

AGRICULTURAL DEVELOPMENT IN AFGHANISTAN

**with
Special Emphasis on Wheat**



A Report By

The United States

Agricultural Review Team

**AGRICULTURAL DEVELOPMENT IN AFGHANISTAN
WITH SPECIAL EMPHASIS ON
WHEAT PROBLEMS, PROSPECTS
AND PRIORITIES**

**A REPORT TO
THE ROYAL GOVERNMENT OF AFGHANISTAN**

BY

THE UNITED STATES AGRICULTURAL REVIEW TEAM

Kabul, Afghanistan

July, 1967

March 28, 1967

USIS News Bulletin

"President Johnson has offered and Afghanistan has accepted the offer of an American study group to advise the Afghanistan Government on agricultural problems, a White House spokesman said Tuesday.

The study group will be comprised of experts from the Agency for International Development and the Agriculture Department.

Mr. Johnson announced the project Tuesday at a White House luncheon he gave for visiting Afghan Prime Minister Mohammed Maiwandwal."

July 15, 1967

His Excellency
Mohammed Hashim Maiwandwal
Prime Minister
Kabul, Afghanistan

Excellency:

I wish to refer to your White House visit with President Lyndon B. Johnson on March 28, 1967 when the President offered to provide an American study group to advise the Government of Afghanistan on agricultural problems. It was agreed at that time that the group would concentrate primarily on wheat and food grain production problems and that they would arrive during the harvest season in order to observe the results of your recently initiated "accelerated wheat production program."

The seven-man U.S. Agricultural Review Team, composed of experts in the fields of irrigation, wheat, agricultural economics, and management began arriving in Afghanistan on June 18, 1967. After a series of meetings with Acting Prime Minister, Abdullah Yaftali and the Ministers of Agriculture, Planning, Finance, Commerce, the U.S. Ambassador, the USAID Mission Director and other prominent Afghan and American officials, the Review Team made an aerial and road tour of Bost, Kandahar, Herat, Mazar-i-Sharif, Gulbahar and Kabul areas. During these visits, the Team had the opportunity to discuss agricultural problems with provincial governors, officials, Ministry of Agriculture personnel and Afghan farmers.

We found your representatives everywhere cooperative and interested in assisting our group in obtaining an understanding of their local problems. With their assistance, we secured valuable and important information concerning the current agricultural situation in Afghanistan. As a result of these discussions and personal observations, we have prepared the attached report which attempts to identify the problems facing Afghan agriculture and to make a series of recommendations which, we believe, will be useful in developing a progressive agricultural program in Afghanistan.

We welcomed the opportunity, Your Excellency, to discuss our views and recommendations with you personally as well as with members of your Government.

Respectfully yours,

Dean F. Peterson

Dean F. Peterson
Chief, Agricultural Review Team

FOREWORD

This report was prepared by the U.S. Agricultural Review Team appointed by the President of the United States in response to a request from the Prime Minister of Afghanistan, Mohammed Hashim Maiwandwal. The request originated at a White House luncheon on March 28, 1967, during which the two leaders discussed Afghanistan's agricultural problems, particularly the country's continuing wheat deficit. It was agreed that a study of Afghan agricultural production was urgently needed to inquire into the causes of the wheat and food grain scarcity and to explore methods for correcting the imbalance.

The Team arrived in June 1967 during the wheat harvest. After consultations with the Acting Prime Minister, the Ministers of Agriculture, Planning, Finance, Commerce, and other prominent Afghan officials, members of the business community and private farming interests, the Ambassador of the United States the Director of the USAID Mission and members of the official American community, the Team undertook a series of field trips to Bost, Kandahar, Herat, Mazar-i-Sharif, Gulbahar, Jalalabad and the Kabul area. A copy of the Team's itinerary is shown in the Appendix.

The Agricultural Review Team consisted of the following members:

Dean F. Peterson, the Dean of the College of Engineering, Utah State University
Team leader and irrigation specialist

Louis Reitz, the Chief of the Wheat Investigations of the Agricultural Research Service, USDA
Wheat production, crop and soil management specialist

Vernon R. McMinimy, a Senior Economist, Staff Economist Group, Office of the U.S. Secretary of Agriculture, USDA
Senior economist

Arnold L. Aspelin, Agricultural Economist, Office of the Administrator Packers and Stockyard Administration, USDA
Agricultural marketing and policy specialist

William A. Carlson, the Head of the Programming Staff, Office of the Secretary of Agriculture, USDA
Budget, administration and management specialist

Clyde S. Adams, Agricultural Advisor, Bureau of Near East/South
Asia, AID
Agriculturist

Raymond Pagan, Officer-in-Charge Afghanistan Affairs, Bureau of Near
East/South Asia, AID.

In its aerial and road tour of Afghanistan, the Team was accompanied by Senator Abdul Wakil, Chairman of the Agricultural Committee of the Meshrano Jirgah; Abdul Ghafoor, President of Research and Extension, Ministry of Agriculture and Irrigation; Mohammad Noori, Director of Cereal Crop Breeding and Production, Ministry of Agriculture and Irrigation; Ghulam Dastagir Sham, President of the Irrigation/Engineering Department, Ministry of Agriculture and Irrigation; Sultan Mohammad, Afghan Air Authority; James Urano, USAID Agricultural Advisor; Joseph Miller, USAID Water Resources Engineer; Blair Allen, Chief of Crop Improvement Branch USAID; Arthur Westfall, of the US Geological Service and Chief of the Surface Water Research Branch USAID; and Thomas Dewhurst, Acting Chief, US Bureau of Reclamation Team which is assisting the Government on small irrigation projects.

The Agricultural Team wishes to express its appreciation to these officials for their assistance in making the observation tour so profitable. It also wishes to thank particularly the General President of the Helmand/Arghandab Valley Authority and Governor of Helmand Province, Mohammad Hashem Safi; the Governor of Kandahar Province, Dr. Mohammad Anas; The Governor of Herat Province, Mr. Mohammad Saddiq; and the Governor of Balkh Province, Dr. Mohammad Nazir Keshawarz for their personal assistance. In addition, the Team is grateful to the Minister of Agriculture and Irrigation, H.E. Engineer Mir Mohammed Akbar Reza, Deputy Minister for Irrigation, H.E. Yasim Mayel, and their staff, for sharing so generously and frankly of their knowledge of the current agricultural situation. Finally, the Team wishes to express its appreciation to U.S. Ambassador Robert G. Neumann, AID Mission Director Russell S. McClure and J. B. Davis, Chief of USAID's Agriculture Division, for their advice and guidance.

The Team's observations cover the period between June 18, 1967 and July 16, 1967, and include preliminary briefings and review of pertinent literature and data in Washington prior to its arrival in Afghanistan. The Team also relied heavily on a draft English translation of the Afghan Third Five-Year Plan, covering the period 1967-1972.

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SUMMARY AND MAJOR RECOMMENDATIONS

Chapter I

SUMMARY AND MAJOR RECOMMENDATIONS

A. INTRODUCTION

Afghanistan's climate and geographical situation have led to an agricultural development based primarily on irrigation and grazing, with some limited dry farming. Much of the livestock raising is carried on by nomads, but in the valleys and river plains, irrigated by ancient canals fed from the high mountains, cereals, vegetables, fruit, and fiber crops flourish. Wheat is the principal crop and occupies nearly 50 percent of the irrigated land and most of the dry-farmed lands.

While recent increases in agricultural production have been relatively small, the Team was impressed that Afghanistan has a great potential for increasing its agricultural production through the adoption of modern technological practices and by some expansion in irrigated acreage. The Team believes that technology is available by which, over the next few years, Afghanistan could become self-sufficient in wheat and, at the same time, expand its production of other crops both for home consumption and for export. In the longer view the Team feels that with continuing population increases, Afghanistan will eventually encounter difficulties in meeting its food and fiber requirements even though modern technology is quite successfully applied.

The Team's principal recommendations focus on:

- (1) providing adequate economic incentives at the farmer level to stimulate necessary production,

- (2) implementing the adoption of modern technological inputs such as fertilizer, improved seed, cultural practices, pest control and water management and,

- (3) developing an increased capability of both the Government and the private sector for providing the new inputs and improving the economic climate.

B. FOCUS OF STUDY

The Team's study was centered on wheat, but the Team was conscious and appreciative of the problems and needs of other areas of agriculture as well. The general principles which apply to wheat can be applied to other crops also,

and as wheat production increases by adoption of improved technology other crops will benefit. The basic technological input, in the Team's view, is fertilizer, but the results of fertilizer can be greatly compounded by adding other inputs, particularly improved varieties and planting practices.

The Government of Afghanistan is dedicated to the task of improving agricultural production and raising the standards of living of its citizens. Recently it implemented an accelerated program of wheat production. The Third Five-Year Plan substantially increased the proportion of resources allocated to agricultural development and the commitment of the Prime Minister and the Minister of Agriculture and Irrigation to agricultural progress is firm and determined. At all levels, the Team found many dedicated and competent personnel.

The goals of Afghanistan and the responsibilities of agriculture are summarized in a speech by Prime Minister Maiwandwal, who said, in relation to the Third Five-Year Plan:

“On the basis of economic democracy, our principal objective is to raise the standard of living of the depressed classes and to rescue the oppressed. -----

“The economic enterprise of the State should be directed toward economic infrastructure while private enterprise within the framework of government planning should be encouraged and protected by the State

“To obtain these objectives priority should be given to increased agricultural and industrial production”.

The Prime Minister outlined a number of steps to be taken in order to increase agricultural production.

In a discussion with the Team, Mir Mohammed Akbar Reza, Minister of Agriculture and Irrigation, stressed the need for increased agricultural production and pointed out that agriculture must provide the base for the nation's industrial development.

C. PRINCIPAL FINDINGS

Meeting Afghanistan's agricultural goals will not be an easy task and this is well appreciated by Afghan officials who were contacted by the Team. Means must be found to disseminate widely and rapidly technological information and institute the practice of modern agricultural technology. Closing the subsistence gap hinges upon early success in this difficult task.

Particularly important in this task is incentives and prices available to the farmer. The Team has great confidence in the innate intelligence and ability of farmers all over the world to respond to economic opportunity. A recent

report to the President of the United States on The World Food Problem by the President's Science Advisory Committee stated,

"In discussing food production in developing countries, no single factor is more important than the provision of adequate incentives for farmers to increase productivity. Agricultural development, in the last analysis, depends on the production decisions and actions of farm operators".

Further the report stated,

"... the unfortunate tendency in most low-technology countries is to base pricing more on a desire for low food costs in cities than on production incentive needs to the farmers".

Perhaps no single factor is more important in increasing Afghanistan's wheat production than the price which the farmer receives. The Team believes that support of prices, in the long run, will be more effective than subsidies of inputs needed by the farmer. Afghanistan now has a wheat purchase program, but this has a primary objective of providing wheat at subsidized prices to government employees and of meeting the needs of the military establishment. The Team believes that some minimum level of price assurance to the farmers is necessary to induce them to institute the required new technology. An equitable price to consumers can best be assured, not by imposing price ceilings, but by increased production.

Continuing development of modern agriculture in Afghanistan will require an efficient marketing system to supply needed technological goods to the farmers and move their products to the consumer. The Government's role in marketing should be one of stimulation rather than control; of furnishing the essential infrastructure, such as roads; and the mechanisms for quality grading and market information; things which the private sector cannot readily provide. Fortunately Afghanistan has an adequate marketing system for traditional commercial inputs for agriculture. This, the Team believes, could evolve into the needed system for modern agriculture. Such an evolution will require the creation of a favorable enterprise climate and encouragement of private enterprise by the Government.

Afghanistan's heavy reliance on an export tax in the form of a foreign exchange discount on certain exported agricultural commodities inhibits production of those commodities. On the other hand, direct taxes on land are now miniscule. The Team believes an accelerated shift toward direct taxation, particularly on land, is urgent as a realistic source for an increasing share of the Government's growing budget needs. Lack of basic titles for land seriously restricts the Government's ability to raise revenues through a land tax and reduces the farmer's ability to use land as collateral. Correction of this difficulty hinges on early completion of the land inventory now under way.

Placing new irrigated land under full production is almost invariably slow and expensive. While hard to estimate, the Team feels that this can be expected to happen at the rate of perhaps 10,000 hectares per year over the next few years. Projections indicate that this rate may need to be increased by from two to four times by the end of the next 10 years depending on the success achieved in the use of other modern technological inputs. Progress on scheduled large project construction and settlement is an essential element in this goal; however, rehabilitation of old systems and construction of smaller projects, and development of groundwater can be accomplished with less capital investment and usually faster. Groundwater development, where adequate supplies are available, is particularly favorable. But groundwater development should not outrun careful planning based on adequate field evaluation. Long-range national plans for irrigation considering the most favorable alternatives must be started well in advance of needs for land. These should be based on comprehensive inventories of land and water, which are now lacking particularly in the Northern Provinces.

Development of Afghanistan's mineral resources could provide substantial benefits to agriculture and the entire economy. The known agricultural and industrial minerals are limited to sulfur, gas, oil, coal, marble, alabaster and semi-precious stones. Discovery of phosphate and potash could provide a less expensive source of fertilizer than importation and brighten current prospects for agricultural development. A geologic and mineral survey would be desirable to determine what mineral resources exist and the feasibility of utilizing them.

Research designed to adapt technological inputs and modern techniques to Afghan agriculture is essential. Eventually more basic problems must be considered. Afghanistan has made a good start on an adaptive research program; a start which proved most fortunate as the recently initiated "Accelerated Wheat Program" got underway. Research programs develop slowly and manpower problems are difficult. Resources should not be spread so thinly that existing research stations are unable to accomplish high quality work. Over time, new disease-resistant wheat strains, will have to be developed and the genetic properties of indigenous varieties will be useful in this effort.

Existing management and administrative processes of the Afghan Government, reflecting the needs of the static economic and social system of the past, have not developed to the full level necessary to serve a dynamic, developing Afghanistan. Major improvements are needed in personnel management, administrative systems management, organization for agricultural development, and objective program planning and budgeting. Unless rather immediate steps are taken to provide improved incentives for personnel and to increase the efficiency of the other administrative processes mentioned above the Team feels that the Government's stated targets of agricultural production will fall by the wayside.

The rate at which agricultural production in Afghanistan must increase depends, of course, on the rate of population growth which has been estimated at 1.9 percent per year. With increasing availability of medical and health

services, this rate will very likely accelerate. At 2.5 percent, population increase in ten years will approach 4.3 million; at 1.5 percent, 2.5 million. The difference is equivalent to about 300,000 tons of wheat per year or the production from about 200,000 hectares of new irrigated land. At \$800 per acre for development, an investment of \$400,000,000 would be required to provide this new land. This investment could go toward raising the standard of living or producing foreign exchange if not needed for basic food production resulting from accelerated population increases.

D. RECOMMENDATIONS

The Team's studies led to a number of recommendations and suggestions. These are included in detail in the appropriate sections of the report. There are several important recommendations, however, which the Team believes are of the highest priority. These are:

(1) The combined advantages of improved technological inputs should be strongly advocated and use of a 'package' of improvements implemented for wheat production. New seed varieties, improved seeding depth control, better weed and pest control by tillage and chemicals, and maximum water conservation by proper tillage and management systems must be coupled with proper fertilization if production goals are to be met.

(2) Use of fertilizer should be greatly accelerated and this should be given highest priority among new technological inputs. All possible means should be mobilized to finance, distribute and effectively utilize fertilizer.

(3) An effective program of wheat price support through purchasing and sale of wheat should be instituted by the Afghanistan Government to assure the farmer a favorable price.

(4) The extension program, training of farm advisors and leaders in agriculture and adaptive research should be given substantially increased budgets and manpower.

(5) Agricultural research should concentrate on adaptation for the immediate future. Provision of adequate staff and financial resources for existing stations should receive priority over establishment of new stations.

(6) Improvement of the management and administrative process in agriculture is urgent. As a first step, the Team recommends appointment of a high-level commission to develop a complete reorganization proposal for agricultural development and draft laws and decrees to put it into effect. Improved personnel policies, administrative practices and objective programming and budgeting should be implemented immediately.

(7) A private marketing system to handle the new commercial inputs needed by agriculture should be promoted and a market information system for principal agricultural products initiated. The Government should enlist maximum assistance of the private sector in accelerating its agricultural program.

(8) Direct taxation, particularly land taxation, should be increased as rapidly as possible as a source of financing.

(9) Manpower devoted to the land inventory and cadastral survey should be increased but priority should be given to the land inventory.

(10) A long-range breeding program with the objectives of providing Afghanistan with necessary future wheat strains should be initiated.

(11) Small irrigation projects should be given increased relative priority in the irrigation development program.

(12) Groundwater inventories in the most favorable areas should be completed and the results published as rapidly as possible.

Chapter II

THE AGRICULTURAL SITUATION

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THE AGRICULTURAL SITUATION

A. INTRODUCTION

The economy of Afghanistan is basically agricultural. From 75 to 85 percent of the population obtain their livelihood directly from agricultural pursuits. About 10 percent of those in agriculture are nomads who migrate seasonally in search of pasture for their livestock. They are the main suppliers of livestock products. The remaining agricultural economy is engaged primarily in production of food grains (wheat, corn and rice) and fruits and vegetables. Cotton and sugar crops are also produced in most intensively irrigated areas.

Wheat is the mainstay of the economy in terms of diet and also in terms of resource use. It constitutes nearly half of the cost of living in cities and about 60 percent of the food grains produced. Wheat is produced on almost every farm largely for use there. About a quarter of the nation's wheat crop is marketed for consumption by others. Corn and rice are the other important food grains - also produced largely for family use.

1. The Problem

The worsening food crisis of the developing nations is evidenced in Afghanistan. Food production is lagging in the face of moderate population growth and increasing incomes. Production of wheat, the major Afghan crop, has not increased significantly in the last decade.

Land in wheat has increased by less than 5 percent since 1955-56 in spite of sizeable investments in irrigation projects. At the same time, yields have shown little tendency to increase. Cultural practices and equipment used in wheat production have changed little in centuries on most farms. Afghan wheat farmers are just beginning to use commercial fertilizer and improved wheat seed.

Official estimates indicate that population in Afghanistan is increasing at a rate of 1.9 percent per year, though there are indications of more rapid population growth.¹ Increasing population along with increased income, has

¹For example, population growth in Kabul, the principal city, is increasing at a rate of 2.5 percent per year based on a pilot census survey. This rate of growth is in addition to a 3.5 percent immigration rate into the city. A national census is planned to provide more accurate data on population growth but will not be available for some time.

placed pressure on wheat supplies. The country was basically self-sufficient in food stuffs prior to 1957, when only 40,000 tons of wheat were imported. Wheat shortages have led to recent sharp increases in food prices, and continued demands for food imports, principally wheat on concessional terms.

Bazaar prices for wheat in Kabul have increased from as low as Afs. 30 to 40 per seer² in 1964 and 1965, to more than Afs. 80³ in early 1967. Projections indicate wheat deficits approaching 500,000 tons within five years, unless productivity is improved. Such deficits would compare with annual production of about 2.25 million tons and imports of about 100,000 tons during recent years.

Progress of Afghanistan's economy during the years ahead depends in no small measure on its ability to increase its agricultural productivity, particularly in wheat. Balanced economic growth in line with comparative advantage and foreign exchange requirements is needed, but it is imperative that productivity of Afghanistan's agriculture be improved in the near future.

2. The Mission of the Review Team

The Mission of the Team is to review Afghanistan's policies and programs for mobilizing its land and other resources in efforts to promote self-sustaining progress and development of its agricultural sector. Based on the review, recommendations are made which appear to offer the greatest potential for increasing productivity.

Specific recommendations are made which relate to short-term programs such as the Royal Government of Afghanistan's "Accelerated Wheat Program" which commenced in late 1966. The emphasis of this program is placed on increasing wheat yields by use of commercial fertilizers and improved wheat seeds. In addition, the review covers the Third Five-Year Plan, now in its first year of implementation.

3. Scope and Approach

Focus of the review is on wheat and other cereal grains in line with the current and projected shortages of these essential food crops. However, programs to increase grain production cannot be viewed in isolation. Accordingly, it is necessary to consider agricultural development strategy from the overall point of view, including reference to other crops and livestock and the economy generally.

The emphasis on wheat follows from its primary role in the economy. Also, improvements in wheat may well serve as a pattern for progress in other sectors. Problems of research, extension, marketing, distribution and program management are certain to be similar in the various commodity areas. Concentrated attention on a single major crop is assumed to be more productive than diffuse

²One seer = 15.6 pounds.

³The free market rate is 75 Afs. to the \$1.00.

consideration of numerous commodities, in view of the limited technical and economic data available and the time limitations placed on the Team's efforts.

The overall approach is to ascertain the current situation with respect to:

- (1) physical inputs and practices used in wheat production;
- (2) the economic environment in which wheat is produced, including government programs and policy;
- (3) institutional and organizational development, such as government planning and management of research and education.

Based on the current situation in each of the policy areas, potentials of alternative actions are considered in light of institutional and resource constraints. In this context, priorities are appraised and recommendations are made which appear to offer the greatest potential for payoff in the short-run, giving due consideration to long-run goals and programs.

B. NATURE AND REQUIREMENTS OF AGRICULTURAL DEVELOPMENT

The cornerstone of economic progress in any nation is the mobilization and development of its natural resources and manpower. This requires vigorous planning and implementation by the government of the developing country. But development does not occur solely by government action—government programs and investments are best conceived as means of spurring development elsewhere in the economy.

The statements to follow concerning the nature and requirements of the development process indicate the framework within which the Team analyzed development problems of Afghan agriculture. The principles outlined would be useful as background for considering agricultural development planning in any country.

1. Nature and Complexities of the Development Process

Agricultural development is a very complex process. It involves progress on numerous fronts, any one (or combination) of which may be a stifling bottleneck. Sustained growth requires technical, economic, attitudinal and political transformations of the entire society—all of which cannot be brought about quickly. Transformation of a traditional subsistence agriculture into one that uses advanced productive technology in producing a surplus for market sale does not occur with change in a single factor. Progress in agriculture occurs differently among countries, even within countries, depending on available resources and other factors such as culture and attitudes.

A dynamic commercial agriculture requires application of new capital-intensive physical inputs such as fertilizer, improved seeds and irrigation water,

on the agronomic side. Increased livestock production requires progress in selective breeding, management and marketing. The economic environment must be conducive to application of new technology and inputs by farmers and livestock producers. They must be educated and encouraged by knowledgeable extension personnel backed by a strong adaptive research program. New technology must be verified locally with respect to physical response and economic validity.

Programs for agricultural development are often stifled by interdependencies among critical factors, which may or may not be subject to policy leverage. For example, the farmer may be supplied fertilizer, but its full potential may not be realized because he will not use new improved seeds due to a dislike for the milling quality of the resulting wheat. Or he may continue to use customary cultural practices that seriously limit productivity of new seeds, even if fertilizer is used. Adherence to traditional beliefs may slow the rate at which technological change is adopted.

Programs to speed agricultural development must reach an extraordinary number of widely dispersed decision-making units. Voluntary efforts of millions of farmers must be enlisted and directed toward common goals. But farmers the world over place a high value on independence. They do not automatically tend toward socially organized collaborative activities.

Government programs may break down for lack of two-way communication between functionaries and farmers. Limited extension and other program resources often limit contact with farmers so that the government does not know the problems and aspirations of farmers. Result—the program may be misdirected or ineffectual.

Another factor complicating agricultural development is that agriculture itself typically is conceived as a low-status occupation. The brightest and most innovative youth often leave the farm, and more often than not, agriculture entirely. The local community suffers, along with farm-related education, research and other programs. Agriculture must attract and hold the highly capable and imaginative to serve as leaders in the future. Prime factors in holding capable people in rural areas are increasing incomes and improved social services.

2. Preconditions for Agricultural Development

Probably the most important ingredient for agricultural development is a will to do so on the part of national and local leadership. Leaders must give more than verbal recognition to the problem. Furthermore, leaders must be capable and must be supported by sufficient resources and capacity to realize development goals.

A will to develop on the part of leadership may be measured in terms of budget (and actual expenditures) for agricultural development. Direct action in rural areas including assignment of civil servants to those areas is also an indication of a will to develop.

The above requirement for agricultural development (i.e., will to develop on the part of leadership) means little in the absence of political stability and

continuity. A minimum of political stability (and public support) is imperative for a people to move ahead in agricultural development.

At least a minimum corps of administrative and organizational talent or expertise must be available to carry out programs. This requirement is over and above needs for technicians. Frequently, technical personnel are poor administrators and managers. Training of technical and management personnel is an integral part of any development program.

One significant precondition for agricultural development is the existence of markets for agricultural produce. Domestic and export markets must exist or at least develop simultaneously with agriculture. Production without a market is barren. Rising consumer incomes associated with development in business and industrial sectors spur agricultural development by increasing effective demand for farm output. On the other hand, over-emphasis on development of industry may be self-defeating. Agriculture often requires initial emphasis. The best strategy is one of balance between agriculture, industry, and infrastructure. However, balance does not mean the same percentages for all countries or over time within a country.

