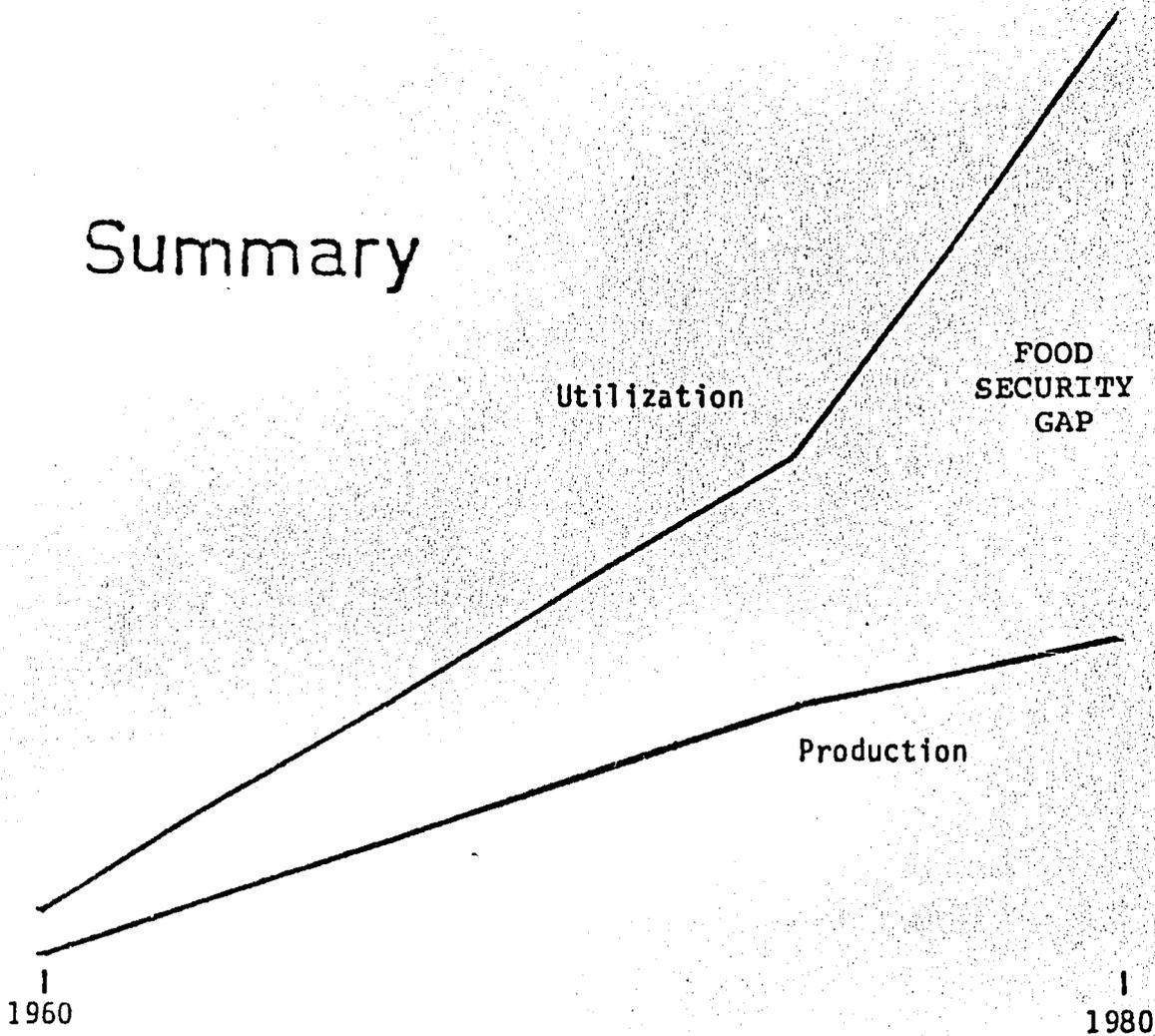


EGYPT

Strategies for Accelerating Agricultural Development

A REPORT OF THE PRESIDENTIAL MISSION
ON AGRICULTURAL DEVELOPMENT IN EGYPT

Summary



Ministry of Agriculture of the Arab Republic of Egypt
and the U.S. Agency for International Development
in cooperation with
The International Agricultural Development Service
and the U.S. Department of Agriculture

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SUMMARY

OVERVIEW

Egypt is facing a critical situation in that its consumption of major food commodities significantly exceeds domestic supply, resulting in a sharp decline in self-sufficiency levels and necessitating the import of large quantities of food and feed commodities.

The potential for expanding the Egyptian agricultural sector is great, and the rapidly widening gap between the production and utilization of food commodities can be reduced.

This potential relates to the well-documented capacity for significantly increasing agricultural productivity on arable lands presently available and for improving the efficiency of animal production (vertical expansion). In addition, there is a potential for expansion of agricultural output through land reclamation efforts (horizontal expansion) and for increasing returns by expanding export markets in those commodities for which the country enjoys a comparative advantage. The greatest immediate potential lies in the area of vertical expansion.

Many problems or constraints currently prevent Egypt from realizing its agricultural development potential. These constraints may be grouped into four broad categories: policy, technological, resource, and institutional.

The Mission's Report, summarized in the following section, provides specific recommendations for addressing and, insofar as is possible, removing these constraints.

There is a great need for the Government of Egypt to implement the strategies set forth herein for accelerating the development of its agricultural sector. Failure to act promptly to implement programs aimed at reducing the rapidly widening food gap or deficit could have critical economic consequences and could seriously jeopardize Egypt's ability to achieve its food security and economic development objectives.

AGRICULTURE AND THE EGYPTIAN ECONOMY

Historically the agricultural sector has been a major contributor to the Egyptian economy and constituted one of the most significant sources of government revenue and foreign exchange. By the early 1970's, however, the relative contribution of agriculture to government revenues and foreign exchange earnings was declining. Indeed, since the October War of 1973, Egypt's economic situation has changed dramatically. Petroleum, remittances from workers' abroad and tourism have become the major foreign-exchange earners. Compared to other sectors, agriculture has shown the slowest growth, increasing by an average of only 2 percent annually between 1975 and 1980, while growth in the services sector averaged more than 8 percent and petroleum 30 percent.

Investment in the agricultural sector has not been optimal. Land reclamation, which received 40 percent of available funds, has given low returns. Other funds have been used mainly for infrastructural improvements, including the Aswan Dam, irrigation canals and drainage facilities. At the farm level relatively little investment in new technology has occurred. Farmers have not been encouraged to save or invest because administered prices and other controls have limited the profitability of farming.

Likewise, growth in the supply of food and agricultural products in Egypt has been slow. A 25 percent gain in value-weighted agricultural output was experienced between 1970 and 1981. Over the same period crop output value expanded 16 percent, while animal product value grew 42 percent. Growth in output of crops was 1.5 percent annually, while growth in animal products was 3.8 percent. Production of traditional field crops such as cotton, rice, wheat and sorghum showed little increase, but output of berseem clover, maize, fruits, vegetables and animal products expanded. These production shifts were related to government policies, farmer response to prices, consumer demand, and technical constraints, among other factors.

The Ministry of Agriculture oversees farm production and influences farm output through crop quotas, fixed crop rotations, administered prices, input allocations, and technical assistance. Government intervention in agriculture has been characterized by mixed goals: earning a surplus from the farm sector through low producer prices; acquiring cheap food for urban distribution; insuring production of profitable export crops; protecting farmers against world price fluctuations; encouraging economies of scale; and encouraging adoption of new technology.

Agricultural land area is limited mainly to the Nile Valley and Delta, with a few oases and some arable land in Sinai. The cultivated area is 5.8 million feddans, 3 percent of the total land area. The entire crop area is irrigated except for some rain-fed areas on the Mediterranean coast. Over the last three decades, land reclamation of 900,000 feddans has been offset by land lost to urbanization of approximately 700,000 feddans. Land holdings are fragmented, with the average size of operating farm units being 2.5 feddans. Land tenure is divided among legal owners, renters, and share-croppers in order of magnitude.

The government maintains fixed producer prices for a number of crops. These prices are low relative to market prices in Egypt and to international prices. Because of distortions resulting from price regulations, farmers have often preferred to cultivate less-regulated crops, including vegetables, fruit and berseem clover.

Per capita consumption of many agricultural commodities has increased significantly, especially since 1974. In fact, in the six-year period from 1974 to 1980, per capita utilization of wheat advanced 38 percent, sugar 69 percent, maize 24 percent, red meat 38 percent, white meat 67 percent, dairy products 41 percent and fish 76 percent. This rapid increase in demand for food is due to a number of factors including a high rate of population growth, a

shift in population from rural to urban areas, increasing income, and substantial government subsidies for food.

Egypt is becoming increasingly reliant upon food imports to meet its food demands and upon foreign assistance to finance them. In 1974 the value of agricultural imports exceeded exports for the first time. The figures rose quickly, and by 1981 Egypt was importing some 48 percent of its staple food commodities. In 1981 the value of agricultural imports exceeded exports by some three billion dollars.

While the value of Egypt's agricultural imports is growing, agricultural exports are falling. In fact, the volume of the three most lucrative exports--cotton, rice and oranges--declined over the last decade.

The rapid growth in domestic demand for agricultural commodities and the decline in their production for export has prompted Egyptian authorities to seek ways to revitalize the agricultural sector and to undertake efforts to increase agricultural productivity and output. This study is concerned with developing strategies to achieve this objective.

AGRICULTURAL DEVELOPMENT POTENTIALS

DEMAND

The principal requirement for growth in any economic sector is that there be sufficient demand for the sector's products at adequate price levels. In the case of agriculture in Egypt, overwhelming evidence demonstrates a strong domestic demand with indications of potentially strong international demands as well.

In view of the current food deficit in the country (in terms of domestic production), the rapidly increasing per capita consumption

of food and the rapid increase in the number of consumers of food, the question is not whether there will be sufficient demand for food to sustain a more rapidly developing agricultural sector. The real question is can the country sufficiently marshal its resources in the agricultural sector to meet its food security needs during the next decade?

Domestic demand for Egypt's agricultural produce is likely to be so formidable one might question whether there is the capacity to accommodate the demand of a substantial export market. However, the goal should not necessarily be that of achieving a state of food self-sufficiency. Rather the goal of food security embraces or, in our opinion, should embrace the concept of giving priority to the production of those commodities for which Egypt holds comparative advantage--with the possibility of exporting at least enough agricultural commodities to pay for those which must be imported.

With this in mind, the issue of Egypt's comparative advantage in agriculture should be carefully studied, and efforts should be made to encourage the further development of the country's agriculture to fully exploit whatever advantage may exist. Despite the absence of a formal study, it appeared to the members of the Mission that Egypt has the potential to develop significant export markets, especially for horticultural crops. This matter warrants careful exploration.

