

HELMAND-ARGHANDAB VALLEY

Yesterday, Today, Tomorrow

by

MILDRED CAUDILL

Lashkar Gah, Afghanistan

1969

UNITED STATES OF AMERICA
AGENCY FOR INTERNATIONAL DEVELOPMENT

KABUL, AFGHANISTAN

هيئت انكشاف بين المملی اضلاع مسجده امریکا
کابل افغانستان

OFFICE OF THE DIRECTOR

دفتر رئیس

FOREWORD

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The research, writing, reviewing, and revision have taken over a year, and I believe the result is well worth the considerable efforts of all who have contributed.

By far the greatest credit goes to Mrs. Caudill who did most of the research, all of the writing, and many of the revisions which resulted in the present text. I especially appreciate the fact that she did all of her work without any compensation other than the personal satisfaction of doing well something that needed to be done. Mrs. Caudill deserves the highest commendation for her perceptivity, her diligence, and her writing skill.



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I. An Introduction to Regional Development in the Helmand-Arghandab Valley

Continuing efforts by the Helmand-Arghandab Valley Authority of the Royal Government of Afghanistan to rehabilitate ancient irrigated areas and modernize the Valley's agriculture hold encouraging promise.

The long range program will ultimately develop a gross irrigated area estimated at 363,000 acres. This includes land of varying classification and quality in most regions now receiving a full or partial water supply.

Approximately 300,000 of these acres lie within the Upper Helmand and Arghandab regions. Attention will center here during the years immediately ahead.

In general nature and potential the Helmand-Arghandab Project corresponds to the Salt River Project in Arizona.

Plans for constructing drainage facilities, leveling land and restoring soil fertility are being formulated and are projects of high priority. The goal is full utilization of available water and land resources.

Such a monumental task, requiring continuing work over a period of years, will involve extensive effort, patience and large additional financing before completion and attainment of goals.

Land development in the Helmand Valley, which has been proceeding at a slower rate than originally contemplated, is now gaining momentum. Feasibility studies have been completed in some areas and are continuing in others. The problems of salinization of soil, waterlogging and low crop yields are being studied. Agricultural development is being accelerated and work is under way to improve and expand the supply of electric power.

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II. Afghanistan ... A Part of its Past

The nation of Afghanistan as it is known today was founded in the eighteenth century, less than 30 years before the United States of America were declared independent. However, history was being recorded in this Asian country long before the discovery of America and the new world.

Ancient documents narrating events of 5,000 years ago mention Afghanistan, which was then known as Aryana, a name taken from migrating Aryan tribes of central Asia. In writings of the seventh century A.D., when the teachings of Islam were becoming known, the country was called Khorasan. This is translated "land from which the sun rises."

Because of its geographical position between Iran and India on the overland trade routes, Afghanistan inevitably became the pathway and objective for military attacks by world conquerors. History tells of centuries when a pattern of invasion and conquest, destruction and restoration was repeated again and again.

Only when archaeologists have classified and evaluated the remains of long buried cities and cultures will the full story of this south Asian area be assembled and the continuity of civilization be established. Many unexcavated sites tempt the scholar and stir the imagination of the curious. Their contents perhaps will shed light on the dim, unknown past and answer many questions of the present.

In the Helmand-Arghandab Valley artifacts have been discovered from a highly developed civilization existing thousands of years ago. Mounds at Mundigak, a prehistoric city in Kandahar province, were found to contain 13 layers rising to a height of 97 feet.

A missing link in early history was supplied when a stone slab of the third century B.C. was found in the Arghandab basin in 1958. It bears an edict of the Indian Emperor Ashoka relating to Buddhist practice during his reign. Modern historians accept this as evidence supporting their belief that the Indian kingdom of that date included portions of Aryana and that Buddhism was once the religion of the Arghandab Valley.

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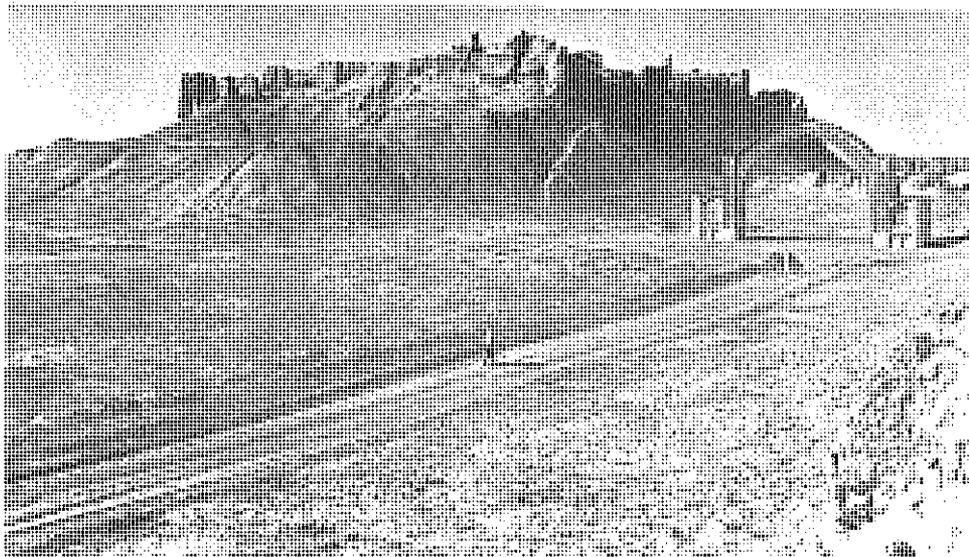
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The climate of the Helmand Valley seems responsible for the position that Lashkar Gah was destined to hold in the history of the tenth century A.D.

During the reign of Sultan Mahmud, when the celebrated Ghaznavid Empire reached the pinnacle of power, the court retinue deserted the cold climate of the capital, Ghazni, to spend the winters at Lashkar Gah.

Sultan Mahmud built a splendid royal palace on the east bank of the Helmand River and conducted here the affairs of state. His soldiers and war elephants defended the fortresses while travel and trade flourished on the Helmand-Arghandab Rivers.

The arch of Qala Bist at the junction of the rivers is the sole structure of this era that remained intact through successive years of invasion and strife. The massive, crumbling walls which line many miles of the river south of Lashkar Gah are today reminders of the glories of the "second capital" of the Ghaznavids. The arch is considered an outstanding example of Islamic design and in 1948 its restoration, to prevent eventual destruction by erosion, was initiated by the Ministry of Education. Representatives of Kabul Museum and the Department for the Preservation of Historical Relics brought members of a French archaeological team to the site. Experts studied the ruins of walls, arches and towers with their



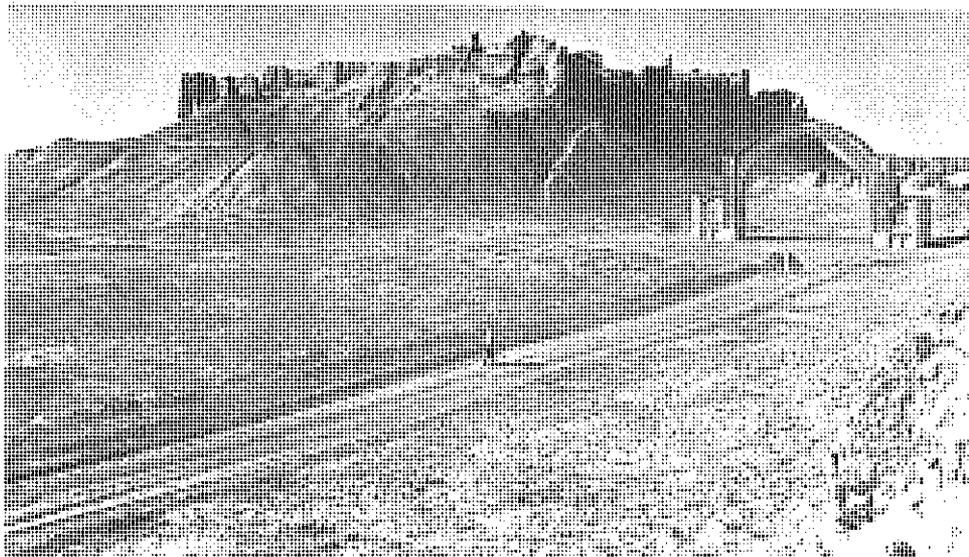
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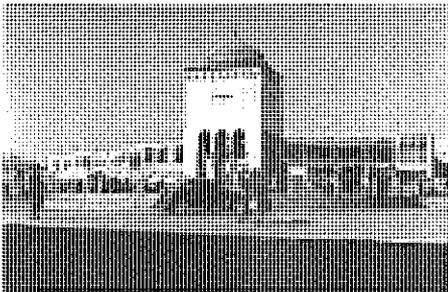
THE ARCH OF QALA BIST

Three wars were fought against the British as the young Afghan nation tried to remove itself from foreign domination and influence. Complete independence was achieved in 1919 but there were periods of conflict as attempts were made to modernize the country. Tribal and traditional ideas and practices did not yield readily to change and there was strong resistance to central government policies.