Balance also presumes availability of capital for investment in the agricultural sector. Investment should be both public and private, from domestic and foreign sources. A growing agriculture may supply its own capital and may even be capable of generating a surplus for diversion elsewhere in the economy. But especially in the beginning, capital and investment initiative must come from other sectors, or from abroad. Credit, both at the farm and national levels, is a fundamental requirement for beginning the transition from traditional to commercial agriculture.

All the investment required for self-sustaining growth cannot be made by the public sector. Government must take care so as not to under-utilize the power of an emerging market economy. Farmers (and businessmen) themselves will invest in their own best interests, based on profitable incentives. New technology must be profitable to the farmer—he cannot be forced to experiment and invest entirely on patriotic grounds. This is particularly true if he is near the subsistence margin where failure can be fatal for his family. New techniques must offer rewards to all parties, including the farmer.

3. Program Strategy

Technology normally cannot be applied directly from other countries. It must first be subjected to adaptive research before being applied on a country-wide or even regional basis. Pilot study of possible technologies or programs in limited areas is advisable. It allows the government to proceed on a more sound basis. The alternative is to proceed by trial-and-error. Snap judgments may commit a government to a risky or ineffective program for a considerable period. With pilot studies, bottlenecks can be anticipated which when applied on large scale could be disastrous. The existence of such potential bottlenecks may determine priorities for action.

Leaders may need to choose between productivity and equity in implementing plans to increase agricultural output. Often, output can be maximized by concentrating efforts in selected local areas or on a limited number of farms or types of farms. But the question of fairness to affect groups emerges. Equity questions also arise concerning the recovery of public investments from those who benefit. Direct expenditures or subsidies may work to the relative disadvantage of some and change the distribution of income in favor of a few.

C. DEVELOPMENT PLANS AND PROGRESS IN THE AFGHAN ECONOMY

1. Structure of the Agricultural Economy

Afghanistan has a total land area of about 63 million hectares (245,000 square miles), 12 percent of which is under cultivation (7.8 million cultivated hectares). Of this 5.3 million hectares (one hectare = 2.5 acres) are equipped for irrigation but only about 2.9 million crop hectares are actually irrigated in any given year because of water shortages. Another 1.3 million hectares are dry-farmed, primarily wheat and barley. In many areas the shortage of irrigation water is due to inefficiency of irrigation systems and practices. Many of the diversion structures are unable to withstand high water flow and must be repaired or rebuilt annually.

Methods of cultivation are primitive. Hand tools or crude animal-drawn implements are the rule. Farms generally are too small or rugged to accommodate large mechanized equipment. The average irrigated farm is about 3 hectares (7.5 acres). About one-half is irrigated at a time and the remainder is idle, with no cultivation to conserve moisture. Farm labor productivity is relatively low due to limited use of modern capital inputs. Use of chemical fertilizers and improved seeds must be increased.

Ordinary and Karakul sheep are primary sources of meat for domestic consumption. Wool and karakul pelts are important sources of domestic and export incomes. Goats are important for meat and milk. Most cattle, donkeys, horses and camels are beasts of burden and as such their numbers are primarily determined by the need for animal power.

Sheep numbers fluctuate widely because of the precarious nature of the weather in Afghanistan. Precipitation varies greatly from year to year and winters are severe. Sheep are reared primarily on natural public grazing lands located in the lower elevation of the mountains. Lack of strategically located livestock drinking water causes many areas to be undergrazed while others closer to water sources are overgrazed. This situation may be further aggravated by the loss of the better grasslands in the plains as a result of increasing dryland wheat production.

Sheep producers have several different forms in which to market their product. The relative price relationships of meat, wool, and pelts determine the quantity of each product marketed each year. In the case of Karakul sheep,

only about 20 percent of total receipts come from pelts. With the doubling of meat prices during the last 5 years and expected continued strong demand for meat, sales of sheep for meat will probably increase more rapidly than will the production of other sheep products.

2. Nature of the Second and Third Five-Year Plans

Since 1957/58 Afghanistan's economic development efforts have been carried out under the guidance of five-year plans. The First Five-Year Plan covered the period 1957/58 to 1961/62 and the Second Plan 1962/63 to 1966/67. The Third Five-Year Plan, now in effect, ends with the year 1971/72. Progress under the Second Plan and programs under the Third give indications of:

- (1) efforts being made in agricultural development,
- (2) realized progress thus far, and
- (3) prospects for future development.

Development expenditures by sector under the Second and Third Plans are shown in Table 1. Total development expenditures under the Second Plan were short of the target by 6.4 billion Afghanis, about 20 percent. Resulting shortfalls occurred in all sectors, except transportation and communications, which actually exceeded the target by 2.2 billion Afghanis or 30 percent. This reflects the decision taken by the Government to accelerate development of infrastructure—especially highways and airports.

Altogether, 39 percent of the total development expenditures under the Second Plan was allocated to transportation and communication. Some 2,000 kilometers of modern asphalt and concrete highways were completed, connecting main domestic economic centers and extending to the borders of the country. Extension of the major highway network under the Second Plan improved significantly the prospects for evolving a more efficient regional and national marketing system, particularly for agricultural products.

Implementation in the areas of agriculture and irrigation during the Second Plan fell short considerably due to the emphasis on infrastructure. Expenditures for agriculture and irrigation fell from the target of 25.5 percent of the total plan to 17.6 percent (from a target of Afs. 8.0 billion to Afs. 4.4 billion) (Table 1). Expenditures for irrigation were Afs. 3.8 billion compared with only 0.6 billion for other agricultural development.

The Third Plan calls for more emphasis upon the areas of agriculture and irrigation. Of the Afs. 33.0 billion total for the Third Plan, Afs. 9.65 billion are allocated for agriculture and irrigation (29.2 percent compared with 17.6 percent of the implemented Second Plan). Irrigation accounts for a smaller relative share under the Third Plan (Afs. 5.69 billion out of the Afs. 9.65 billion

**Table 1.—Sectoral Distribution of Development Expenditures under Second Plan
(Billions of Afghanis)**

Sector	Second Plan Targets		Second Plan Implementation		Third Plan Targets	
	Amount ^{1/}	Percent of Total	Amount ^{1/}	Percent of Total	Amount ^{2/}	Percent of Total
Agriculture	2.1	7.0	0.6	2.4	3.96	12.0
Irrigation	5.9	18.5	3.8	15.2	5.69	17.2
Total	8.0	25.5	4.4	17.6	9.65	29.2
Industry, Mining and Power	10.5	33.5	8.5	34.0	10.74	32.5
Transportation and Communication	7.4	23.5	9.6	38.4	4.10	12.5
Education, Health and Other Social Services ^{3/}	5.5	17.5	2.5	10.0	5.51	16.7
Reserve	--	--	--	--	3.00	9.1
Total	31.4	100.0	25.0	100.0	33.00	100.0

^{1/}Foreign project aid converted at a rate of Afs. 32.35 per U.S. \$1.00.

^{2/}Foreign project aid converted at a rate of Afs. 45.3 per U.S. \$1.00.

^{3/}Includes small amounts of miscellaneous expenditures.

Source: Ministry of Planning.

total for agriculture and irrigation). In Second Plan implementation, the ratio of irrigation to other agricultural development expenditure was better than 6 to 1.

Increased expenditures on agriculture in the Third Plan are a reflection of less emphasis on transportation and communication (38.4 percent of Second Plan implementation compared with 12.5 percent for the Third Plan). Education, health and other social services are targeted at 16.7 percent for the Third Plan (compared with target of 17.5 percent Second Plan target and 10.0 percent actual expenditure).

Goals of the Third Plan combine increased production in agriculture and industry with expansion of education and training to meet the demands for trained technical, scientific, professional and administrative personnel.

The shift in emphasis to agriculture in the Third Plan includes expanded research, extension, and credit service as well as continued emphasis on construction of multipurpose dams, larger irrigation and network systems, and smaller irrigation projects.

The overall objectives for the agriculture sector, as set forth in the Third Plan, include:

(1) Increased production of basic foodstuffs, principally wheat, rice, corn and barley to meet the primary domestic food needs and become self-sufficient in food grain production during the Third Plan period.

(2) To upgrade diets of the rural and urban population by increasing production and availability of meats, fruits, vegetables, dairy and poultry products.

(3) Increased production of agricultural raw materials needed for domestic industry and for export in order to save foreign exchange on imported goods and earn foreign exchange on exports to pay for capital imports required for agricultural and industrial development.

Percentage distribution of target expenditures for the Second and Third Plans are shown in Table 2 for the various project areas within the overall areas of agriculture and irrigation. Irrigation accounts for about three-fourths of the total in each case, increasing slightly during the Third Plan. Target expenditures for large project irrigation development are roughly 10 to 1 over small scale projects.

The second largest area of targeted expenditures in the Second Plan was mechanization (14.8 percent), followed by animal husbandry (2.5 percent) (Table 2). The Third Plan calls for increased emphasis on animal husbandry, forestry and plant protection (including plant improvement and soil research).

Agricultural extension and research were given little emphasis in the Second Plan. These two areas together accounted for 1.0 percent. Data were not available on any proposed expenditures in these areas during the Third Plan.

Because of the large increase in wheat prices during the last year of the Second Plan, and the dominant role of wheat in the Afghan economy and diet, the Afghan Government decided to accelerate development programs which would expand production of wheat in Afghanistan.

Programs under the direct administrative control of the MA & I which were specifically designed to accelerate wheat production—such as improved seed production and distribution, wheat research, extension and demonstration work—were brought together and budgeted as a special ‘Wheat Project’. However, other activities of the MA & I, the regional authorities, and the Rural Development Department in the Ministry of Interior which have a major contribution to make to accelerated wheat production (e.g., water development, fertilizer activities, etc.) were not included in the ‘Wheat Project’ budget.

The development budget for the MA & I for the year 1346 (1967-1968), the first year of the Third Plan, (Table 3) indicates that the ‘Wheat Project’ constitutes seven percent of the portion of the budget financed from Afghani

**Table 2.—Distribution of Expenditures for Agriculture Development,
Second and Third Plans**

Item	Second Plan Targets - - Percent of Total	Third Plan Targets (Approx.) - -
Irrigation:		
Small Scale	7.3	6.8
Large Works	66.4	71.7
Total	73.7	78.5
Animal Husbandry	2.5	3.9
Forestry	0.2	3.2
Agricultural Extension	0.6	N.A.
Mechanization	14.8	1.5
Sericulture	0.2	0.5
Beekeeping	0.1	0.1
Fisheries	0.1	0.3
Plant Protection	0.2	11.62 ^{2/}
Agricultural Research	0.4	N.A.
Agricultural Statistics	0.1	0.3
Agricultural Credit	6.2	N.A.
Other	0.1	0.1
 Total	 100.0 ^{1/}	 100.0

^{1/}Percentages do not add to 100 due to rounding.

^{2/}Includes Plant Improvement and Soil Research in Third Plan.

Source: Ministry of Planning.

and 21 percent of the budget financed from foreign aid. However, the "Fertilizer Project", which will contribute primarily to the wheat expansion program, consumes another 21 percent of the budget financed by Afghans.

While the MA & I Budget for 1346 reflects a relatively high priority for wheat, the past heavy investment in irrigation and other water development activities continues. Over 50 percent of the Afghani expenditures, and over

**Table 3.—Summary of the 1346 Budget for the Ministry of
Agriculture and Irrigation**

	Afghan Budget (Afs)		Foreign Aid (Dollar Equivalent)	
	Amount (Thousands)	Percent	Amount (Thousands)	Percent
Water Conservation & Development	346,905	52.2	12,414	70.8
Crops	221,036	33.3	3,728	21.3
(Wheat Project)	(47,944)	(7.2)	(3,605)	(20.6)
(Fertilizer Project)	(140,000)	(21.1)	(--)	(--)
(All Other Crops)	(33,092)	(5.0)	(123)	(.7)
Livestock and Animal Products	50,704	7.6	1,125	6.4
Forestry	16,399	2.4	30	.2
Other Projects	29,227	4.4	243	1.4
Total	664,270	100.0	17,540	100.0

Source: Ministry of Agriculture and Irrigation.

70 percent of the foreign aid expenditures, are allocated for water conservation and development projects. Most of this goes to four large projects, as follows:

Water Conservation & Development	Afghanis (Thousands)	Foreign Aid (Dollars) (Thousands)
Nangarhar Canal	200,000	5,000
Parwan Irrigation Project	21,000	2,000
Kochka Valley Project	20,000	2,000
Sarda Irrigation Project	30,000	2,500
	<u>271,000</u>	<u>11,500</u>
All Others ^{1/}	75,904	914
Total Water Conservation & Development	346,904	12,414

^{1/} Does not include Helmand Valley which is not in the MA & I budget.

The contribution of these projects to the increased wheat productivity capacity of Afghanistan, while no doubt significant, has not been systematically analyzed and measured by the Afghan Government. Also, there has not been a careful evaluation of costs and relative effectiveness of alternative investments to increase wheat production during the Third Five-Year Plan period.

Since foreign aid contributions constitute two-thirds of the total expenditures for the MA & I (at 75 Afs. to the dollar), the short-run opportunities for the Government to shift additional resources to the "first priority" wheat expansion program would be limited by the conditions set by the donors.

3. Agricultural Progress Under the Second Plan

The reliability of Afghanistan's agricultural production and yield data, with the exception of cotton and sugar beets, is questionable. There has never been a census of agriculture or population, making it extremely difficult to evaluate production trends. Estimated agricultural production growth rates are likely to be closer to the actual rates than are production levels.

Crop production under the Second Plan was generally disappointing, based on available data. This was particularly true of the food grains. Average annual wheat production during the Second Plan was 45,000 metric tons less than during the First Plan, for an annual growth rate of -0.5 percent (Table 4). This rate of growth is in contrast with population growth currently estimated at 1.9 percent per year. Average wheat area increased by 112,000 hectares (1.0 percent per year) while yield per hectare declined from 987 to 920 kilos (-1.4 percent per year).

Production of the other food grains (corn, barley and rice) increased to some extent, but in each case by much less than the annual growth rate of population. Food grain production under the Second Plan increased at a rate of only 0.1 percent per year. Of the food grains, corn had the highest growth rate during the Second Plan (1.2 percent per year) (Table 4).

It is significant that the annual growth rate for each of the food grains on any basis (production, area or yield) was far less than for population on any basis (production, area or yield).

Cotton is one of the major cash crops of Afghanistan. Because of its importance as an export commodity and a source of raw materials for industry, the Government has employed a compulsory acreage allotment program, supervised by the field extension staff. An annual growth rate of 10.9 percent in cotton production experienced between the First and Second Plan periods was due largely to better cultural practices. Cotton area increased by only 2.4 percent per year. A 25 percent price increase encouraged cotton production along with the Government program.

The historical performance of sugar beet production is similar to that of cotton. Governmental policy is instrumental in determining the level of its

Table 4.—Annual Average Crop Production, Area and Yield Under First and Second Five-Year Plans, with Comparisons *

Crop	Production			Area			Yield		
	First Plan 1957-58- 1961-62 (1000 MT)	Second Plan 1962-63- 1966-67 (1000 MT)	Annual Growth Rate (Percent)	First Plan 1957-58- 1961-67 (1000 Ha)	Second Plan 1962-63- 1966-67 (1000 Ha)	Annual Growth Rate (Percent)	First Plan 1957-58- 1961-62 (Kilos/Ha)	Second Plan 1962-63 1966-67 (Kilos/Ha)	Annual Growth Rate Percent
Food Grains	3,554	3,579	0.1	3,266	3,407	0.8	1,088	1,050	-0.7
Wheat	2,203	2,158	-0.5	2,231	2,343	1.0	987	920	-1.4
Corn	674	714	1.2	494	500	0.2	1,364	1,430	0.9
Barley	364	378	0.8	336	350	0.8	1,083	1,080	0.0
Rice (Milled)	313	328	0.9	205	214	1.1	1,527	1,533	0.1
Cotton	50	80	10.9	64	72	2.4	781	1,167	8.4
Sugar Beets	41	52	6.1	3.8	3.7	-0.5	10,789	14,865	-6.6
Sugar Cane	41	47	2.7	1.6	1.9	3.5	25,625	25,263	-0.3
Oil Seeds	48	51	1.2	148	150	0.3	324	340	1.0
Fruits	275	349	4.8	59	67	2.6	4,678	5,209	2.2
Vegetables	490	546	2.0	100	104	0.8	5,000	5,308	1.2
Total	--	--	--	3,642	3,806	0.9	--	--	--

* Year begins in mid-March.

Source: Ministry of Agriculture and Irrigation

production. Sugar beet production during the Second Plan increased 6.1 percent annually compared to the First Plan (Table 4). At the same time, beet sugar production increased 9.6 percent annually, indicating an increase in the sugar content of beets.

Sugarcane is locally processed and consumed in the form of crude sugar known as gur. Production increased at 2.7 percent per year during the Second Plan (Table 4). Increased production in the future will depend upon rejuvenation of the sugarcane processing plant in Jalalabad and incentives to growers to increase production.⁴

⁴ A recent study indicates that sugar production should not be expanded beyond that required to operate the plant at Baghlon. The study favored expanded cotton production (on a voluntary basis), although cotton would be competitive with wheat. See: The Place of Cotton and Sugar Beet in the Afghan Economy, by G. Allanson (1345/1967).

Afghanistan has a favorable climate for fruit culture. The quality of fruit grown is generally very high. Fruits produced include apples, pears, apricots, peaches, plums, quinces, cherries, pomegranates and many varieties of grapes and melons. Fruit production during the Second Plan increased at a rate of about 4.8 percent per year (Table 4). This rate of increase is assumed to be a fair indication of the production trend but is subject to considerable error. Increased domestic and export market, growth in this subsector should continue at a relatively rapid rate. However, there are significant marketing problems in the areas of quality control, sorting and assembly.

According to available data, the population of each kind of livestock in Afghanistan increased, at least to some extent, during the Second Plan, with the exception of ordinary sheep (a decline from 15.0 to 14.5 million during the Second Plan) (Table 5). Meanwhile, the population of karakul sheep increased by more than 40 percent. Only nominal increases occurred in horses, mules and camels. Poor condition of the vast rangelands of Afghanistan will severely limit improvement in carrying capacity in the near future.

Agricultural production and input targets were not realized in most cases by the last year of the Second Plan (1966/67) (Table 6). Only one production goal was attained (Wool, 15 percent over target). Production of food grains

Table 5.—Annual Average Livestock Population in Afghanistan under First and Second Five-Year Plans, with comparisons

Kind of Livestock	First Plan 1957/58 - 1961/62	Second Plan 1962/63 - 1966/67	Percent Change
- - - - Millions of Head - - - -			
Sheep			
Ordinary	15.0	14.5	-4
Karakul	4.1	5.8	43
Goats	1.7	3.0	71
Cattle	2.4	3.7	53
Horses & Mules	.26	.3	16
Camels	.26	.3	15
Donkeys	.96	1.24	29

Source: Ministry of Agriculture and Irrigation.

Table 6.--Second Plan Agricultural Production and Input Targets and Achievement

Item	Production in last year of Second Plan (1966/67)			Comparison of actual to targets
	Unit	Plan Target	Actual	
Percent				
<u>Production</u>				
Food Grains:	1,000 MT	3,966	3,465	-12.6
Wheat	1,000 MT	2,449	2,033	-16.9
Corn	1,000 MT	755	720	- 4.6
Barley	1,000 MT	405	375	- 7.4
Rice	1,000 MT	357	337	- 5.7
Cotton (Raw)	1,000 MT	159	59	-62.9
Sugar Beets	1,000 MT	66	56	-15.2
Oil Seeds (Exc. cotton Seed)	1,000 MT	57	55	- 3.5
Wool	1,000 MT	20	23	+15.0
Karakul Pelts	1,000	2,800	2,610	- 6.8
Sheep and Goat Skins	1,000	7,500	7,230	- 3.6
<u>Inputs</u>				
Irrigation:				
New Lands	Hectares	115,000	31,000	-73.0
Improved Water Supply	Hectares	96,000	N.A.	--
Fertilizer: Production	MT	50,000	--	--
Imports	MT	--	37,387	--

Source: Second Plan Targets - Ministry of Planning.

was off target by 12.6 percent, with the largest shortfall in wheat (16.9 percent). Cotton was 62.9 percent short of target.

Limited information is available on realization of input targets. However, it appears that irrigation of new lands fell short by 73.0 percent (only 31,000 out of 115,000 hectares planned) (Table 6). Data are not available as to realization of the goal of improved water supply on 96,000 hectares.

The Second Plan did not call for importation of commercial fertilizers. However, 37,387 metric tons were imported (Table 6). During the Second Plan, work began on a commercial fertilizer plant but it is not scheduled to be completed for several years.

The Third Five-Year Plan calls for a 13 percent increase in food grain production by the final year (1971/72) (Table 7). The largest increase is planned for wheat (19 percent from 2,158 MT to 2,562 MT). Barley and rice production is not expected to increase substantially by 1971/72.

Table 7.—Base Period Production and Third Plan Targets, with Comparisons

Commodity	Unit	Base Production	Third Plan Target (1971/72)	Percent Increase
Wheat	1000 MT	2,157.5	2,530 ^a	17.0
Corn	1000 MT	720.0	774	7.5
Rice	1000 MT	331.0	344	4.0
Raw Cotton	1000 MT	67.0	130 ^a	94.0
Sugar Beets	1000 MT	56.0	88	57.0
Oil Seeds ^b	1000 MT	53.5	57	7.0
Fruits	1000 MT	371.0	425	15.5
Vegetables	1000 MT	585.0	631	8.0

^aExpected production in the Helmand-Arghandab Valley included. Figures for other crops are exclusive of production in the Helmand and Arghandab Valleys.

^bCotton seed excluded.

Source: Base Production - Ministry of Agriculture and Irrigation, Third Plan Target - The Third Five-Year Plan. RGA Ministry of Planning.^{1/}

^{1/}The following information was included in the penultimate draft of the Third Five-Year Plan but was dropped in the final draft. The data are included for information:

Commodity	Unit	Base Production	Third Plan Target (1971/72)	Percent Increase
Barley.....	1000 MT	375.0	376.0	-
Sheep, ordinary ..	Million Head	15.0	16.0	7
Sheep, Karakul...	Million Head	5.6	6.0	7
Cattle	Million Head	3.6	4.1	14
Meat	1000 MT	172.3	198.4	15

Extremely large increases are projected for cotton and sugar beets (more than 100 percent increase in each case). Among other commodities, the largest increases are expected in fruits, cattle (numbers) and meat production.

4. Afghanistan's Wheat Deficit

Demand for wheat in Afghanistan has been computed for recent years and projected for the future based on per capital consumption of 162 Kg per year. A population growth rate of 1.75 percent per year was assumed through 1966/67. Projections for more recent years are based on 1.90 percent increase per year. Based on these assumptions, the annual wheat requirement has increased from 2,244,000 MT in 1960/61 to 2,495,000 MT in 1966/67 (Table 8). The wheat requirement will increase to an estimated 2,741,000 MT by 1971/72.

Production on the other hand has not increased significantly since 1960/61, based on the available estimates which are subject to considerable error. Production in 1966/67 was estimated at 2,033,000 MT which was 462,000 MT less than the calculated requirement for that year. This was the second very large deficit to occur in Afghanistan. The first large deficit was in 1963/64 when it was calculated at 419,000 MT.

The current wheat crop (1967/68) is expected to be considerably improved over the previous year, due primarily to favorable weather. The preliminary estimate is 2,300,000 MT which would give a deficit of 242,000 MT (Table 8).

The indicated deficits of previous years have been offset partially by wheat imports. Between 1963/64 and 1966/67, imports have been generally within the 80,000 - 100,000 MT range.

During this period wheat flour prices increased markedly over the previous level of about Afs. 19 per seer in 1961/62 and 1962/63. By 1966/67 the national average price of wheat flour had increased to Afs. 38.0 per seer. The largest price increase over a previous year during this period was in 1963/64 (Afs. 10.2 per seer). The impact of this deficit was reflected in flour prices the following year—an increase of another Afs. 5.4 per seer in 1964/65, in spite of imports of 89,000 MT.

Somewhat the same pattern was repeated recently, however with a greater price impact. The shortage of 462,000 MT in 1966/67 had a small impact on the flour price (Afs. 2.0 increase from previous year), possibly due to more than 100,000 MT of imports. However, during the first four months of 1967/68, the national average price of flour doubled—from Afs. 38.0 per seer in 1966/67 to Afs. 79.2 per seer.

Flour prices increased sharply in January 1967 (U.S. Year) and peaked at near Afs. 100 per seer in late April. Prices in early July were less than Afs. 70 per seer as the 1967/68 harvest got under way. Since the outlook for the 1967/68 wheat crop is favorable, hopes are held out that prices will not again increase to levels of the last few months, prior to harvest of the 1968/69 crop.