EGYPT'S UNIQUE RESOURCES

Prior assessments of Egyptian agriculture have often emphasized Egypt's unusually favorable land, water and climatic resources, along with the relatively high levels of agricultural productivity which these resources have enabled the country to achieve. Such assessments show yields of most Egyptian crops to be substantially above average world yields, and, in fact, to compare very favorably with those of more developed regions of the world such as North America and Europe.

Many have assumed from such comparisons that opportunities for further increasing productivity per unit of land must be limited. Such views have been reinforced by crop yields during the past decade which, with few exceptions, have tended to level off or, in several instances, to decline.

However, ample and ever-increasing evidence suggests that despite relatively high levels of productivity by world standards, or even by those of more developed nations, Egypt's potential for further augmenting agricultural output on existing arable lands is enormous. Such increases would be in excess of whatever gains might be realized by bringing additional lands under production through reclamation efforts.

Yield comparisons with other agricultural areas of the world often fail to take into account the truly unique nature of Egyptian agriculture. In no other country is the agricultural system so completely irrigation-based. In no other country is the total cropland so abundantly supplied with high quality water. This uniqueness is further enhanced by the deep, rich alluvial soils throughout the Nile River and Delta area. Finally, no country can claim more optimal climatic conditions for agriculture.

To derive a meaningful comparison of Egyptian agricultural productivity, the matter should be considered with reference to other areas where conditions are similar. However, a strictly parallel situation is not available. In its absence perhaps the most useful comparison would entail setting Egypt's productivity levels against those achieved under irrigated conditions in the U.S. When such comparisons are made, it is found that average U.S. yields are substantially greater than those in Egypt. This would suggest that the productivity of Egyptian crops has by no means attained full potential considering the fact that Egypt's overall environment for crop production is generally superior to that found under average

irrigated conditions in the U.S.

LARGE POTENTIAL FOR VERTICAL EXPANSION

Actual experiences within the country provide even more direct indication of the significant potential for increasing crop productivity on existing arable land (vertical expansion). Research trials, large-scale demonstrations conducted on farmers' fields, and experiences by farmers themselves have indicated the probability of achieving significantly increased yields.

Perhaps the most current and meaningful information available for cereal and vegetable crops are the data accumulated from large-scale field demonstrations carried out by the Ministry of Agriculture and USAID as part of the Rice Research and Training, the Major Cereals Improvement, and the Agricultural Assistance Projects. These extensive demonstrations under farm conditions, involving thousands of feddans, have indicated a potential with current technology and know-how for increasing yields of cereals by 50-70 percent and certain vegetables by 160-260 percent. Given the broad scope and scale of these demonstrations the yields realized represent levels that could be achieved by average Egyptian farmers within a few years provided the various constraints presently limiting production were appropriately addressed and removed.

Maximum yields observed in demonstrations and other field trials, as well as performance by better farmers, suggest that long-range potentials for increasing output are in the range of 200 percent and even higher for many crops.

Certainly, a strong, well-conceived and viable research program can be expected to develop the technology needed to increase yields far above the levels which are now possible--and, of course, even further above the average levels now realized.

Substantially less information is available to indicate the potential for improving animal productivity. The general information at hand, however, suggests that the opportunities may be of comparable magnitude.

A very general approximation of overall potential suggests that the opportunity exists for doubling broiler- and cattle-feeding efficiency, egg production per hen and milk production per cow over levels currently achieved in villages. It is further estimated that improvements in milk production by buffalo of 1 to 2 percent per year may be possible through genetic improvement and that fish production per feddan may be tripled.

LESS CERTAIN POTENTIAL FOR HORIZONTAL EXPANSION

The potentials for bringing additional land into production and expanding existing livestock enterprises (horizontal expansion) are not nearly so encouraging as prospects for increasing productivity of existing cropping areas and livestock operations (vertical expansion).

With only 3 percent of Egypt's land base under cultivation, there is obviously space for agricultural expansion. However, appropriate soils that could be developed at reasonable costs are extremely scarce. Although the water supply might support two million feddans of reclaimed lands, one might question the feasibility of bringing more than one million additional feddans into cultivation in the immediate future, given the nature of available soils and other topographic constraints.

In the 1960's considerable emphasis was placed on efforts to develop "new" lands; more than 900,000 feddans were reclaimed. However, the Ministry of Agriculture now indicates that only 500,000 of these feddans are "above marginal production." This reclaimed area, which constitutes approximately 13 percent of the total cultivated land in

Egypt, currently accounts for only about 2 percent of total agricultural production.

The great expense of reclamation, along with the low productivity realized to date, cause us to be less than optimistic regarding the short-range potential for substantially increasing agricultural output on "new" lands. Certainly, the potential for increasing output is much greater and the costs substantially less per unit of output on "old" lands than on reclaimed desert lands. Consequently, if the government of Egypt must choose between investing in "old" versus "new" lands for agricultural development, the greatest returns by far would be realized from investments aimed at maximizing output from land already being cultivated.

However, despite the disappointing history of reclamation efforts, the potential exists--given the application of the appropriate technology and suitable management--for producing acceptable yields of high-value, specialty crops on newly reclaimed desert lands. In addition, a broader range of crops could be cultivated in those areas left to be developed in the Delta.

Considerations other than agricultural production will influence decisions concerning reclamation. However, the results may continue to be disappointing unless a concerted research effort is undertaken to learn how the "new" lands can best be managed and utilized for agricultural purposes. Such research should be initiated at least ten years before large-scale projects are launched.

The relatively high levels of agricultural productivity permitted by Egypt's unusually favorable land, water and climatic resources support one of the most dense livestock populations in the world--about one animal unit (cow-equivalent) per feddan.

Given the fact that the country already falls far short of producing enough food to meet human needs, and given the limited availability of arable land, one might question the desirability of expanding the production of meat and animal products. Indeed one might question whether even the present level of resources devoted to animal production can be justified.

In this type of situation, priority is normally given to producing from a given land area, the staple food commodities that would generate the most energy and provide the best nutrition for humans. Converting large quantities of grain to meat or animal products and using large areas of fertile land to grow forages indicate a questionable allocation of scarce resources.

Given the severe food deficits that currently confront Egypt and the likelihood that the situation will be even more acute in the future, the strategy of continuing those policies which have favored expanded production of meat and animal products at the expense of crops needed for domestic consumption or export appears unwise. Furthermore, we doubt that Egypt's comparative advantage lies in the production of meat and animal products. Accordingly, it appears better to concentrate on producing those commodities for which Egypt does have a comparative advantage and to import whatever level of meat and animal products the country wants and can afford (above and beyond local production derived primarily by using residues and by-products for feed.

Two possible exceptions to this general statement might apply-- the first is fish and the second, poultry. Egypt's distinctive resources and capabilities for aquacultural operations are such that further development in this area may be warranted. In addition, commercial poultry operations have shown impressive efficiency in terms of the effective conversion rates of feed to meat. Consequently expanding poultry production to supply more of the animal

protein needs of the country could also be warranted, especially in light of the substantially increased production levels of domestic maize and sorghum which now seem possible.

In the final analysis, however, as long as Egypt is in a deficit situation with respect to concentrates for poultry and fish, the relative merit of importing the meat directly (instead of the concentrates) should be carefully evaluated.

If Egypt hopes to attain its full potential in agriculture, then a broad array of effective and efficient agriculturally-related businesses and industries are needed. Certainly the potential exists to develop such enterprises. At present, however, many public-sector organizations have been established to serve these needs, and their performance leaves much to be desired in terms of providing the kind of assistance required. Unfortunately, the general economic climate, as well as many government policies, discourage private-sector investment in enterprises which are of crucial importance to the task at hand.

On the other hand, many leaders in government are now advocating more private-sector investment and activity. However, more sustained efforts to encourage the development of appropriate businesses and industries are necessary to bring about and sustain growth within the agricultural sector.

CONSTRAINTS LIMITING ACHIEVEMENT OF DEVELOPMENT POTENTIAL

Although the potential for further agricultural development in Egypt is significant, many constraints limit the realization of this potential. We have grouped these constraints into four broad categories--policy, institutions and organizations, resources and technology--and examined their influence on both production and marketing.

1. Policies

Agricultural policies have acted to seriously constrain the growth of Egyptian agriculture. Prices for many agricultural commodities are fixed at low levels; this is a serious disincentive to farmers as it gives no encouragement for increasing production and actually promotes the inefficient allocation of resources and the inequitable distribution of sectoral income. Government pricing of major agricultural inputs has also been a part of Egypt's overall agricultural development strategy. Although such input subsidies partially offset the income transfer effects of administered commodity prices, they also contribute to misallocations of resources.

We recommend that the government of Egypt permit agricultural output and input prices to move towards world price levels. Correcting distortions in relative prices received and paid by farmers is central to using resources in the agricultural sector more efficiently and reducing Egypt's growing dependence on imported food. Changing relative prices in the direction of world market prices will produce incentives for farmers to reallocate resources between crop and livestock enterprises. Allowing prices to reflect international opportunity costs will also provide incentives to adopt yield-increasing technologies.

We further believe that public-sector investment in agriculture has been insufficient for increasing the contribution of rural areas to Egypt's economic growth. Consequently, we recommend that the government of Egypt increase the rate of investment in the agricultural sector. The decision to invest should be based upon economic criteria and the country's development objectives.

2. Institutions and Organizations

The institutions and organizations related to the agricultural sector are complex. Four Ministries are directly involved in various aspects of food production. Others are indirectly involved. The result is overlapping duties and, not infrequently, conflicting policies. If the agricultural sector is to meet the future goals of food production, all facets of the sector should be considered within a holistic framework for planning and executing national programs.

A number of mechanisms could assist in coordinating the development of an integrated approach to problems presented by the agricultural sector. We suggest three:

- better cooperation between the Ministers and Undersecretaries of the involved Ministries;
- the establishment of a Supreme Council of Ministers for Food and Agriculture (Ministers of Agriculture and Food Security, Irrigation and the Sudan, Reconstruction and Land Reclamation, and Supply).
- the establishment of a formal structure that would encompass and relate all Ministries directly concerned with the agricultural sector (Agriculture and Food Security, Irrigation and the Sudan, Reconstruction and Land Reclamation, Supply) under the leadership of a Deputy Prime Minister for Food and Agriculture.

We believe that the establishment of the position of Deputy Prime Minister for Food and Agriculture would offer significant advantages.

We also recommend the formation of Inter-Ministerial Work Groups between the Ministry of Agriculture and the Ministry of Irrigation. Such work groups would be active at the national, governorate,

and district levels. Their purpose would be to focus on the interface between the responsibilities of the two Ministries.

Likewise, the establishment of Inter-Ministerial work groups between the Ministry of Agriculture and the Ministry of Reconstruction and Land Reclamation is also recommended, with these work groups also operating at the national, governorate and district levels.