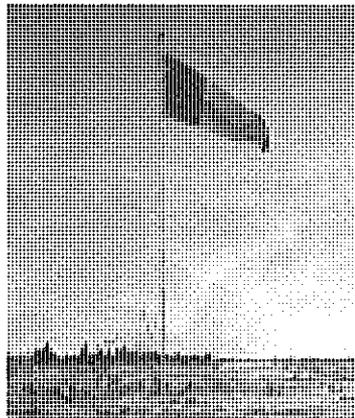
It was only after the present King Zahir Shah ascended to the throne in 1933 that Afghanistan began to emerge as a nation ready to accept a position of responsibility in the world. Profiting by the experience of earlier rulers who had attempted bold changes too quickly, the new King began a program of reform on a modest scale.

A constitution, adopted in 1964, proclaimed that "Afghanistan is a Constitutional Monarchy." It affirmed Islam as the sacred religion of the country; designated Pashto and Dari as the official languages; and adopted the tri-color (black, red and green) flag as the national emblem.

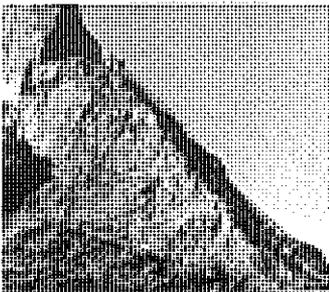
Improvements in agriculture have been considered of prime importance in King Zahir Shah's program, and one of the first major projects was begun in the Helmand-Arghandab Valley.



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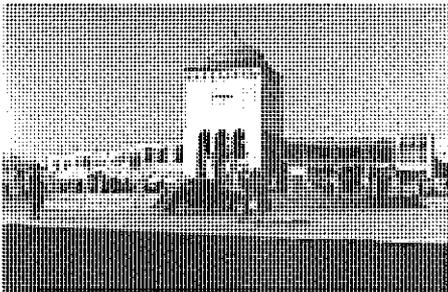
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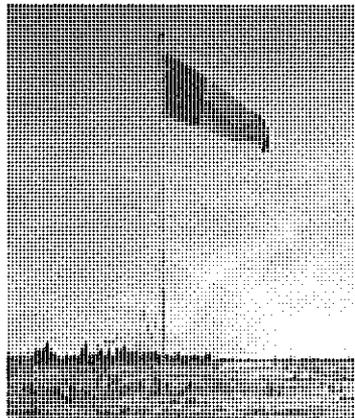
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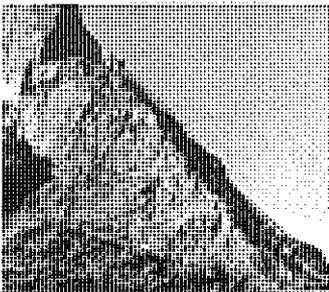
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III. Background: How the Project Began

Initial development of the Helmand Valley Region began 30 years ago when the Royal Government of Afghanistan (RGA), striving to improve agriculture, employed Japanese engineers to rehabilitate the Deh Adam Khan Canal above Girishk.

Through this system water had been diverted from the Helmand River for more than 200 years to irrigate the valley along the west bank. Original plans called for enlargement and realignment of the waterway to better serve existing farms and some additional acres.

Using hand labor almost exclusively, the work had proceeded about 14 kilometers ($8\frac{1}{2}$ miles) by February 1942 when the Japanese were recalled home by the outbreak of World War II.

Afghanistan continued the work with no outside assistance during the next four years, completing another 26 kilometers (15.6 miles) of the canal. Plans were revised during this period to relocate some sections of the channel and establish new points of diversion and intake.

Seeking to expedite the project and obtain technical advice when World War II ended, the RGA negotiated a contract with Morrison-Knudsen, an American construction firm, with funds made available by the U.S. Export-Import Bank.

In 1946 that company established Morrison-Knudsen Afghanistan, Inc. (MKA) to facilitate operations in this country, making regional headquarters in Kandahar. Their mission necessitated building roads, establishing permanent camps and training many Afghan laborers to operate machinery or perform skilled work. The company was awarded additional contracts in 1950 and 1954 which continued actual MKA operations until 1960.

Renewed activity inspired more detailed planning and what had earlier been visualized as modification of only one canal now became a project of regional scope.

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ARGHANDAB RESERVOIR

From Kajakai reservoir water flowing down the Helmand River enters the Boghra Canal at a diversion dam above Girishk. A second canal, the Shamalan, branches from the Boghra about 18 miles downstream. It follows valley alluvial lands on the right bank, providing water for juis that previously took water directly from the river. The Darweshan diversion dam and canal bring water to the left bank along a 30-mile stretch farther downstream.

In the Arghandab valley, South Canal brought the new and more reliable water supply from Arghandab Dam to land around Kandahar. An extension, Tarnak Canal, serves the area south and southeast of the city, near the International Airport.

Under MKA operations, extensive irrigation laterals and drainage systems were constructed in Nad-i-Ali and Marja areas and some major drains were completed for Shamalan and Darweshan.

One of MKA's last jobs in the Helmand Valley was construction of a small hydroelectric plant (about 3,000 KV) on the Boghra Canal about midway between the diversion dam and Girishk. Built in 1959, this plant generates electricity for Girishk, Lashkar Gah and Chah-i-Anjirs.

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ACU, which since 1953 had been a division of HAVA, was later designated Helmand-Arghandab Construction Unit (HACU) and made a separate enterprise. MKA technicians and machinery were originally used to staff and equip the organization, but in recent years the Construction Unit has been developing its capabilities independently, with the support of HAVA. HACU is now responsible for all major HAVA construction programs. In addition to leveling agricultural lands and supplying irrigation or drainage canals, roads and bridges have been built and domestic water and sewer systems developed for Lashkar Gah. The unit maintains its own major construction and transportation equipment.

Efforts to develop the valley economy have been hampered because most units of the irrigation system were only partially complete when MKA departed.

The task of following original project plans while coping with new problems has been difficult but the experience has been valuable. More certain knowledge of agricultural requirements of the area is now available and guidelines have been established for the future.



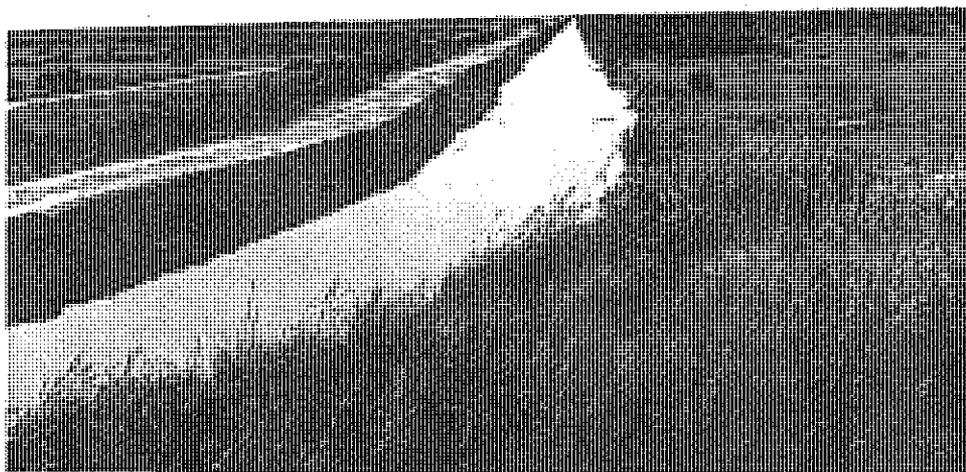
NAD-I-ALI AREA drain and wasteway illustrates the need of such facilities to prevent waterlogging of farm lands.