Table 8.—Summary of Data on Afghanistan's Wheat Deficit, 1961/62-1966/67 and
1971/72 Projection

U. S. Year (3/21-3/20)	Population ^{1/}	Wheat Requirements ^{2/}	Wheat Production ^{3/}	Apparent Production Deficit	Imports ^{4/}	National Average Price of Wheat Flour (2nd grade) ^{5/}
	(000)	Metric Tons				Afs per seer
1960/61 . . .	13,852	2,244,000	2,279,000	--	49,853	N.A.
1961/62 . . .	14,099	2,284,000	2,279,000	5,000	32,422	18.4
1962/63 . . .	14,350	2,325,000	2,279,000	46,000	6,786	18.1
1963/64 . . .	14,606	2,366,000	1,947,000	419,000	79,902	28.3
1964/65 . . .	14,866	2,408,000	2,250,000	158,000	89,000	33.7
1965/66 . . .	15,131	2,451,000	2,282,000	169,000	108,432 ^{7/}	36.0
1966/67 . . .	15,400	2,495,000	2,033,000	462,000	102,816 ^{7/}	38.0
1967/68 . . .	15,693	2,542,000	2,300,000 ^{6/}	242,000	N.A.	79.2 ^{8/}

1971/72 . . .	16,920	2,741,000	2,562,000 ^{9/}	179,000 ^{8/}	--	--

^{1/} Population computed from base of 15.4 million in 1966/67. Population growth compounded backward at rate of 1.75 percent and forward at rate of 1.90 percent per year. (Ministry of Planning assumptions).

^{2/} Based on per capita consumption of 162 kilo/year (Ministry of Agriculture and Irrigation figure).

^{3/} Figures obtained from Ministry of Agriculture and Irrigation.

^{4/} "Survey of Progress," 1962-64, Ministry of Planning, Department of Statistics and Research, p. 92.

^{5/} Da Afghanistan Bank

^{6/} USAID Agriculture places estimate somewhat higher.

^{7/} USAID/A records of PL 480 receipts. Adjusted to the Afghan year by using half the January-June figure in each year.

^{8/} March 21 - July 6, 1967

^{9/} Third Plan target for wheat production in year 1971/72.

The wheat deficit in Afghanistan conceivably can be closed in several ways:

- (1) by importing increasing amounts of wheat,
- (2) by increasing wheat acreage (preferably irrigated land which currently yields about 20 bushels per acre),
- (3) by increasing productivity per acre or
- (4) by a combination of the above alternatives.

In reality, a combination of the above no doubt will occur. However, it may be that more emphasis should be placed on some alternatives than on others.

The Third Plan target in wheat production is 2,562,000 MT (in 1971/72), compared with a requirement of 2,741,000 MT (Table 6). This would give a deficit 179,000 MT. In other words, the Third Plan calls for a smaller increase in output than is required to become self-sufficient in wheat. Apparently, the Government plans to continue large volume wheat imports through the Third Plan, probably in the magnitude of 100,000 to 200,000 MT per year.

Wheat production will need to be increased by about 300,000 MT over the level of recent years to attain the Third Plan goal of 2,562,000 MT. If new irrigated land were alone used to close the gap, this would mean an additional 550,000 acres of irrigated wheat production by 1971/72 at 20 bushels per acre (0.544 T/acre), the approximate current yield. However, it is expected that irrigated land in wheat production will increase by only 51,000 hectares (126,000 acres) during the Third Plan. At a yield of 0.544 T/acre, this new irrigated wheat would produce only 68,000 T. The 300,000 MT of wheat are unlikely to be forthcoming from new irrigated wheat land. Prospects for large increases in acreage of dry land wheat are limited.

Self-sufficiency in wheat by 1971/72 would involve an increase in production of more than 583,000 MT (2,741,000 MT compared with Second Plan base of 2,158,000 MT). Closing such a deficit by new irrigated land would involve more than a million acres of new wheat land at current yields (1,200 pounds or 0.544 MT per acre).

These data indicate that Afghanistan must make considerable progress in increasing wheat yields per acre if it is to avoid large wheat deficits by as early as 1971/72. Indeed, if it is to attain its goal of 2,562,000 MT by that year, it will need to increase yields considerably. Yet, this goal would result in a deficit of 179,000 MT to be made up by imports.

Considering the expected modest increase in irrigated wheat acreage, it seems clear that wheat yields per acre will need to be increased by an average of more than 15.0 percent on dry and irrigated wheat land to merely attain

the 1971/72 goal.⁵ If the increase is to be made up by increased yields on irrigated land only (along with the 51,000 hectares of new wheat land), the irrigated yields will need to increase in the order of 21 percent.⁶ To attain full self-sufficiency, irrigated yields would need to be increased by about one-third.⁷ Such increases in yields may well be possible but this will require a technological revolution of Afghanistan's agriculture in five years.

⁵ Assumes: base production of 2,158,000 MT plus 57,000 MT from 51,000 hectares of wheat land, a total of 2,226,000 T, and goal of 2,562,000 MT by 1971/72.

⁶ Assumes: 600,000 MT produced on dry land (out of 2,186,000 MT which includes the 2,158,000 MT base plus 68,000 MT from new irrigated land) leaving 1,586,000 MT irrigated base. The increase in required production of 336,000 MT (2,562,000 - 2,226,000 MT) gives an increased yield requirement of 20.7 percent.

⁷ Assumes: increased production of 515,000 MT (2,741,000 MT goal - 2,226,000 MT) on irrigated base production of 1,626,000 MT, giving an increased yield requirement of 31.7 percent.

PHYSICAL INPUTS

Chapter III

PHYSICAL INPUTS

A. TECHNOLOGY OF WHEAT PRODUCTION

Afghanistan can become self-sufficient in wheat production by 1972/73 by combining its great human, economic, water, soil and plant resources. The physical factors must be brought into balance through improved technology and large increases in plant nutrients supplied to the best local and introduced varieties. Whether the country can remain self-sufficient in the long pull is highly problematical.

Projections of yield increases of 33%, 50%, and 75% provide rough estimates of the long-range prospects for increasing total production of wheat without increasing the land under cultivation. In 1966, the estimated wheat crop was 1,620,000 tons from irrigated land and 660,000 tons from dryland for a total of 2,280,000 tons. A 33% gain would bring 2,155,000 tons from irrigated land and 877,000 tons from dryland for a total of 3,032,000 tons. A 50% gain on irrigated land seems feasible but may not be attainable on dryland. On the basis of 50% for irrigated and 33% for dryland increases, the total crop might be 3,307,000 tons. Using a 75% gain on irrigated land leads to a total of 3,712,000 tons. Obviously, such average gains assume that all farmers will be reached and influenced, or that a higher level of gain will be obtained on fewer farms. These estimates give a basis for optimism in the short run; however, the prospects for reaching enough farmers with adequate incentives to stimulate production much above 3 million tons needed by 1978 with foreseeable technology and no change in acreage are not encouraging. Even to attain this level of wheat production will require use of the entire output of nitrogen (N) from the urea plant near Mazar and the importation of several thousand tons of phosphorous fertilizer. Afghanistan must match the unusual performance of Mexico to reach wheat production beyond 3,000,000 T.

There are a number of ways to increase the wheat acreage and each has its limitations. Afghanistan needs land for crops other than wheat so it is not compatible with the country's total objective to shift major acreage from other crops to wheat. An increase in the total cultivated land in the country and improved water supplies to all land now within irrigation districts are worthy goals. Wheat could not be assumed to occupy more than about half of such new land. Some estimates of the amount of land which might be brought under cultivation have been made. The Third Five-year Plan calls for development of 51,000 hectares (127,500 acres) of new irrigated wheat land on which 163,000

tons of grain might be produced. By estimating a gain of slightly less than 1% per year, about 200,000 to 250,000 ha. could be added to the tillable irrigated land of the country by 1978. Of this, half could be devoted to wheat for an increase in the crop of 100,000 to 125,000 ha. (250,000 to 312,500 acres). These are rather uncertain but fairly optimistic estimates for the next 10 years. To all of this, an unknown addition from deep wells could be made.

Afghan farmers have no peer in the Near East. However, they seriously lack essential factors with which to make their labor more productive and remunerative. They include:

- (1) plant food
- (2) adequate and dependable supplies of water
- (3) seed of responsive, high-yielding varieties of wheat, and
- (4) the tools or power to perform essential operations in a timely manner.

While all of these factors are required and the lack of any of them can be limiting, the priority of need will vary from area to area. The technological requirements to overcome these obstacles are only partially available. Experimentation, adequate research, and some inventiveness to supplement known technology, and a commitment to educational and development demands are needed. Finally, the economic incentives and vehicles by which these practices can be introduced and the costs can be assumed by the farmers must be made available.

Yields are very low. The scanty rainfall (4-15") puts severe limitations on dryland wheat and makes irrigation a necessity if high yields are to be obtained. Yields exceeding 100 bushels per acre should be attainable on some farms. Records and experimental evidence support the conjecture that it would be practical to increase the national average from the present 15 bushels per acre to 25 in the next decade with known technology, an increase of 66%.

Yields from irrigated land range from a few bushels per acre to more than 65. The yield is said to be 10-12 bushels per acre on land where no soil improvement practices or fertilizers are used. The great hope for immediate and large increases in tonnage of wheat is the irrigated land whereon a series of several practices must be integrated to make improvements in the wheat crop.

It should not be inferred that no improvements can be obtained on dryland. However, advances will be slower and the actual gain in yield can not be as large even if the same percentage of increase is achieved.

Physical factors will be discussed under headings as follows:

- (1) Fertilizer

- (2) Seed
- (3) Cultural Practices
- (4) Irrigation
- (5) Tools and Machinery, and
- (6) Pest Control

1. Fertilizer

Current situation: Only limited amounts of fertilizer have been available in Afghanistan. All of it must be imported at the present time. Nevertheless, a survey conducted by the Faculty of Agriculture, Kabul University, revealed that farmers in the six eastern provinces listed fertilizer as the major limiting factor in wheat production, even ahead of the water shortage, which ranked second. Over 1/5 of the farmers interviewed said they needed fertilizer and that fertilizer would increase their wheat yields by 50%.

Prior to 1966, only about 7,000 tons of fertilizer were available for all crops in Afghanistan. Hence, natural manures and legumes were the significant fertilizers. In 1966-67, 3,400 tons of superphosphate and 6,600 tons of urea were imported by the Government. About 7,000 tons of this was distributed on a subsidized basis under which plan the farmer paid 55% of the cost. In 1967, the amounts to be imported were considerably increased. For 1967-68, 6,000 tons of urea and 6,000 tons of superphosphate have been ordered and negotiations are under way for 7,250 tons of diammonium phosphate and 5,700 tons of urea.

A urea plant in the gas field area near Mazar-i-Sharif is under construction. It is to have a capacity of 105,000 tons of urea (47% N). The need for this amount of N is clear and it is in Afghanistan's self interest to build a market and marketing system to promote full use of the output. In fact, this output is needed on wheat alone without consideration of the other crops such as corn and cotton where N is vital to high yields and economical production.

Farmers are free to obtain fertilizer from private dealers. However, the subsidy on government supplies makes privately obtained fertilizer non-competitive in price. Distribution of supplies is feasible to the larger cities now connected by good roads, but farm-to-market roads are meager, generally poor, and impassable for trucks during part of the year.

Other means of adding plant nutrients to the soil are practiced. These include spreading animal manures on the fields, growing legumes, and spreading deposits from canals, ditches, and building refuse. These are effective in the order listed. The practice of fallow undoubtedly results in liberation of plant foods but the net effect probably is a loss of total nutrients. Without the benefits of nutrients added from other sources, the nutrient level declines

to a very low point, more or less in equilibrium with general soil building forces.

Nitrogen (N): This element is undoubtedly the most universally limiting of plant nutrients. Wherever observed in demonstration plots, use of nitrogen fertilizer, manures and legumes showed beneficial effects on irrigated land. Examples of 2-fold, even 3-fold increases were called to the attention of the Team. In order to produce one bushel of wheat about 2 3/4 pounds of N are required. A yield of 40 bushels involves about 110 pounds of N. Unimproved soils probably provide residual release of N in a range of 20 to 30 pounds per acre per year and will be especially low under continuous cereal crop production. Since other sources of N are limited, the bulk of the additional requirement must be supplied as chemical fertilizer.

Local varieties have tall, weak straw and lodge (i.e., bend over so that the heads touch the ground) under high fertility levels. New varieties which tolerate and respond to higher rates of N without lodging are being increased for distribution. Local varieties probably can be satisfactorily fertilized with 30 to 40 pounds of N per acre not including the residual in the soil. New stiffer strawed, tall varieties can respond to double this amount. Semidwarf varieties respond to even higher amounts (90 lbs N or more), and do not lodge. Only limited data are available on these relationships from Afghanistan trials, but rapid acquisition of data can be made by full use of experimental and demonstration results. Likewise, only limited information is available regarding the interaction of N and other fertilizer elements and the exact timing of application. It is expected that N will be most efficient if half is applied at seeding time and the other half when the plants are jointing but not headed. The manner of application and form of the N must be considered. For example, urea is partially lost to the air unless tilled into the soil.

Under dryland conditions moisture may be so limited that application of nutrients will not give a yield response. N, in particular, may cause "overstimulation" during the early part of the season with excessive use of stored moisture and result in shriveled grain. A yield increase from the use of N on dryland in Afghanistan is largely unknown, but it should not be regarded as of no consequence. Research and experimentation may show striking ways to utilize N on dryland. What in part has always been blamed on drought may well be inadequate plant nutrition.

Phosphorus (P₂ O₅): This element is needed especially during the early stages of growth. Experiments and demonstrations are in progress to determine the effects of phosphorus applications. This is the best procedure initially and can later be supplemented by a carefully calibrated laboratory soil test. Extensive field testing is required in any case.

Responses to as little as 8 to 16 pounds of P₂ O₅ have been reported in parts of the world. Rates above 40 pounds are seldom used. Banding the fertilizer with the seed usually results in more efficient utilization. This is especially noticeable at low rates. Broadcasting is easier and when seed is broadcast, no opportunity for banding exists. Both practices need to be tried

in Afghanistan to determine the best method and rate of application. Some of this work is underway and should be greatly expanded.

The interaction of phosphorus with nitrogen can be anticipated and P_2O_5 plus N gives better results than either alone.

Potassium (K): It is not known how widely this element is needed for proper fertilization of wheat in Afghanistan. At high yield levels it may be anticipated that sooner or later, this element will become limiting on some soils. For the short term it is suggested that this element be limited to wheat production research and not included in commercial fertilizers made available to farmers. Here again, a soil testing laboratory could commence to supply the needed basic data on availability of exchangeable K in the various soils of Afghanistan.

Recommendations: Greatly expanded availability of N and P_2O_5 , especially N, seems fully justified for use on irrigated land in Afghanistan. Using a common ratio of 8 tons of cereal grain for each ton of nutrients applied to responsive soils, Afghanistan could close a wheat supply gap of 400,000 T. by the use of 50,000 tons of nutrient elements, providing the fertilizer were used in conjunction with good seed and cultural practices. Distribution services which enlist the fullest possible participation of private dealers is recommended because the Government needs the help of the private sector to relieve them of the expense and the drain on their already short supply of manpower, and to expedite movement of the large tonnages involved.

Extensive demonstration and research plots should be continued during the next 5 years, or longer. Two functions would be served:

- (1) educational, and
- (2) performance data acquisition

Both are needed. These initially should be concentrated in the larger project areas where wheat in excess of local needs is produced. Individual locations of plots should change annually.

Adaptive research should be conducted on rates, placement and formulations of fertilizer as a means to establish more precise recommendations in the future.

A soil testing laboratory should be established to determine nutrient element and other needs of various soils and perform follow-up research so that tests may be calibrated to reflect actual field situations. One or more additional laboratories may be required as experience is gained. Such studies would build up a fund of information on which refined recommendations could be based.

2. Seed

Current Situation: "Local" varieties, more or less of mixed morphological type, but well adapted to the climatic regions of the country, are used now

in Afghanistan. They seem meritorious in specific survival traits including good emergence from variable planting depths, non-shattering of seed at maturity, and general tolerance of winter cold, drought and low soil fertility. However, they have a low yield ceiling mainly because of weak straw and lodging under high fertility, irrigated conditions, and are susceptible to rust.

New varieties with higher yielding capacity and great responsiveness to high rates of fertilizer have been introduced for trial, seed multiplication and release to farmers. The seed increase program for 1966-1967 by varieties is estimated to be as follows:

	<u>Acres seeded</u>	<u>Expected yield</u>
Lerma Rojo 64A.....	1,984	2,574 T.
Kenya Mentana	198	237 T.
Vilufen	115	146 T.
UN 6389	15	28 T.
Sonora 64	1	2 T.
Marja Red (local)	300	360 T.
Tascosa	1,890	2,286 T.
Farah awned (local)	16	28 T.
8156 (Mexipak)	10	20 T.

Seed cleaning machines have been obtained at numerous centers with capacity to process the seed from the increase farms. In 1967, there were 13 of these. In addition, there were about 100 portable cleaners scheduled for purchase. Removal of weed seeds and, if possible, rye should both preserve the purity of the new varieties and provide a better seed source than has been possible before. Farmers who get new seed should be instructed to put it on clean land and carefully remove weeds, rye and off-type plants. Harvesting, stacking, and threshing should be done as a separate operation so that the seed will not be mixed. This supply would serve as the seed for next year's crop.

Potential: New varieties probably will have only a small immediate impact on the total wheat economy unless coupled with improved soil fertility. The combination could readily lead to a 33% and even a 50% increase nationally. Maximum yields of 100 bushels per acre are attainable. Those parts of Afghanistan with irrigation and mild winters appear ideal for exploitation of the semi-dwarf wheats such as Lerma Rojo 64, Mexipak, etc. Further testing and searching for adapted, responsive varieties is needed for the areas with colder winters. Even more intensive work and care is apparent for the dryland areas. No one can say how many years of testing is "enough" but more years are needed for dryland testing than is needed on irrigated land.

Recommendations: All-out efforts should be made to increase the newly discovered high-yielding varieties and place this seed in the hands of leading farmers in the areas of known adaptation. A large enough amount should be allocated so that each farmer can justify a separate threshing floor for the new variety; otherwise, the seed increase will stop at the first distribution.

Placement of new varieties should be done on the basis of favorable results from regional varietal trials and demonstration plots. The assertion that Lerma Rojo, for example, or any one variety, should be used everywhere would seem to be irresponsible at this time; to push Sonora 64, promising from a one-year trial, into strictly dryland areas without further testing would be equally unjustified. Such sweeping generalities could give an otherwise sound program a severe setback.

A rigorous variety testing program should be conducted based on selected local and introduced varieties. A large number of exotic varieties are on hand from neighboring countries, Mexico, USA, FAO, and other sources. Additional ones can be obtained annually. These should be the main source of new varieties in the immediate future.

The present concept of coordinated variety testing is commended and encouraged. Appropriate uniform trials should be conducted at the 6 regional stations. A much reduced number of varieties (2 to 5) is suggested for the demonstrations. The close cooperation of agronomists, pathologists and other specialists is essential to efficient work.

The practice of choosing promising selections after two or three years trial for preliminary seed increase plots is commended. This provides a means whereby variety release could be simultaneous with completion of the testing program.

A seed production program that involves leading seed-minded farmers should be developed. Afghanistan does not need to depend upon other countries for its foundation and certified seed. No one can produce it better provided the elementary principles are observed. A seed testing and standards laboratory should be established as a useful service to the seed industry. A local seed production program would contribute incentives for the more skilled farmers and sales would be an added source of income. Such program could take any of several forms ranging from purely private individual operations to group participation, and government contracts with growers.

A long-range breeding program could be expected to yield results after 10 to 12 years of continuous effort under competent leadership. Such a program would provide Afghanistan with assurance that desired traits in indigenous wheats would be preserved in new varieties and is a sound investment in the future. An alternative or adjunct to a local breeding program would be to enlist the Rockefeller Foundation, for example, to breed numerous populations by the back-cross method wherein Afghan parental stocks were used as the recurrent parents. Semi-dwarf habit, wide adaptation and rust resistance would be the primary

bases for selection. Final testing of a large number of selections could be done in Afghanistan following the usual plan for evaluating new varieties.

3. Cultural Practices

The cultural practices in general use are the same ones used for centuries. The output is largely limited by the power generated by a pair of oxen and the work a man can do with his hands. Only limited mechanization has been introduced. There are said to be about 500 farm tractors of which about 350 are privately owned in the country. Something over 800 have been imported since 1960 although some of these are used for construction. Size of fields, size of farms, irrigation system, and wheat variety are all interrelated in a balanced agriculture—balanced at or near the subsistence level. In established areas, a shift to large tractors frequently would require alterations in size and shape of fields, land leveling and changes in water spreading. Erosion would be of greater significance also.

Potential for improvement lies mainly in better seeding practices, better weed control, more timely seeding and culture operations, and better conservation of moisture. Full scale mechanization is feasible on flat land of the northwestern provinces and parts of the larger projects. Small scale mechanical devices such as the 8-12 horsepower units could be used in many places. While these would provide more power and release some (but not much) land from producing ox feed, their main advantage would come from the performance of operations now impossible and to critical time-dependent operations. Alfalfa and clover could be more readily utilized in the rotation if a moldboard plow were available to cut the roots. Weed control would be done more effectively by moldboard plows and blade sweeps. Moisture might be conserved and more plant food liberated if more rapid plowing and firming the land were possible. However, there would be little reason to expect an effect on yields wherever the mechanical power merely took over the job being done at present.

A major obstacle to adoption of the new semi-dwarf varieties is control of seeding depth. The numerous failures with these varieties in 1967 are traceable to poor stands, for the most part. These varieties must be seeded 1-1/2 to 2-1/2 inches deep. Some kind of implement to do this is of equal priority to increasing of the seed of these varieties. The rabi drill (29 units) is being imported from Pakistan for experimentation and demonstration.

Too little attention has been given to weed control by chemical and mechanical means. Maximum yields cannot be obtained where wheat must compete with weeds for moisture, nutrients, and light. The Team saw the weed problem on four experiment farms and, if rye is included as a weed, the problem is widespread.

Recommendations: An effective, simple, easily copied and oxen-powered seeder is badly needed. Not only would this permit placement of the seed of the semi-dwarf varieties at the correct depth, but it would save seed no matter what the variety and provide a basis for banding phosphate with the seed to make more efficient use of this element.

Blade and rod weeders and other devices for weed control on plowed land in lieu of replowing should be investigated. The moisture conservation value of such tools might be significant.

Chemical control of perennial weeds should be promoted. The risk to sensitive crop plants must be demonstrated prior to the introduction of chemicals in commercial areas.

New irrigation projects should be planned and constructed with due consideration of mechanization of tillage and harvesting operations.

Combinations of good practices yield better results than single practices and package combinations are recommended for maximum impact. This is especially important because of high cost and scarcity of fertilizer. Credit preferentials to farmers adopting a "package" might be a device to augment other incentives.

See also section "Tools and Machinery"

4. Pest Control

Insects and diseases are estimated to cause 10 to 30% of damage in some years. Only minor damage (below 10%) was observed this year by the Team. However, severe damage may be done to susceptible wheats by stem rust, stripe rust, and leaf rust. The last named is a minor problem. Bunt may occur but losses seldom exceed 5%. The loose smut loss is generally below 1%. Cutworms or army worms do considerable damage. The Senn pest reduces quality of the grain and thereby cuts yield. Locusts (grasshoppers) are sporadic pests. Birds and rodents cause extensive but generally local loss.

Highly resistant wheat varieties are the best control measure for all diseases. Newly introduced varieties demonstrate resistance to the rusts. Since new races of rust arise periodically, varieties may not continue to manifest resistance and must be replaced with new resistant varieties. Likewise, varieties may be resistant to the smuts; organic mercurials and hexachlorobenzene used as seed treatments effectively control bunt. A new chemical seed dressing (Oxathiin) controls loose smut both in wheat and barley. Many insects can be controlled by chemicals. The costs and availability of equipment often make this approach uneconomic. However, large scale control of grasshoppers and certain other insects, using either aircraft or ground equipment, is feasible.

Recommendations: An active, continuous variety testing program is vital to continued availability of rust resisting wheat varieties. Therefore, a continuing variety development program is recommended.

Educational programs should contain information about diseases, weeds, insects, etc., and control measures should be demonstrated in areas of particular need. A chemical control program for bunt eradication should be associated with seed cleaning operations in the various centers where cleaners are available.

A program to assure that private dealers would stock needed pest control chemicals is recommended. Restraints should be minimized so that supplies would move readily, but assure that the use of chemicals would be done with due regard to safety.

5. Power, Tools and Machinery

Present Situation: Afghanistan currently depends largely upon animal power; bullocks for draft power, camels, donkeys and men for transport. Tractors are limited with an estimated 500 in use, of which 400 were imported in the past two years. Tools and implements are largely those used for the past several centuries. Efficient utilization of the 500 tractors is handicapped due to the lack of suitable attachments, spare parts, trained operators, logistic support, financing for farmers, an efficient distribution system and improved cultural practices.

Potential: Large scale and rapid promotion of full mechanization for all Afghanistan is not considered feasible at this time. While more rapid, efficient and timely operations could result and a considerable amount of land could be cropped which is now fallow due to lack of draft power, water and other inputs, Afghanistan has neither the financial, technical or administrative resources to make such an immediate change.

Further the possible social effects of surplus labor would have to be considered. However there are several potential areas where mechanization and modernization could provide major benefits. Medium to large tractors are already being used in areas where land holdings are of sufficient size (100 to 500 acres) to justify their purchase. Such holdings are found in Mazar-i-Sharif, Herat, Kunduz, etc. Custom operations or cooperative ownership should be encouraged where farmers cannot individually afford a tractor but still could benefit from more timely and efficient operations. For small operators the use of small size tractors (8 to 15 horsepower) could be studied. Other pieces of equipment that could have considerable application under Afghanistan conditions are plot threshers, seed cleaners, land leveling devices and seeding equipment for use by farmers with limited acreage. Modifications of the plot threshers and seed cleaners would be necessary in order to prevent cracking of grain as well as to produce the desired quality of chopped straw (for animal feeding and building construction). Improved land leveling and seeding equipment would permit better water utilization and seed germination.