At present, the organization "within" the Office of the Minister of Agriculture and Food Security involves a collection of 17 semi-autonomous groups and companies and 13 operating undersecretariats. Such an organizational structure is somewhat cumbersome and inefficient in that it results in overlapping or duplication of functions and engenders uncertainty regarding the responsibilities of the various agencies. We recommend a restructuring of the semiautonomous organizations under the Ministry as well as a reorganization of the Ministry itself to facilitate more efficient operations and a more effective span of control by the Minister.

We believe this can be accomplished by grouping the major organizations and agencies which report to the Minister under three first Undersecretaries as follows:

- First Undersecretary for Companies and Authorities,
- First Undersecretary for the Ministry of Agriculture,
- First Undersecretary for Agricultural Research and Extension.

There is a great need to substantially strengthen the agricultural research and extension programs so that they might provide the technology critically needed to further advance the nation's agricultural sector. To this end, we strongly endorse the recommendation of the USAID-BIFAD Extension Team in 1981 for the creation of an overall research and extension organization.

We have suggested that such an organization be an Agricultural Research and Extension Authority, established as a semiautonomous agency under a First Undersecretary who would report to the Minister. Specific recommendations focus on strengthening existing research and extension programs and on developing others to serve needs not now being met such as in marketing and areas related to rural women and development. It is also recommended that efforts be made to involve the faculty and other resources of the agricultural colleges throughout the country in programs carried out by the Agricultural Research and Extension Authority.

The universities are awarding large numbers of degrees in agriculture. However, many students receive little laboratory or field training, and laboratories are generally overcrowded and poorly equipped. We suggest that admission and graduation requirements be increased while the number of degree-granting programs is reduced. Many more agricultural graduates than can be effectively used are now employed within the government; under present circumstances we believe it would be better to provide an improved university education for fewer numbers of students in agriculture than to continue to try to accommodate the large numbers currently enrolled.

Likewise, the agricultural secondary schools should be upgraded, and the idea of establishing two-year technical institutes should be given careful consideration. Such facilities could train persons for government service or employment in the private sector in capacities that do not require university degrees.

3. Resources

a. Land Base. The amount of arable land is a key constraint to increased agricultural production in Egypt. The agricultural land base now consists of 5.8 million feddans of fully irrigated "old" lands and 900,000 of old "new" lands, only half of which are now in production. By the year 2000, sufficient water will be available in the Nile System to fully irrigate 2.0 million more feddans. Several steps which should be taken to preserve, improve and enlarge the land base for agriculture include:

- preserving for agricultural use all arable land. Construction activities by the government should lead the way in using nonagricultural land for building sites; laws should be enforced to protect arable lands from nonagricultural use.
- devising substitute materials that can be used in place of the bricks that are currently formed from agricultural soils.
- upgrading the productive capacity of "old" land by improving drainage and undertaking periodic land amelioration practices.
- completing the development of the old "new" lands by installing drainage systems and more appropriate systems of irrigation.
- giving priority to the development of "new" lands on low-lying, fine-textured soils.

b. Water Management. Imperfect water management is a serious constraint. Conveyance losses in on-farm channels are often high because of poor design and low flow rates from the sakia or meska. Poor land-leveling and low flow rates cause uneven field distribution and flow water applications that greatly exceed annual crop needs. These

imperfections result in reduced yields and restrict efforts that could be made to intensify cropping via more timely seedbed preparation, transplanting etc. Inadequate on-farm drainage often results from poor maintenance of field drains and/or main drains.

We recommend that farmers be provided with technical assistance in:

- rationalizing and improving within-farm conveyance channels.
- land-leveling.
- basin or furrow design and layout.
- obtaining appropriate flow rates for efficient irrigation, using pumps as needed.
- forming water use groups for better regulation of the meska.
- conducting field studies to develop and test alternative systems of group action by farmers for off-farm management and maintenance of irrigation and drainage systems.

c. Water Management Coordination. The physical limitations of the water conveyance system, as well as the human factors influencing its operation, together with the multiple objectives of the system lead to a situation that frequently is not compatible with best on-farm water management. Water is often delivered at the wrong time or at the wrong flow rates, making good water management impossible on the farm. Conversely, the diversion of a large flow upstream to irrigate quickly and efficiently may interfere with water availability downstream.

Good water management calls for "total" water management with careful and explicit integration of components. This highlights the importance of coordinated planning and operation of systems.

d. Soil, Water and Crop Management. Effective crop production requires a holistic approach that takes into account all the interacting components of the production system. The often fragmented approach that results when different entities are responsible for scheduling water, providing fertilizer, growing the crop, or installing and maintaining drains can lead to significant reductions in output.

Water, soil and crop management decisions should be closely coordinated and integrated at the farm level. This requires that necessary supplies and services be made available on a timely basis to the farmer decision-maker.

e. Drainage. Imperfections in the drainage system are a chronic constraint. Perennial irrigation with widespread over-irrigation and high conveyance losses have overtaxed existing drainage systems on "old" lands. The current, large-scale program of installing tile field-drains will help reduce waterlogging only if the basic system of open-drain outlets function properly. Lack of maintenance and the deterioration of pumping stations seriously jeopardize the drainage systems in many areas.

An accelerated program of renovation of the entire system of primary and secondary drains and associated pumping facilities should be implemented at once to avoid further deterioration of the system. A systematic program of monitoring the hydraulic, agronomic, and economic performance of the system should be established and used as an administrative and design data base.

f. Waterlogging. Waterlogging and secondary salinization are by-products of heavy irrigation. With the advent of perennial irrigation, the amount of water entering the

arable land area has far exceeded that lost by evapotranspiration. This has led to heavy recharge of the ground water and the rise of the water table, which in turn has caused secondary salinization of the root zone--both of which depress yields.

Closer operational relations should be developed between the Ministries of Irrigation and Agriculture at the branch canal level. Pilot studies of methods for converting canals and meskas to gravity flow with higher turnout flow rates and for devising and evaluating ways by which farmer groups can assume greater responsibility for operating and maintaining irrigation and drainage systems should be pursued.

g. New Land Development. Arable land constraints will continue to be addressed as efforts to develop "new" lands continue, even though past efforts have led to disappointing results. Large investments notwithstanding, returns have been meager.

To avoid the mistakes of the past, a well-planned and well-directed effort should be begun that develops crop production packages suitable for typical desert situations. Such efforts should precede the planning of large development projects by five years and implementation by ten years.

h. Agricultural Mechanization. A lack of appropriate agricultural machinery and support services is restraining agricultural production potentials. Over the last ten years the rapid increase in the use of agricultural machinery, particularly tractors and mechanical irrigation pumps, has been accompanied by problems in maintaining this machinery at full operating capacity. Constraints include: poorly

equipped village repair shops, inefficient supplies of spare parts and the cost of agricultural labor.

Extension education programs in preventive maintenance and repair should be undertaken for owners of agricultural equipment and operators of village repair shops. The Principal Bank for Development and Agricultural Credit should move to liberalize policies permitting loans to small farmers and owners of village repair shops who wish to undertake selected mechanization or make other improvements in support services. Research and development should be continued and intensified regarding appropriate equipment for improved fertilizer and seed placement, land-leveling, threshing and crop driers to reduce harvest times.

i. Agricultural Chemicals. The system for distribution of agricultural chemicals is inadequate to obtain production potentials. It is estimated that 5 percent of the fertilizer is lost before reaching the farmer with additional wastage occurring on the farms. There are shortages of appropriate fertilizer placement and spraying equipment.

The Principal Bank for Development and Agricultural Credit should proceed to improve its storage facilities and handling practices to reduce losses and prevent deterioration in quality of agricultural chemical supplies. Research and development should be continued and intensified concerning equipment for fertilizer placement and spraying with the goal of mechanization appropriate for small farm operations.

j. Agricultural Credit. There is currently a lack of sufficient medium- and long-term credit to realize the development potential of Egyptian agriculture. It is recommended that the Principal Bank for Development and Agricultural Credit substantially increase resources for

medium- and long-term loans. The PBDAC should also move to implement liberalized loan policies to meet the credit needs of small and tenant farmers and agriculturally related village enterprises.

k. Labor for Agriculture. There has been a continuing exodus of labor from farms and villages to cities and oil countries of the Middle East. The degree to which this is affecting agricultural production is difficult to assess. Shortages of male adult labor have been reported in various parts of the country, particularly in the peak labor seasons of May-July, and September-November. The wage rate has increased substantially for agricultural labor but is still less than that for workers in most other sectors.

If the current tightening of labor markets is a permanent phase of the development process in which labor is transferred from agriculture to other sectors, then a policy to induce gradual substitution of capital for labor would be appropriate. On the other hand, if the factors forcing a contraction of the hired agricultural labor supply are temporary or will be offset by additional entries into the labor markets due to the very high birthrates in rural areas, a policy of capital substitution for mechanization which is labor-displacing could generate unemployment and exacerbate the unemployment that already exists. At this time the evidence, which is far from clear, suggests a "go slow" policy of inducing selective mechanization without large labor-displacing effects would be appropriate.

l. Contribution of Women to the Human Resource Base for Agriculture. Rural women are carrying the heavy burden of family and household responsibilities without adequate nutrition, health-training or household technology. Training

in agricultural practices is directed towards and taught by men. Women are seriously limited by a pervasive lack of skills, illiteracy, lack of access to information and lack of involvement in decision-making outside the household.

More attention should be given to the needs of the rural family as a means of improving production and living conditions; such improvements would impact on health, nutrition, decisions on family size, education of the youth, management of the household and other factors which ultimately must be associated with a progressive agriculture.

4. Technology

Egypt's future in agriculture depends on a continuing stream of improved technology. Because of the relatively high levels of productivity already achieved, the technological constraints on Egyptian agriculture are greater and more sophisticated than those operating on most other developing countries. Indeed because of its unique circumstances, Egypt is perhaps more dependent upon improved agricultural technology than any other country in the world.

Accordingly, any strategy for improving the agricultural sector must give high priority to removing whatever constraints limit the effectiveness of programs concerned with the generation and application of improved technology. To be specific, developing the strongest possible programs in agricultural research and extension is absolutely essential.

It is obvious that there is much available but unused technology in Egypt which could readily be applied by Egyptian farmers. This emphasizes the need for strong and effective extension

programs.

While much improved technology is already available, it is likely that other technologies developed elsewhere and not yet evaluated in Egypt, could be adapted to Egyptian conditions. Strong programs in applied or adaptive research are needed to evaluate these technologies and to determine which might be used effectively.

Furthermore, strong agricultural research programs that go beyond adapting or applying to Egyptian conditions technology developed elsewhere are needed. Programs that push back the frontiers of knowledge in agricultural science by exploring new and more advanced means of enhancing agricultural production and marketing are also needed. Many believe that agricultural science is on the threshold of major breakthroughs which could contribute substantially to advances in such areas as improved photosynthetic efficiency and nitrogen fixation by plants, genetic improvement of plants and animals through a variety of new techniques etc.

Egypt has many well-trained agricultural scientists who can make significant contributions to such scientific endeavors. Research programs in Egypt should recognize and take advantage of such capabilities. Success in this type of endeavor could, in time, provide the basis for increased agricultural productivity substantially in excess of the short-range potentials considered in this report.