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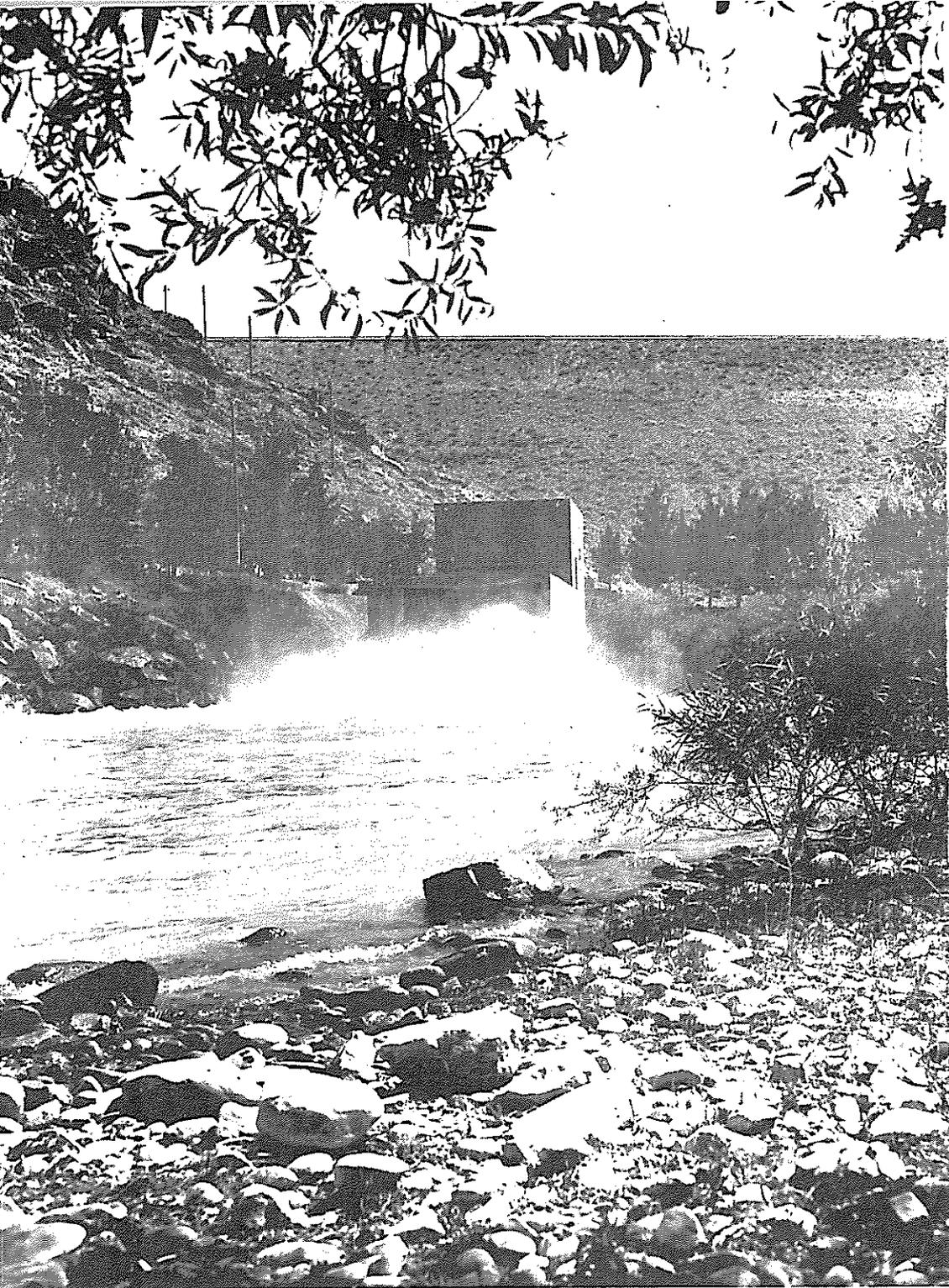
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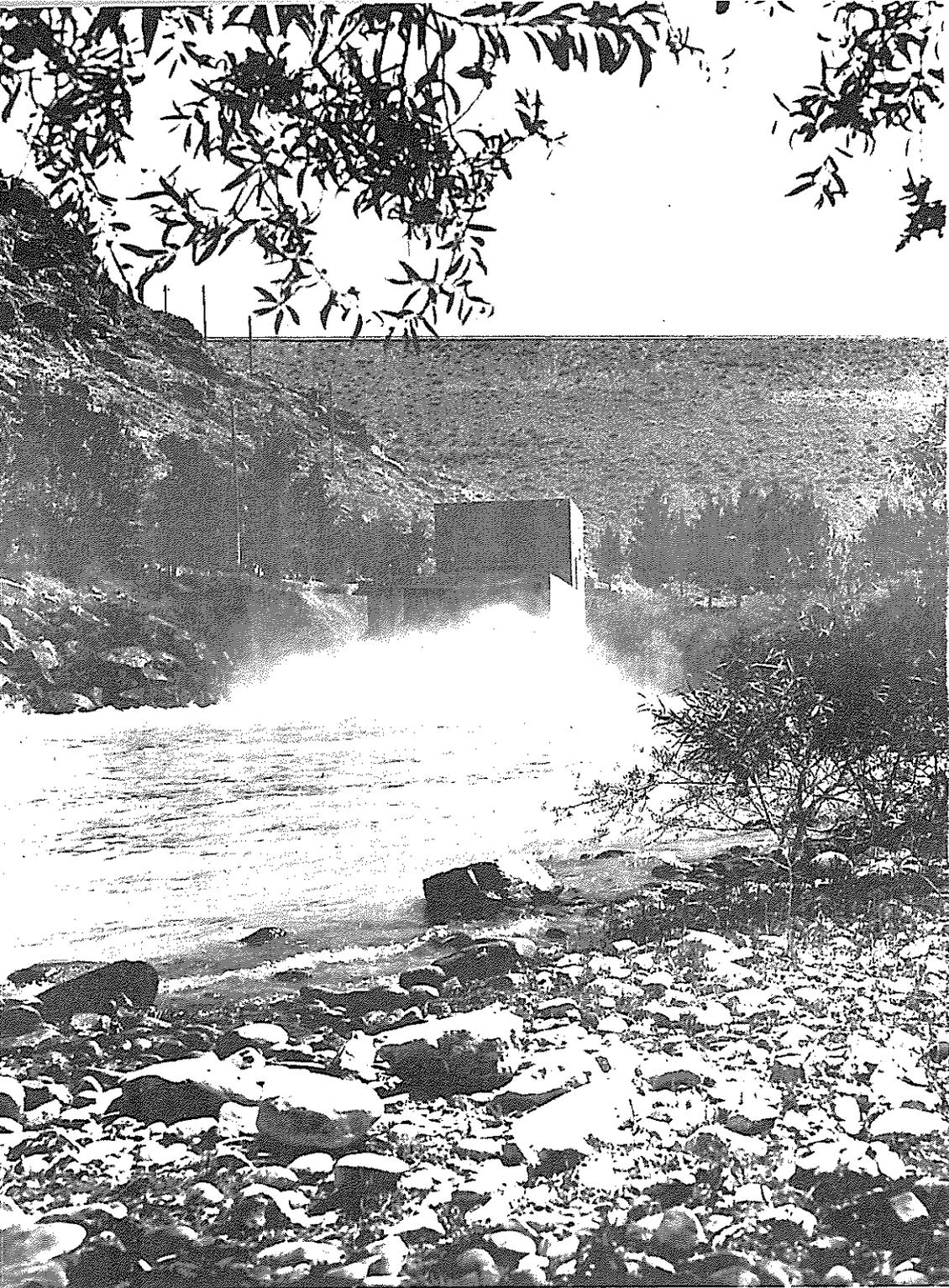
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IV. Costs and Calculations

The construction of dams on the Helmand and Arghandab Rivers and continuing development of the irrigation systems necessary for modern agriculture have required vast sums of money.

The RGA estimates that more than \$100 million from its own resources and foreign loan funds have been invested in building the basic infrastructure of the water and potential power system. Economic and technical aid from other nations has played an important role in achievements of recent years.

The RGA relied upon its own financial resources in developing the Helmand Valley until 1949-50 when it applied for and received the first of two loans from the United States Export-Import Bank. A second loan, granted by the Export-Import Bank in 1953, boosted the total amount loaned to \$39.5 million.

Altogether, the United States has made \$73.4 million available for projects in the Valley. New loans totaling \$16.6 million were approved in mid-1967 for equipment and personnel services to assist the HAVA land development program and for expansion of electric power.

While not specifically Helmand-Arghandab Valley projects, U.S. assistance in establishing or improving transportation facilities has been important in the Valley's economic progress. Both surface and air routes have realized substantial benefits from this portion of U.S. assistance to Afghanistan.

Kandahar International Airport, one of the country's most important installations, was completed in 1962 with \$14.6 million of U.S. aid. Another \$53 million of U.S. funds provided a paved road from Kandahar to Kabul which was dedicated in 1966.

As early as 1960 the United States had supplied about 65 miles of asphalt surfacing at a cost of \$2 million for improving the road from Kandahar to Spin-Baldak near the border of Pakistan. This gave Afghanistan all-weather access to a railroad leading to the port of Karachi so that fruit, wool and other commodities could reach distant markets. It also provided the highway on which imported construction equipment and other supplies move into the Valley.