A final benefit of mechanization that is often overlooked is the potential double cropping made possible by more timely operation. This coupled with shorter maturity wheat like Lerma Rojo would make possible the planting of a corn crop on many acres following wheat.

The potential for improvement with regard to tools and implements has not been fully exploited. However, in view of the complete dependence upon traditional implements, considerable improvement could be attained. For example, one is struck by the fact that the sickle is used to harvest wheat whereas in other countries the scythe and cradle was the intermediate step before mechanization. The Ministry is giving recognition to the potential with a project to test small agricultural tools and implements being funded in this year's budget.

Requirements and Constraints: Any large scale attempts to mechanize will encounter many administrative and technical problems unless a carefully planned and phased operation is carried out. Helpful would be a study of conditions and

problems in countries similar to Afghanistan where mechanization is more advanced. Manufacturers and dealers who desire to import tractors and implements should continue to meet a requirement of providing adequate spare parts. A system of sales, distribution and service should also be required with trained mechanics and operators in order that tractors needing repairs will be deadlined for a minimum period of time. Education of farmers in the use and benefits of tractors should be carried out through extension demonstrations in cooperation with private dealers and adequate financing under reasonable terms for both lender and borrower must be provided. Foreign manufacturers would be encouraged by a standard exchange rate applicable to all agricultural equipment regardless of origin.

With regard to animal-drawn implements, emphasis should be placed on improved design and modification. A study and possible adaptation of implements used in surrounding countries such as Pakistan, India, and Iran, where considerable work has been done in this field might be helpful. In particular, a critical need exists to modify or change the combination of land preparation practices and implements with regard to the introduction of the semi-dwarf wheats because depth of planting is critical with these wheats. Implements that might well be introduced would include blade and sweep rod weeders which would not only control weeds but would also act to conserve moisture. Drills that would band fertilizers should also be investigated.

The potential for use of small type tractors is not known. However, if experience in Japan, Taiwan, Iran and Southern Italy is any guide these tractors (with implements) will have a definite beneficial use particularly for small farms. However, one cannot assume that existing models will adequately meet Afghan conditions. Thus field testing is necessary to ascertain their suitability.

6. Recommendations

(1) Expand current efforts towards improving and inventing or introducing new animal-drawn implements that are more efficient and which would be available to farmers having low incomes. This would accelerate the transition to more modern efficient methods. Also test alternative cultural practices designed to improve production. This is especially crucial with the new Mexican wheats.

(2) Explore the possibilities of assembly and manufacture of small animal drawn implements such as plows, planters, cultivators, tillers, threshers, etc., by utilizing existing local facilities. This would promote small agricultural business enterprises plus help alleviate unemployment created by mechanization in agriculture.

(3) Encourage foreign manufacturers of small tractors and implements and threshers to test under Afghan conditions and then market suitable equipment.

- (4) For large tractors and implements,
 - a. Encourage manufacturers to organize training programs and require that importers set up spare parts depots and maintenance facilities.
 - b. Encourage private custom and cooperative operations.
 - c. Continue duty-free entry of agricultural equipment and standardize foreign exchange rates for such equipment.
 - d. Initiate rental-purchase methods of financing that permit farmers to acquire machinery with a minimum of financial resources.
 - e. Concentrate initial efforts in areas of larger land holdings where success seems more assured.

(5) Exchange technical information between the Ministry of Agriculture and Irrigation and Ministries of other countries who share similar conditions and problems.

B. IRRIGATION

1. The Setting

Afghanistan's continental climatic situation with high mountain ranges and river plains has led to the development of traditional irrigation on a level not surpassed in any other country. But there are limits to what can be accomplished without modern technology. Only 22 percent of the land area or 14 million hectares is arable and 5.5 million hectares have been placed under the ditch. Of this, however, only 2.9 million hectares are irrigated in any single year primarily because of the unreliable nature of the water supply at the farmers' turnout. About 1.2 million hectares produce wheat.

The limited surface waters of Afghanistan, mostly snow-fed, are highly variable and silt laden, especially at high flow; and the soils are low in organic matter, nitrogen and phosphorus. Nevertheless, the Afghan farmer does a good job of leveling and applying water to his field within the constraints of the tools and the water supply and distribution system available to him.

The origin of Afghanistan's canals are lost in history. Some are quite large, having capacities as high as 25 to 50 cubic meters per second. Nevertheless, the water supply to the farm may be quite haphazard. At high river flows the uncontrolled intakes admit so much water that the canal is often overtopped and washed away and the intake usually filled with debris to the point that, as the river recedes, the canal is left high and dry until the intake can be cleared, and perhaps relocated. The Team saw perhaps a thousand workers shoveling the coarse debris from the inlet of the upper right-bank of the Balkh River

canal commanding 30,000 hectares and inspected the remnants of earlier intake constructions. Canals also suffer washouts due to summer storms where wadi drainages cross their courses. Some of these were inspected by the Team and clearly downstream users suffer from these. As with canals all over the world, the upper users on the ditch have an advantage which they usually exercise and Afghanistan is no exception. Only organized management of turnouts and adequate flood bypass structures can cure this inequity. Estimates from various sources of land left fallow each year due to poor water supply are variable, but the extent is evident from a comparison of the amounts of total and annual irrigated acreage mentioned earlier.

Besides rehabilitation of old canals for improved efficiency, Afghanistan has the potential to bring additional land under irrigation both by extending existing canals, developing reservoirs for these, and by entire new projects. Canal rehabilitation projects are now under way on a small scale and several large projects are in various stages of construction and settlement: principally Helmand Valley; about 150,000 hectares of new land, some of which is marginal or submarginal; Nangarhar, commanding 25,000 hectares of new land and Sardeh Dam, which is expected to furnish water for 15,000 hectares.

The Water and Soil Survey Authority, under an arrangement with FAO has completed assessments in five river basins and worked out preliminary development schemes for three of these involving about 155,000 hectares of additional land in the Herat Valley, Upper Kabul and Farah Rud basins. Groundwater assessments are only beginning but there are indications of great potential for groundwater development.

2. Organization

The Minister of Agriculture and Irrigation is assisted by two deputies, one for Agriculture and one for Irrigation. Under the Deputy Minister for Irrigation are the Irrigation Construction Unit, the Irrigation Department and the Water and Soil Survey Authority. The Irrigation Department prepares plans for canal rehabilitation projects and the Water and Soil Survey Authority collects hydrographic data and makes soil survey studies. The Construction Unit is aided by FAO; the Irrigation Department by USAID and the Water and Soil Survey by USAID, Federal Republic of Germany, UN and USSR. Bi-lateral aid agreements on the larger projects such as Nangarhar are made separately at the ministerial level. The Helmand Valley Authority is an autonomous organization with its own president.

3. Resource and Development Potentials

Current Situation: The Water and Soil Survey Authority report mentioned earlier covered the major areas of southern Afghanistan and is summarized by Table 9.

Table 9.—Irrigable Land Resources, Southern Afghanistan

Basin	New Irrigable Land (Hectares)	Gross Area (Hectares)	Estimated Cost Based on Gross Area Afs./Ha	Adjusted Cost on New Land Afs./Ha*
Hari Rud....	76,000	130,900	61,950	128,000
Farah Rud...	38,400	59,200**	51,000	72,500
Shakar Dara..	29,000	63,000***	40,950	57,700
Kabul.....	16,000	43,500	71,775	158,000

*The adjusted cost to the new lands has been determined by the team by assuming the benefit of rehabilitation to old canals to old lands is 15 per cent of the value per hectare of the benefits to new lands. In general, the proposed projects provide storage so that late season water is available.

**Includes 7,600 hectares of Class IV lands in Farah Valley and Juwain requiring special reclamation, not included in new lands.

***12,600 hectares of total are excluded in computing the cost per acre.

The Third Five-Year Plan includes the following items:

Table 10.—Irrigation Projects in Third Five Year Plan

Name	River	New Area	Cost per Hectare	
Sardehi	Jilga	15,000 Ha	45,000 Afs	Completion
Parwan ¹	Panisher	9,000 ²	—	} Initiation of Construction
Hari Rud ¹	Hari Rud-Gaigan	4,500 ³	—	
Kokcha	Kakeh	9,400	70,000	Completion
Kunduz-Aliabad...	Khanabad	5,000 ⁴		

¹ Included in Table A.

² Plus 10,000 hectares presently irrigated.

³ Plus 28,500 hectares presently irrigated.

⁴ Plus 14,700 presently irrigated.

The Nangarhar project, now nearing completion, will irrigate 25,000 hectares of new land near Jalalabad. In the Helmand Valley, 101,500 hectares are served by the Kajakai Reservoir of which about 45,800 hectares are lands not previously

irrigated; plus 45,000 hectares previously irrigated by the Arghandab Reservoir. The plan is to develop this land over the next 11 years. In addition, there may be perhaps 40,000 hectares of new lands eventually available under the Arghandab and Chakhansur divisions.

There is less information about the potential for increased irrigation from surface supplies in the north. Storage has been considered on the Balkh River and the other major opportunities in the reasonably near future appear to be in the Kunduz and Panj River Basins. An additional 105,000 hectares is under detailed study in the Kunduz-Khanabad area, but only part of this, perhaps 30,000 hectares, will be new land. Preliminary investigations of potentialities on the Panj and Amu (Oxus) Rivers are being conducted jointly with U.S.S.R.

Rehabilitation of existing systems, without storage, has three benefits:

- (1) providing a dependable water supply for lands under irrigation,
- (2) providing water supply to fallow lands under the canal, and
- (3) extending the canal to cover new lands.

The distribution of the land receiving these benefits is not known.⁸ The Third plan proposes a total of 102,000 hectares under its small irrigation works program. Of this about 40,000 hectares might be new or fallow land. The total cost is estimated at Afs. 529 million and allocating this in the proportion indicated below would place the cost of new and fallow lands at about Afs 11,000 per hectare and Afs 1,700 per hectare for presently irrigated lands. Over the long run, the cost of new and fallow lands has been estimated by USAID officials at Afs 22,000 per hectare.

Near Future Development and Long-Range Potential: From all sources there would appear to be about 110,000 hectares of new land under one stage or another of development, during the next 5 years. But all will not be completed and settled in that time—perhaps about one half, or a rate of about 10,000 hectares per year.

In the long run the presently visible additional potential for irrigation from surface supplies appears to be of the order of 300,000 hectares from large projects plus some unknown figure from rehabilitation of traditional canal systems. The total from rehabilitation might be as large as 500,000 hectares, of which 200,000 hectares might be new land. These add to 500,000 hectares new land total.

⁸ Based on an analysis of 6 project estimates these run approximately: presently irrigated 60 percent; under ditch but fallow, 20 percent; new land, 20 percent. The benefit to crop production due to insurance against water supply interruption has been variously estimated at from 10 to 30 percent. Assuming 15 percent the value of the benefits from canal rehabilitation without storage would be about 40 percent each to new and fallow lands and 20 percent to lands presently irrigated. While this is a very small sample, the figures appear reasonable.

These estimates do not include the possibilities for irrigation from groundwater supplies, which are largely unknown. Groundwater can be developed fairly rapidly, the cost of development is relatively low (\$100 - \$200 per hectare), it can be tackled in relatively small pieces and private enterprise can easily assume a major responsibility for capital investment.

Assessment of needs for wheat, considering what can be expected from other inputs indicate that by the late 1970's Afghanistan likely will need to place new irrigated land under wheat at the order of 20,000 hectares per year to close the wheat gap, in addition to new land needed for other purposes. But the water supplies of Afghanistan definitely limit the amounts of land that can be irrigated; and these will approach exhaustion within the next two or three decades.

4. Physical and Management Problems

a. Hydrography

Available water supply is the most obvious physical restraint to irrigation development. A knowledge of its extent and nature is very important if it is to be utilized effectively. As pressure increases on the resource, the unit cost of developmental investment also increases so that information needs to be increasingly detailed. In addition to detailed knowledge, there needs to be a stable and equitable water rights administration based on traditional or statutory law.

Surface water surveys have been underway in Afghanistan, beginning in the Helmand Valley in 1946 and more generally since 1952. Currently these activities are centered in the Water and Soil Survey Department which receives technical assistance from the United States, the United Nations Special Fund and Federal Republic of Germany. Investigations have also been conducted by USSR and various international organizations mainly in connection with specific project developments. The present network includes 65 stations located primarily to serve specific projects plus a few canal and reservoir stations. An additional 85 stations are scheduled for completion in March 1968. These stations will provide a first-step primary network and serve other special purposes.

From the point of view of irrigation the important water quality factors are sediment and dissolved solids. Afghan rivers carry large loads of sediment, especially during flood. Recent preliminary investigations of Arghandab and Kajakai Reservoirs by U.S. Geological Survey personnel indicate that loss of capacity due to sedimentation has approximated 25 percent over the 15-year life of the Arghandab and that Kajakai is silting equally fast. The studies of water resources by the FAO Team also brought out the importance of silt as a major detriment to many reservoir storage projects. A reconnaissance survey has been made and a tentative sediment sampling program involving 34 stations has been proposed by the U.S. Geological Survey. There appears to be little information available on chemical water quality.

Groundwater development should be based on some reasonable appraisal of the supplies. Kharizes indicate the presence of shallow groundwater at many locations and there are a number of wells, shallow and deep, throughout Afghanistan. Twenty-four deep wells, mostly for water supply, have been drilled by government-owned rigs. Some comprehensive appraisals are under way by the United Nations in the area south and east of Ghazni, some drilling for public water supplies has been done by representatives of the Federal Republic of Germany in Paktia and there is more comprehensive drilling by USSR representatives in the north. The latter information has not yet been released. With the limited data, an assessment by the Team of general groundwater potential was not possible.

A major problem of the hydrographic effort is lack of trained manpower. Estimated needs for the network are 50 persons including 16 professionals and 30 technicians (sub-professional). Presently about 25 Afghan personnel are employed, only three with college degrees. The professionals will need to be trained by participant training outside of the country or by in-service programs. There are also problems of equipment servicing, transportation and administration.

b. Project Infrastructure and Settlement

The agricultural results from the large investment in the Helmand Valley have been particularly disappointing. Some of the problem will be delineated by the re-evaluation of land resources presently going on. Development appears to be prevented by lack of water distribution facilities to the farmer's fields, and roads. Especially where drainage may be difficult, land development often needs more attention than a settler can be expected to provide. In the Darweshan Division of HAVA the cost of providing these services is estimated at \$750 per hectare. Land development problems are apt to be more acute in the larger reservoir projects, but these also need consideration in smaller projects which provide new land. As much of this responsibility as is economical and expeditious should remain in the farmers' hands but this may take too long or be beyond his means.

c. Irrigation Practice and Water Delivery

An important factor in maximizing crop production under irrigation is the right amount of water properly applied at the right time. Irrigation distribution systems are somewhat inflexible, but frequently, by readjustment of schedules and some reconstruction, these can be improved. Over application of water leads to wastage and inefficient use and taxes drainage. Length of run, method of application and size of stream, as well as land preparation, are important factors in economical use of water. Little or no information is available on water use efficiency in Afghanistan. While irrigation practice on the farm appears to be better than in many countries at similar stages of agricultural development, there are important gains that could be made. Some assistance is rendered in irrigation practice in the Helmand Valley, but the

Ministry of Agriculture and Irrigation has not yet developed such a program. Eventually some organizational responsibility may need to be assigned in this area.

d. Groundwater Development

Groundwater development should be based on sound plans developed from adequate hydrological information. Although a favorable source may exist, groundwater pumping should not be permitted to outrun adequate planning. Generally, deep tube wells are more effective than shallow wells, since they utilize the available reservoir much more effectively. Shallow wells can be used where conditions for deep wells are not favorable, or temporarily. If shallow-well water rights are developed first in areas favorable for deep wells, there may be resistance later to developing the deep ones. Groundwater provides an excellent opportunity for the investment of private capital and effort in its development.

e. New Irrigated Land vs. Other Inputs

Justification for the development of irrigated land depends on whether the returns exceed the costs. However, if investment resources are scarce, irrigation investment needs to be weighed against other needs which may have equal or higher economic returns. Economic returns are not the only consideration, of course. Other factors such as needed food production, regional development, resettlement, political and social aspirations etc., have to be considered.

Strictly speaking, if the single objective is increased wheat production and capital is limited, the returns from irrigation development must compete at the margin with returns from other alternative inputs on presently irrigated land. If there is much more such irrigated land available than there are such inputs as fertilizer, seed, etc., rehabilitation of irrigation systems would be justified if the annual cost of stabilizing the water supply is less than the cost of making up the damage losses from unreliable water supply by the least expensive alternative means—probably the cost of extending the new inputs to a larger area of irrigated land. Development of new land is justified if the needed production can not be met by other means, or if this is the least expensive alternative to the Government. While a strong program of fertilizer, improved seed and cultural practices could possibly close the wheat gap in Afghanistan in the next few years, in the long run,—after a decade or so—these practices alone cannot be expected to keep up, and an increasing amount of new land will be needed each year not only for wheat, but for other crops.

Irrigation development requires a long lead time both in terms of planning and organizational competence. The present level of effort by the Afghan Government in this area appears necessary for the next few years if future needs are to be met; however, some shift of priority to the small irrigation program is highly desirable.

f. Manpower

Probably the most serious constraint facing irrigation development in the Ministry of Agriculture and Irrigation is manpower. The Ministry's plans for developing the manpower necessary by 1972 is contingent on its ability to hold present personnel and to employ additional qualified people. Whether or not the manpower goals set are adequate to reach the targets for new land requirements is open to question. Manpower development occurs slowly. The Department of Irrigation presently has difficulty in preparing the necessary surveys and designs developed with sufficient rapidity, but this will be improved by the arrival of the USAID/Bureau of Reclamation Team. The training function of technical experts should not become submerged by the pressure to prepare plans and designs, however.

g. Organization

The effectiveness of any program hinges on an adequate organization. The team feels that the Government should move toward bringing the present Irrigation Construction Unit and the Irrigation Department under a single Irrigation Department with a President or a Chief Engineer with Divisions of Planning, Surveys, Design and Construction. The Water and Soils Survey Authority could remain separate reporting to the Deputy Ministry for Irrigation.

The Ministry has drawn on foreign aid assistance from several sources, and there is a problem of coordinating these efforts at the operating level. This is a serious problem, but not so great that the program is stymied. In any case, the revised organization should be able to deal with it more effectively.

h. Assistance from Private Sector

Both engineering and construction services are available from private sources and Afghanistan has utilized these from time to time. It may well find this worthwhile in the future, including construction of smaller works. Effective use of outside engineering and construction services requires adequate professional supervisory capability within the Government, especially in engineering design. Equipment problems may be particularly frustrating on construction projects where inefficient equipment, or failure or lack of strategic items can greatly increase cost, problems frequently faced by Government construction organizations.

i. Coordination of Water Activities

Water is essential in so many of man's activities that invariably most government agencies in all countries at all levels become involved in some aspect or another of its management. Afghanistan is no exception. At least seven ministries and 10 autonomous agencies (such as Helmand Arghandab Valley

Authority) have important responsibilities in water development planning. Obviously these activities need some central coordination. Resource and economic data should be available to all and programs of data collection should not be duplicated. Conflicts between agencies as well as conflicts between users are bound to arise and these later will grow more acute as new developments impinge on the traditional uses of water.⁹ This implies the need for a national policy and for a legal code; and for the administrative and judicial system to implement them.

Under the present constitution, the Minister of Agriculture and Irrigation is responsible for water development particularly for irrigation, but other agencies also develop water for this and for other purposes. Afghanistan has become conscious of the coordination problem and is taking steps to cope with it. Consultants have been employed and there is under consideration a proposal to the United Nations to set up an integrated and coordinated Water Management Department and to develop water legislation. The Third Five-Year Plan allocates appropriate resources to this effort and provides for a Central National Water Committee. Not entirely clear at this time is how the new Agency will then relate to the existing Ministries and to the Departments in the Ministry of Agriculture and Irrigation.

The Team agrees that a ministerial committee to settle problems of coordination where multiple interests are involved is necessary. Further, availability of hydrographic data to all concerned could be assured by its timely publication and dissemination. Ministers or Presidents of Departments should be able to coordinate foreign aid activities within their areas under the overall coordination of the Ministry of Planning. National Water Policy should delineate the general responsibilities of various departments and governmental units and some basic water rights code should be developed.

On the other hand, the Team feels that Afghanistan should proceed cautiously. The establishment of mechanisms for coordination and for administration of water rights should not outrun the real need at any particular time. There is some danger of establishing bottlenecks if this happens. Project development generally has proceeded with the support and approval of those users concerned. Full registration and proof of water rights could take a long time and considerable resources. Detailed aspects of water law and policy should develop in response to indigenous needs rather than be transposed from advanced systems developed under different economic and cultural conditions. Project development, if a user consensus can be obtained, should not be held up unduly by water rights, legislation or adjudication. On the other hand, since groundwater resources are relatively undeveloped, registration and proof of new underground water use rights deserve timely attention.

The Team is concerned with the expressed idea of "controlling" water resource development by central authority. Rather than control, an environment

⁹ Multilateral and bi-lateral international aid arrangements in the same areas of activity aggravate the difficulty.

should be created whereby the Government and the people have the incentive to develop their resources in an expeditious fashion with reasonable amount of order.

By far the major consumer of water in Afghanistan is, and will continue to be, irrigation. Experience has shown that water developed for irrigation will move to industry and domestic use as these economies develop because of its greater value in these sectors. One important objective, nevertheless is that hydroelectric development and flood control be integrated with irrigation development.

j. Financing

Irrigation development requires relatively large amounts of capital investment usually for long periods of time and progress of new irrigation will be limited by available financing. The need for new land must be weighed by the Government against the need of other governmental activities for limited financial resources. There are two areas especially favorable for private financing to assist the government in its irrigation development program: rehabilitation of old canals and other small projects, and groundwater development. The Team noted with satisfaction that some of the small projects are being paid for partly or wholly by private financing and that sale of new lands brought under the canals could reimburse the Government for much of its investment. Availability of credit to benefitted water users would increase the amount of private financing available.

5. Recommendations

(1) Development of new irrigated land should continue at least at the present level for the near future; however, greater emphasis should be given to the development of small irrigation systems and rehabilitation of old systems.

(2) Continued emphasis should be given to training and manpower development; this emphasis may need to be increased if present goals are to be met.

(3) The irrigation development, design and construction efforts in the Ministry of Agriculture and Irrigation should be consolidated into a single Department of Irrigation with a President and a Chief Engineer.

(4) Coordination of water resource development activities should be accomplished at the ministerial level in association with the Ministry of Planning. A water policy should be developed to clarify the responsibilities of the various agencies.

(5) Some attention should be given to developing a simple basic water rights code; administrative and judicial procedures should evolve consistently with water resource development needs specific to Afghanistan. Consideration should be given to early registration of groundwater rights from new wells.

(6) Direct user financing of small irrigation development and rehabilitation projects should be encouraged; opportunities should be provided for private development of groundwater for irrigation.

(7) Inventory and evaluation of groundwater resources in the most promising areas should be accomplished as rapidly as possible. Groundwater development should not be permitted to outrun adequate planning based on field investigations.

(8) Systematic land and water resource surveys in the northern provinces should be completed and the results published as expeditiously as practical.

(9) Adequate silt transport data necessary to predict accurately the life of reservoirs should be collected. The implications of recently-noticed accelerated reservoir siltation should be carefully studied and silt effects should be given increased consideration in future reservoir planning.

(10) Consideration should be given to improving irrigation practice factors in the operation of rehabilitated irrigation systems. The Ministry of Agriculture and Irrigation should consider including an irrigation practice specialist on the staff of the Irrigation Department.

(11) An attempt should be made to evaluate the agricultural benefits of canal rehabilitation on existing irrigated lands by making a study of water use and production prior to and following rehabilitation.

ECONOMIC ENVIRONMENT

Chapter IV

ECONOMIC ENVIRONMENT

A. INTRODUCTION

Because of the limitation imposed on Afghan agriculture by its natural resources, any substantial increase in production must come from the use of more modern methods. This requires intensifying agriculture and the use of modern commercial inputs. The effort to increase output will require greater use of capital by government for irrigation projects and by the individual farmer for fertilizers, improved seeds, etc.

The growth of the whole economy will depend on the farmer's ability to purchase and properly use new and costly factors of production. To acquire these required inputs, the farmer will need to sell his surplus production at prices which permit him to purchase the necessary inputs. In countries where agriculture has been traditionally subsistence, farmers require substantial incentives before they will risk change. The President's Science Advisory Committee in their report The World Food Problem states:

“To persuade farmers to accept the techniques and methods of modern agriculture is a formidable and complex undertaking. Farmers in traditional subsistence economies are understandably wary of assuming new risks because they are so close to the margin of survival. If a farmer is to invest in the modern inputs of improved seeds, fertilizers, and pesticides that are essential to increasing the output of his land, these resources must be easily available to him . . . and, above all, he must be shown that the potential payoff is worth the risk.”¹⁰

“To induce farmers to change, the potential payoff must be high—not 5 to 10 percent, but 50 to 100 percent.”¹¹

“Both producers and consumers are responsive to prices if governments will recognize and use the market mechanism. The

¹⁰ The World Food Problem, a Report of the President's Science Advisory Committee, Vol. I The White House: May, 1967, Page 15.

