹²⁸ NRC (1980a), Village Demographic Survey.

¹²⁹ NRC (1980b), Village Socio-Economic Baseline, Vols. II-III

latter however are too general to serve as proxies for nutritional status (see discussion in Chapter 2).

The third is the write-up of a small NRC nutrition survey which sampled children coming to the health centers for vaccination. It includes information on weights, heights and ages of the children, infant-feeding practices, as well as indicators of diseases that are associated with malnutrition; it does not however include any information on the household to which the child belongs.¹³⁰

If the children screened by the nutrition survey could be matched up with their households, presumably with the help of the clinic staff, the information from the NRC Census Survey could be used to draw up a profile such as the one in Figure 6. For each socio-economic stratum in the village, the profile might include the prevalence of wasting (<80% Weight-for-Height) and stunting (<90% Height-for-Age), the percentage of poor dwellings, the percentage of dwellings without latrines, and the percentage without a private water source. If enough children covered by the nutrition survey could be matched up with households sampled by the baseline, further project-relevant classifications could be drawn up based on the farming systems characteristics of the two villages.

¹³⁰ Abdalla (1981).

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The main decision to be made based on these classifications would be whether or not the project, as designed and implemented, is likely to benefit those groups identified as poorly-off, and to what extent the project could meet their needs if changes in design and implementation were instituted. Therefore, it is crucial that information also be available on project participants and extent of dissemination to non-project participants.

Using one of the Cook and Campbell (1979) designs mentioned in Chapter 2, the survey could be designed to provide before-and after-project data. These might include not only measures of the dependent variable, nutritional status, and of the independent variable, the project, but also of those variables that are likely to influence the relationship between the two. For Omdurman and Kafr el Khadra, these should probably include land-holding size, main source of income, amount of produce marketed, household labor patterns, some measure of sanitation and some measure of intra-household food distribution. Statistical manipulation through multiple regression analysis would then be possible to isolate the effect of the project on nutrition. The behavior of the interfering factors themselves would also be of interest to help identify the most significant determinants of nutritional status, and to find out which factors, if any, might be open to intervention.

When dealing with a theoretical construct as complex as that which places nutrition in the poverty "web", it may be advisable to supplement general survey data with a case study that examines in detail the project impact on a small number of beneficiaries.¹³¹ This may be the best way to estimate the causes of the various observed effects. Indeed, even if data is available for a comprehensive analysis of nutritional status, it is difficult to find significant relationships. It has been suggested that it is not unusual for only 10% of the variance of the dependent variable to be explained by the independent variables included in the model.¹³²

DESIGN ALTERNATIVES FOR ACHIEVING EQUITY GOALS

If the evaluation of the MBF Project shows that the technologies are being widely adopted, it would be important to find out the extent to which the beneficiaries represent households with malnourished members. If however, the evaluation shows that few farmers are adopting or continuing to use the new technologies at all, it may be important to find out why (qualitative judgements based on discussions with participants would suffice) and find ways to better adapt the technologies to local conditions.

¹³¹ Casley and Lury (1982), p.52.

¹³² Mason (1983), p.43.

If only a few project sub-components seem to have an impact on households with malnourished members, the activities of those sub-projects could be expanded and others reduced. For example, it is likely that the evaluation will find that in Kafr el Khadra, the project is not affecting either the landless workers or the fishermen, two of the groups whose caloric intake appears to be inadequate. If that is the case, it might be recommended that some of the sub-projects, such as poultry, be expanded and implemented with an orientation towards those groups. Indeed, the baseline data shows that some landless households and some fishermen's households own and raise poultry. Of the four landless households sampled in the socio-economic survey, three owned poultry: two families owned twelve chickens each and one family had four. None of the households however sold any poultry and they all reported a high mortality rate. Of the five fishermen's households sampled, only two own poultry; both had six chickens. Some of them did report selling poultry although the information is incomplete.¹³³ It is conceivable that with proper subsidies to begin with, these households could be equipped with the confinement areas that worked so well for others in the village, and could produce chickens to be sold for meat in the market, thereby increasing their income-generation potential.

¹³³ NRC (1980b), Village Socio-economic Baseline Survey, Vol. II.