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V. Agricultural Awakening

The Past

Farming has always been a simple operation in the Valley with methods and equipment virtually unchanged from one generation to another. A man, therefore, needed only primitive implements and a work animal or two to earn his livelihood from the land.

A metal-pointed stick plow drawn by oxen turned the soil. Land leveling was done with a shovel, or a board called a Racol which was pulled by oxen moved the soil from high to low places. To smooth contours, the farmer stood on logs joined in "T" formation and drove his oxen across the field.

Wheat seed, scattered by hand, was covered by again plowing the field. There was little weeding or cultivation. Only scant amounts of fertilizer were used, but farmers learned the value of organic materials for enriching the ground. The practice of bringing soil from old ditch banks for distribution in fields, orchards or vineyards was widely accepted.

After the wheat was sown and covered, a shovel-and-rope implement handled by two men constructed borders around basins to facilitate irrigation. Harvests were gathered by hand sickle and threshed by the trampling hooves of donkeys or oxen. Grain was cleaned on a windy day when it was tossed up into the air by wooden forks.

Farms of 12 to 18 acres, which were common, produced only enough food for the farmer's family. Owners of larger acreages, who had tenants making their living from the land, usually sold some surplus products. Cash crops, transported in primitive containers to market by camels or donkeys, suffered heavy tolls in perishable vegetables or fruit. However, farmers of the Kandahar area have always realized substantial profits from the sale of pomegranates, grapes and raisins to Pakistan and India. In recent years, trucks have carried these seasonal products across the new, improved highways to distant markets.

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HAVA has therefore set as basic agricultural goals: (1) Improved Yields of wheat and corn, helping to meet national self-sufficiency goals; and (2) Increased Production of agro-industrial products, promising good economic returns as well as earning or saving foreign exchange.

Greater production on private or individual farms has been deemed preferable by the Government to the alternative solution -- "large state mechanical farms and livestock centers." In a recent publication, in support of the Government position, HAVA expresses the desire to "promote the economic, social and living levels of the people of this area."

The land development program and plans for completion of the irrigation system have been outlined. Once these objectives are accomplished, HAVA believes agriculture can be modernized through: (1) use of improved seed and fertilizers; (2) better cultural practices and irrigation methods; (3) pest and weed controls; (4) agricultural credit for farmers, and finally, (5) cooperative marketing efforts. Preliminary planning for all these programs is being carried out in HAVA's Agricultural Department with USAID technical assistance.



FIELDS AND ORCHARDS near Kandahar form neat patterns to the east of the mountain of the Forty Steps.

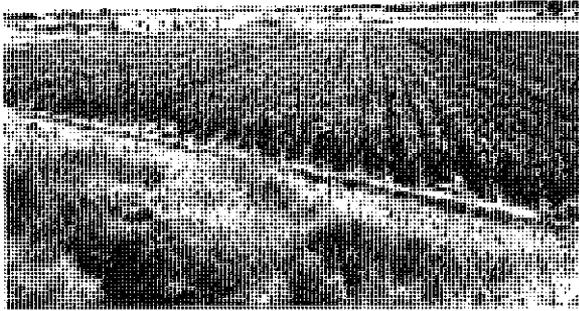
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Specialists from the HAVA Livestock Division strive to improve the quality of cattle, sheep and poultry. This division conducts research on feeds and their effect on milk, meat and egg production. Brown Swiss cattle have been imported as breeding stock and a strain of Indian cattle is being tested for adaptability to this climate. Crossing Brown Swiss bulls with native cows has been a popular program, with at least 300 farmers' cows being bred annually. The progeny have produced twice as much milk and the male crosses command premium prices as bullocks. Artificial insemination service is being started soon to make it possible to vastly increase the number of cows that can be bred by the available bulls.

Better strains of sheep are being developed for the production of fine quality wool, especially yarn wool suitable for carpet weaving.

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THE FUTURE

HAVA has laid an excellent agricultural development foundation over the past 15 years, starting virtually from scratch. It has progressed to the stage that ways have been found to dramatically increase yields of the major crops. The Extension Service has trained an effective corps of field workers who have gained the confidence of the farmers. HAVA seed increase programs have produced the new seeds in abundance. In 1968 about 10% of the wheat and 2% of the corn lands of the area were planted with improved seed, using fertilizer and improved methods. During the balance of the current 5-year plan, HAVA hopes to extend this program on its two major food grain crops, to at least half the acreage planted. This should result in rapid increases in total agricultural production of the area.



Helmand Valley farmer describing his success with improved wheat varieties to Minister of Agriculture and Irrigation, Mir Mohammad Akbar Reza, and President of HAVA and Helmand Province governor Mohammad Hashim Safi.

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To take advantage of modern technology, farmers need large additional investments in new inputs such as improved seed, chemical fertilizer, insecticides, mechanized equipment, etc. Most farmers need credit if they are to take full advantage of these new inputs. Therefore, USAID is helping HAVA to start a supervised agricultural credit program which expects to start making low interest loans to farmers before the end of 1969.

More attention is being directed towards cash crops that can earn or save foreign exchange. Increases in oil crop production are planned to supply raw material for Lashkar Gah's new vegetable oil processing factory. Acreage is being expanded in the lucrative horticultural crops such as pomegranates, grapes, apricots, apples, peaches, plums, figs, watermelons, melons, onions, carrots and cucumbers. Research is being carried out constantly to determine feasibility of possible new crops such as sugar beets, jute, guar, peanuts, sunflowers, and soybeans.

Emphasis is currently being placed on more intensive use of available lands of the area. Some land is left idle due to lack of sufficient labor and bullocks to farm it all. Now that there is adequate water available throughout the entire year, double-cropping (summer crops planted after the wheat harvest) is not only possible, but highly encouraged. As more tractors, threshing machines, and other mechanized equipment become available, the acreage of double-cropping should increase rapidly and the acreage of idle land should decrease. Farmers owning tractors and mechanized equipment will be able to plant their crops in a small fraction of the time required with bullocks and traditional implements and should be able to keep their land in crops throughout the year.

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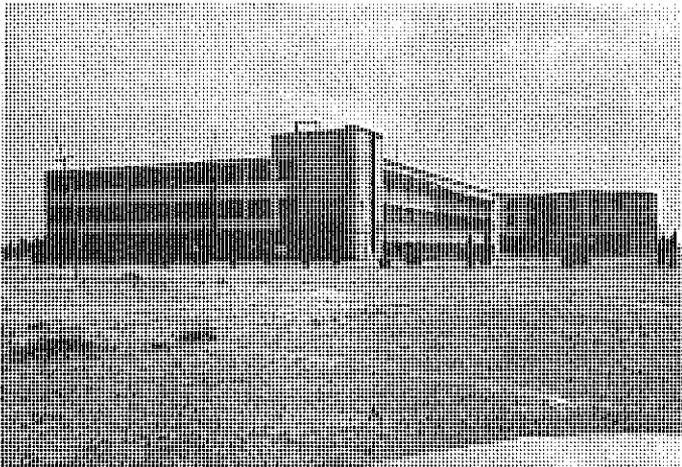




VI. HAVA: Director-Protector

The wide range of responsibilities which HAVA must assume in the Helmand-Arghandab Valley makes this agency virtually the guardian of public interests.

Apart from agriculture, irrigation and land development, HAVA works to expand power and industrial facilities and is accountable for progress in the fields of education and public health.



HAVA HEADQUARTERS in Lashkar Gah.

EDUCATION

The need for improving and expanding the educational system of Afghanistan has been recognized and provided for in each of the Government's Five Year Plans.

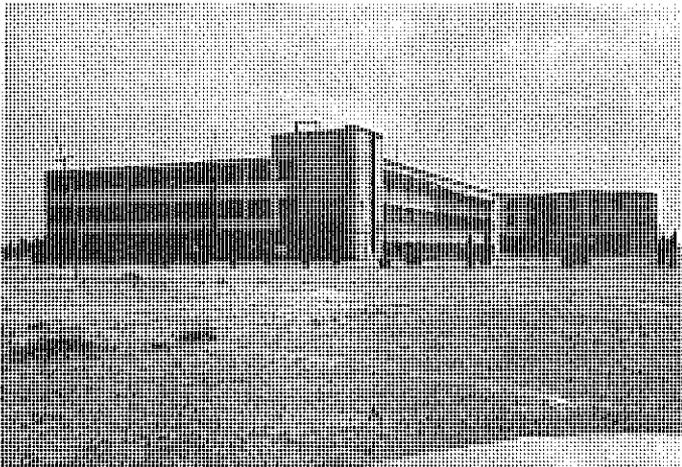
Since 1957, when the first of these plans was inaugurated, many accomplishments have been noted. Shortages of teachers, buildings and materials are serious handicaps but the Ministry of Education estimates that by 1980 65% of the children of Afghanistan's 7-12 age group will be in school.*

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Dormitories were being constructed for 500 students at Lashkar Gah Lycee, a new co-educational institution. Both classroom facilities and dormitories were financed by United States PL 480 Title II funds totaling 15 million Afghanis (approximately \$200,000). In addition to the regular curriculum prescribed by the Ministry of Education in Kabul, this high school offers home-making and child care courses for girls and an agricultural program for boys. Graduates are offered jobs with HAVA or are given the opportunity to study abroad in order to qualify for technical or teaching positions at home.

