USOM - LIBYA
IN COOPERATION WITH
LIBYAN - AMERICAN JOINT SERVICE
PRESENTS

AGRICULTURAL DEVELOPMENTS IN LIBYA

JULY 1 1958 JUNE 30 1960

OFFICIAL APPRECIATION

As a climax to the cooperative achievements of the Libyan American Joint Service agency at the time of its dissolution, an official statement of Libyan appreciation for assistance rendered by technicians was made by His Excellency, the Prime Minister of Libya, Mohammed Othman Assaid, at a meeting with USOM technicians at the Uaddan Hotel, Tripoli, on November 29, 1960. An official translation of his statement follows:

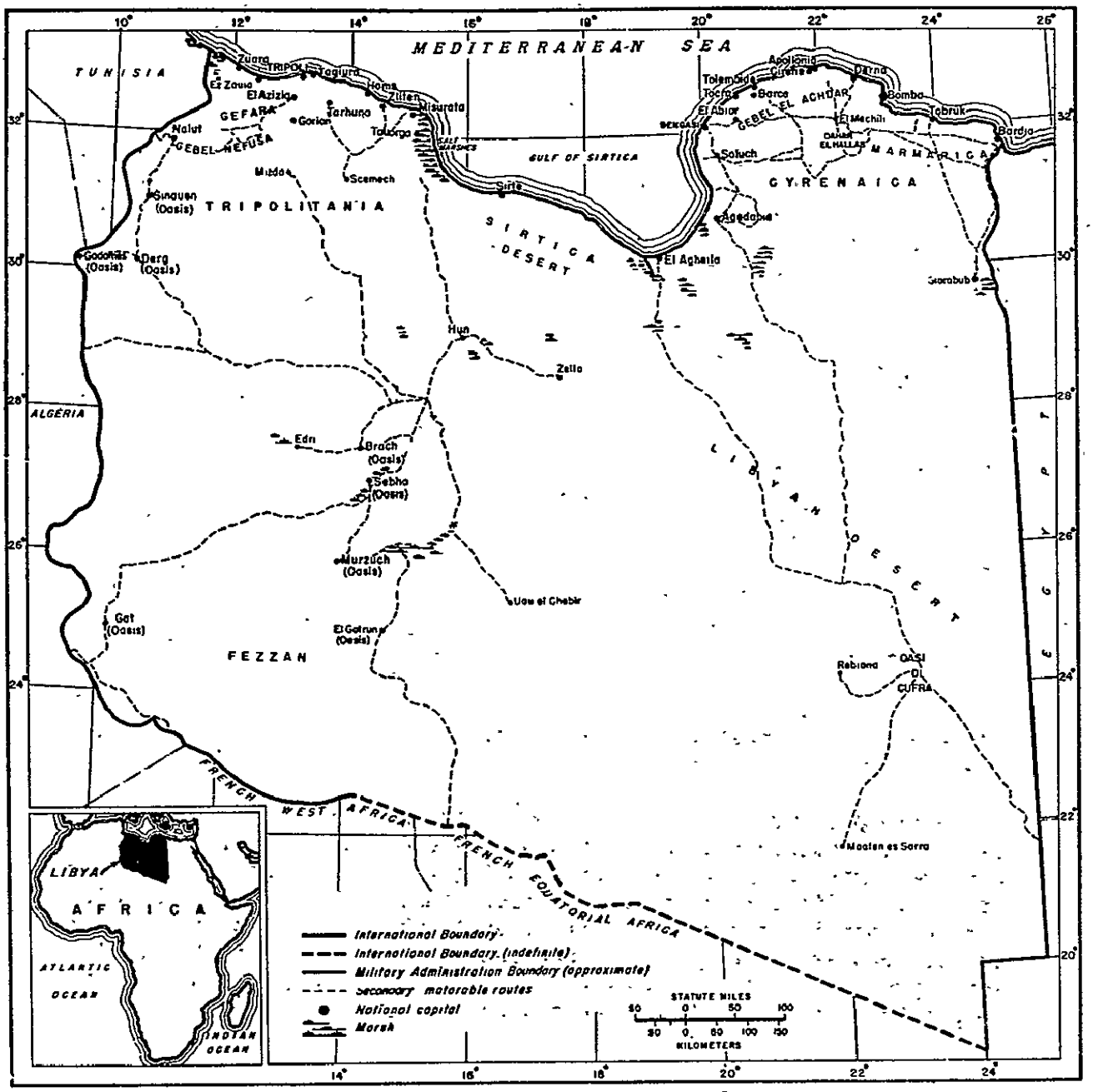
"It is a pleasure for me to welcome our distinguished American experts who are serving in the Libyan American Joint Services for the development of the national resources in the various sectors of the Libyan economy; and who have contributed, with a commendable attitude in training a great number of our Libyan youth to acquire the technical knowledge required in the various fields.