¹¹ Ibid, Page 16.

Mexican government has recognized this fact in pricing policies and this is a major reason for the growing promise of the Mexican agricultural development program."¹²

On production incentives for farmers, the Committee states:

"In discussing food production in developing countries, no single factor is more important than the provision of adequate incentives for farmers to increase productivity. Agricultural development, in the last analysis, depends on the production decisions and actions of farm operators."¹³

Three groups of factors affect economic incentives. First are the cultural influences, traditions, social organizations and land tenure arrangements. These cultural influences affect the farmer's freedom of action. Second are the private and public programs including the availability of markets for farm products, local outlets for farm supplies and equipment, transportation, credit, and irrigation structures. These determine the opportunity for farmers to improve their productivity. The third set of factors are programs to increase production incentives, primarily price policies and extension education.

The Report states regarding pricing policy: "the unfortunate tendency in most low-technology countries is to base pricing more on a desire for low food costs in cities than on the production incentive needs of farmers."

In viewing Afghanistan's agriculture one can see the relevance of all these statements. Afghanistan is in the process of emerging from a subsistence agriculture. Many of its traditions and social organizations are the products of having been at the subsistence level of production for centuries. Its facilities for marketing farm products and farm supplies are just developing. Credit is inadequate. Better and more adequate transportation and irrigation facilities are sorely needed. A good beginning has been made, but much remains to be accomplished. New efforts are needed in the field of extension education. This vital means of providing the farmer with the knowledge he needs to realize new opportunities has not been used adequately. The incentive of price appears to have been used least of all.

In the case of cotton, prices to farmers have been held below free market levels and production has been materially reduced below its potential. To complicate matters, Extension Service personnel have been used to police producers' compliance under the cotton program. The Government has thus materially impaired the usefulness of one of their scarcest resources—knowledgeable agriculturalists. The Government's future efforts to increase productivity in cotton producing areas could have been significantly blunted as a result of this policy.

¹² Ibid, Page 16.

¹³ Ibid, Page 77.

The economic climate for farmers must be improved if Afghanistan is to increase agricultural production and attain the goal of its Third Five-Year Plan. New institutions and social organizations must be developed to provide the farmer with greater freedom of action. Greater opportunity must be provided the farmer to increase his output. This requires that he have cash markets for his products, better marketing facilities, modern inputs, transportation, credit and reliable irrigation structures.

He must be provided with the knowledge which will enable him to use new resources and opportunities. Finally, prices must be favorable to encourage him to take advantage of the opportunity to increase his own welfare and thus the welfare of the society.

Today, in Afghanistan, much effort is being devoted to creating an economic climate that will stimulate economic development in agriculture. A lot has been accomplished toward this end; however, much remains to be accomplished.

The following sections on price policy, marketing, credit, land tenure and taxation discuss changes which are needed to further improve the economic climate for development.

B. PRICE POLICY AND INCENTIVES

Prices received by farmers in most developed countries determine what quantities of each crop farmers will produce. The farmer's alternatives are constrained considerably by various physical and economic factors. But, within these constraints, prices play a major allocation role. In lesser developed countries, other factors such as those mentioned earlier may place additional constraints on price as an allocator of resources. However, to say that the price mechanism may be less significant as an allocator of resources in less-developed countries does not mean that it is not important at all. The fact that Afghanistan was required to undertake pricing procedures in an attempt to maintain cotton production under unfavorable prices is strong evidence that prices play a significant role in allocating land to various crop alternatives in Afghanistan. The Government cotton program was more successful when farm cotton prices were increased by 25 percent.

The Government has undertaken a program to increase wheat production with the aim of achieving self-sufficiency in wheat within the next seven years. The achievement of this goal has justifiably been given a high priority.

The Afghan Government hopes to achieve this objective through a three pronged effort:

- (1) expand use of seeds of high yielding improved wheat varieties (204,000 tons) to be cultivated with 312,000 tons of commercial fertilizer by the last year of the Third Five-Year Plan;

(2) increase land area devoted to wheat by 51,000 hectares of new irrigated cropland; and

(3) expand extension education of farmers to facilitate adoption of better cultivative practices and farming equipment in conjunction with proper use of fertilizer and improved seed.

The Plan contains most of the incentive elements thought to be important to stimulate increased production. However, one major element has not been adequately provided for in the current plans. That element is a minimum price assurance to producers.

1. Wheat Price Policy

If farmers are expected to utilize improved seeds, commercial fertilizer, improved cultivative practices and machinery to obtain higher yields, they must be assured that they will be rewarded by increased output and income. As was indicated above in Chapter III (Section A. "Technology of Wheat Production"), substantial yield increases can be obtained on irrigated land in Afghanistan by use of fertilizer and improved seeds. Yield increases in the magnitude of 50 percent and more are technically feasible on irrigated land with existing knowledge. The potential for increased wheat yields is somewhat less on dry land.

The problem, then, is to convince the farmer not only that substantial yield increases are possible technically (which the Team believes to be the case), but that they are economically sound. The farmer must be assured that the value of additional wheat obtained per hectare will exceed the additional cost of the fertilizer, improved seeds, and cultural practices. Ignoring for purposes of this discussion the costs of new inputs such as fertilizer and improved seeds (which can be influenced by government programs such as currently in the case of the fertilizer subsidy), the profitability of innovation hinges on the price of the final product—wheat. The general principle is: the higher the price of wheat per seer, the greater the return or incentive to increase yield and vice versa.

The Team found no reliable information on the price of wheat actually received by farmers in Afghanistan. The only price information available was for wheat (and flour) sold at the bazaar. While it is generally thought that farm prices vary in direct relation to bazaar prices, this could not be demonstrated by statistics. Bazaar prices for wheat and flour may serve to indicate trends in wheat prices received by farmers, but the level of farm prices is substantially unknown.

In recent years the bazaar price of wheat has been increasing, lending support to the proposition that demand for wheat has been increasing relative

Table 11.—Annual Average Consumer Wheat Prices—12 Cities—1961 to 1966

Area	1340 1961	1341 1962	1342 1963	1343 1964	1344 1965	1345 1966 ^{1/}
	(afs. per seer)					
Kabul	23.0	19.9	27.2	38.4	41.9	41.7
Kandahar	23.9	23.7	33.9	36.6	42.8	42.0
Herat.....	13.5	18.0	46.6	36.2	34.2	34.0
Mazar	12.7	13.4	21.6	29.2	35.3	40.7
Baghlan	12.4	11.2	22.9	33.2	36.6	39.3
Ghazni	16.4	16.9	28.2	37.1	40.5	38.0
Gardiz.....	19.4	22.2	30.9	36.2	44.7	43.0
Girishk.....	18.8	22.8	39.6	37.2	36.0	37.7
Farah	18.1	29.2	35.1	30.5	32.0	33.0
Maimana	9.5	9.0	18.2	24.2	33.9	44.7
Faizabad	12.1	10.3	13.8	17.0	28.5	48.0
Parwan.....	19.9	20.5	30.1	37.7	41.6	43.7
AVERAGE	18.4	18.5	29.2	34.1	40.8	40.6

^{1/} First 3 months of the year.

Source: Da Afghanistan Bank.

to supply. Between 1961 and 1966, the season average price for wheat at bazaars in Afghanistan has more than doubled (Table 11). During this period, the Afghan economy has also undergone a substantial inflation which has effectively reduced the real increase in prices of wheat. However, the price index of cereals has risen relative to other commodities indicating that the real value of cereals has risen in recent years (Table 12). As was indicated previously (Table 8), particularly sharp increases in wheat prices (flour) occurred during winter and spring of 1966/67.

One factor leading to low farm prices for wheat is that farm sales of wheat are concentrated heavily in the period soon after the threshing season. The result is that wheat farmers typically receive the lowest price available during

Table 12.—National Price Index Series

Commodity Group	1961	1962	1963	1964	1965
All-item Index	100	98.1	132.2	156.1	170.5
Cereals	100	95.7	143.5	173.4	186.5
Meats	100	97.9	110.4	145.0	174.9
Fruits and nuts	100	100.5	138.3	147.0	168.0
Vegetables	100	103.6	127.9	138.7	144.6
Other Foods	100	107.4	106.9	129.9	141.0
Non-Foods	100	101.6	98.6	99.1	100.4

Source: Robert R. Nathan Associates, Kabul, Afghanistan.

the year. It is this price—not the yearly average—that determines the return received by many producers.¹⁴

This low price situation at harvest time is aggravated by the need for many farmers to repay creditors, which often charge high fees for credit extended (30 or 40 percent per year).¹⁵ No doubt some farmers are in poor bargaining positions vis-a-vis creditors—particularly since there is no market news service to inform them of the value of wheat at various markets.

Price differences among the various areas of Afghanistan have narrowed considerably during the last two years (Table 11). This is a reflection of improved transportation and communication. However, the substantially lower prices in some areas, particularly prior to 1965, suggest that prices in outlying wheat areas are quite low—even at the bazaar level where sales may be by traders or money lenders rather than farmers themselves. Again, the bazaar price may not be a good basis for judging the level of prices received by farmers.

In the last two to three years, P.L. 480 wheat imports have equalled 5 percent of total supply. This wheat has been distributed in the urban areas—such as Kabul—to government employees and bakers. It has been sold at reduced prices.

These sales have had the effect of holding consumer prices of flour and nan down, and have been a source of revenue for the Government. The import and sale of wheat also has had the effect of reducing the price available to

¹⁴ Bazaar prices of wheat and flour are known to vary greatly during the year, typically with prices lowest after harvest (based on monthly price data for recent years and opinions of persons familiar with price trends in Afghanistan).

¹⁵ This is considered in more detail in Section "D" of this chapter.

wheat farmers. Given that the price elasticity of demand for wheat in Afghanistan is low (at least as low as -0.2), imports of wheat could have kept wheat prices as much as 20 to 25 percent below the levels that would have existed in the absence of imports.¹⁶ Wheat imports under P.L. 480 probably have reduced the producer's prices to some extent and, therefore, their incentive to increase output.

The Government is currently undertaking a purchase program for wheat which is designed to

- (1) support or stabilize the price of wheat to producers at threshing time, and
- (2) acquire wheat for use in the Government's food distribution programs.

Under this program, the purchase price is to be determined by a five-man committee in each province. A one billion Afghani line of credit is to be established for the operation of this program.

According to official statistics, the Government purchased 4,653 tons in 1964-65 and 5,075 tons in 1965-66. If future wheat purchases are of these small magnitudes they will not significantly affect producer prices. Further, purchases of wheat at market prices leave producers without an assured minimum price.

To assure that the price of wheat provides a favorable incentive for the use of improved seed, commercial fertilizer, and improved cultivative practices, the Team strongly urges that the Government provide the farmer a minimum price for his wheat. This could be accomplished by a more vigorous price program in which the Government announces that it will buy any producer's wheat at a specified price.

The effectiveness of a Government program which creates a minimum price floor for wheat in inducing increased wheat production depends principally on the following:

- (1) the level and timing of the price offer;
- (2) the extent of government purchases; and
- (3) the responsiveness of producers to increased returns.

Regarding the first of these, the price must be set at a level which will assure the producer of a profitable return at current production levels. However, setting the price too high will result in a substantial shift in acreage from other crops to wheat. While some shift may be desirable, a very substantial shift probably should be avoided.

¹⁶ Assuming a price elasticity of demand equal to -0.2 , a 5.0 percent increase in supplies would lower the price by 25 percent, other things being equal.

The delivered price of wheat imports into Afghanistan might serve as a guide for price support level as long as the country is a deficit producer. As production increases toward the production goal, the support level may need to be modified.

The basic minimum price could be on a delivered basis at Kabul (the principal market for wheat) or some other city, with prices in outlying provinces being adjusted in line with transportation costs. Similar adjustments in transportation costs could be made for deliveries at collection stations within provinces.

The Government's announcement of a minimum price should be made prior to planting of the crop, in order that producers be given maximum opportunity to respond.

Government purchase of wheat at the announced price should not be limited in amount. In order for the minimum price floor to be maintained, the Government must be willing to take all wheat that is delivered at the announced price. Otherwise, the price will drop below the desired minimum.

The remaining consideration as to the effectiveness of such a price program is that of the responsiveness of producers to higher prices. The question may be asked: In view of the fact that annual production of wheat in Afghanistan has been essentially static during the last decade and that prices have increased greatly, why would such a program be likely to induce increased production in the future?

A price support program which assures producers an adequate return with traditional production methods will, with the use of improved seeds, chemical fertilizer, and improved cultural practices, assure the producer of 50 to 100 percent increases in returns - the magnitude of incentive considered necessary to induce farmers to change from their traditional methods to newer more productive methods of production.

Inasmuch as increased potential now exists for additional wheat production in Afghanistan, a price program should be helpful in attaining the goal of self-sufficiency in wheat. The short wheat crop of 1966/67 induced record high wheat prices which in turn appear to have resulted in incentives to produce more wheat. The 1967/68 crop, according to preliminary estimates, will be a record crop. An effective price program will not only increase production incentives through a higher level of prices, but it would stabilize prices during the year. If the program were complemented with credit and market information, there are prospects for an improved farmer bargaining position leading to even greater production incentives. The problem is to ensure an attractive price at the farm level, regardless of time of sale during the year.

A schedule of price support levels can be developed relating the support price for the following year to the deficit which existed in the crop year just ended. This will permit prices to be adjusted as the urgent need diminishes. For example, when the country has a deficit of 300,000 tons or more, the support would be at the maximum. The support price would fall to the minimum whenever the country had no deficit or was a net exporter. The following is an example schedule, for illustration only.

Illustrative Schedule Relating Price Support Level to Wheat Deficit

<u>Deficit (Thousand Tons)</u>	<u>Support Level (Afs. per seer)</u>
0-49	30
50-99	35
100-199	40
200-299	45
300 and more	50

Such an adjustment in the support level would reflect the country's need for wheat and would facilitate adjustments in the support level as the country moves toward self-sufficiency.

To the extent that Afghanistan remains in a wheat deficit position and does not provide a significant quantity of wheat to consumers at subsidized prices, such a price support program should not result in any significant governmental expenditures. Farm prices should remain above the support level, thereby, minimizing the quantities which would be offered to the Government at the support price. It needs to be fully recognized that the current policy of subsidizing consumers through providing foreign wheat at reduced prices is in conflict with the high priority objective of increasing domestic wheat production.

Two primary principles must be followed if such a support is to provide meaningful incentives. First, the price level must be one that will permit the producer to receive a profitable return at average production levels. The incentives of increased incomes will stimulate subsistence farmers to become commercial farmers producing a surplus for market sale. Second, the Government must be willing and capable of receiving farmers' wheat at the support price. If either of these principles is violated, the program will not provide sufficient incentives to encourage the desired increase in wheat production.

2. Recommendations

(1) Adopt price policies to provide production incentives to producers. This will require protecting the farmer from the price depressive effects of present policies subsidizing consumers in the cities. It will also require that the Government adjust programs that impose indirect export taxes on agricultural commodities.

(2) Adopt a price support program to assure wheat farmers a profitable return and provide incentive to increase wheat production through the use of improved seed, chemical fertilizers and improved cultivative practices.

(3) Inform the farmer of the support price applicable to next year's crop well before the crop is planted.

(4) Relate the support price to the magnitude of the wheat deficit and impacts on production of crops competitive with wheat on irrigated land.

(5) Obtain wheat price data at the farm level, as well as for wheat and flour at bazaars.

C. MARKETING

Marketing is basically the process of moving goods from the point of production to the point of consumption or use. In a completely subsistence economy, marketing approaches the point of non-existence. Afghan agriculture is often characterized as largely a subsistence agriculture, therefore one may be led to believe that marketing in Afghanistan presents few if any significant problems. This conclusion would be quite a valid one if Afghan agriculture were content to remain at its present state of development. However, the evidence of expressed aspirations, plans, programs, and activity indicate that Afghanistan expects to achieve a higher level of development in the near future.

The Third Five-Year Plan contains various proposals to improve the productivity of agriculture through the introduction of new inputs such as improved seed, chemical fertilizer, more effective and efficient farming equipment, and other elements of modern technology. Most of these modern inputs are produced off the farm; thus, some means (or system) will be required to move these products from their point of production to the farm. A marketing system must exist or be created to facilitate this movement if these inputs are to contribute to improving agricultural production.

As the productivity of agriculture is improved, more and more farmers will be producing beyond their own needs. It will become increasingly important that an efficient marketing system be developed to provide for the movement of these items from the farm to the consumer.

The marketing system in Afghanistan is one which has evolved to serve the current needs and demands of agriculture. Too little is known of its nature to permit a detailed analysis of its attributes and shortcomings; however, recent studies and general knowledge do permit some observations.

1. Current Situation

A recent observer of Afghan marketing stated that agriculture is largely characterized as a subsistence type where farmers earn little more than enough to feed their families. Little reliance is placed on factors of production other than those provided by their own labors. There is, however, an emerging group of commercial farmers who specialize in the production of one or more commodities for sale in local markets. These farmers have begun to realize the need for commercial inputs and favorable markets for their produce. To date, an adequate marketing system does not exist to satisfy the needs of the commercial farmer for either the inputs he needs to purchase or the produce he hopes to sell.

Some progress is being made to provide the physical facilities required for a better marketing system. Most of this progress has been in the area of improving the infrastructure facilities. Much has been done to build a primary road system and central grain storage. While these are necessary, they aren't

sufficient for an efficient marketing system. In addition to the roads and central storage facilities, the system needs:

- (1) better grades and standards for produce;
- (2) improved market price information;
- (3) adequate storage on farm and at nearby market centers,
- (4) farm to market roads, and
- (5) improved modes of transportation (i.e., motor vehicles in lieu of camels and donkeys).

Some of these elements, by necessity, must be provided by the Government. However, many other elements can be provided by private individuals.

Recently, interest has developed regarding adequacy of the existing marketing system to facilitate the movement of commercial inputs. An adequate system does exist for the traditional commercial inputs, plow points, buckets, chains, picks, shovels, etc. A recent study by Dr. Norman Whittlesey found that while the marketing system for these items was, by western standards, not well structured, it nonetheless was operating efficiently in providing the traditional commercial inputs.

On the basis of Dr. Whittlesey's findings, given time, information, and encouragement the merchants of Afghanistan can develop an effective and efficient marketing system for modern agricultural inputs.

The Government has done little to encourage merchants to develop a capability for handling the new inputs. The only alternative to a private marketing system would be for the Government to develop and manage the distribution of these inputs. Insofar as the incomes of the managers of a government system (government officials) will be determined independent of the efficiency of the system a private marketing system would, in the long run, be more effective than a government system.

Afghan merchants are largely unaware of the contents of commercial fertilizer and the recommendations that need to accompany its sale. There is a fear that in the near future, while supplies of fertilizers are inadequate to satisfy demand, merchants will try to exploit the farmers. Also, as long as the Government is offering fertilizer to farmers at a subsidized rate, there will be no opportunity for merchants to develop the capability of marketing fertilizers. In spite of these concerns, efforts should be made to develop a private marketing system for these inputs. The development of a private system should parallel the development of their use on the farm. The Team found no evidence to substantiate the concern that a private marketing system would be disadvantageous to the development of Afghan agriculture. We feel it would contribute significantly to agricultural development.

2. Requirements and Constraints

Two major constraints at present seem to stand in the way of developing an efficient marketing system. First, merchants lack knowledge of the needs of the farmer for these inputs, as well as those facilities required to handle them. Second, and equally important, is the attitude of officials that the development of a private system would be detrimental to both the farmer and welfare of the society.

Given a continuation of the officials' attitudes, it will be next to impossible to undertake the task of developing a viable and effective private marketing system for new inputs in Afghanistan. The result will be that if these inputs are in fact brought into use, the Government will have no recourse but to provide the marketing services itself. To accomplish this, the Government will have to employ its scarce resources for the purpose of financing the development of a distribution system. The net result may well be that other important development programs will have to be curtailed.

The marketing system required to handle commercial outputs presents a different set of requirements. It is in need of additional services which can only be provided by the Government. Following are some areas in which continued effort by the Government will be needed.

(1) Improved market information at all levels of marketing.

(2) A system of grades and standards which is consistent with those used in the international markets. The lack of adequate grades and standards for exported commodities will continue to rob the Afghan producer of much needed income and the country of precious foreign exchange. Development of adequate grades and standards will permit the pricing system to provide incentives for producer, handler, and processor to exercise greater care in the management of producing and marketing agricultural products.

(3) Farm to market roads will be needed in the regions where commercial agriculture will appear. It is possible that much of the labor required for the construction of these roads could be obtained from unemployed workers and under-employed farm labor. Once the product has been produced, particularly in the case of perishables, it must reach the consumer as soon as possible to insure that it retains its maximum value to both producer and consumer.

(4) Adequate credit must be available to facilitate trading and development of the necessary marketing facilities (e.g. building adequate grain storage facilities at the farm, initial collection points, and terminal points).

(5) Farmer cooperatives can serve as a useful vehicle whereby farmers can obtain some additional marketing power both in the merchandizing of their products and in the acquisition of new commercial inputs.

Development of an improved marketing system for Afghanistan's agriculture should be well coordinated with the increases in productivity. The hope is that the marketing system will be in a position to facilitate the needs of the commercial agriculture sector as those needs become apparent.

3. Recommendations

(1) The Government should promote the development of a private marketing system to handle new commercial inputs such as fertilizer, insecticides, mechanical farm equipment, etc.

(2) The Government should develop a system of grades and standards particularly for those commodities produced for the export market.

(3) A market information system should be developed so that producers become aware of and know the value of the products they produce.

(4) The creation of farmer cooperatives should be promoted.

(5) A program for building farm-to-market roads should be instituted. This effort should make extensive use of surplus farm labor.

D. CREDIT

The availability of production credit is a necessity if farmers are expected to respond to the opportunity to employ commercial inputs. This need is probably substantial in an economy which is moving from a subsistence to a commercial basis. Having credit available is one of the preconditions necessary to obtain the full impact from the availability of commercial inputs. The expansion of agriculture in Afghanistan depends primarily on the adoption of new technology. Most of the new technological inputs—improved seeds, fertilizer, irrigation improvements, machinery, etc.—cost money.

The current credit requirements for Afghan agriculture are unknown. No comprehensive study is available which indicates the magnitude of the credit needs of the Afghan farmer. Some general studies have been made in specific areas of the country that contain information regarding the farmers' needs for credit. How representative the credit problems found in these areas are of the whole of Afghanistan is not known.

A study conducted at the University of Kabul found that an average of 45 percent of the farm families in the province of Nangarhar borrowed an average of Afs. 6,204. The average rate of interest paid on these loans was about 33 percent (See table 13).

**Table 13.—Percent of Families Borrowing Money,
Average Amount Borrowed and Interest Rate
Nengerhar Province, 1963**

Villages	Percent Families Who Borrowed Money	Ave. Amount of Money Borrowed Per Family (Afs.)	Percent Interest
Mazar Dara..	48	12,600	30
Villages Near Jalalabad..	23	1,625	30
Lalpoora....	75	4,430	26
Shewa.....	32	6,160	45
Total.....	178	24,815	131
Average....	45	6,204	33

Source: Report on Economic Survey of Agriculture in Nengerhar Province, M. O. Senzai and Dr. R. K. Harlan. *Agri-Facts*, printed by the Faculty of Agriculture, Kabul University. December 1965.

“Most of the farmers borrowed money from village people, but some of them borrowed from Kochi and Momand people. (Momand is the name of a tribe).

There are three kinds of interest payments:

(1) Giving land (gerawi), one jerib¹⁷ of farming land instead of Afs. 5,000 to 10,000; most of the farmers pay this kind of interest.

(2) Some of the families pay a share of their corn and wheat crops. Converted into money, it would average 33% interest per year.

(3) There are very few who borrow money and pay interest in the form of money. These interest rates range from 20 to 40 percent. Those who borrowed money from Momand people, usually paid money interest.”¹⁸

A study of agricultural production in the Helmand Valley by Ira M. Stevens and K. Torza, found

“An adequate credit system is one of the greatest needs of farmers in the Helmand Valley today. Two types of credit are needed. One is the credit needed for present purposes—wheat for food and other consumption items, as well as seed and simple farm implements, etc. This is needed widely by most

¹⁷ 1 jerib = .477 acres and .194 hectares.

¹⁸ Ibid, p. 13.

farmers throughout the Valley. The other type is credit that will be needed to inaugurate improved farming practices—chiefly for fertilizers, improved seed varieties, and purchase of better farming equipment. Neither of these credit programs can be adequately solved without a complete revamping or reform of the present credit system. Credit from established banks today does not reach most of the people who so badly need it. When these people obtain credit, it is from the only source available to them—well-to-do landowners or merchants. Interest rates on loans from these sources are exorbitant.”¹⁹

The major source of agricultural credit in Afghanistan, other than private individuals, is the present Agricultural and Cottage Industries Bank. However, at the present time this bank is in the process of being reorganized. The bank is now functioning at a very low level of effectiveness.