English, typing, accounting and drafting courses have been made available so that HAVA personnel, already working in various departments, can improve their skills. HAVA officials may also receive secretarial and clerical training.

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More than 300 women have taken advantage of the opportunities offered by this vocational study center. Through a system of community centers being planned by HAVA, this type of education will be extended to village families.

Women attending the Institute learn to sew or weave and can supplement their family income by participating in a crafts program. Here traditional Afghan designs and needlework proficiency combine to create marketable items. Hand-made dolls in Afghan national dress, much admired in the foreign community, assured the financial success of the project. A variety of household and gift articles were later added.

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Opportunities for additional study are available in several fields. More than 300 young men have been trained in Aeronautics under a U.S.-sponsored program, and the Cadastral Survey School (another USAID project) has graduated 400 surveyors. There is a teacher training center, Darul Mu Allamein, and instructors from the Republic of West Germany staff the Kandahar Technical School.

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A safe water supply and sewage disposal system are ranked by HAVA as health needs of the provinces equaling that of improved hospital facilities.

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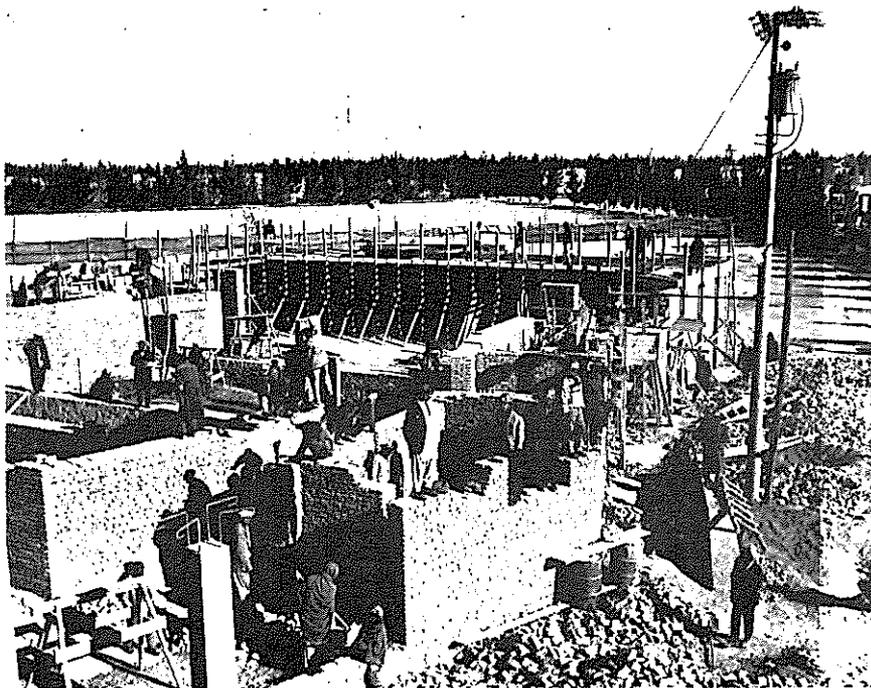
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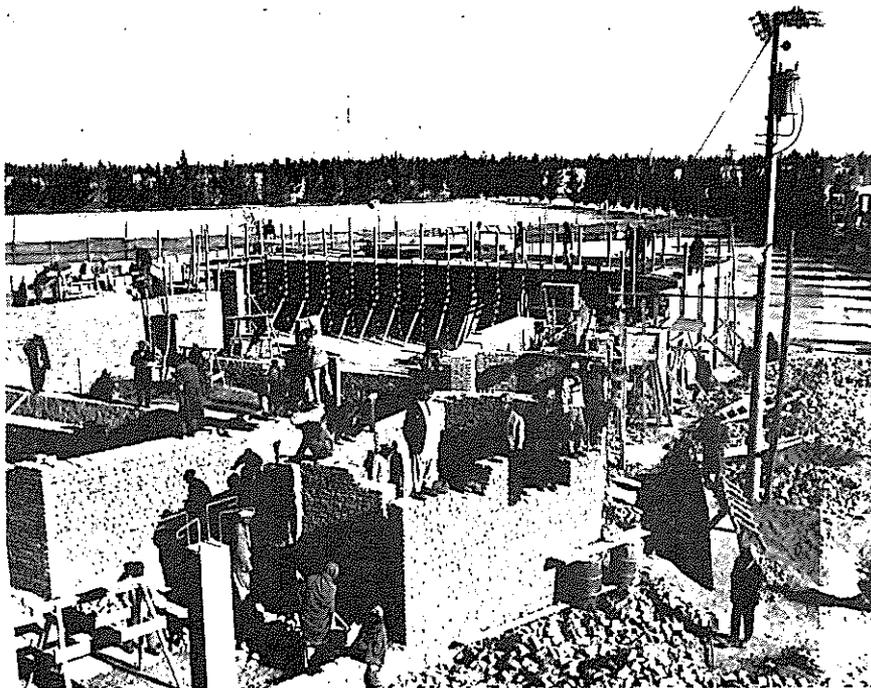
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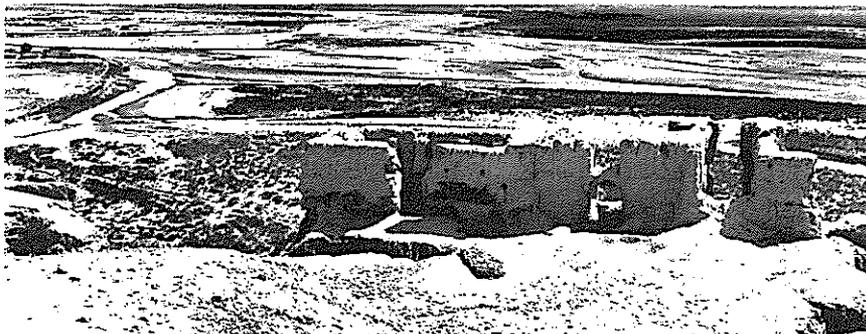


VII. Rivers and Reservoirs

The watershed of the Helmand-Arghandab Rivers and their numerous tributaries occupies nearly half the total area of Afghanistan.

For centuries these rivers have supplied most of the water for irrigating grain and fruit crops and many of the old ditches (juis) are still in use. Farmers also depended on seasonal showers to produce run-off in wide, shallow washes from the bare mountains, irrigating large areas in one sweep. If these were not sufficient, there was the karez or qanat, that ancient and unique system of using ground water. Distinguished on the broad plains by their irregular mounds of earth, some of these systems are still functioning.

The Helmand River, more than 600 miles long, has its source in the Hindu Kush mountains not far west of Kabul where elevations range from 12,000 to more than 20,000 feet. Most of the river water comes from melting snow and descends from the rugged terrain north of Helmand and Kandahar provinces. The river flows 400 miles southwest and drops to an elevation of 2,460 feet at Qala Bist where it is joined by the Arghandab.



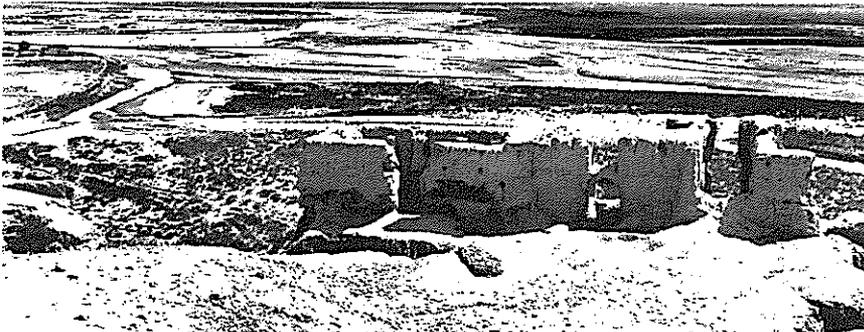
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DONKEYS LOADED WITH CAMEL THORN plod along the Shamalan Canal road.