"I am also pleased that the dissolution of the Libyan American Joint Service agency and its integration into the various departments of the Libyan Government means that the efforts made by those experts and technicians and their assistance have been crowned with great success. Evidence of this is that the competent Libyan Departments have reached the capable stage which enables them to carry out, by themselves, the task of the economical development in the country in a satisfactory manner.

"I avail myself of this opportunity to state that both the Government and the people of Libya do fully appreciate the practical and technical results which have been realized by the Libyan American Joint Services during the last five years acting as an executive agency for the development projects financed by the I.C.A. Those successful results embrace various fields: Health, Agriculture, Education, Administration, etc.

"While putting on record our appreciation to the I.C.A. for its beneficial assistance, may I mention the cooperative spirit shown by American experts and technicians during the performances of their services in Libya - and it is our hope that they will continue with the same spirit in their present task in the Libyan Departments to ensure success in the present cooperative stage in order to realize more progress in the economical sectors, thus enabling the Libyan people to achieve a better standard of living."

Agriculture & Water Resources Activities Extend to Remote Communities of this Expansive Country



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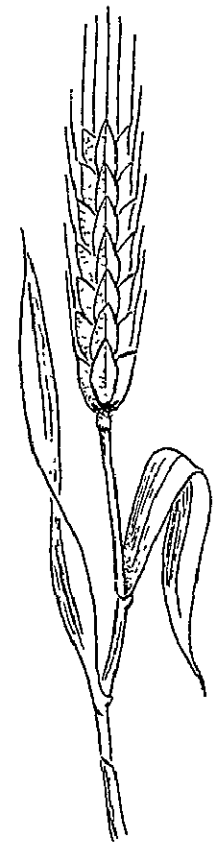
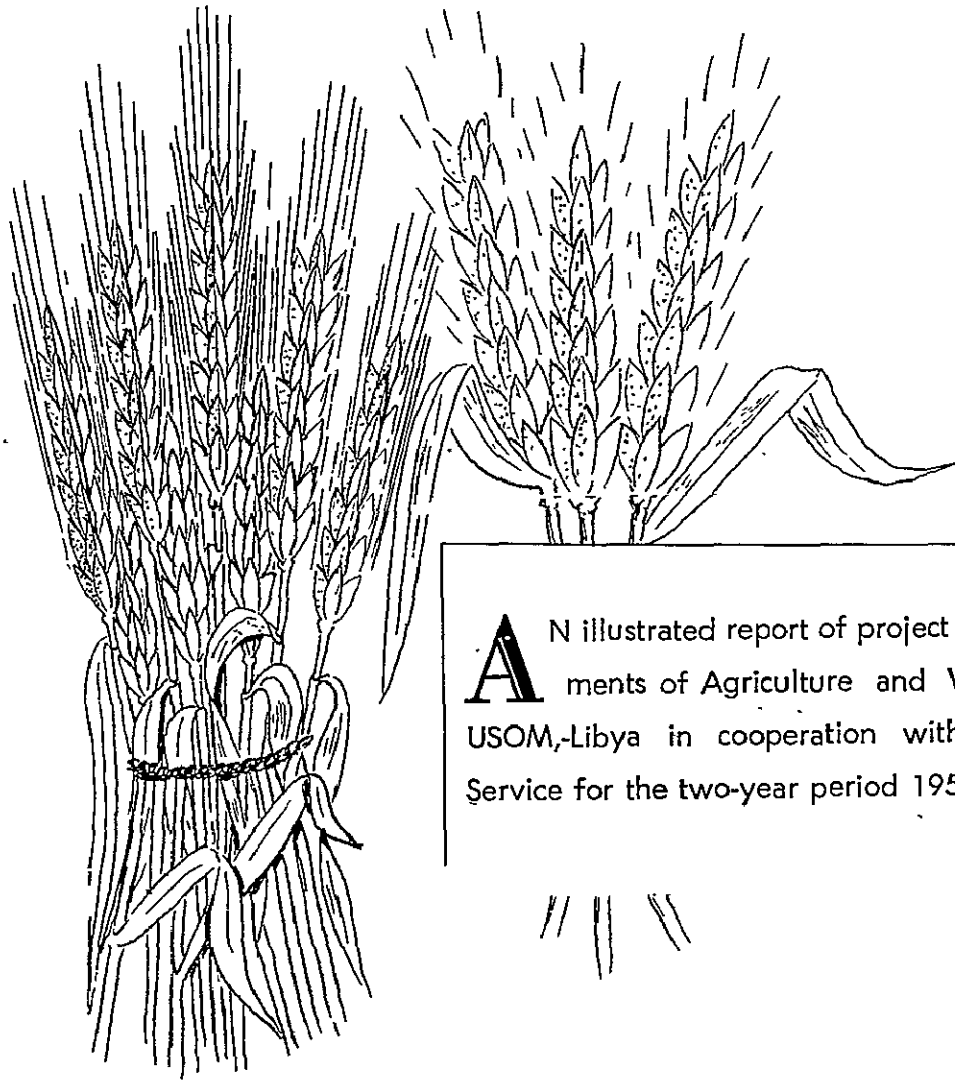




AN illustrated report of project activities and accomplishments of Agriculture and Water Resources Division, USOM,-Libya in cooperation with Libyan-American Joint Service for the two-year period 1958-1960.

FOREWORD

FOR the past eight years the United States of America has been sharing its agricultural « know how » with Libyan farmers and livestock owners. It has assisted in training Libyan agricultural technicians locally and abroad. They, in turn, are instructing a large number of other Libyans while on the job.