5. Marketing

The marketing of agricultural products in Egypt presents a generally bleak picture. Large quantities of food are never consumed because of spoilage and other losses. Markets and processing facilities are inefficient, and broader involvement

and more competition are needed.

The quality and quantity of produce available for consumption and export is seriously constrained by weaknesses in marketing. Lack of attention to the marketing system as production has shifted to more perishable crops such as vegetables, fruit and livestock products has resulted in the marketing infrastructure not having commensurate investment and development. As a result, quality of these products is frequently poor when they reach consumers and large losses occur.

Marketing of farm products in Egypt needs attention at all levels. It is recommended that many technological improvements be introduced, that cooperative and private sector marketing be encouraged while government involvement is reduced, and that a functional government marketing service be established. To this end a number of specific constraints along with related recommendations are addressed. These include constraints related to:

- Farm-to-market roads and transportation.
- Containers and packing.
- Lack of adequate off-loading at Egyptian ports.
- Storage and refrigeration.
- Sanitation.
- Grades and standards.
- Satellite wholesale markets.
- Facilities for preparing and handling products from animals.
- Food and vegetable processing plants.
- Difficulties of internal food distribution by the government.
- Poor performance of government export marketing organizations.
- Poor performance by food processing organizations.
- Concentration of power in the wholesaling of fresh fruits and vegetables.
- Government price policies.

- Import tariffs on equipment used in the marketing system.
- Lack of government monitoring of the marketing sector.

STRATEGIES FOR ACCELERATING AGRICULTURAL DEVELOPMENT

We have considered in detail the problems or constraints which currently limit the further development of the agricultural sector in Egypt. We believe that a carefully conceived plan of action consistent with the recommendations set forth in this report needs to be developed by the government of Egypt to address and, to the extent possible, remove these constraints.

AREA OF EMPHASIS

While it would be difficult to establish a set of precise priorities in terms of needed government action, a few crucial areas should be emphasized:

- We believe that current government commodity price policies serve as serious disincentives to increasing agricultural output and changes must be made before there can be hope for substantial improvement. These changes must receive priority attention.
- With limited arable land and equally limited opportunities for expansion, Egypt is very dependent upon the development and application of improved technology. It is essential, therefore, that the country have strong and effective programs of agricultural research and extension aimed at serving the type of high-technology agriculture which Egypt must maintain. High priority should be given to the development and maintenance of such programs.
- Given Egypt's limited land and water resources, priority attention should be given to the management of these resources so that they will be used most effectively and efficiently. This will involve, among other things, better coordination of

efforts among the various Ministries concerned with soil and water management problems.

--In addition to addressing such specific constraints as those set forth above, the government should explore and develop more fully the agricultural enterprises concerned with producing those commodities for which Egypt enjoys a significant competitive advantage and which offer opportunities for developing or expanding export markets. We believe that Egypt's agriculturally related resources are sufficiently unique to suggest significant development opportunities in this area.

MAJOR PRODUCTION CAMPAIGNS

In terms of immediate action, and in addition to the areas of priority attention suggested above, we believe there is adequate basis to launch a series of major efforts to increase agricultural output through well-planned and executed production campaigns, suggestions for which follow.

We recommend that interdisciplinary teams in research and extension be formed to organize and carry out well-integrated programs involving "packages" of technological practices aimed at increasing productivity of principal agricultural commodities. These programs would constitute the basis for major national campaigns aimed at increasing agricultural output.

The proposed campaigns involve many of the same techniques used on a more limited scale in demonstrations carried out in the Major Cereals, Rice and ADS Horticultural Projects by the Egyptian MOA with USAID assistance. The success of these large-scale demonstrations indicates something of the potential of such efforts; these experiences should help facilitate the development of similar but larger country-wide campaigns.

In fact, we recommend that these USAID supported projects be institutionalized as part of the revitalized research and extension programs proposed herein. It is obvious that personnel associated with these projects could contribute significantly to the revitalization process.

We further recommend that USAID and other foreign donors, to the extent feasible, channel development funds towards the Egyptian government in carrying out the programs recommended herein. We also recommend that foreign assistance efforts continue to involve expatriate advisors in planning and carrying out such programs.

We believe that such campaigns carried out in conjunction with efforts to remove specific constraints limiting agricultural production could contribute significantly to diminishing the current food production/utilization gap within the country.

REDUCING THE GAP BETWEEN DOMESTIC AGRICULTURAL PRODUCTION AND UTILIZATION

The crux of the problem addressed by the Mission is the rapidly widening gap between the production and utilization of major food commodities over the last two decades. This gap translates into an expenditure of \$4 billion for agricultural imports (mostly food commodities in 1981--up some 20 percent over the 1980 level). The rapidly escalating costs of agricultural imports could have significant economic consequences if something is not done to change current trends.

Two major factors contribute to the rapid increase in demand or utilization:

- the rapid increase in per capita utilization of food commodities;
- the high rate of population growth.

While the primary task of our Mission is to address issues related to production and to recommend actions that might over the next several years increase the slope of the production curve, we recognize that production increases alone will not narrow the gaps sufficiently to solve the problems of major food deficits.

We believe, therefore, that it is imperative that the government of Egypt initiate immediate actions aimed at reducing the rapidly growing demand for agricultural commodities, while continuing to meet the basic nutritional needs of the people. We believe both goals can be achieved.

First, the rapidly increasing rate of per capita demand or utilization of food is not within the scope of our primary concern. It is influenced, however, by a wide range of government policies which do relate to our concern and, accordingly, are briefly addressed here.

Very cheap food made possible by extensive government subsidies has undoubtedly contributed very directly to increased per capita utilization. There also have been significant indirect effects such as excessive waste made affordable by highly subsidized food commodities. We heard many reports that highly subsidized bread sold for human consumption was being fed to poultry and livestock. In addition, highly subsidized feed has encouraged the expansion of the livestock industry and the rapid increase in the use of such grains as maize. It is also alleged that low fixed prices for wheat have resulted in some farmers feeding their own wheat to livestock and buying highly subsidized wheat bread and flour for their own consumption.

A second step to reduce the rapid rate of increase in food consumption entails the establishment of effective programs of family planning to reduce the rate of population growth. It should be recognized, however, that even if such programs were initiated

immediately, there would be a substantial time lag before they would have a significant impact on reducing the rate of food demand.

Although these efforts to limit the future rate of increase in food demand could be influential, any significant reduction in the food production/utilization gap in Egypt by the year 2000 will be dependent primarily upon increases in production--the basis for which we have outlined herein.

PRIORITIES FOR INCREASING OUTPUT

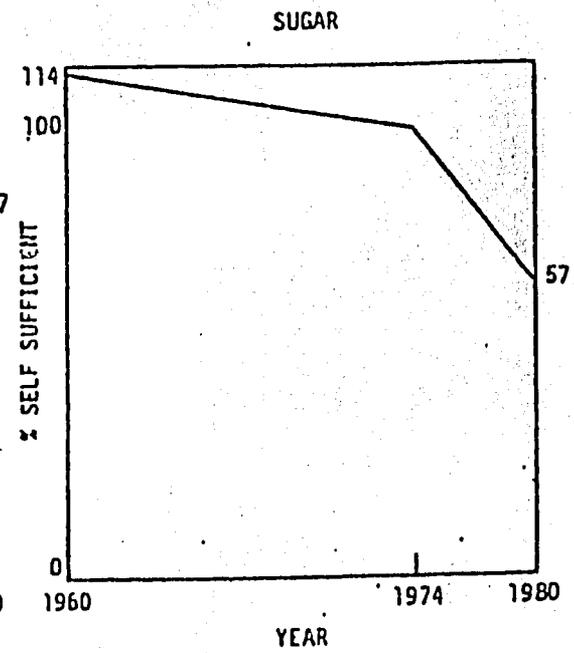
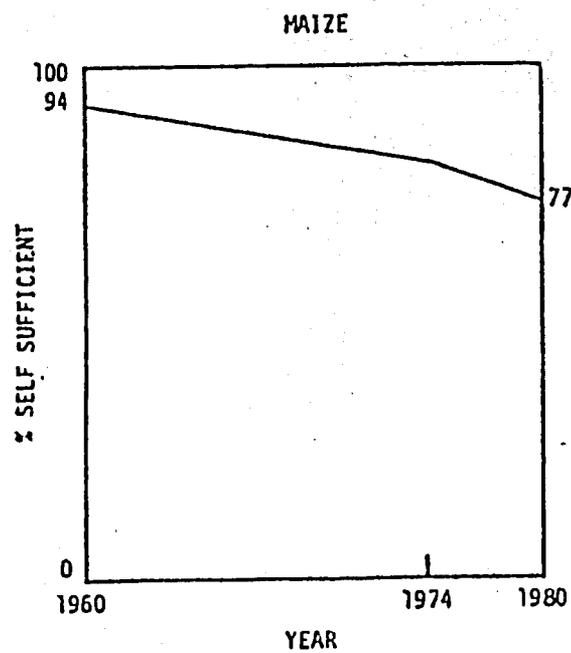
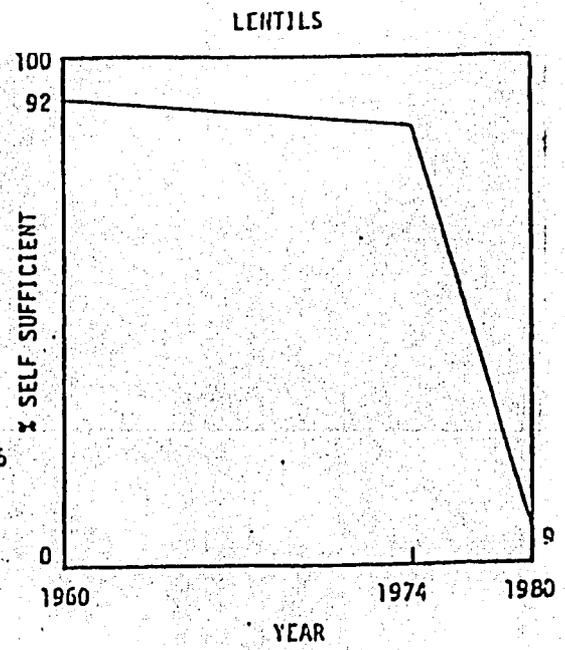
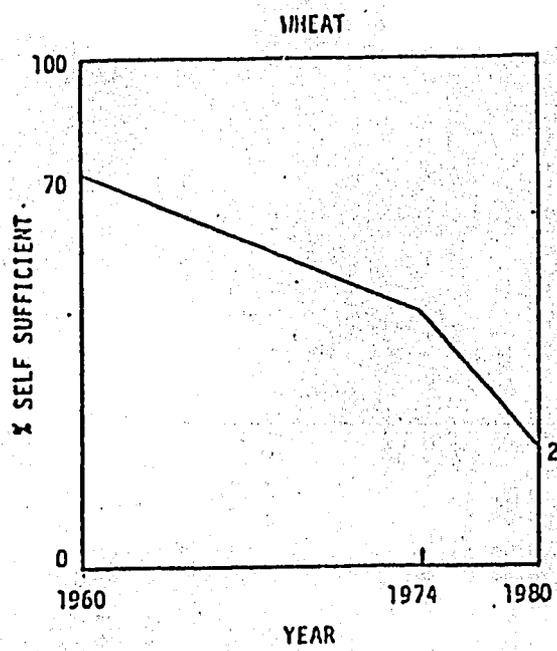
We believe that the potential exists to reduce the production/utilization gap to manageable levels during the next two decades if the following efforts are given substantial endorsement policy-wise and financially:

- A major all-out effort to increase the productivity of currently available lands and farming enterprises.
- Further exploration of the potential economic returns from agricultural operations on "old new" lands and "new" desert lands, along with development and use of such lands insofar as is economically feasible.
- A concerted effort to explore fully the potential for developing significant export markets for high value horticultural crops.
- Further exploration of the potential for producing significant levels of agricultural commodities for Egyptian use in the Sudan and the development of this potential insofar as is economically feasible.