Wells about 250 feet deep supply potable domestic water for Lashkar Gah. The city of Kandahar depends mainly on water from the Patow Canal and its laterals but in the summer of 1968 began piping drinking water from two wells to streets in the main bazaar. In both provinces, farms and villages obtain water from canals and ditches, so maintenance periods on the irrigation systems must be limited.

Construction of the modern dams on the two rivers has alleviated periodic water shortages which used to occur in summer. It also has controlled, at the other extreme, spring floods which were a hazard each year when rivers, swollen with rain and melting snow, swept tons of debris downstream. Tributaries that are dry most of the year also become raging torrents rushing toward the main rivers during this season.

Kajakai Dam, costing over \$13 million, is constructed in a narrow and steep walled limestone gorge. (Kajakai is translated "small bend and a village of the same name is nearby). The reservoir originally had a capacity of 1.5 million acre feet below the crest of the uncontrolled spillway. According to recent estimates the capacity could be



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Wells about 250 feet deep supply potable domestic water for Lashkar Gah. The city of Kandahar depends mainly on water from the Patow Canal and its laterals but in the summer of 1968 began piping drinking water from two wells to streets in the main bazaar. In both provinces, farms and villages obtain water from canals and ditches, so maintenance periods on the irrigation systems must be limited.

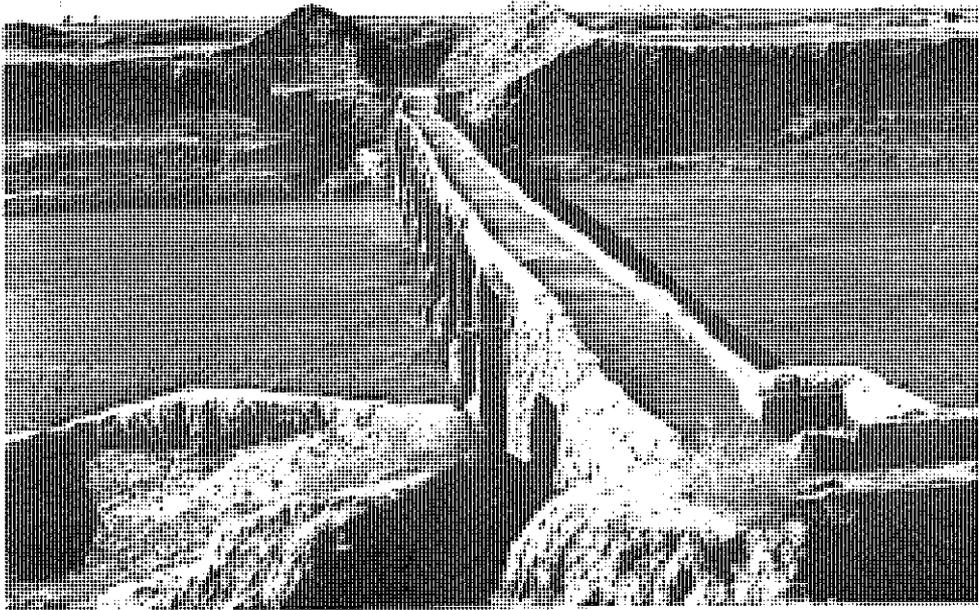
Construction of the modern dams on the two rivers has alleviated periodic water shortages which used to occur in summer. It also has controlled, at the other extreme, spring floods which were a hazard each year when rivers, swollen with rain and melting snow, swept tons of debris downstream. Tributaries that are dry most of the year also become raging torrents rushing toward the main rivers during this season.

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This project was designed to provide irrigation, flood control and a water supply for the Valley and City of Kandahar. Provisions were made for a future hydro-electric power unit, but a shortage of water has delayed such development. While the Arghandab reservoir has added substantially to the region's water supply, it is still considered inadequate and supplemental sources are being sought. Suggested solutions include the development of wells, diversion of water from the Helmand, or a second storage reservoir on the Arghandab River.

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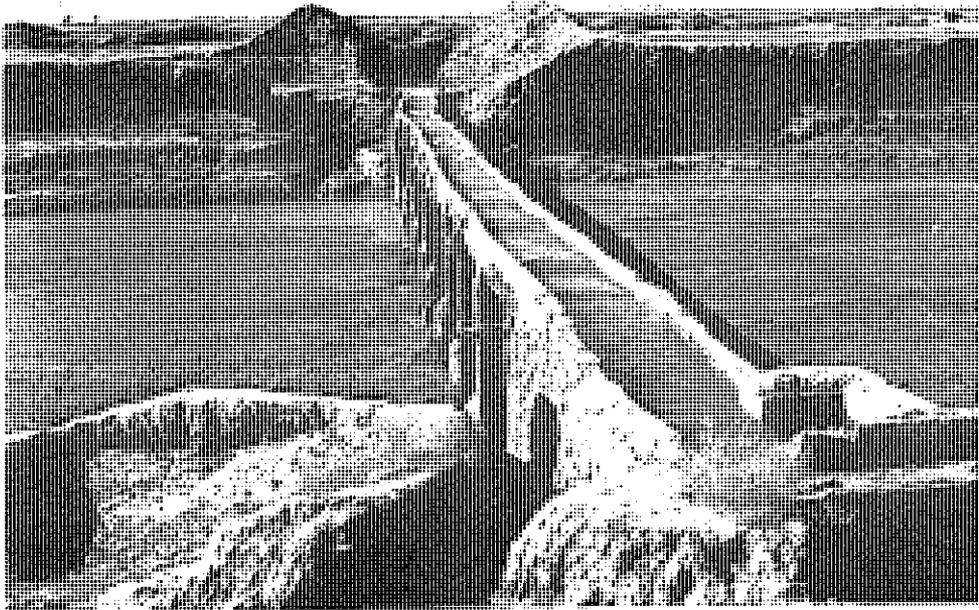


WATER FROM THE ARGHANDAB River is lifted across the Tarnak River in this flume, built and maintained by farmers south of Kandahar.

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VIII. Teams and Technicians

Present United States assistance to Afghanistan is being administered through the Agency for International Development (USAID). Headquarters for the Helmand-Arghandab Valley Region is in the HAVA building in Lashkar Gah. A smaller operating unit is at Kandahar.

Since 1952 the United States has provided \$14.8 million in grants to bring technical knowledge and training to the Valley. This program includes USAID agricultural, education and administrative specialists, and a water resources advisory group from the Bureau of Reclamation. Afghan counterparts who work with these technicians learn the jobs they will later handle alone.

In Lashkar Gah, management improvement and training has been directed by a contract team from J.G. White Engineering Corporation of New York.

Engineers from Harza Company of Chicago and linemen of the National Rural Electrical Cooperative Association (NRECA), working between the Girishk Power Station, Lashkar Gah and Kandahar, are rehabilitating regional electrical distribution systems.

In Kandahar the Cadastral Survey School has been training young Afghan men to make the measurements which will ultimately determine land ownerships and establish a basis for property and water tax systems. A USAID financed contract with the Public Administration Service of Chicago, Ill., a non-profit organization, provided technicians to assist the RGA in this effort, both in an advisory capacity and as instructors. The school and cadastral survey field work have been supported since 1963 by about \$1.5 million in USAID grants and another 18.6 million Afghanis under PL 480 Title II.

Pan American Airways personnel and a Civil Aviation Assistance Group (CAAG) have supplied technical help at Kandahar International Airport. USAID contracts with these agencies have totaled about \$7.5 million.

About 50 American families associated with the USAID program now live in Lashkar Gah or Kandahar. Another 25 unmarried men and women hold administrative or secretarial positions with teams or agencies.