Eventually this knowledge will reach a large proportion of Libyan farmers and livestock producers. Then, Libyan agriculture will be in a position to more nearly produce adequate supplies of food and fiber for its own needs and something left over to sell to its neighbors.

Accomplishments in agricultural development in Libya during the past few years reflect the earnest endeavors of the Nazarates of Agriculture and Ministry of National Economy in cooperation with USOM and FAO technicians.

INTRODUCTION

WHEN the first American agriculturists came to the newly independent nation of Libya after the signing of the Point IV Agreement providing technical cooperation by the United States to Libya eight years ago, they saw four general objectives to reach:

1. Strengthen Libyan agriculture as a source of revenue;
2. Elevate agriculture in its role as an employer of a large part of the population;
3. Increase production and raise the standard of living;
4. Provide an adequate diet for the population.

To accomplish these general objectives, one of the main activities from the start, and which continues to be of paramount importance at the present time, was that of training Libyans in the various technical phases of all fields of agriculture.

More water was needed to increase agricultural output by expanding land under cultivation or by increasing yields per acre. So while technical training of Libyans was going on, Ground Water Geologists began searching for new supplies. Soil and Water Conservationists drew up plans to make the best use of available supplies of surface water.

The water program dovetailed closely into the agricultural program and in 1955 it was combined with agriculture, creating the Agriculture and Water Resources Joint Service Division.

Therefore, much of the American activity during the early years of this period was confined to planning and laying groundwork for carrying out the plans aimed at reaching the overall agricultural objectives.