The bank was established in 1954 and made loans, over the years, for various purposes, including motor pumps, tractors, construction, canal improvements, purchase of fertilizer, etc.,. However, the volume of credit has been small and sporadic. Loan experience has been less than satisfactory.

An effort has been made, and is continuing, to improve both the quantity and quality of credit available. Current plans call for rehabilitation of the bank with the assistance and supervision of the International Bank for Reconstruction and Development.

The Bank is expected to be reactivated in the not too distant future. A major problem that effectively curtails a more rapid expansion of the bank's activity is a very serious shortage of qualified and experienced personnel. Until this problem is overcome, activity of the bank cannot be expected to significantly increase the credit available to farmers. The bank will hopefully be in a position within the next few years to lend strategic support to the program to promote the use of new technology in agriculture. It is evident that unless the bank's rate of progress increases substantially, lack of adequate credit may hamper progress in increasing the production of wheat and other commodities.

After the bank has made satisfactory progress towards rehabilitation, ways and means of extending credit to promising farmers while minimizing the need for direct credit supervision on the bank's part should be explored.

A concerted effort should be made to provide the required credit to farmers who are willing and able to produce wheat using a combination of new wheat varieties, recommended applications of fertilizers, and improved cultivation practices.

¹⁹“Afghanistan Economics of Agricultural Production in Helmand Valley” Report by Ira M. Stevens, Bureau of Reclamation and K. Tarzi, Helmand Valley Authority, 1965, page 60.

The extension of credit to wheat producers might effectively be promoted through the creation of a Producers Improvement Council in the community. The members of this council would be chosen from the leading citizens within the community. This council then could be given the responsibility of assisting in the channeling and supervision of production credit extended within its community.

Recommendations

• (1) The Agricultural Bank should be rehabilitated and put into effective operation as soon as possible.

(2) Expand the credit program of the bank as soon as feasible, with emphasis on serving the credit needs of those implementing new technology.

(3) Give first priority to communities which develop a cooperative effort to promote implementation of new technology (i.e., Producers Improvement Councils and Irrigation Improvement Associations.)

(4) Loan priorities should be based on the contribution the loan makes to increasing production. Credit should be extended to those activities which have the highest returns per unit of cost.

E. LAND TENURE

1. Current Situation

No evidence has been found to indicate that there is, at present, a serious land tenure problem in Afghanistan. A basic problem is that clear ownership and title to land occupied by most of the farmers has never been established. This fact seriously restricts the Government's ability to raise revenues through a land tax and reduces the farmer's ability to use land as a source of collateral. Further, lack of clear title can dampen incentive to increase the productivity of land.

It is not known whether distribution of land ownership constitutes a serious problem or not. One set of published figures showing distribution by size of holding, suggests that distribution of ownership may be a serious problem.

However, the Review Team in its travels and interviews did not find any evidence that distribution of land ownership in Afghanistan constitutes a significant barrier to achieving greater productivity. The only potential land ownership problem discovered is lack of legal ownership rights to land being operated by many farmers.

During the Second Five-Year Plan a cadastral survey and land inventory program was begun. This project is to be expanded during the Third Five-Year Plan. The land inventory program, which is supplementary to the cadastral survey, will provide a temporary land registration and value classification for land. This supplemental land inventory program will permit the most rapid establishment of land rights and will improve the climate for increasing productivity in agriculture.

The Third Five-Year Plan calls for a total of 10.7 million jeribs (15 percent of the estimated available arable land) to be completed under the two programs by 1972.

The cadastral survey and land inventory program will result in several benefits. They will provide better statistics for economic planning, improve the value of land as collateral, define ownership, promote incentive for land development and improvement, and provide a basis for establishing an equitable and meaningful land tax.

The potential benefits which will flow from the cadastral survey and land inventory programs are quite significant. Determination of land ownership and statistical information obtained from these programs are necessary if development in Afghanistan is to progress at an adequate rate. Thus these two programs need to proceed at a rapid pace in those areas of the country where development is most likely to occur now.

The major factor limiting faster progress is the lack of trained personnel. Present plans call for a total of 752 persons working on both programs by 1972. The plans also indicate a relative increase in land covered by the cadastral survey versus that covered by the land inventory program during the Third Five-Year Plan. However, much more land can be covered by one person under the land inventory program than under the cadastral survey program. The land inventory program does provide temporary land ownership rights and sufficient statistical information to facilitate better economic planning and establishment of a more equitable land tax. It appears that the land inventory program provides many of the benefits which will be obtained from the cadastral survey. Therefore, rather than increasing the manpower devoted to the cadastral survey relative to the land inventory program, as the present plan calls for, manpower devoted to the land inventory program should be increased relative to that devoted to the cadastral survey. Such a shift in manpower resources should result in a much greater benefit per unit of input during the Third Five-Year Plan.

2. Recommendations

(1) Manpower devoted to the cadastral survey and the land inventory programs should be increased by one third if possible.

(2) Emphasis during the Third Five-Year Plan should be placed on the land inventory program.

(3) Both programs should concentrate their efforts in those regions where the greatest progress is expected to occur in agricultural development.

F. TAXATION POLICY

Due to the limitation of time and the attention given other aspects of economic development in Afghanistan, the Team did not focus attention on the problems of taxation and Government revenues. The Team was, however, impressed with the fact that the country suffers greatly from the lack of institutions which facilitate the development of an adequate and equitable taxation program. As a result of collection problems, the Government has turned to various indirect means of collecting revenues. One such means is to sell cotton on the world market at the free market exchange rate (approximately Afs. 75 per dollar), and paying the exporter at a much reduced official rate (reportedly Afs. 40 to 45 per dollar). Government revenue is the difference between the two rates of exchange. This type of tax, while effective from the collection point of view, has undoubtedly reduced production and thus foreign exchange earnings.

A major revenue problem arises if these production discouraging taxes are discontinued. Alternative sources of revenue need to be developed so these incentive destroying taxes can be eliminated. Any alternate sources of revenue, found in agriculture, should be collectable, yet not discourage production.

The present land tax is such a tax. The land tax can be a substantial source of revenue to the Government provided problems of collection are solved and the rate is placed at a reasonable level.

Recommendation

(1) Make an intensive study of the Government's current and potential revenue sources with the objective of eliminating those that discourage agriculture production. But, a reasonable land tax policy should be put into effect as rapidly as possible.²⁰

²⁰ For a more detailed analysis of public finance in Afghanistan see: The Role of Public Finance in Economic Development of Afghanistan, by Harley H. Hinricks; Prepared for the Royal Government of Afghanistan by Robert Nathan Associates, Inc., Washington, D. C., May 1967.

**INSTITUTIONAL AND
ORGANIZATIONAL DEVELOPMENT**

Chapter V

INSTITUTIONAL AND ORGANIZATIONAL DEVELOPMENT

A. EDUCATION

1. Present Situation

Afghanistan's most valuable natural resource is its 15.6 million people. The development of this resource must proceed on the basis of receiving maximum return, social and economic, for the capital invested. With agriculture providing employment for about 80 percent of the population, investments in education and training for those who serve the agricultural sector should return large dividends.

Currently an estimated 20 percent of the children of primary school age (grades 1 to 6) are in school. The percentages drop sharply for middle school (grades 7 to 9) 5 percent and Lycee (grades 10 to 12) under 2 percent. When it is recognized that the rate of attendance is much higher in urban²¹ than in rural areas, the implications for agriculture become even more critical. Also, it is generally agreed that the quality of instruction as well as physical facilities are considerably poorer in the rural schools.

In recognition of the importance of agriculture in the economy, as well as to provide a source of agriculturally trained students for Kabul University, the Ministry of Education is placing some emphasis on vocational agriculture at the Lycee level. A vocational agricultural school, originally established at Kabul in 1925 under French auspices, has been moved to Darweshan. A second vocational agricultural school was established in Baghlan in 1960. The Third Plan proposes construction of three additional schools early in the plan with two additional planned later. An agricultural education option, expected to be offered at Kabul University this fall, will provide a limited number of agricultural teachers for the vocational agricultural schools.

In another effort to inject more agriculture into the educational system the Ministry of Education in 1960 established the Community School concept. A pilot school was started in each province where some elementary agriculture and home economics instruction is given. Simple tools are provided to the schools, and vegetable plants and seeds are grown and provided to local

²¹One estimate places 60 percent of the boys of grade school age in Kabul attending school.

farmers, i.e. parents of the children. Adult education is provided during periods when the children are not in school. This program has currently spread to an estimated 60 schools. As would be expected, it has been most successful where it has received good local support.

At the university level the only professional agricultural training in the country is given at Kabul University. Course offerings are provided in general agriculture, agricultural economics, agricultural engineering, animal science, plant science agricultural extension and agricultural education (planned for Fall 1967). A two-year pre-veterinary course will be offered soon to prepare students for entry to veterinary colleges outside of Afghanistan.

Past enrollment in the Faculty of Agriculture has been disappointing, with a total enrollment in 1966 of only 132. However, a concerted effort was made last fall and approximately 160 freshmen students were enrolled. It is estimated that the university can handle, on a sustained basis, an average freshman class of 165.

2. Potential

Studies of developing countries throughout the world have indicated that agricultural progress occurs as a series of steps rather than in a straight line. This is because there are sets of relatively simple and unsophisticated inputs that can be utilized with a low level of education. However, to move up the next step takes a more highly educated research and extension service coupled with a higher degree of knowledge on the part of the farmer to put newly discovered practices into effect. Thus, for Afghanistan to continue to progress, a sustained effort needs to be made in the agricultural education field.

3. Requirements and Constraints

Basically, efforts in the educational field are long term in both implementation and in effect. The effect on wheat production in the near future will be slight. However, it can not be neglected as the base upon which to build a competent research and extension service as well as to enable farmers to take advantage of newer inputs.

Agriculture must be stressed in the schools both from a technical standpoint and also as an honorable and profitable occupation. The schools, particularly at the elementary and secondary levels, which are terminal for so many young people, must broaden their curricula to include courses and practical work that will prepare graduates for the tasks they will face in life. This is particularly necessary in the agricultural field. While expanding the number of vocational agricultural schools will help to provide trained manpower for the Ministry of Agriculture and Irrigation as well as feed students into the Agricultural Faculty at Kabul University, the problem of better educated farmers is not directly met by this system. Vocational agriculture teachers and programs should also be incorporated into the existing Lycees as well as the lower

schools as rapidly as possible. Of even greater potential and importance is the building of additional middle level and secondary schools to meet the needs of smaller towns and rural areas, including the possible establishment of traveling tent schools for children of nomads.

One positive way to give more emphasis to agriculture would be to give vocational agriculture separate status with its own President under the Ministry of Education. This President would cooperate and coordinate his programs very closely with the Ministry of Agriculture and Irrigation.

The Agricultural Faculty probably is expanding as fast as is feasible at this time. Additional emphasis placed on quality of staff and of instruction will probably pay bigger dividends than the same emphasis placed on quantity. Over the years it may be feasible to convert the present vocational agriculture schools to agricultural junior colleges to the extent that active vocational agriculture programs have been established in the lycees. These junior agricultural colleges could become an integral part of the Agricultural Faculty at the University of Kabul. They would provide both a terminal education for many agricultural technicians as well as expand the ability of the Agricultural Faculty to graduate degree holding agriculturalists. The Faculty should continue its close relationships with the Ministry of Agriculture and Irrigation, particularly in the fields of extension and research so that the needs of the farmers will be met in a timely and efficient manner.

4. Recommendations

(1) Broaden the practical aspect of education, particularly agriculture, by introducing the concept into as many schools as possible, especially in the rural areas. In this connection, the Government should encourage local support of the Community School concept, particularly in developing local leadership as well as moving rapidly toward a program of incorporating vocational agriculture programs into the rural schools.

(2) Accelerate the establishment of middle level and secondary schools in the smaller towns and in rural areas.

(3) Implement as rapidly as possible the five new vocational agriculture schools programmed in the Third Plan in order to insure adequate numbers of staff for the immediate needs of the Ministry of Agriculture and Irrigation and to provide qualified students for the Faculty of Agriculture at Kabul University.

(4) Implement and expand the agricultural education option at Kabul University.

(5) Consider establishing a traveling tent school system for the nomads similar to that in Iran.

(6) Elevate the status and importance of vocational agriculture by placing it under a separate President in the Ministry of Education.

B. AGRICULTURAL RESEARCH

1. Present Situation

Basic legislation establishing agriculture research in the Ministry of Agriculture and Irrigation was promulgated in April 1963. In the March 1966 reorganization, both research and extension were brought together under the administrative head of a President for "Agricultural Research & Extension" in order to bring about closer coordination and implementation of agricultural programs. Each service is under the operational management of a Director-General. The chart below shows the existing organizational set up of the research section.

Two National Experiment stations exist; one at Darul Aman, Kabul for cereals, vegetable oils, and other crops and one at Badam Bagh for horticultural crops. (Badam Bagh also serves as a regional station). Regional and sub stations are shown below:

Regional Stations

Shisham Bagh — Jalalabad
Poze-i-shan — Baghlan
Balkh — Mazar-i-Sharif
Kokoran — Kandahar
Urdu Khan — Herat
Badam Bagh — Kabul

Sub-Stations

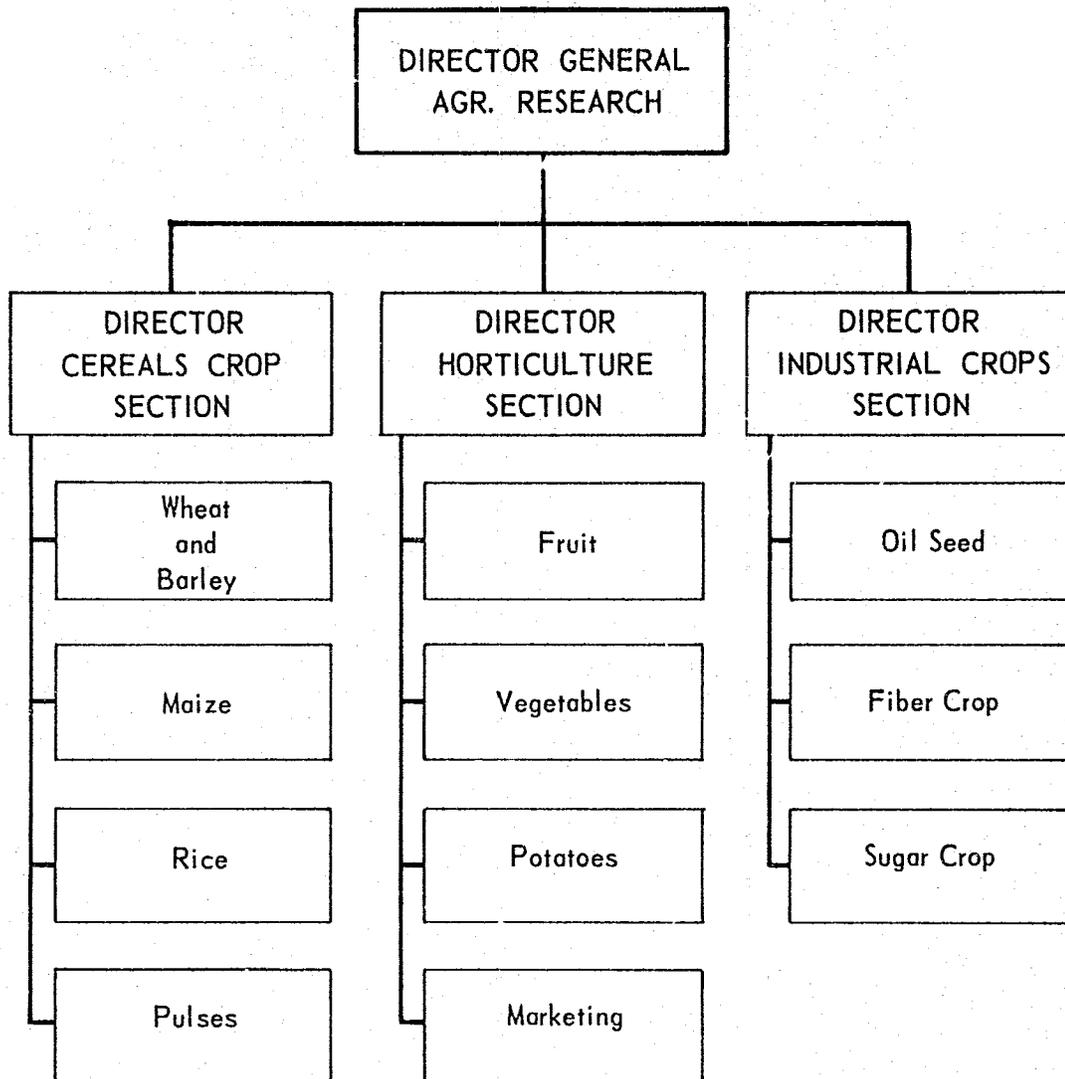
Ortobloqui — Kunduz
Kunduz — Kunduz
Ghazni — Kabul (to start 1967-68)
Bamiyan — Kabul (-do-)
Farm Jadid — Jalalabad
Abdul Khail — Jalalabad
Dund — Kandahar

Six additional sub-stations are proposed for Logar, Laghman, Talugan, Daihadadi, Qala Nau and Kalat, with a total of 36 stations and sub-stations projected. The basic objective of these stations is to provide the essential technical services needed for the development of respective areas with emphasis on:

- (1) adaptive trials and experiments and
- (2) production of pure foundation seed and certified nursery stock.

In order to secure more adequate coordination of work and to be more fully responsive to the needs of the farmers, the regional Agriculture Extension Service headquarters are being located at or near to the Regional Research Stations.

**AGRICULTURAL RESEARCH
MINISTRY OF AGRICULTURE AND IRRIGATION**



The stations are in varying stages of development at the present time with necessary buildings, farm equipment and farm development expected to be completed in the near future. Field plot experiments with wheat and seed multiplication combined with extension work are being carried out at all stations. Variety orchards and nursery plantings have been established at some of the stations.

In 1963, all the work of foreign experts in wheat and barley was concentrated at the National Research Station, Darul Aman and in 1964, placed under the supervision of one trained Afghan. Then in 1965/66, the Ministry determined

that the major effort of the research organization should be devoted to the wheat program. Fortunately work in progress had laid a good basis for an expanded effort. Work with the semi-dwarf Mexican varieties has indicated that four lines may have considerable promise for Afghanistan. Two of these, Lerma Rojo 64A and Mexi-Pak have shown a considerable range of adaptability. Continued testing is in progress with 30 lines planted at seven locations in 1966/67. Two other varieties that are normal in straw length, Kenya Mentana and Vilufen have been tested and released to farmers particularly in the Kabul region. These varieties have given excellent results and farmers are enthusiastic in their acceptance. Newer better yielding varieties are now being readied as replacements.

2. Potential

Afghanistan faces a potential wheat deficit of about 500,000 metric tons by 1972 increasing to over a million tons by 1982 according to current trends unless wheat production is increased. A tremendous research effort needs to be mounted in order to assist in overcoming a deficit of such a magnitude. In the immediate future major emphasis will, of necessity, have to be placed on adaptive research and testing of work performed elsewhere. At the same time however, a base will have to be established upon which Afghanistan can build its own research competence at all levels. Of major importance is the provision of a dedicated and highly educated and trained staff of scientists. While no accurate estimate of the potential benefit that will derive from a research program is possible, it is generally agreed that funds spent on research will, if wisely used, be among the country's most productive investments.

3. Requirements and Constraints

Probably the single most important requirement of an effective research organization is highly educated and well trained people. The more sophisticated and technical the research becomes the higher the premium on quality staff. Because of this and other factors, Afghanistan should concentrate its major research efforts for the next few years on adaptive research and the training of more competent personnel. Continuation of a research program emphasizing the testing and demonstration of new improved varieties of seed coupled with added inputs of water and fertilizer plus the introduction of improved cultural practices should yield maximum results.

An expanded program of education and training of research personnel will lay the groundwork for a more technical and basic research program in the future. In addition to higher salaries and better working conditions for research personnel, there is the question of recognition for superior performance and the concept of accountability for the quality of research results. Public awards, merit raises, and expanded opportunities to publish research findings and to attend research conferences and seminars, will encourage more dedication and excellence in the research field.

The Team believes that a careful study of the research needs of the country should be undertaken by the Ministry of Agriculture and Irrigation, keeping in mind the limited resources of the country in terms of personnel, financing, and other priority needs. Fruitful areas of research are discussed under the various technical sections of this report. In allocating research funds, Afghanistan should exercise considerable care in its priorities. As noted earlier in this report, 36 research and sub-stations are eventually planned for the country. A careful assessment of the needs might indicate that the benefit from such a large addition to the present number of stations could be marginal. In any event, the opening of new stations should be delayed until trained personnel, equipment and development needs of existing stations are fully met. Also a fully functioning extension service, capable of translating research findings to the farmers and reflecting farmers' needs to the researchers, should be developed before expending large sums on new stations.

4. Recommendations

(1) For the immediate future, continue the emphasis on adaptive research testing and release of improved varieties received from other parts of the world. Adaptive research on cultural practices, fertilizer treatments, water use etc., should be combined with varietal testing in order to realize the full genetic potential of the introduced varieties.

(2) Concentrate limited staff and financial resources on transforming the existing national and regional research stations into fully staffed, equipped and developed stations, administratively and technically capable of carrying out an efficient and action-oriented, adaptive research program.

(3) In order to meet future needs for an expanded research program, plan and implement a training, educational and incentive program that will provide trained scientists and leadership abilities, both administrative and technical.

(4) Expand the spectrum of records and observations on material available to gain maximum information on varieties as to behavior, weaknesses and special properties. This should include some indication of seed quality such as hardness, plumpness, and protein content (of advanced lines). Cooperate with researchers in other countries in obtaining information of value to make interpretations in Afghanistan. The latter includes participation by Afghans in such regional trials as the Asian-American uniform nurseries, Near-East Wheat and Barley uniform trial, and the wheat quality project of the A.I.D. Contract at the University of Nebraska.

(5) Plan and implement research trials as indicated under the various technical sections of this report i.e. fertility studies, water use, cultural practices, varietal testing, machinery implements etc.

C. AGRICULTURAL EXTENSION

1. Present Situation

Agricultural Extension was first established in Afghanistan in 1958 as the Department of Extension, Publicity and Library under a Director. It was upgraded in 1959 with the Director becoming a Director General. In the reorganization in 1963, the Extension Service became a separate Directorate with its own Director General under the overall administration of the President of Agricultural Production and Extension. Early in 1966, another reorganization was effected bringing extension and research closer together with the Director-Generals of both organizations being placed under the President of Agricultural Research and Extension.

Staffing for the Agricultural Extension Service includes about 133 professionals with five Regional Extension Directors, 22 supervisors, 88 agents and 18 assistant agents. In 1966, a large scale drive to reach farmers was organized when more than 800 wheat/fertilizer demonstration plots were established throughout the country on farmers' farms. Prior to 1966, extension agents were often looked upon with suspicion and distrust by farmers because they were required to enforce cotton planting quotas and other regulatory duties.

2. Potential

It is estimated that there are approximately 2.2 million farmers in Afghanistan not including the nomadic tribes. With presently limited staff and financial constraints, it will be impossible to reach directly and influence significantly any large percentage of these farmers during the next five years. If production targets are to be met, significantly increased extension work, backed by a concentrated training program, is essential. With care in selection of farmer participants to ensure that key farmers are involved, these farmers could educate their neighbors in the use of fertilizer, improved seed, better land preparation practices, and other improved practices leading to production increases. While helpful, this is not a substitute for an expanded professional extension service. Successful demonstrations also will assist in rebuilding confidence in the Extension Service.

In many parts of the world an extension service is not considered complete without some attention paid to rural youth and to women. An active information service with competent staff and full facilities should complete the extension package.

Training farm youth in simple practices that can be implemented on their home farms or villages, and stimulating interest in agriculture by proving that it can be a successful and profitable occupation, is a basic technique in building future leaders. In the immediate future, a successful project by a son or daughter may well be the stimulus for getting the father to adopt new practices. Neglect of women in extension results in a waste of 50 percent of the human resources in agriculture. Programs designed to improve family living through

better nutrition, clothing, shelter and health have been implemented through home economics extension in many countries.

While emphasis on wheat is the announced policy of the Government for the next five years, considerable concern was expressed in many quarters about the role of the industrial crops and their importance both as earners and savers of foreign exchange. In order not to neglect this agricultural resource while at the same time preventing undue strain on limited government staff and financing, it is suggested that private industry might play a larger role in developing agricultural resources. The Agricultural Review Team understands that in Turkey, for example, the sugar industry conducts one of the most successful development services for agriculture in the country. This service consists of extension advice, credit, marketing, provision of agricultural inputs, and pest control. A similar service backed by industry might well serve the needs of the industrial crops sector of Afghanistan at low cost to the Government.

An improved Extension Service, backed up by a Research Service with proven adaptive research is an absolute necessity in assisting Afghanistan to realize its goals of self sufficiency and improved standards of living. The close association and coordination made possible by having both research and extension under the same direction should be continued to assure responsiveness to farmers' needs.