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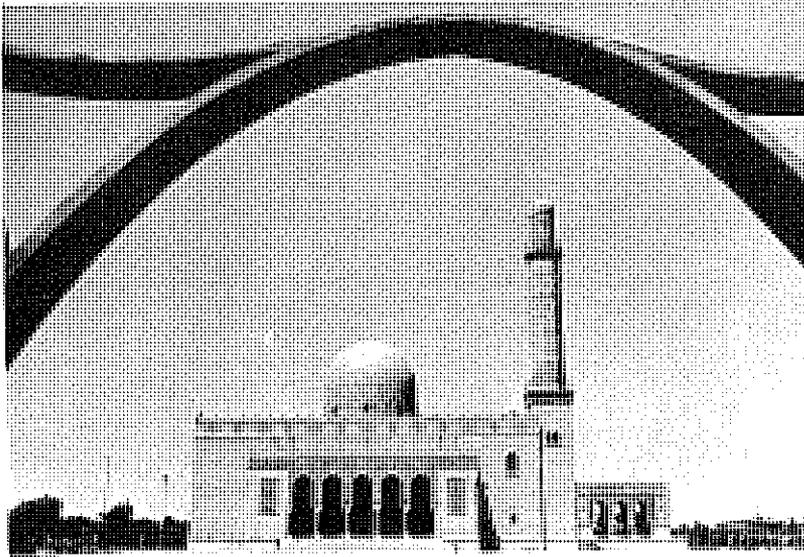
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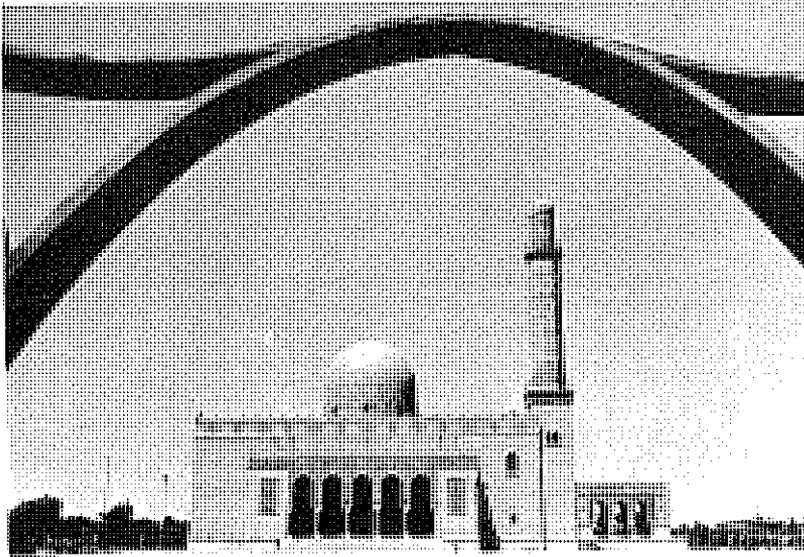
The centrally located Mosque with its brilliant blue dome and tall minaret dominates the skyline of Lashkar Gah. Tree-lined boulevards have been designed to beautify this growing metropolis which is rising near an historical site on the Helmand River.



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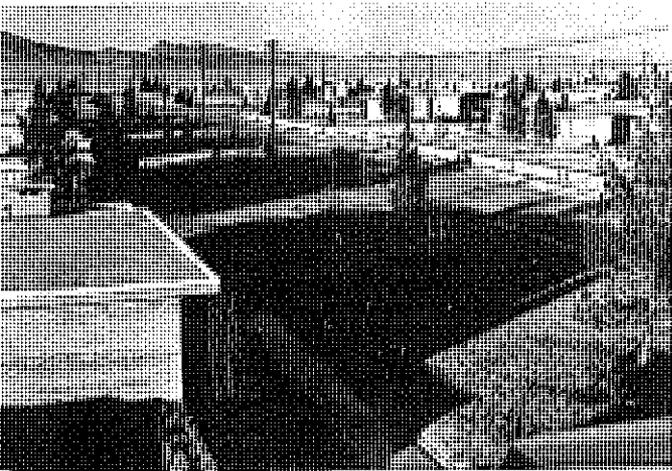
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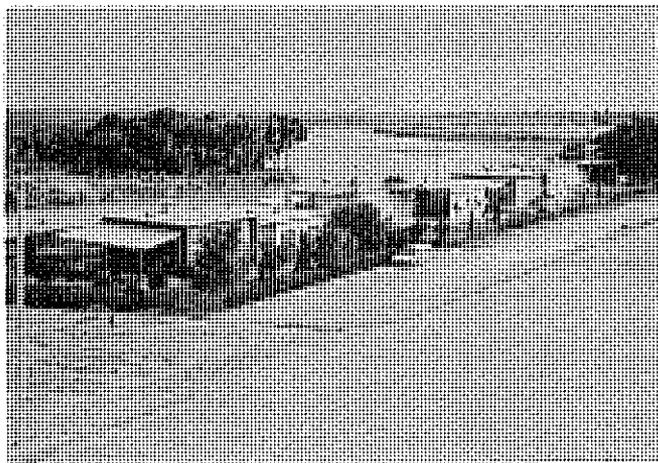
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USAID/HAVR activities in Kandahar are centered in an area between these highways which was formerly the base camp for Afghan Highway Constructors (AHC), a private company. Offices, warehouses, residences, a Staff House and an American Embassy Commissary are located in a fenced compound. Bureau of Reclamation offices and those of the Harza Company are in the Manzel-Bagh section of northeast Kandahar, a short distance away, near the Arghandab Valley headquarters of HAVA.

Sixteen houses of two or three-bedroom design and a few apartments are available for families in the Kandahar USAID/HAVR compound. Other residences are obtained, as needed, in the International Airport housing area or in the city.



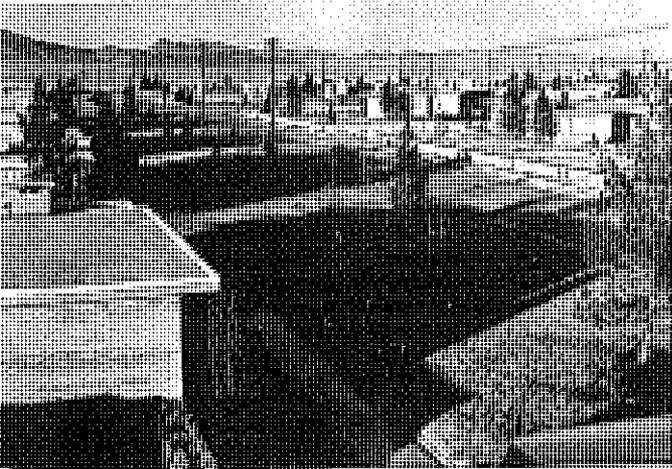
USAID ACTIVITIES IN KANDAHAR center in an area between two highways east of the city.