We believe the first action proposed above offers the greatest immediate potential for expanding the agricultural sector and achieving food security goals. We recommend that the Egyptian government give highest priority to efforts directed towards this objective.

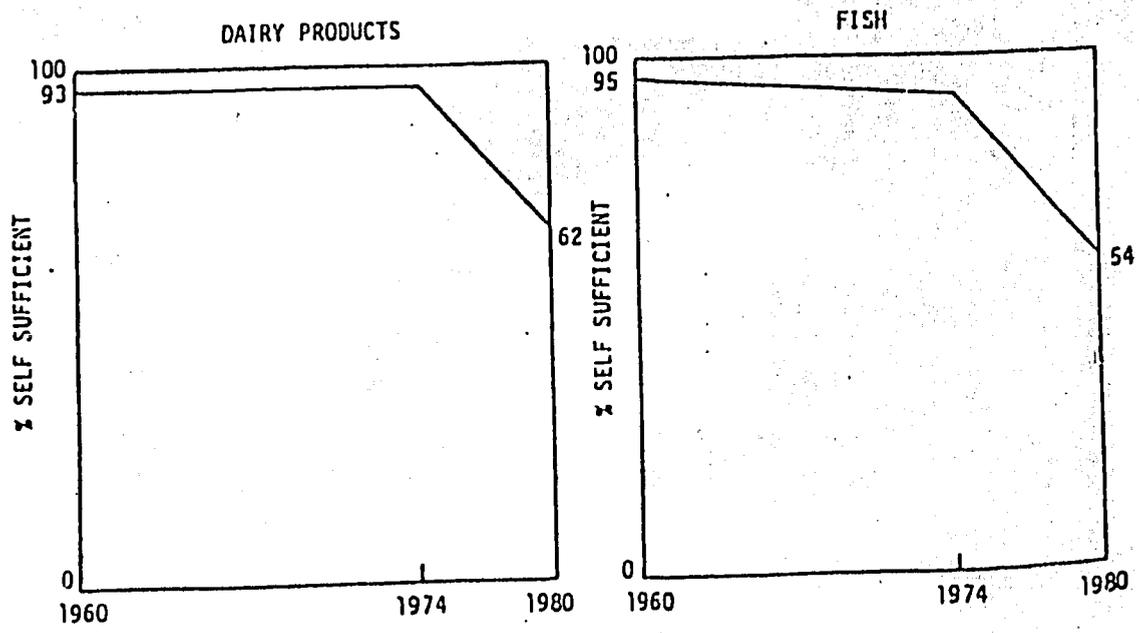
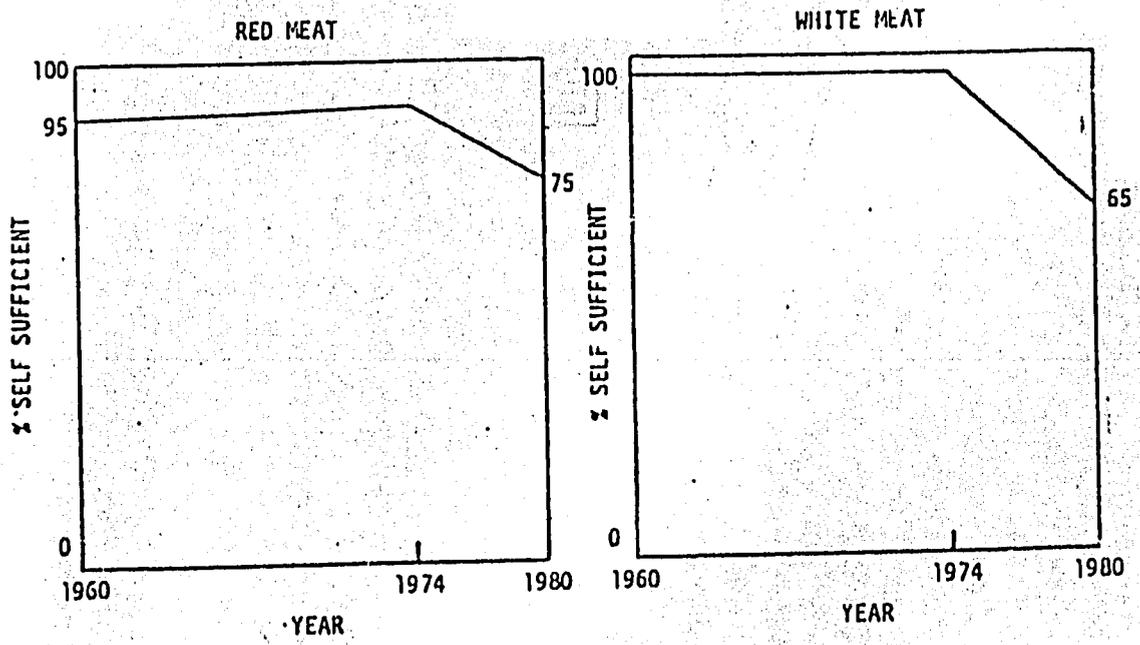
The other proposals represent longer range potentials and should be pursued as resources and opportunities permit.

We conclude by expressing strong optimism concerning the future of Egyptian agriculture. Few places in the world, in our opinion, offer greater potentials. However, if these potentials are to be translated into reality, a major commitment on the part of the people and government of Egypt is essential. We fervently hope such a commitment will be made.



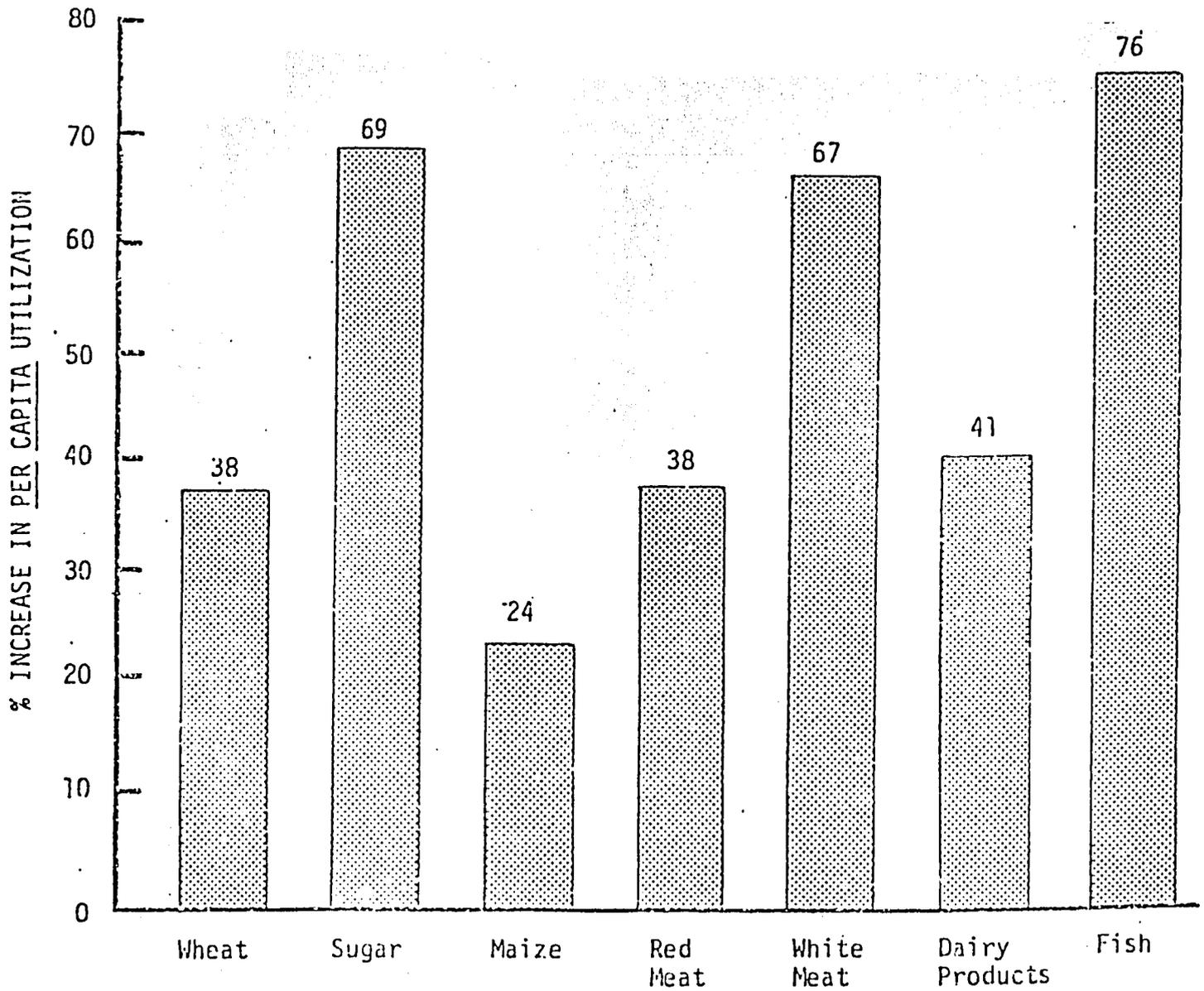
PERCENT SELF SUFFICIENCY - 1960-1980.

Source: Wally, Youssef. "Strategies for Agricultural Development in the Eighties." 1982.