3. Requirements and Constraints

The biggest limiting factor in the Extension Service is manpower, both quantity and quality. While ratios of farmers to Extension workers are not always a valid comparison, Afghanistan with approximately 2.2 million farmers has only one extension worker for 16,500 farmers. Ratios of extension workers to farmers in many other countries are more often in the range of one to 600 up to one to 2,000. A goal of one to 2,000 by 1972 for Afghanistan would require the training of about 1,000 new workers, assuming no personnel losses. Probably a 25 percent over run should be allowed to compensate for drop-outs in the training program as well as retirees from the system. With limited communications, transport, poor roads, and rugged topography the problem of reaching farmers becomes even more difficult.

Even more crucial is the level of education and training. Supervisors generally are experienced agents who have been promoted; agents receive 12 years of schooling and some advanced training, and assistant agents receive only nine years of education. While the long-term goal should be a B.S. degree for all agents, this is not realistic in the foreseeable future. Rather Afghanistan should concentrate its limited resources towards two types of training:

- (1) pre-service training at two levels of instruction with one center for new agents in Kabul and one for new assistant agents in each of the six administrative regions;
- (2) concentrated in-service training in each region for all agents and assistant agents in both extension philosophy and methodology as well

as on the major crops in the area. Technical training and methodology should be combined as much as possible. Supervisors and technical specialists should continue to be sent to the U. S. for training.

Demonstration is one of the oldest and most effective tools known to extension workers. Last year approximately 800 such demonstrations emphasizing fertilizer and improved seed were placed on land owned by farmers. Results of these demonstrations have been enthusiastically received by the participating farmers and their influence has spread to the neighbors. The Team understands that the Ministry of Agriculture & Irrigation plans 17,050 of these demonstrations during the next five years; 800 were established in 1967. This ambitious plan will necessitate the training of a large staff to properly supervise the demonstrations. The Team believes that the results in increased production will be well worth the effort on 800 to 1,000 per year. Along with the fertilizer/seed demonstrations, the Ministry should provide a smaller number of demonstrations featuring a complete package of improvements for the most progressive farmers. These more sophisticated demonstrations would include better land preparation, uniform seeding depth, more timely irrigation, weed control, pest control as well as fertilizer and better seed.

"Pilot Extension Areas" in each of the six regions and village level "Production Improvement Councils" have been suggested as ways of improving and strengthening the Extension Service. Basically, a "Pilot Extension Area" would be an area where all feasible production techniques will be applied on a concentrated basis in an effort to demonstrate to all farmers in the area the benefits of fertilizer, better seed, adequate and timely use of irrigation water, improved cultural practices, pest control, weeding, etc.

The "Pilot Area" would be given active support by the establishment of "Village Crop Improvement Councils". The "Councils" would mobilize and capitalize upon local leadership ability channeling it into full support for the "Pilot Area". A long-term benefit of such councils could be the establishment and development of true cooperatives.

The "Pilot" approach will allow a concentration of resources which maximizes the chances for success while also providing excellent opportunities for in-service training of the staff. The use of "Production Councils" will inject the local farmer into the decision making process and will take advantage of his intimate knowledge of local conditions; will exert social pressure on area farmers to innovate and accept improved practices; and will lessen the load of administration and operation of extension work by the Government. In addition, Production Councils may lay the foundation for cooperatives. Research-extension conferences, where leading farmers as well as government workers could meet on a regular basis, could be organized to review problems and progress and to discuss programs for the future.

4. Recommendations

(1) Expansion — Increased budgets and manpower should be made available for basic extension services. This is essential if modern technology is to be adopted on a sufficiently wide scale to meet production goals. Expand the pre-service training program to ensure that all new agents receive training in both extension techniques as well as production practices prior to entry on the job. This training can be given at the extension training center being completed at Badam Bagh. Initiate pre-service training at centers in each of the six regions for new assistant agents along the same lines as for agents. For all agents and assistants a concentrated in-service training program in both technical agriculture, and extension methodology and philosophy should be implemented as rapidly as staff and funds permit. Supervisory personnel and specialists should continue to receive training overseas.

(2) Rapid expansion of demonstrations, with the complete package approach utilized for the more progressive farmers and new seed and fertilizer package for other farmers, should be emphasized.

(3) Initiation of "Pilot Extension Areas" in six regions coupled with "Production Improvement Councils" should be completed as soon as possible.

(4) Consider establishment of both rural youth and home economics extension in Afghanistan starting in areas where the "Pilot Extension" programs are initiated.

(5) Encourage industry to carry more of the load of agricultural development by providing advice and service for industrial crops.

(6) Remove all enforcement duties from the Extension Service so that farmers will not be suspicious of the agent's motives.

**PLANNING AND MANAGEMENT
FOR AGRICULTURAL DEVELOPMENT**

Chapter VI

PLANNING AND MANAGEMENT FOR AGRICULTURAL DEVELOPMENT

A. INTRODUCTION

The review of Afghanistan's technical and economic potential and conditions for expanding wheat production indicates that it is well within the theoretical capability of the country to achieve self-sufficiency—or even to produce a surplus for export. However, the current condition of the organization, staffing, methods and procedures of the Government casts substantial doubt of the Government's prospects for exploiting the opportunities that exist in a sufficiently effective and efficient manner to achieve its development objectives. Only between one-third and one-fourth of the modest budget for general agriculture under the Second Five-Year Plan was actually implemented.

The existing management and administrative processes of the Afghan Government reflect the needs and conditions of the static economic and social system that characterized Afghanistan in the past. They are inadequate to serve the needs of a dynamic, developing Afghanistan. Major changes in bureaucratic attitudes, habits, practices and procedures are essential; otherwise, development efforts will continue to be dissipated and project objectives will be frustrated by administrative bottlenecks.

It is commendable that many officials in the Afghan Government, and particularly in the Ministry of Agriculture and Irrigation (MA&I) have recognized the critical importance of management and administrative problems. There is a growing awareness that the most sophisticated plans, the most heroic sacrifices, the most intensive efforts to mobilize scarce resources to meet development objectives can all be in vain if the government apparatus is not adequately geared to do the job.

Dimensions of the Problem

While some of the problems identified are particularly pertinent to the MA&I, many are problems characteristic of the Government generally and must be resolved in the broader context. Three general aspects of the overall problem can be identified:

- (1) Insufficient numbers of adequately trained personnel
- (2) The absence of appropriate motivations

(3) The lack of mechanisms within the government apparatus for systematically identifying critical administrative problems, developing solutions, and introducing planned innovations.

The most limiting constraint on successful development efforts is, of course, insufficient numbers of adequately trained personnel—including professional, managerial, technical, administrative and clerical personnel. The Afghan Government, in all of its Five-Year Plans, has recognized the need for expanded educational and training programs and has allocated substantial resources to meet this need. However, attention has been focused on engineering, scientific, medical, and technical fields on the one hand, and law, literature, and theology on the other (26% of the student enrollment in Kabul University and 34% of the graduates in 1965/66 were in law, literature or theology). Practically no attention has been given to training in the administrative sciences. Greater use should be made of existing opportunities for training personnel in management and administration, and new means should be developed for providing such training.

There are a number of officials and employees who are strongly motivated to plan and carry out expeditiously programs to advance the economic and social development of Afghanistan. They are energetic, imaginative, and willing to assume responsibility and take risks to attain program targets. Unfortunately, these people are few in number. The majority of personnel appear to be motivated primarily by status aspirations, job tenure and security, the desire to avoid responsibility and risk-taking, and the preference for established routines. This is in part the natural result of the gradual evolution of bureaucratic style in a static society, and in part the product of the system of rewards and sanctions in the personnel system. A major breakthrough is needed in the development of a modern personnel management system for the Afghan Government. Revision in salary scales, improved training, career development programs, incentives for innovation, fringe benefits for duty tours in the Provinces, and other steps must be taken to upgrade the quality and quantity of personnel, improve efficiency, and release the creative energies of employees.

Even in highly developed countries, the presence of large numbers of well-trained, highly-motivated, and progress-oriented people is not sufficient to assure that organizational forms, methods, and procedures will be skillfully adapted in a timely way to facilitate achievement of program objectives. Experience has demonstrated the need for the establishment of institutional mechanisms for continuously appraising the efficiency of existing ways of doing business, conducting special studies and development efforts to find workable solutions to administrative problems, and following through with vigorous action to assure that needed changes are promptly introduced, evaluated and perfected. These usually take the form of specialized organizational units reporting directly to chief executive officers at the highest levels in the government.

To meet its commitments for progress, the Government must launch a vigorous well-planned campaign on all three fronts. To assure success in the

program for expansion of agriculture, and to meet the specific objectives for wheat production, the MA&I might well be selected as the ministry for intensive introduction of management improvements and thus serve as a model for extension of new techniques throughout the Government.

B. PERSONNEL MANAGEMENT

1. Situation

The foundation for effective and efficient execution of the public business is a career service comprised of well-trained highly-motivated staff operating under modern principles of personnel management.

The personnel situation in the Afghan Government, and the MA&I, can be characterized as one in which a small number of intelligent, energetic, dedicated people are underpaid, overworked, and seriously hampered in carrying out their duties by obsolete personnel practices no longer responsive to the needs of a developing country and an expanding government.

Some of the major problems include:

(1) Pay scales substantially below those required to assure adequate living standards and to eliminate the need for supplementary sources of income.

(2) Insufficient provision of within-grade salary increases, resulting in frequent promotions to higher grades (and frequently to positions outside professional competence) to retain and reward experienced personnel.

(3) Lack of adequate fringe benefits such as housing, medical facilities, transportation and other allowances to encourage trained personnel to serve for extended periods in remote areas of the country where their services are needed.

(4) Absence of professional career development concepts and practices to assure that employees trained in scientific, technical, engineering, management, and administrative specialties can advance from lower to higher grades within the field of their training, and in accordance with their competence.

(5) Insufficient use of existing training opportunities, particularly in the field of administration, and failure to effectively use newly trained personnel in their fields of competence.

(6) Excessive staffing unrelated to specific workloads.

Basic reforms in the civil service are not within the powers of the MA&I, of course. The Prime Minister's office must be the source of energy and leadership in developing and implementing the far-reaching changes that are needed.

2. Recommendations

It is gratifying that some recognition of the personnel problem is reflected in the Third Five-Year Plan. The Plan tentatively allocates one billion Afghanis for improving salary rates and for establishing consumer cooperatives for government employees, pending study by government agencies and the development of specific proposals. However, relatively low priority has been given to this proposal since the availability of funds depends upon the realization of possible supplementary revenues which are still only under consideration.

The Plan also indicates that studies will be made of classification, employment, promotion, and job assignment policies by the Civil Service Department.

The Agricultural Review Team believes that the need for obtaining and retaining sufficient numbers of adequately trained and experienced personnel is important enough to justify a higher priority for improved salaries and incentives than is accorded in the Third Plan.

The Team strongly supports the proposal for comprehensive studies of the personnel management and civil service systems. Such studies should not, however, be limited to the topics listed in the Third Five-Year Plan. Special attention should also be given to the need to develop a professional cadre of personnel management specialists, trained in modern techniques of public and business personnel management, to be located both in the central Civil Service Department and in each of the operating Ministries.

Careful consideration will need to be given to the best practices in various countries, and special notice taken of the variations in practices among countries, to assure that the system or combination of practices selected are those most suitable to conditions in Afghanistan.

C. ADMINISTRATIVE SYSTEMS ANALYSIS

1. Situation

The rapid expansion of government operations during recent years, to meet the insistent pressures for rapid economic and social development, has overtaxed the traditional arrangements and practices of the Afghan Government. Administrative habits, practices and procedures which might have adequately served the needs of a static society can, and do, seriously impair the effective administration of development programs in a dynamic society.

The shortage of adequately trained personnel to staff and operate development programs creates a particularly urgent and continuous need to improve, simplify and streamline administrative procedures in order to obtain maximum

productive use of the available personnel. It is of greatest importance to reduce to an absolute minimum the detailed complex paperwork, and burdensome and time-consuming clearance procedures, which consume excessive amounts of time of professional, scientific and technical personnel.

Prompt performance of tasks is especially critical in agricultural development programs. The biological, seasonal, and climatic imperatives of crop and livestock production demand close scheduling and speedy performance of tasks if desired results are to be achieved. A delay of a few days in a critical season can mean a set-back of a full-year in getting the job done. The operations of a pest control working force can be substantially delayed by multiple-clearance procedures, overly detailed pre-audit requirements, and time-consuming red tape—but the locusts won't wait. Soil and water and temperature may reach the proper state for planting—but if delivery of improved seeds is unduly delayed by inefficient government procedures, the crop will not be there to harvest.

The experience of the MA&I and other agencies in the Afghan Government in recent years indicates that a crisis of major proportions is developing. Critical bottlenecks growing out of antiquated notions of control requirements are emerging in all administrative sectors. Among the problems and difficulties encountered are:

- (1) Excessively detailed and time-consuming pre-audit of transactions by finance officials, reportedly leading to use of bribes by government program personnel to expedite clearance processes.
- (2) Post-audit practices focusing primarily on detailed consideration of the legal and procedural propriety of financial actions, rather than on the overall effectiveness of program performance.
- (3) Insufficient delegation of authority coupled with responsibilities assigned to field operating personnel.
- (4) Failure to reproduce and widely disseminate copies of relevant laws, rules, regulations and procedure manuals, leading to confusion, misunderstanding and interminable disputes.
- (5) Unduly cumbersome warehousing procedures, with excessive emphasis on preserving and protecting materials at the expense of expeditious distribution to meet operating program needs. (An example was cited of one warehouse transaction accumulating over 100 signatures for completion, some officials signing three or four times.)
- (6) Uneven matching of workloads and manpower, resulting in large backlogs and inordinate delays in some sections which other sections are overstaffed and underemployed.

(7) General lack of clear definitions of job assignments, responsibilities and authorities and absence of job performance standards, making effective supervision impossible.

(8) No published functional organization charts or organizational manuals describing the mission, role and scope of activities of government agencies and units.

(9) Excessive production of voluminous and detailed reports which are stored (not filed), and neither summarized, analyzed nor distributed to prospective users.

Other problems, and numerous examples, have been cited by officials of the Afghan Government and by foreign advisors.

2. Recommendations

A number of special A.I.D.-sponsored projects are under way to improve individual processes and procedures, including an accounting system and procedures improvement program and a recently approved project to streamline, simplify and improve materials management and warehousing practices. Some attention is also being given to training in administrative management and supervision as part of several functional programs. The Team believes that these activities are very valuable and should be encouraged.

However, it is even more important to attack the roots of the general problem—along with special corrective measures on particular problems. There is a need for a recognition at the highest levels of the Government that continuing attention to administrative systems and processes—by full-time experts specially trained in the techniques of systematic analysis—is essential if the Government's procedures and work methods are to change in response to the dynamic forces unleashed by development efforts rather than constitute a straight-jacket which constrains achievement of program targets.

Experience in developed countries, as well as in other developing countries, demonstrates the need for permanent institutional mechanisms within the government apparatus for continuously appraising the efficiency and effectiveness of existing ways of doing business, conducting special studies of individual procedures and of overall management systems, developing workable solutions to specific administrative problems, and following through with vigorous action to assure that needed changes are promptly introduced by responsible officials.

These usually take the form of a separate organizational unit in, or reporting to, the chief executive's office in the central government and in at least the larger operating ministries. Titles vary from "organization and methods staff" to "office of management improvement" to "systems and procedures analysis department", etc..

Proposals have been made to, and are under consideration by, the Afghan Government for establishing a "Management Institute" as a separate agency

under the direction of a High Council chaired by the Minister of Education and including Deputy Ministers of various Ministries as members, together with the Presidents of Kabul University and the Civil Service Department. The Institute would provide training in administrative management to government officials, maintain a library and clearing-house for information on scientific and practical aspects of management, and conduct special studies and analyses of administrative problems for the various Ministries upon request.

The proposal for a Management Institute has much to recommend it. In view of the limited number of personnel with advanced training in modern methods of management and administration, the Institute approach may well be the most feasible for the immediate future. As additional trained personnel become available, however, the Team believes that there should eventually be established within each of the Ministries a full-time staff of professional management specialists to assist the Minister in keeping his administrative system and processes up to date, responsive, and efficient.

D. ORGANIZATION FOR AGRICULTURAL DEVELOPMENT

1. Situation

The Afghan Government is not well organized to efficiently administer a major priority development effort to substantially expand wheat production.

A successful development program depends upon the existence of a clear-cut assignment of responsibility to a single source for overall management, adequate authority commensurate with responsibility, and a straight-line continuous chain-of-command from the responsible manager to the lowest employee. The organizational arrangements of the Afghan Government for agricultural development are characterized by diffusion of responsibilities, overlapping jurisdictions, ambiguous authority, fragmentation of operations, and tangled chain-of-command.

The Ministry of Agriculture and Irrigation is the agency with the largest role and responsibility for national agricultural development. It develops program plans and policies, performs research, conducts extension, engages in regulation and protection activities, and carries out small-scale irrigation projects on existing systems. It is also responsible for large irrigation and reclamation work in the Nangarhar Valley—but must operate through a semi-autonomous agency, the Nangarhar Valley Authority.

On the other hand, major agricultural development efforts are carried out by agencies not under the direction of the Ministry of Agriculture. Autonomous regional development authorities in the Helmand-Arghandab Valley and in Paktia Province report through the Ministry of Planning. Each operates its own water development, agricultural research and extension services. In addition, a Rural Development Department under the Ministry of Interior carries out village development projects with major agricultural components (including extension)

throughout the country. An independent government agency, Foods and Common Needs Supply Department, operates grain storage facilities in the major production and consuming areas of the country.

During the Second Five-Year Plan, government expenditures under the immediate control of the MA&I amounted to only one-third of the total spent for the above activities.

Within the area of operations under the immediate jurisdiction of the MA&I, the previous arrangements for administering programs through Directors-General of Agriculture under the overall supervision of Provincial Governors complicated administrative arrangements unduly, without offsetting advantages, and created opportunities for confusion in responsibility and authority detrimental to program operations. A recent reorganization within the MA&I has occurred along regional lines for research and extension, without, however, eliminating the position of Director of Agriculture in the Provincial Government. Preliminary experience with the arrangement indicates some improvement, but much remains to be done.

2. Recommendations

Successful exploitation of the available economic and technical opportunities for agricultural development requires major changes in present organizational arrangements.

The guiding organizational principle should be unity and integration of authority and responsibility for all operations from initial long-range program planning through application of improved technology at the farm site.

Consideration should be given to a basic reorganization of agricultural programs operated by the Afghan Government, as well as reorganization within the MA&I.

The short period available for the Team review, and the absence of adequate English-language documentation of the details of existing organizational arrangements, assignments of responsibilities, coordinating mechanisms, work loads, staffing, operating methods and procedures did not permit development of detailed reorganization proposals. The Team believes, in any case, that the detailed analysis of existing arrangements and problems, and the development of specific solutions should be carried out by knowledgeable and responsible officials of the Afghan Government, with technical advice and assistance from outside specialists in the field of agricultural development administration.

There are, in Kabul, a number of Afghans—both within and outside the Government—who have received specialized and advanced training in public administration and industrial management in recent years. In many instances it appears that the Government is not profiting to the extent it could from this valuable, and extremely scarce, human resource. It would be highly advantageous to the Government, the MA&I, and to the success of agricultural development efforts, if a team of these Afghan experts were brought together on temporary assignment for some period (say six months) to conduct a major organizational study of all agricultural programs. This might well take the form of a

National Commission, recommended by the Prime Minister and appointed by his Majesty, to assure adequate support at all levels and effective follow-through on implementation of recommendations. The Commission would be responsible for developing a complete reorganization proposal and draft laws and decrees to put it into effect.

The experience gained in this enterprise, if successful, could lead to the permanent establishment of a professional staff of organization and management experts to conduct such studies on a continuing systematic basis throughout the Government.

In its study, the Commission should consider the relative advantages and disadvantages of at least the following proposals:

(1) Transfer to the MA&I all agricultural research and extension activities, personnel and funds presently under the various regional authorities and the Rural Development Department.

(2) Transfer to the MA&I the grain storage facilities and operations of the Department of Foods and Common Needs.

(3) Centralize in the MA&I, responsibility for (a) developing standard government-wide procedures and criteria for collection and publication of hydrologic data, (b) development of design criteria and specifications for a National Hydrological and Hydrometeorological Network, and (c) drafting of national water policies and a national plan for the development of water resources.

(4) Establish a cabinet committee for national water resource conservation and development to establish policies and priorities for water programs.

(5) Complete the regionalization of the MA&I by eliminating controls, whether formal or informal, exercised by Provincial Governors over MA&I activities in the Provinces, and by providing adequate authority, staff and administrative services to the Regional Directors-General to enable them to do their jobs effectively.

(6) Expand and strengthen the economic analysis and planning staff in the MA&I.

(7) Expand and strengthen the capability of MA&I to collect, process, analyze, and publish agricultural statistics.

(8) Transfer all control and regulatory functions performed by agricultural extension agents to the Ministry of Interior or to a separate production control organization reporting to Regional Directors-General of Agriculture.

(9) Establish in the MA&I, perhaps under the Director General of Administration, a staff of experts trained in organization and methods analysis to perform continuing management studies and develop improved organizational arrangements and simplified operating procedures.

E. PROGRAM PLANNING AND BUDGETING

1. Situation

The importance of sound planning and careful budgeting to successful development programs is recognized throughout the Afghan Government. A separate Ministry of Planning has been established, and planning organizations are in being or in prospect for each of the operating Ministries. Extensive use has been made of foreign advisors from many different countries. Increased status has been accorded economic planning recently by the establishment of a High Economic Council chaired by the Prime Minister.

The MA&I is foremost among the operating ministries in placing commendable emphasis on the planning function. Economic analysis, statistics and plan development and coordination are centralized under the direction of a President for Planning reporting directly to the Ministry. As with other fields, however, planning activities in the Afghan Government have not evolved to the extent or at the rate required by development needs. The Planning Ministry, and the planning units in the operating ministries, are not fully staffed with sufficient numbers of trained personnel. The foreign technical advisors are not always used most effectively, or assigned to the highest priority analytical tasks.

The annual budget development process is not well integrated with the long-range program planning process, and the timing and procedures for legislative enactment of the annual budget are only beginning to evolve under the new Constitution. At the time of the Team review (July 1967) the Shura (Parliament) had not yet enacted the budget for the year 1346 (1967-1968), which commenced on March 21, 1967. Thus, four months of the first year of the Third Five-Year Plan had expired without provision of funds for the rapid expansion set out in the plan. This was particularly critical for the agricultural development programs because of the seasonal nature of many of the activities.

Budget execution processes within the Government are exceedingly complicated and time-consuming, with multiple levels of detailed review preceding allotments of funds (which are advanced on a quarter by quarter basis). Finance and accounting officials exercise wide latitude in challenging proposed expenditures even when clearly within operating budgets approved by higher authorities.

The structure, format and content of planning and budgeting documents are not well designed to facilitate analysis and decision-making at all levels. Basically oriented to organizational units and object classes, with occasional project displays focusing on activities crossing organizational lines, the documents do not bring into focus the basic program objectives and goals of the Afghan Govern-

ment, identify the major alternatives available, or reveal the total costs and relative effectiveness of the alternative means of achieving objectives. Nowhere in the materials available to the Team, for instance, was it possible to collect the total costs over time of all activities of the Afghan Government contributing to the objective of self-sufficiency in wheat—although this was constantly described as the "first priority" objective by Afghan officials.

2. Recommendations

A review of the draft of the Third Plan conducted by the International Bank for Reconstruction and Development at the request of the Afghan Government led to a series of recommendations for improvements in the planning process. These included:

- (1) Elevating the position of the Ministry of Planning to the status of a Planning Commission under the Deputy Prime Minister.
- (2) Strengthening the role of the recently established High Economic Council.
- (3) Improving the professional staffing of the planning units throughout the Government.

The Team believes that these suggestions deserve serious consideration by the Government. In addition, planning personnel should make a special effort to improve the basic structure of the plan format to emphasize basic program goals and objectives, bring together the major activities contributing to the same objectives, and display the major alternatives available to achieve program objectives together with their relative costs and effectiveness over time.

A special short-term study should be made to substantially streamline budget executive procedures, perhaps by a blue-ribbon team of top management officials from the operating Ministries and the Ministry of Finance under the auspices of the Prime Minister's office. Reforms in procedures should be guided by the realization that attempts to achieve small-scale economies through multiple levels of pre-audit by employees unversed in program needs and conditions are likely to be self-defeating. The purpose of government in a developing dynamic society is to meet the needs of its citizens through expeditious attainment of program objectives—not to take maximum precautions against possible error or waste on the part of responsible officials. Economy and efficiency must be based on getting the job done at least cost, not minimizing cost at the expense of failing to get the job done. The latter course merely results in wasting all of the resources that were spent, without producing needed program results. Experience in other countries has amply demonstrated that adequate control can be achieved through appropriately designed operating budgets, with post-audits conducted with skill and understanding, without strangling program operations with tangled skeins of red-tape.

Budget development procedures and schedules should be adjusted to facilitate the review and consideration of budget requests by the Shura. Earlier presentation of the budget, with better supporting justifications relating costs to program objectives, would help eliminate the delays experienced this year in enacting the first-year appropriations for the Third Plan.