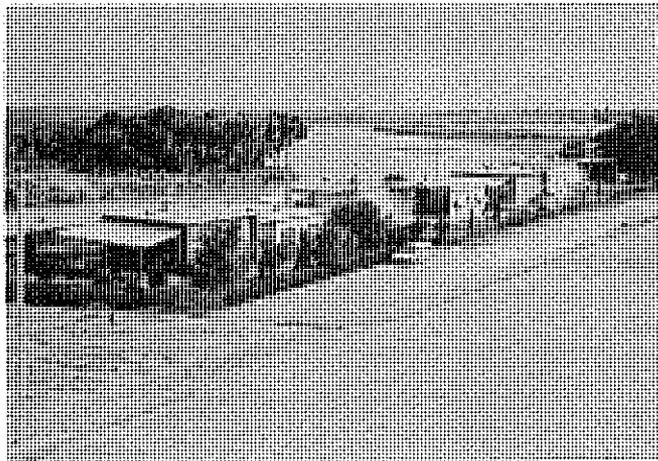
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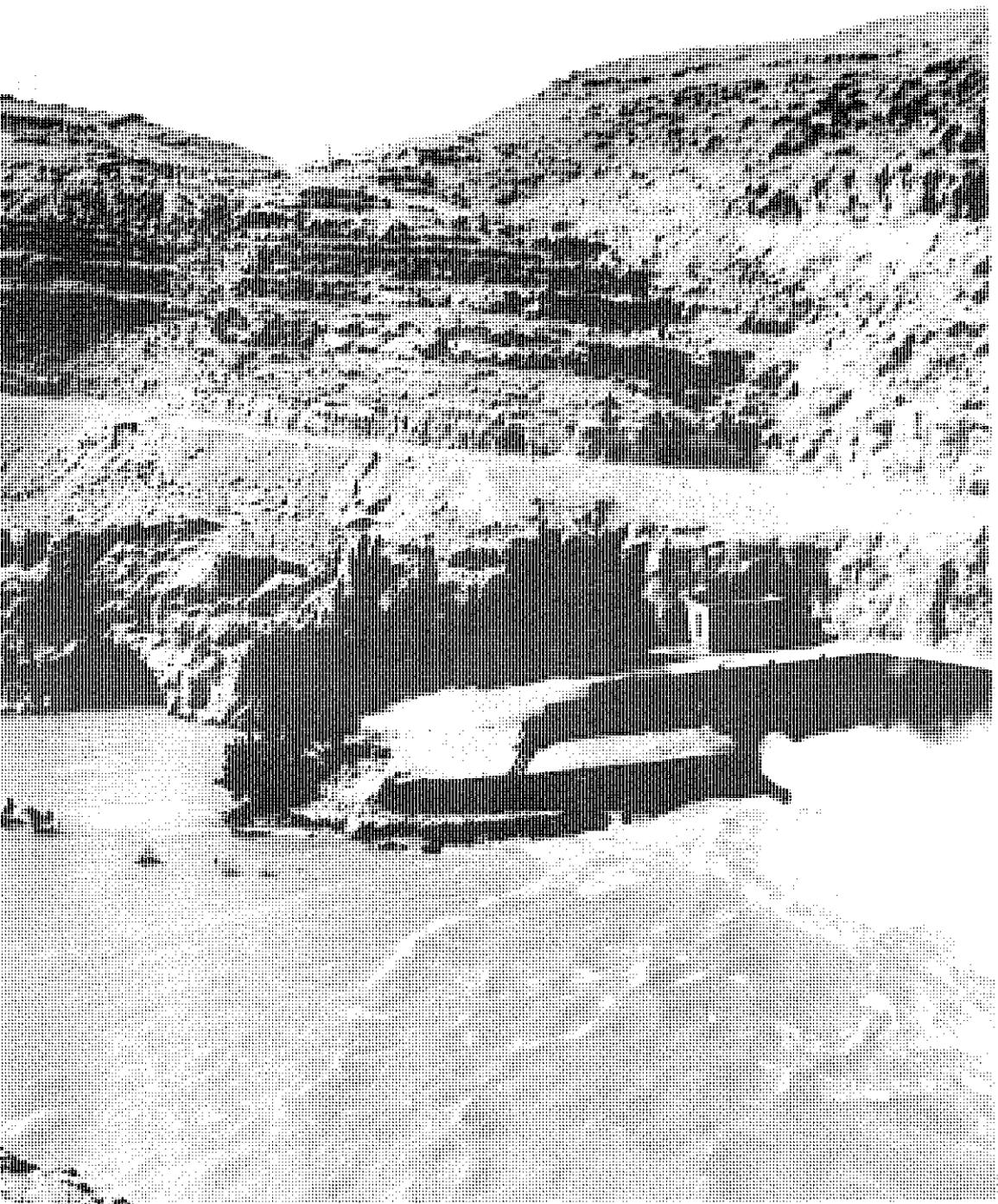
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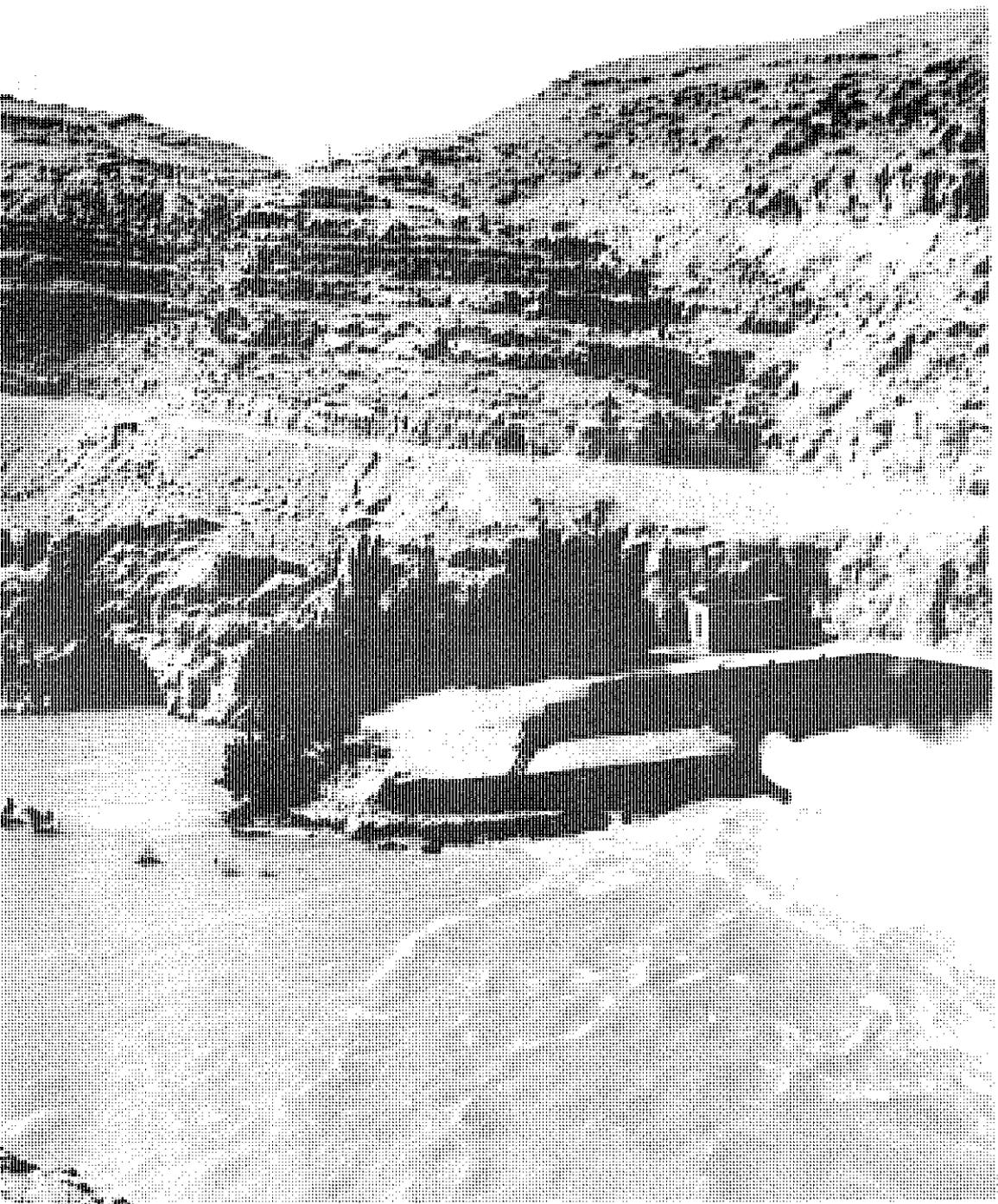


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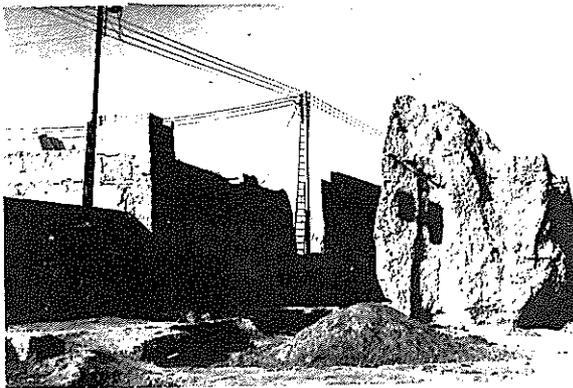
IX. Today's Targets: Tomorrow's Triumphs

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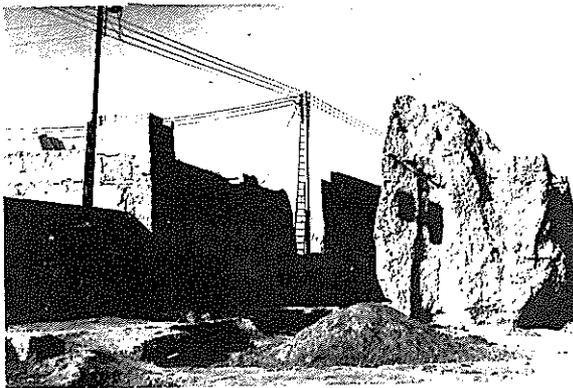
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Long range plans for Kajakai include construction of spillway gates to raise the level of the reservoir; installation of the third 16,500 KW unit some years after completion of the first stage of development and subsequent installation of four 25,000 KW units, as the need justifies enlargement of the system, to an eventual 150,000 KW capacity.

Completion of the Helmand-Arghandab irrigation systems, development of land areas that now lack farm laterals and drainage canals, and preparation of these acres for more efficient cultivation, will be made possible by the new \$4.6 million loan.



IRRIGATION ON HELMAND VALLEY FARM

These funds will be used to rehabilitate HACU construction equipment; procure new machinery, spare parts, materials and supplies. Technical, supervisory and training services, to be provided over a two-year period under terms of the loan, will prepare HACU personnel for the intensive work schedule ahead. Operations will be geared for 5,000 to 7,000 acres of land per year.

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Deep wells will eventually replace irrigation canals and drains as sources of domestic water for farms. This will not only supply safer water for human consumption but will eliminate many problems of drainage, canal cleaning and maintenance.

An improved agricultural program, the final condition on which success of the Shamalan project will depend, is to be introduced as soon as the physical preparation of the land is completed. If modern techniques and farming practices are accepted, maximum production from the newly developed land can ultimately be achieved.

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