EMPHASIS ON TRAINING

Within the past two years, (FY 1959-60) acceleration and broadening of activities have resulted in some very definite progress. Notable among the accomplishments, is the fact that Libyan technicians and administrators have received intensified training and are taking over the responsibilities of the Agricultural & Water Resources program in a commendable manner. The first definite steps are now being taken toward phasing out of some of the projects by gradually turning them over to experienced and trained Libyans to continue unassisted.

By the end of FY 1960, ten Libyans were sufficiently trained and experienced to take leadership responsibilities in seven projects, as follows:

Gr. Water Investigation
Cyrenaica . . 1 Proj. Leader

Agricultural Extension
Tripolitania . . 1 Proj. Leader

Forestry Development
Cyrenaica . . 1 Proj. Leader
Tripolitania . . 1 Co-proj. Leader

Irrigation
Cyrenaica . . 1 Co-proj. Leader

Land Settlement
Tripolitania . . 1 Co-proj. Leader

Livestock Improvement
Cyrenaica . . 1 Co-proj. Leader
Tripolitania . . 1 Co-proj. Leader

Equipment Maintenance
Cyrenaica . . 1 Co-proj. Leader
Tripolitania . . 1 Co-proj. Leader

Working cooperatively under the guidance of America technicians on methods of increasing production of food and fiber to advance the general economy and standard of living on farms, many Libyans are now specialists in their respective fields. American technicians are cooperating and coaching, when necessary, along the sidelines.

TRAIN 589 IN TWO YEARS

In the past two years (FY 1959-60) a total of 589 Libyans received training in various fields of Agriculture & Water Resources program as follows:

On the job training	250
Individual training	60
Off shore training in neighboring countries	25
*Participant training (T.C. Funds) . .	72
Local group training	182
Total	589

* **(Those who have received or are still in training in America, Cyprus or Beirut)**

These men have gained technical knowledge for conducting a program embracing:

1. Search for new supplies of ground water;
2. Efficient utilization of available surface water;
3. Control of soil erosion;
4. Sand dune fixation and establishment of forest areas;
5. Location and development of new areas of potential farm land;
6. Development of grazing areas and forage crops;
7. Selection of improved crops adapted to certain areas;
8. Introduction of improved seed varieties;
9. Introduction of improved breeding stock;
10. Control of plant disease and pests;
11. Control of livestock pests and parasites;
12. Dissemination of agricultural information through expansion of Extension services;
13. Development of farm youth clubs and home economics services;
14. Organization and management of farmer cooperatives;
15. Extension of farm credit through the Agricultural National Bank;
16. Care and maintenance of farm and heavy machinery;
17. Agricultural area development.

It is gratifying to report that the counterparts of American Technicians and recently appointed Project, and Co-project Leaders are capably cooperating and coordinating their activities toward reaching the overall objectives.

Moreover, Libyan Techincians are being called upon to assist some of the neighboring countries which have similar problems. During the past year several groups have visited Cyrenaica and Tripolitania to obtain first hand information on Libyan methods of Surface Water Conservation, and fixation of sand dunes.