F. COORDINATION OF FOREIGN ASSISTANCE

1. Situation

Afghanistan receives aid in the form of loans, grants and technical assistance from some ten foreign sources. The type of aid provided tends to reflect the capabilities, interests, availabilities and priorities of the donors rather than the considered balanced priority needs of the Government.

To qualify for such aid, Afghanistan may commit budget resources and manpower to projects of lower value for development objectives, or initiate worthwhile activities at inopportune time, thus reducing the productivity of both domestic and foreign contributions.

The basic responsibility for coordinating the availability and utilization of foreign assistance rests jointly with the Government and the donors.

2. Recommendations

The Afghan Government needs to strengthen its capability and procedures for long-range planning and annual budgeting, with particular emphasis on developing analytical capability at the Ministry of Planning and in each of the program Ministries. Choices among alternative program goals, objectives, levels and methods should be guided by their relative contribution to the economic and social development of Afghanistan rather than the immediate (and perhaps temporary) availability of foreign aid.

Donors should explore means to jointly plan and coordinate their assistance programs, both to facilitate planning and implementation by the Government and to increase the productivity of their aid programs. The degree of cooperation could range from a standing committee to serve as a clearinghouse for information and to sponsor joint studies or projects, to a more formal arrangement involving joint planning and combined operations and financing.

THE ROLE OF THE PRIVATE SECTOR

Chapter VII

THE ROLE OF THE PRIVATE SECTOR

A. INTRODUCTION AND SUMMARY

A stated goal of Government in the Third Five-Year Plan is "Expansion of the private sector with the encouragement of quick-producing projects in agriculture and industry." The Five-Year Plan anticipates that private investment will be effected on a large scale. To implement the development program requires the cooperation and assistance of private investors and operators. Incentives and a generally favorable climate must be established by the Government so that the fullest benefits for the whole of Afghanistan may be achieved.

A great, unknown potential and challenge to the Afghanistan Government to give impetus to its accelerated wheat program is the private sector and the contribution it can make to the Government's goals.

The farmer is a private business man who understands the practical economics of growing food, providing for his family, and obtaining other basic needs. He is responsive to innovations if they have demonstrated value and are within his means. He is skeptical of unproved or complicated processes and involved agreements and promises. He is suspicious of additional policing and regimentation. He needs markets for his products and he needs many items to make his labor more productive. Most of his needs have been available at the local or nearby bazaars and special shops. Until now, the agricultural business sector has operated largely within the subsistence type of farming. Needs are vastly different in the present developing economy. The Government has courageously accepted the responsibilities for these new needs. It needs help. The private sector should be allowed and encouraged to take the lead in merchandizing fertilizer, seed, insecticides, pumps, tools, repairs, and many other items.

1. Potentials of the Private Sector

The Government has repeatedly stressed that it has insufficient manpower, financing, and technical skills to do all of the work that needs to be done. It must find ways to utilize other sources within the economy to help in the process. It must find ways to provide incentives to businessmen to assume a major part of the commercial aspects of farming under conditions which provide the farmer the right to bargain for these inputs at a fair price. Systems within present

law, or new legislation, to liberalize licensing, imports, distribution, and processing and to encourage operators of small businesses by favorable taxation should be developed.

The new and more sophisticated inputs will require that dealers and distributors be given technical advice and training. This is a duty of the Government through its extension and educational facilities. A trained group of fertilizer distributors should, in turn, assist the extension service in accomplishing its goals.

A study is being made by Dr. N. K. Whittlesey on marketing of agricultural inputs. The objectives of this study are to investigate and describe the commercial marketing system of Afghanistan as it pertains to agriculture. This, when completed, will be invaluable as a basis upon which the problems of agri-business can be judged. Problems of importance include credit, taxes, licenses, sources of goods, transportation, inventories, pricing, distribution, trade agreements, foreign exchange, "baksheesh", and supervision. Obviously, the interrelationships are complex. Nevertheless, there is a private-sector marketing system in operation now. Its enhancement and direction to serve agriculture in new ways is urgent.

Distribution of large tonnages of imported fertilizer and the out-put of the new urea plant near Mazar could well become a model program to utilize the private sector in fertilizer merchandizing. Custom plowing, harvesting, and threshing by improved machinery are other examples wherein the use of private and group investment can help mobilize Afghanistan's accelerated wheat program. Self-help cooperative action by farmers with some government aid can lead to improved irrigation water diversion, canal maintenance, and water distribution systems. Grain storage is another area of activity for the private sector whereby a useful service to the country could be performed, and large savings made by prevention of storage losses through proper housing and insect control.

A seed industry developed under adequate rules and standards could assist the Government in the production of improved wheat seed and other seeds needed in the country. Seed-minded farmers would do well to organize a seed improvement association and associated marketing service in each of the Provinces. The farmers of Afghanistan badly need simple seed drills. These could be manufactured in the country by local artisans or manufactured centrally and merchandized by private dealers. These opportunities are merely suggestive, but they show that a wide range of activities might be assumed by the private sector in the interest of the wheat economy and total development of the country.

2. Cooperatives

Formal cooperatives as used in the West do not appear to exist in Afghanistan to any great extent. However, because of their potential for mobilizing local leadership and energies at little cost to the government, they should be encouraged. In the section on "Extension," the possibility is shown of using "Village Improvement Councils" to assist extension development. These councils could eventually grow into fullfledged cooperatives, given the proper encouragement and leadership.

Similarly in the section "Power, Tools, and Machinery," cooperative ownership of tractors and equipment by several farmers is encouraged. It is conceivable that modest efforts in this direction could lead to full cooperative development.

Most successful cooperatives start after farmers become fully aware of problems that need solving. When they become desperate enough, or at least willing, they will give up some of their independence in favor of joint action. At the same time, many cooperatives start with full promise, only to flounder on the rock of mutual distrust. Thus, to be successful, rural cooperatives must meet the fully expressed needs of farmers and be founded on mutual trust. A comprehensive program of education as to organization, function and potential benefit of cooperative action as well as membership responsibilities, must be conducted if cooperatives are to be successful.

3. Recommendations

(1) It is recommended that the stated goal of the Afghan Third Five-Year Plan to expand the private sector be implemented by a favorable attitude among administrators and by formulating policies whereby agri-business can develop.

(2) It is recommended that the Government seek ways to turn over to the private sector, the merchandizing and distribution of fertilizer, seeds, machinery, pesticides, storage and other such large new inputs to agriculture.

(3) Establish a seed production system in the private sector. This would include private production and merchandizing of seed as well as seed for use by the Government.

(4) Encouragement and assistance should be given in the development of groups of farmers under some kind of cooperative plan for joint marketing of produce and purchase of needed supplies. Attention should be given to mutual benefits based on sound business policies. Leadership should be developed whereby these groups may eventually grow into full cooperatives.

APPENDICES

- A. Chronological Summary of Team's Schedule**
- B. Map of Inspection Route**
- C. Bibliography**

Appendix A

Summary of Schedule

- June 18 The Team, except for Mr. Carlson and Mr. McMinimy, arrived from Tehran. The afternoon was spent in discussions with Mr. J. B. Davis, Mr. C. B. Allen, Dr. Staker, Dr. Rice, Dr. Owens, Mr. Caudill and Mr. Urano of the USAID/Afghanistan Agricultural staff regarding the information resources available and the methodology to be used by the Team.
- June 19 The Team inspected the National Agriculture Research Center, Darul Aman, and the Chardek rural area, accompanied by representatives of the Afghanistan Government. It conferred with Ambassador Robert G. Neumann, and met with USAID representatives to review its schedule.
- June 20 The Team and Mr. Davis met with Mr. R. S. McClure, USAID/Afghanistan Mission Director and Dr. R. G. Neumann, U. S. Ambassador to Afghanistan.
- Mr. McClure and the Team called on Acting Prime Minister, H. E. Minister Without Portfolio, Mr. Abdullah Yaftali. The Team conferred with Mr. McClure, Mr. Robert Hubbell, USAID Deputy Mission Director, Mr. Davis and Mr. Urano.
- The Team was briefed on the USAID program by Mr. John Kean, Assistant Director for Program Development and Program Office Staff, USAID.
- The Team discussed wheat technology and irrigation with Mr. Davis, Mr. Urano, Mr. Blair Allen, Chief of Crop Improvement Branch, Dr. Ernest Staker, Agronomy Advisor (Research), Dr. Edward Waldee, Agriculture Research Advisor and Mr. Joseph Miller, Water Resources Engineer of USAID/Afghanistan.
- June 21 Mr. McMinimy arrived in Kabul. The Team and Mr. Davis was briefed on agriculture and irrigation by H. E. The Deputy Minister

of Irrigation (Acting Minister of Agriculture and Irrigation), Mr. Yasim Mayel and other members of MA&I staff including: President of Planning, Mr. Abdul Majid; President of Research and Extension, Mr. Abdul Ghafoor; President of Irrigation and Engineering, Dr. Tayeb Baqaie; Director General of Statistics, Mod'd Mohammad; Director General of Irrigation, Mr. Ghulam Sham; Director of Cereal Crop Breeding and Production, Mr. Mohammad Aref Noori.

Mr. Davis, Mr. Kean and Mr. Urano and the Team conferred with H. E. Minister of Planning, Dr. A. H. Ziayee and Deputy Minister Haider.

The Team, accompanied by Mr. Davis, Mr. Kean and Mr. Urano, conferred with H. E. Minister of Finance, Mr. A. H. Hakimi.

June 22 The Team met with USAID Industries Division; Mr. George Diehl, Chief; Mr. Winstanley Briggs, Mr. Albert Feldman and Mr. Howard Nyberg of the Thomas H. Miner and Associates and Mr. A. G. Redja, President of Afghan Karakul Institute.

The Team, accompanied by Mr. Diehl, called on H. E. Minister of Commerce, Dr. Nour Ali.

The Team conferred with the Robert Nathan Associates, Dr. Glenn Craig, Team Chief, and Dr. Glen Parker.

The Team met with members of the University of Wyoming Team at the University of Kabul, College of Agriculture, headed by Dr. R. Harlan, Acting Team Chief, and later visited the Faculty of Agriculture Farm at Darul Aman, accompanied by Dr. Harlan and Mr. John First also of the Wyoming Team.

June 23 Individual Conferences and free time.

June 24 The Team inspected the Panjar River diversion works, main canal and the irrigated farming under the Kohestan Project, a canal rehabilitation project of the Ministry of Agriculture and Irrigation. Farm demonstrations on wheat and fertilizer and micro plots were visited enroute.

June 25 Mr. Carlson arrived in Kabul. The Team discussed a plan of approach for its analysis and developed an outline for its report.

The Team called on H. E. Minister of Agriculture and Irrigation, Engineer Mir Mohammad Akbar Reza and his staff and discussed agricultural plans in considerable detail. Position topics for study and development were assigned to Team members.

Individual conferences were held by various Team members.

June 26 Reading and individual conferences.

June 27 Except for Mr. Aspelin, the Team travelled from Kabul to Bost accompanied by H. E. Governor M. Safi, H. E. Senator Abdul Wakil and other officials inspecting Kajaki reservoir and Helmand and Arghandab River Valley areas by air.

The Team conferred with H. E. Governor of Helmand Province and General President of Helmand Arghandab Valley Authority (HAVA); Mr. Mohammad Hashim Safi and staff.

The Team continued discussions with the Governor's staff and with Dr. Raymond Moyer, Assistant Director for AID/Helmand Arghandab Valley Region; and staff members.

The Team visited Bolan Research station and took a short trip down the Shamalon Canal to observe farming practices.

June 28 By air Bost to Kandahar overflying Arghandab Reservoir and the Arghandab River watershed.

The Team lunched and conferred with H. E. Governor of Kandahar Province; Dr. Mohammad Anas and staff.

The Team visited the Arghandab Valley area, accompanied by Mr. Ali Kharzi, Regional Director General of Agriculture; and Mr. Ahmaddin, Chief of HAVA District Agriculture and visited Kokoran and Dund Stations.

June 29 Mr. McMinimy and Mr. Carlson returned to Kabul by auto. The remainder of the Team travelled by air to Herat inspecting the watersheds of the Farah Rud and Hari Rud enroute. Upon arrival the Team conferred with H. E. Governor of Herat Province; Mr. Mohammad Saddiq and his staff and MA&I officials.

The Team visited a rug factory accompanied by H. E. The Governor, and visited the flood overpass structure on Jui Injeel Canal and the Urdu Khan Regional Experiment Station.

June 30 Visited in Herat. Lunch with M. E. M. Saddiq.

July 1 The Team proceeded by air via the Murghab watershed, Belchirag, Marmana and Andkhui to Mazar-i-Sharif where they conferred with H. E. Governor of Balkh Province, Dr. Mohammad Nasir Keshwarz and staff and visited the Regional Experiment Station and the USSR-assisted Tractor/Machinery Assembling/Repairing and Instructional Center.

The Team, accompanied by the Governor, visited the diversion of the upper right bank canal on the Balkh River where the farmers were cleaning out the intake, and the site of the new fertilizer factory being constructed with USSR assistance.

July 2 The Team travelled by air to Kabul via Kunduz.

Individual work and conferences.

July 3 The Team left Kabul by auto to go to Jalalabad. The Tangi Garu Gauging Station was inspected. The balance of the trip was cancelled due to a road washout in the lower Kabul River Gorge.

Individual conferences and writing report.

July 4 Individual conferences and writing report.

July 5-7 Reading, individual conferences and writing report.

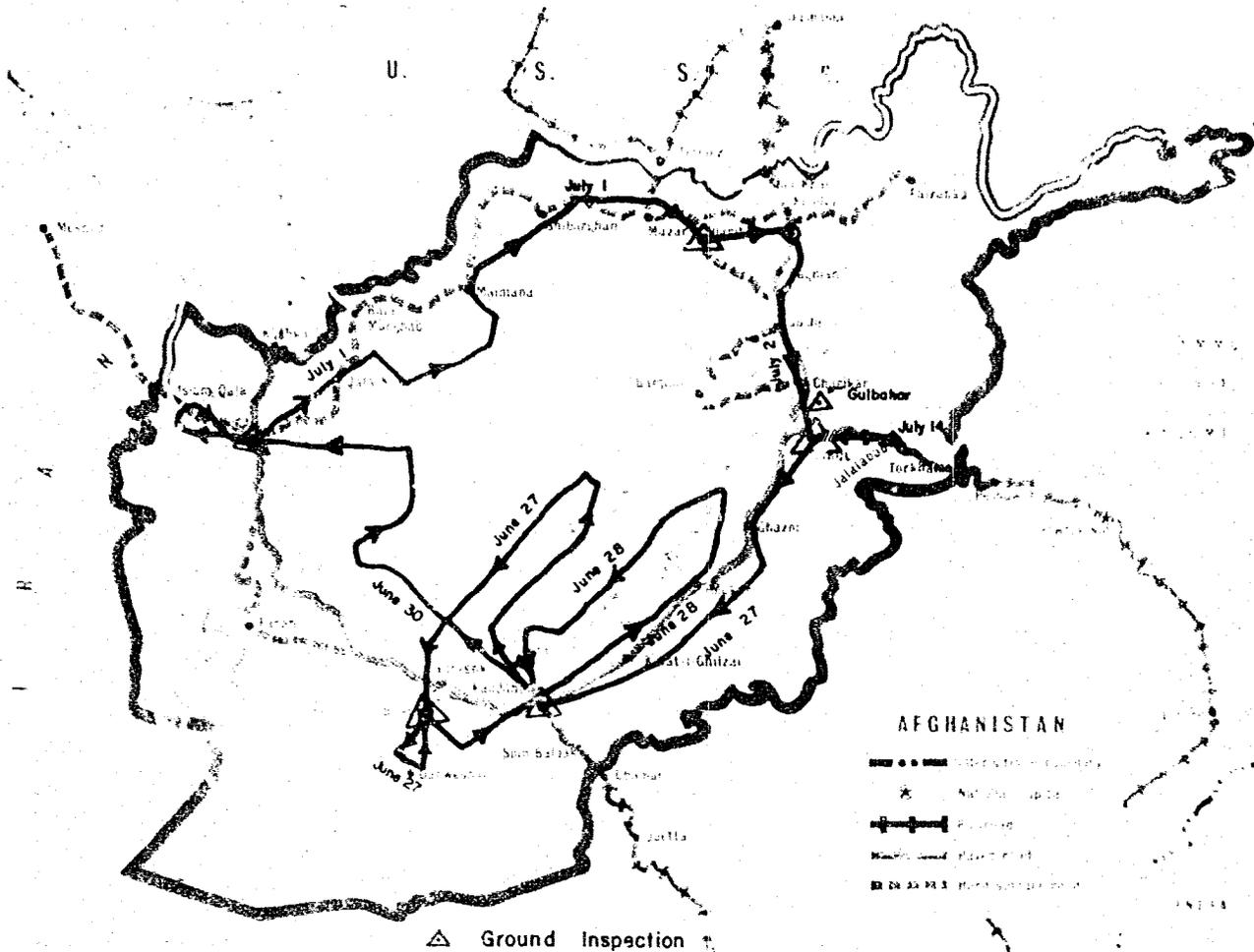
July 8 Writing report. The Team discussed its findings and recommendations with Mr. Davis and Mr. Allen of the USAID staff.

July 10 The Team presented a summary of findings and recommendations to Director McClure and Ambassador Neumann.

- July 11 The Team continued to work on writing and producing the report, made changes and amendments and continued writing assignments. A summary of the report was presented to the Minister of Agriculture and Irrigation, by Dr. Peterson accompanied by Mr. Davis; and to H. E. Prime Minister Maiwandwal by Dr. Peterson accompanied by Director McClure and Ambassador Neumann. The Team continued to work on production of the report.
- July 12 The Team completed the first mimeographed draft of report. The Team was received by His Majesty Mohammad Zahir Shah and summarized its report for him.
- July 13 The Team met with H. E. Minister of Agriculture and Irrigation, Engineer Mir Mohammad Akbar Reza; H. E. Deputy Minister of Agriculture, Dr. Eshan Rafiq; H. E. Deputy Minister of Irrigation, Mr. Yasim Mayel; President of Research and Extension, Mr. Abdul Ghafoor and AID Chief of Agriculture, Mr. J. B. Davis in the Ministry of Agriculture and Irrigation.
- Continued work on report.
- July 14 William Carlson, Arnold Aspelin and Clyde Adams visited Jalalabad by auto and in company with Mr. Ernest Mortenson, Mr. William Harris and Mr. Sahibdad, Agricultural Advisor and Extension Advisor, USAID; and Director of the Shisham Bagh Regional Experiment Station, respectively, visiting parts of the Nangarhar project and observing agriculture in the area. The remainder of Team made final revisions in the draft report. The master copy was left with USAID/A. A second master copy and mimeographed copies of the revised report were prepared for transmittal to the Department of State, AID and USDA.
- July 15 The Team met with H. E. the Minister of Planning, Dr. Abdul Hakim Ziayee and H. E. the Deputy Minister of Planning, Mr. Abdul Wahab Haider; H. E. the Minister of Finance, Mr. Abdul Karim Hakimi; H. E. the Minister of Commerce, Dr. Nour Ali.
- Mr. Adams departed Kabul.
- July 16 The remainder of the Team departed Kabul.

Appendix B

Map of Inspection Route



The above map depicts the aerial and road surveys to agricultural sites made by the U.S. Agriculture Review Team during its visit to Afghanistan.

Appendix C

Bibliography

- Agricultural Information on Helmand Arghandab Valley. Mimeo 5 pages, June 27, 1967.
- Allanson, G. 1967. The Place of Cotton and Beet Sugar in the Afghan Economy. Processed unnumbered report. Six chapters and appendices.
- Baker, Burton A. (Editor) 1964. Public Administration: A Key to Development. The Graduate School, U.S. Department of Agriculture, Washington, D. C. 66 pages.
- Brown, Davis S. The Key to Self Help: Improving the Administrative Capabilities of the Aid-Receiving Countries. Public Administrative Review, June 1964.
- Burkhead, Jesse. 1956. Government Budgeting. John Wiley and Sons, New York.
- Food and Agriculture Organization of the United Nations. 1965. Survey of Land and Water Resources. Afghanistan General Report. Rome.
- Givens, Meredith, B. 1967. Human Resources Development and Manpower Utilization in Afghanistan. (Mimeograph). A report submitted to USAID/Kabul by the author.
- Griffiths, John C. 1967. Afghanistan. Frederick A. Praeger, 179 pages. New York.
- Gul, Azam and Lloyd Pickett. 1966. An Agronomic Survey in Six Eastern Provinces of Afghanistan. Faculty of Agriculture Kabul University. Mimeo., unnumbered publication - 82 pages.
- Hapgood, David (Editor) reprinted 1965. Policies for Promoting Agricultural Development. Massachusetts Institute of Technology, Cambridge Massachusetts. Processed Report C/65-3.
- Kapp, K. William. Economic Development, National Planning and Public Administration, Kyklos, Vol. 13, 1960.

- Kriesberg, Martin (editor) 1965. Public Administration in Developing Countries. Proceedings of an international conference held in Bogota, Columbia, 1963. The Brookings Institution, Washington, D.C.
- Miller, Joseph. 1967. Completion Report Overflow Wasteway, Herat, Afghanistan. USAID, Afghanistan.
- Ministry of Planning. Second Five-Year Plan 1341-45 (March 1962-March 1967). Kabul, Afghanistan - 1342. 100 pages.
- Ministry of Planning. Survey of Progress. Kabul, Afghanistan. 1960 (215 pages and appendix); 1961-62 (Part I, 81 pages and Part II 51 pages); 1963-64 (152 pages); 1966 (91 pages and appendix).
- Ministry of Planning. Third Five-Year Plan of the Economic and Social Development of Afghanistan. Kabul, Afghanistan - (1967?) Processed.
- Pickett, Lloyd, H. A. Naitaqi, John First, G. A. Nielsen. 1967. Influence of Three Mechanization Schemes Upon Wheat Yields. Technical Bulletin 3, Faculty of Agriculture, Kabul University. 9 pages.
- Pickett, Lloyd and Lee Fabricius. 1967. Seeding Rates and Row Spacings on Wheat in Afghanistan. Technical Bulletin 2 Faculty of Agriculture, Kabul University. 18 pages.
- Public Administration Service, USAID 1962, Modernizing Government Budget Administration. Chicago.
- Robert R. Nathan Associates, Inc. 1965. Agricultural Development in Afghanistan. Kabul, Afghanistan.
- Royal Government of Afghanistan. 1966. Special Fund Proposal for Integrated Water management Department including Water Legislation and Training of Required Personnel.
- Selected unpublished papers and reports of USAID/Kabul, the Ministries of the Afghanistan Government, and others, were used as background material.
- Staker, E. V. 1967. Afghanistan Wheat Yield Data. USAID/Kabul. Processed 44 pages.
- Stevens, I. M. and K. Tarzi. 1965. Economics of Agricultural Production in Helmand Valley. U. S. Department of Interior, Denver, Colorado. 101 pages.
- Swerdlow, Irving (Editor) 1963. Development Administration: Concepts and Problems. Syracuse University Press.

The Brookings Institution, Washington, D.C. 1965. Symposium on Research Needs Regarding the Development of Administrative Capabilities in Emerging Countries.

The White House. 1967. The World Food Problem. Vol. I. A report of the Panel on the World Food Supply. 127 pages. U. S. Government Printing Office, Washington, D.C.

United Nations, Department of Economic and Social Affairs, ST/TAO/M/16 New York, 1961. A Handbook of Administration: Current Concept and Practice with Special Reference to Developing Countries.

U.S.A.I.D./Afghanistan Country Assistance Program (CAP). September 1966.

United States Bureau of Reclamation. 1966. Draft Feasibility Report. West Shamalan Division, Shamalan Unit. Helmand Valley Development Project, Afghanistan.

U.S. Bureau of Reclamation. 1967. Helmand Valley Development Project. Appendix A, Agricultural Economics, Bost, Afghanistan. 27 pages and 31 tables.

United States Department of Agriculture 1964. Public Administration in Agricultural Development, a summary report. Washington, D.C.

U.S. Geological Survey. 1967. A Proposed Sediment Data Collection Program for Afghanistan. Prepared by the U.S. Geological Survey in cooperation with the United States Agency for International Development. Administrative Report. Kabul, Afghanistan.

U.S. Geological Survey. 1967. Reconnaissance Sediment Survey of Kajakai and Arghandab Reservoirs.

Waldee, E. L. 1967. Afghanistan Wheat Yield Comparisons, Kabul Area, 1955-64. USAID/Kabul. Processed, 12 pages.

Waterson, Albert. 1965. Development Planning: Lessons of Experience. The John Hopkins Press, Baltimore, Maryland.

Weidner Edward, 1964. Technical Assistance in Public Administration Overseas. Chicago University Press.

Westfall, A. O. and V. J. Latkovich. 1967. A Surface Water Resources Investigation Plan for Afghanistan. U.S. Geological Survey. In press. Prepared in cooperation with the Water and Soil Survey Department of the Ministry of Agriculture and Irrigation, Royal Government of Afghanistan, and United States Agency for International Development.

Yaftali, Abcullah. Planning Machinery in Afghanistan. UN Conference on the Application of Science and Technology for the benefit of the Less Developed Areas. E/CONF. 39/H/40. October 22, 1962.