Likewise, the dairy processing project might help the landless in Kafr el Khadra since the ones in the sample reported producing a variety of dairy products, all from buffaio's milk. They also report selling some (about one half of their production). If these households could also be equipped with bee-hives and sericulture frames, and trained to use them, their income-generation potential would be substantially increased.

If the evaluation shows that the agricultural projects are not likely to have an adequate impact on nutrition, and it was determined that certain groups of malnourished villagers could not be brought into the project, then additional project components might be considered. The choice of alternatives should involve the opinions of the potential beneficiaries and their participation in design, as was done for the subcomponents already implemented. This may involve more time and outreach than was necessary for the demonstration projects because typically, those families that are less well-off have had little contact with extension workers of any kind, much less with researchers. Once needs have been identified, then a decision can be made as to whether intervention can effectively address them, and as to which alternatives are the most cost-effective.¹³⁴

¹³⁴ Some alternatives have already been mentioned: subprojects dealing with sanitation, programs addressing the needs of non-agricultural producers, programs oriented towards women as producers and combined with nutrition and health education.

Clearly, effective information channels, including both qualitative and quantitative data flows, are crucial to ensuring that the project achieves the expected impact on general welfare and nutritional status. At least, the information mentioned above may help project managers to avoid possible negative side-effects. It may also help achieve positive effects by identifying those groups most in need and clarifying the determinants of their poverty. However, accurate information per se will not guarantee that the overall goals of improving general welfare and nutritional status are actually met. The ability of the project staff to develop technologies that lead to self-sustainable increases in income, and their success in ensuring that the innovations are accessible even to the worse-off groups, are also necessary steps along the way.

To this end, two additional components might be considered. One might be referred to as an institution-building component, and the other as a training component. An institution-building component -- assistance in organizing producer cooperatives, working with the agricultural extension service to provide new services -- might ensure that the demonstration centers became an integral part of the community and that the farmers were able to continue using the new techniques after the MBF Project subsidies were withdrawn and the NRC no longer delivered inputs unavailable locally. Such an approach might include in the design a strategy for

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dissemination , i.e. an explicit process whereby the results of applied scientific trials would be "translated" and disseminated, either to individual villagers or to local government personnel and organizations responsible for programs with a broad outreach. This would include funding proposals if necessary, and a plan for assessing the impact of the project on the villages. An approach such as this one would most likely involve establishing effective linkages with the various government bodies that have an extension capability (Agriculture, Health, Education, Social Affairs) at the governorate or district level as well as village leaders and local organizations.

In order to better reach low-income producers, it might also be advisable to build into the project a training component in which researchers, extension workers, and the innovating farmers work together to determine the best way to institutionalize the new agricultural practices and the spreading of information to other producers. The latter component would presumably address the question of how best to bring the locus of project decision-making closer to the field in order to ensure the true integration of the multi-disciplinary activities.

In the long run, it seems that the best way for the NRC to reconcile its institutional goals and the personal goals of its staff, with the objectives of IRD, is for it to join forces with one or several other organizations that have

supportive facilities in the rural areas and the extension capability that the NRC lacks. In the Egyptian context, one possibility is to collaborate with one of the nation's provincial universities. These are mandated to train scientific and technological personnel for service in Egypt, and in the rural areas in particular. This is the approach being considered currently by MBF Project managers as they contemplate including two new villages in the project.¹³⁵

Another possibility is to collaborate with national and governorate-level institutions with infrastructure and personnel in the rural areas. The Middle Egypt Project, a venture jointly funded by the Academy for Scientific Research and Technology, and the Ministry of Agriculture, has adopted this approach. It involves NRC scientists working with the Organization for Reconstruction and Development of Egyptian Villages (ORDEV) and the extension service of the Ministry of Agriculture, to teach farmers the use of new seed varieties and cultivation techniques for maize and tomatoes respectively. It is currently working with 12,500 feddans of maize and 7,500 feddans of tomatoes in the governorates of Giza, Beni Sweif, and Fayoum.¹³⁶ Collaborating with other institutions in the implementation of the MBF Project would allow it to impact a much larger number of people and in a

¹³⁵ The NRC is discussing collaborating with Assiut University in Upper Egypt to implement the MBF concept in surrounding areas. The division of responsibilities is yet to be worked out.