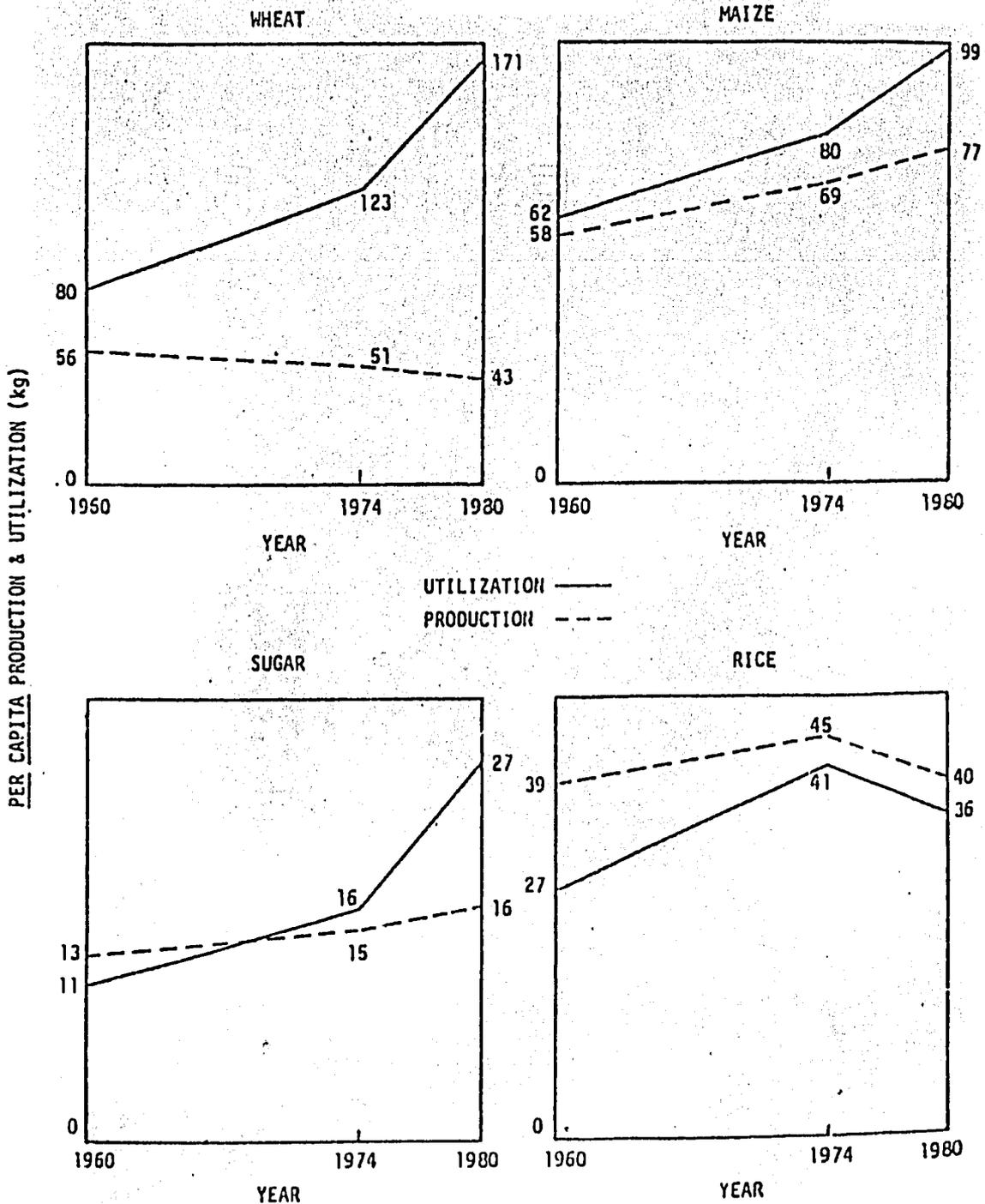
PERCENT SELF SUFFICIENCY - 1960-1980.

Source: Wally. Ibid.



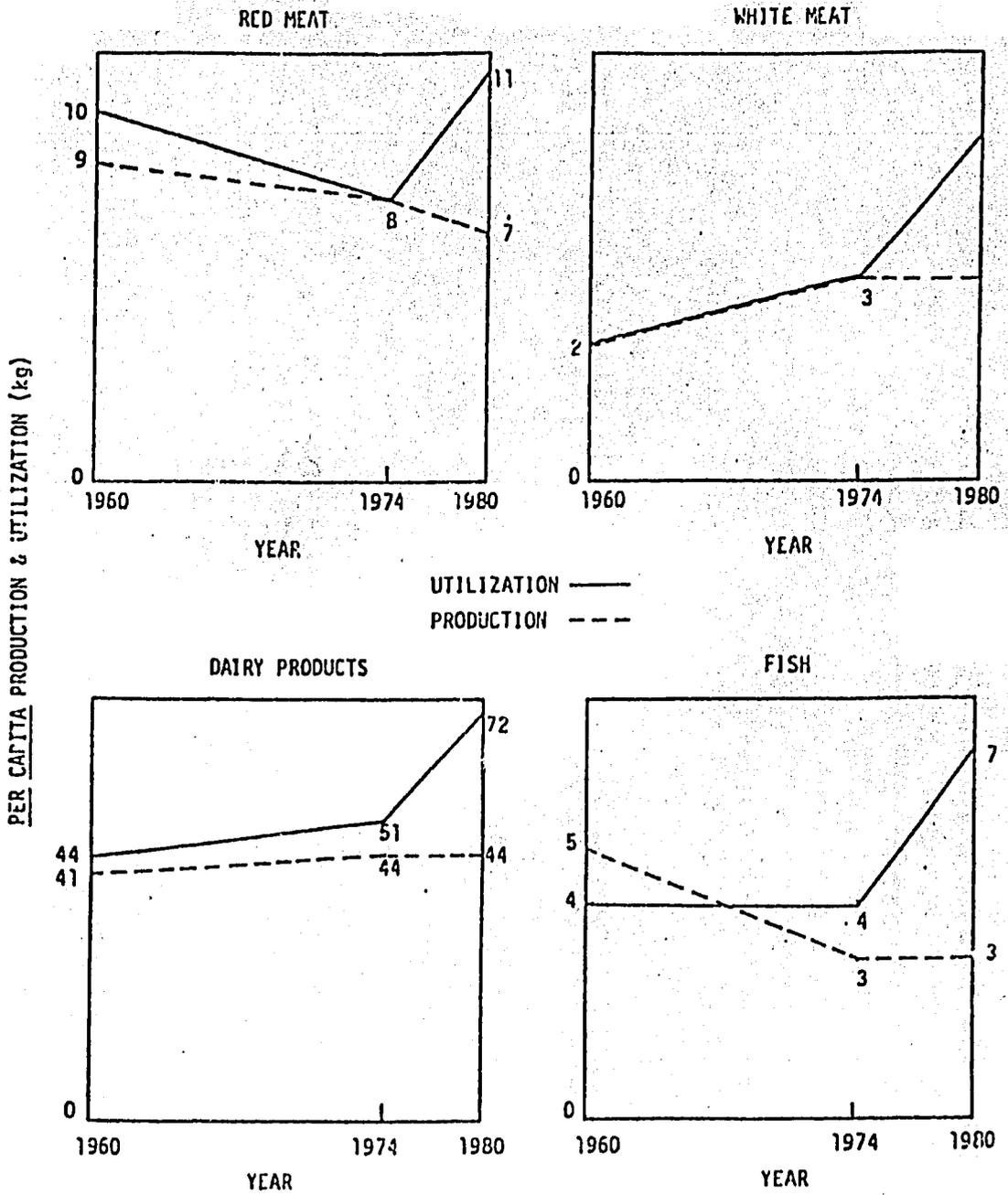
PERCENT INCREASE IN PER CAPITA UTILIZATION, 1974-1980.

Source: Wally. Ibid.



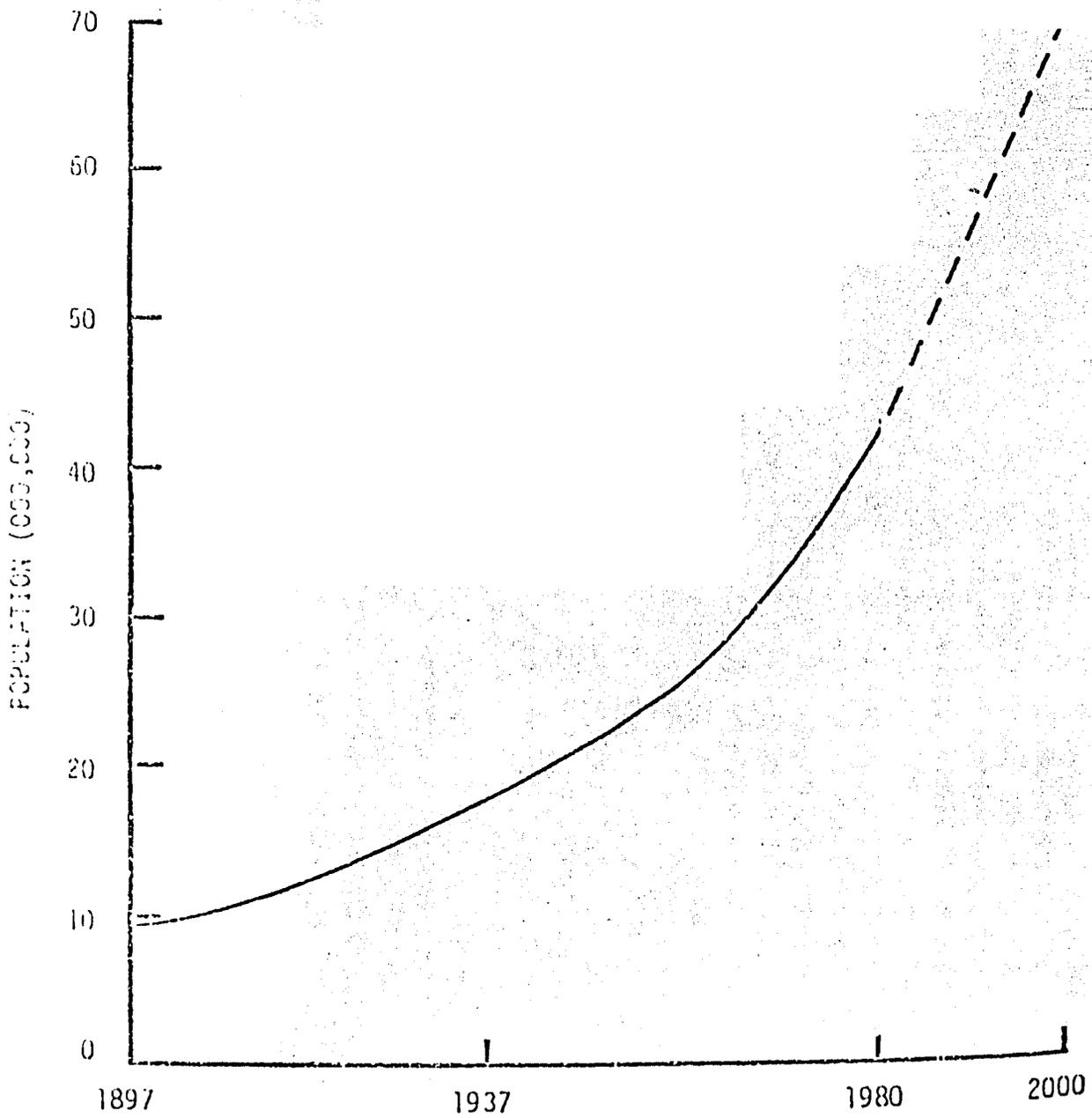
PER CAPITA PRODUCTION AND UTILIZATION OF WHEAT, MAIZE, SUGAR, AND RICE 1960-1980 (KILOGRAMS ANNUALLY).

Source: Wally. Ibid.



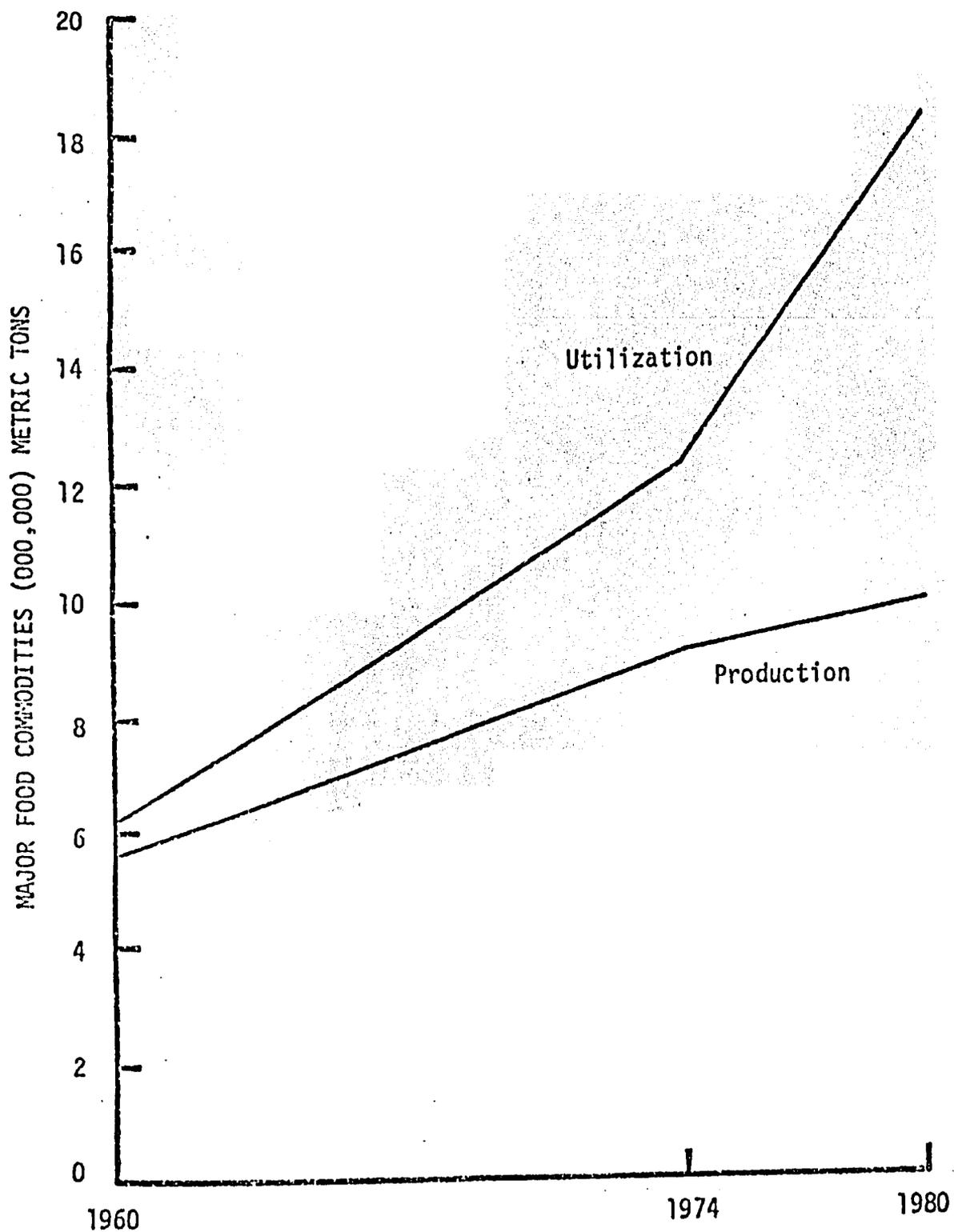
PER CAPITA PRODUCTION AND UTILIZATION OF MEAT AND ANIMAL PRODUCTS 1960-1980 (KILOGRAMS ANNUALLY).

Source: Hally. Ibid.



POPULATION GROWTH IN EGYPT, 1899-1980 WITH PROJECTIONS TO THE YEAR 2000.

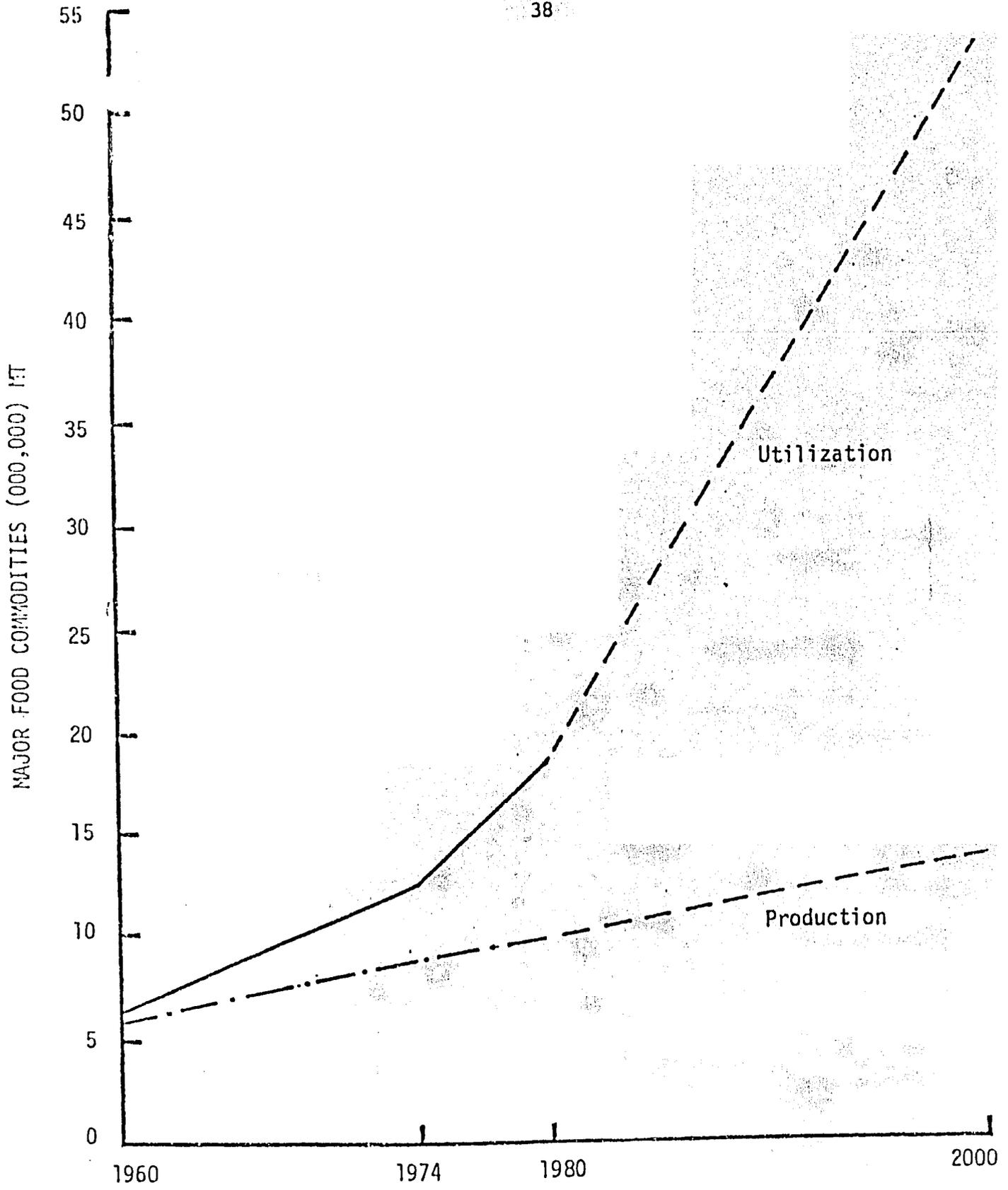
Source: Data from Table 1.10.



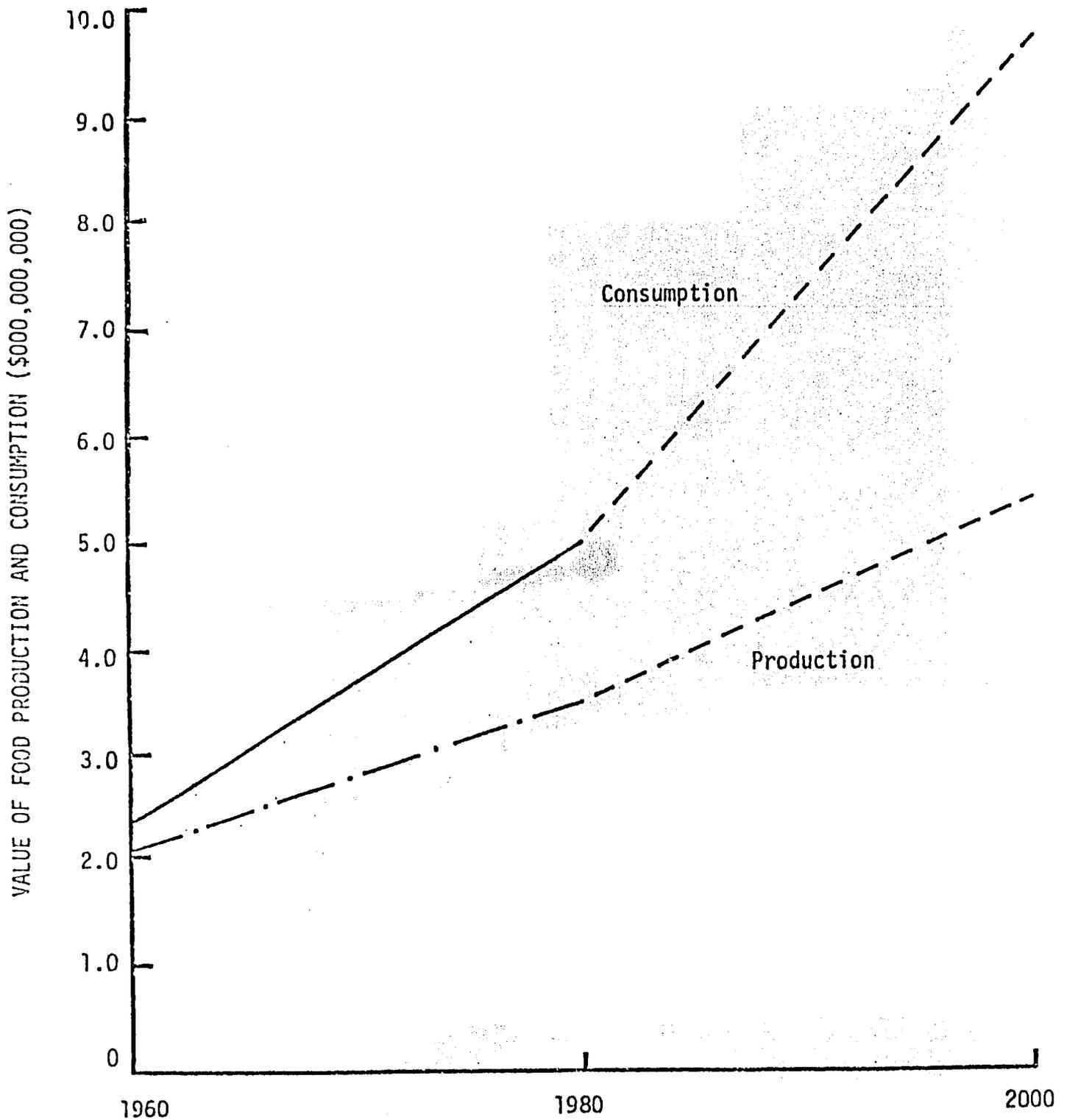
PRODUCTION AND UTILIZATION OF MAJOR FOOD COMMODITIES^{1/}
IN EGYPT, 1960-1980.