¹³⁶ Interviews with NRC scientists involved in the project.

sustained manner over time. However, if upscaling the project is a high priority, it will be important for the NRC to decide how and if nutrition will be integrated into the activities, and if indeed Integrated Rural Development is the appropriate model for the project.

CONCLUSION

The experience of the MBF Project with introducing nutrition as a measure and a goal for development, highlights opportunities and problems that need further study. First, nutritional status is a fairly sensitive indicator of the living conditions of the rural poor. If a certain group of people have low purchasing power, poor sanitary conditions, or an intra-household decision-making process biased against nutritional considerations, it will show up in measures of the nutritional status of women and children. Indeed, these groups have been found to be most at risk of malnutrition. If conditions improve, the changes will be reflected in measures of nutritional status, and in particular in the growth of children aged 2 to 4.

Second, measurement and surveys can greatly help in the management of the various factors influencing nutritional status. As a part of project design, information on nutrition and socio-economic status can identify those groups most in need, and help determine the nature of their problems. In a mid-term assessment, measures of nutritional status can help

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determine whether or not the project is effectively reaching the intended beneficiaries, and whether unintended side-effects may be inhibiting any improvement in living conditions. As a part of project evaluation, measures of nutritional status may be compared with baseline measures to see whether the project had a lasting impact on living conditions.

Third, as a goal for IRD projects, nutrition may help to clarify the kind of development that is being promoted, i.e. self-sustaining development that improves the living conditions of the rural poor. An analysis such as the one presented here, points to the importance of identifying the structural constraints to innovation and actively promoting the wide-scale dissemination of improved technologies, in particular to those socio-economic groups who for various reasons are often left out of the development process. Indeed, although information is crucial in ensuring that project resources are oriented towards the needs of malnourished groups, the implementation processes are equally important, i.e. project initiatives in the delivery of goods and services, and the response of rural populations to those initiatives. In addition, an analysis that explicitly considers nutritional status and its determinants, suggests that an integrated approach would ensure greater project effectiveness in reaching the equity goals of IRD.

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The preceding analysis has identified opportunities for introducing nutritional considerations into IRD, but also problems. The lack of consensus on the design characteristics needed for a self-sustaining program, the lack of unambiguous measures of nutritional status, and a poor understanding of the process by which income is translated into food consumption and to the nutritional status of individuals, all represent areas needing further research.

As more experience with IRD accumulates, it may be possible to identify those program components most likely to ensure the self-sustainability of development processes set in motion. The MBF Project suggests that participation by potential beneficiaries appears to be essential, as is the location of project activity and decision-making near the population it is intended to benefit. In addition, some kind of training/extension component designed to work with groups of low-income producers seems advisable. Although the autonomy and small scale of the project were helpful at the experimental stage, they concentrated resources in two small areas and limited the number of people who could be reached. It remains to be seen whether the lessons learned in the MBF Project can be generalized and effectively upscaled to the governorate level.

However, it should be noted that the problems of measuring and interpreting nutritional status as a proxy for general living conditions are not any greater than those accompanying

other indicators of equitable development such as income or expenditure. If the interrelationships with other determinants of poverty were better understood, nutritional status would be relatively easier to measure because it can be summarized by a series of physical indicators: anthropometrics, infant mortality rates, and other measures such as birth weights. Therefore, more research is needed to specify those factors which are the strongest determinants of nutritional status as an indicator of poverty, and to explain the process at work.

In summary, explicit considerations of nutritional status as a proxy for changes in general living conditions may help to clarify the goals of IRD projects. Such concerns as who will benefit from the project activities and to what extent these will be self-sustaining improvements, might provide a common goal for such diverse activities as pest control, water quality improvement, and small-scale food processing. A design that clearly lays out the transformations that must occur in order for project processes to bring about positive changes in nutrition, or at least to avoid negative ones, would provide a common set of objectives for professionals from widely divergent fields and backgrounds, and might ensure that the needy do indeed benefit from Integrated Rural Development .

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