Source: Wally. Ibid.

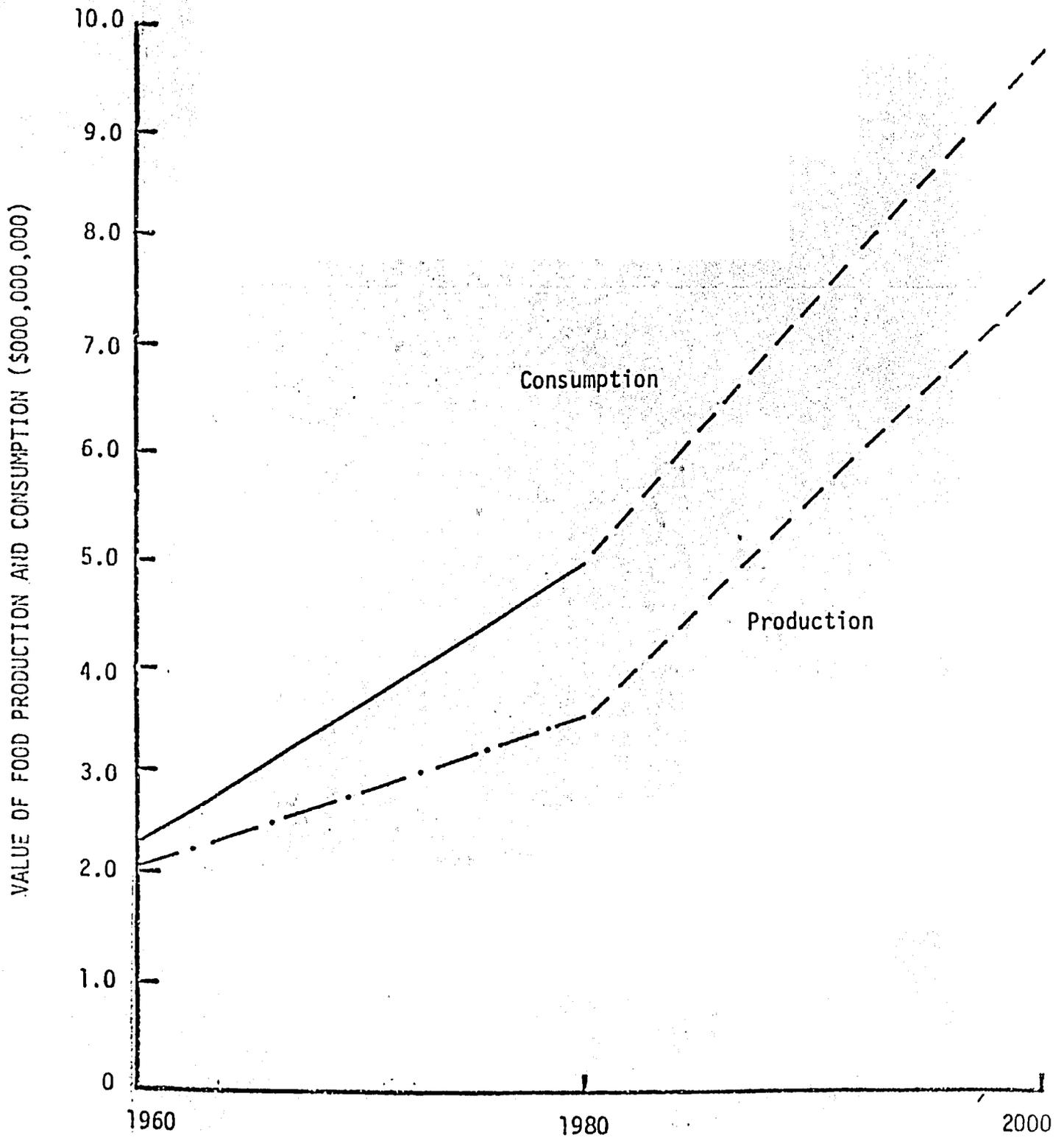
^{1/}Wheat, maize, rice, sugar, red meat, white meat, dairy products, fish, vegetable oils.



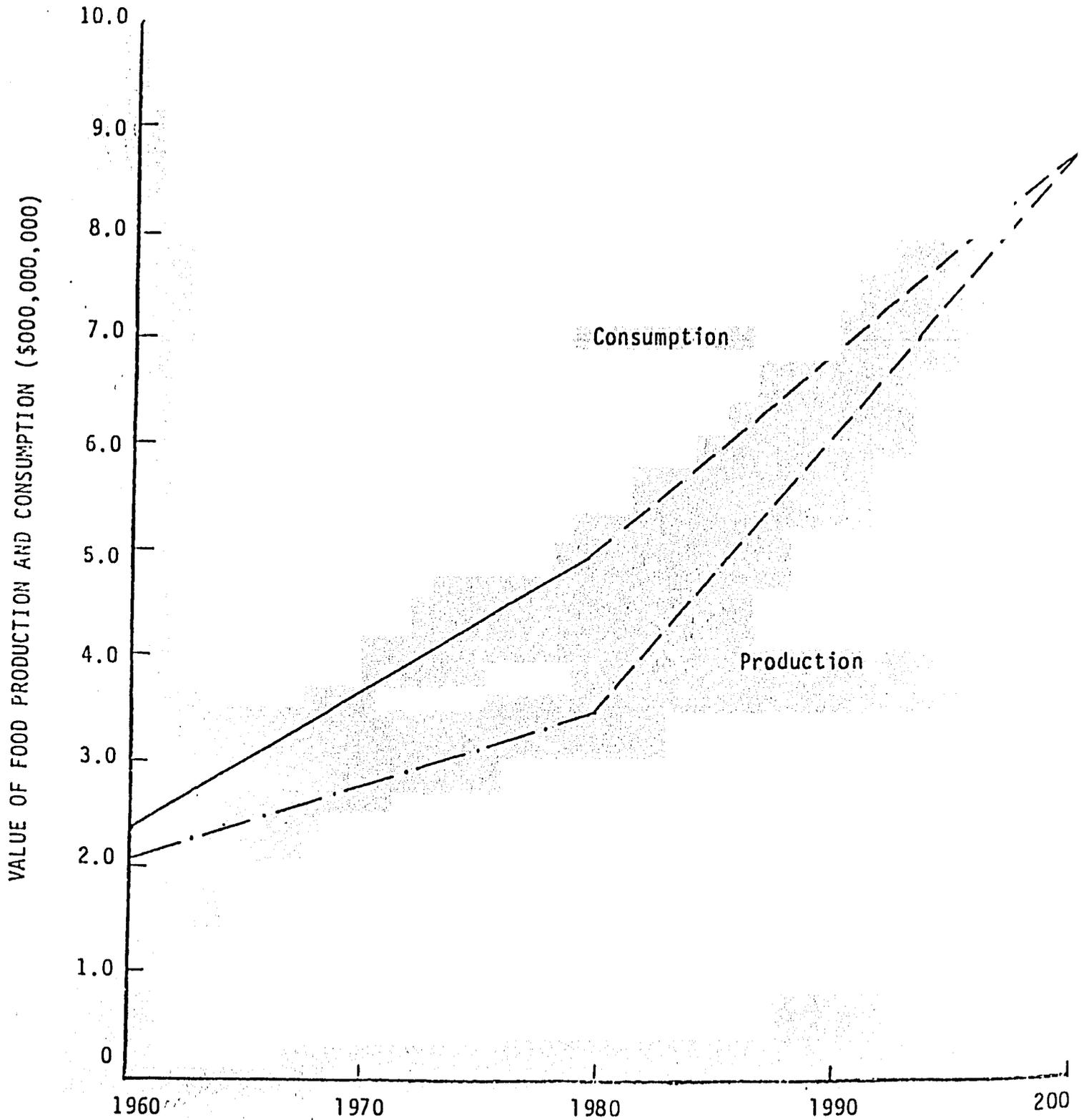
PRODUCTION AND UTILIZATION OF MAJOR FOOD COMMODITIES IN EGYPT, 1960 - 1980 AND PROJECTIONS TO YEAR 2000, ASSUMING A CONTINUATION OF CURRENT TRENDS.



THE VALUE OF FOOD PRODUCED AND CONSUMED IN EGYPT FROM 1960 - 1980 WITH PROJECTIONS TO 2000 A.D., ASSUMING A CONTINUATION OF THE PRESENT RATE OF INCREASE IN PRODUCTION (REFERRED TO AS "LOW" IN TEXT).



THE VALUE OF FOOD PRODUCED AND CONSUMED IN EGYPT FROM 1960 - 1980 WITH PROEJCTIONS TO 2000 A.D., ASSUMING AN INCREASE IN OUTPUT OF APPROXIMATELY 100 PERCENT OVER 1980LEVELS (REFERRED TO AS "HIGH" PRODUCTION LEVELS IN TEXT).



THE VALUE OF FOOD PRODUCED AND CONSUMED IN EGYPT FROM 1960-1980 WITH PROJECTIONS TO 2000 A.D., ASSUMING PRODUCTIVITY INCREASES SET FORTH IN FIGURE 4.3, SOME SHIFTS TO HIGHER VALUED CROPS FOR EXPORT, AND SOME REDUCTION IN PER CAPITA CONSUMPTION LEVELS BELOW THOSE PROJECTED IN FIGURE 4.3.