APPROPRIATIONS REACH PEAK

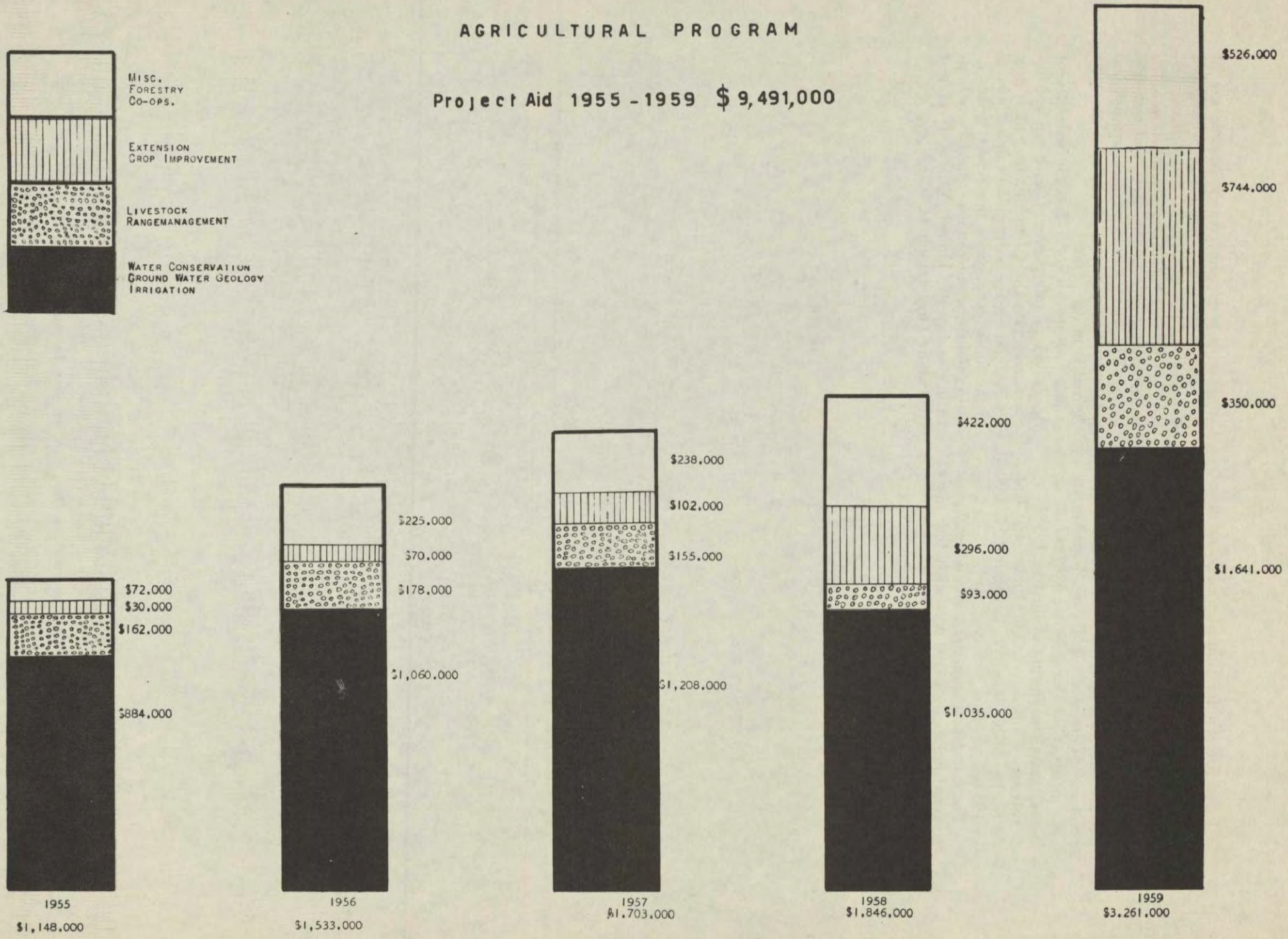
In general, this report deals with the purposes of the various agricultural projects and the accomplishments made during the past two years of accelerated activity under the guidance of 39 American technicians.

As shown in the accompanying chart, all activities in Agriculture & Water Resources stepped up sharply in 1959 when a total of $3,261,000 was allocated to assist Libyan agriculture during one of the worst drought years in the history of the country. This amount was nearly double the 1958 funds.

This group of 23 Libyans, « Agricultural Policy Group », at Idris Airport, enplaned for America where they studied and observed agricultural practices in southwestern United States which could be advantegously applied to Libyan agriculture.

AGRICULTURAL PROGRAM

Project Aid 1955 - 1959 $ 9,491,000



In preparation for future possible droughts, special emphasis was given to projects of Surface Water and Soil Conservation, and Ground Water Investigation. A total of $1,641,000 was allotted for the year's activities.

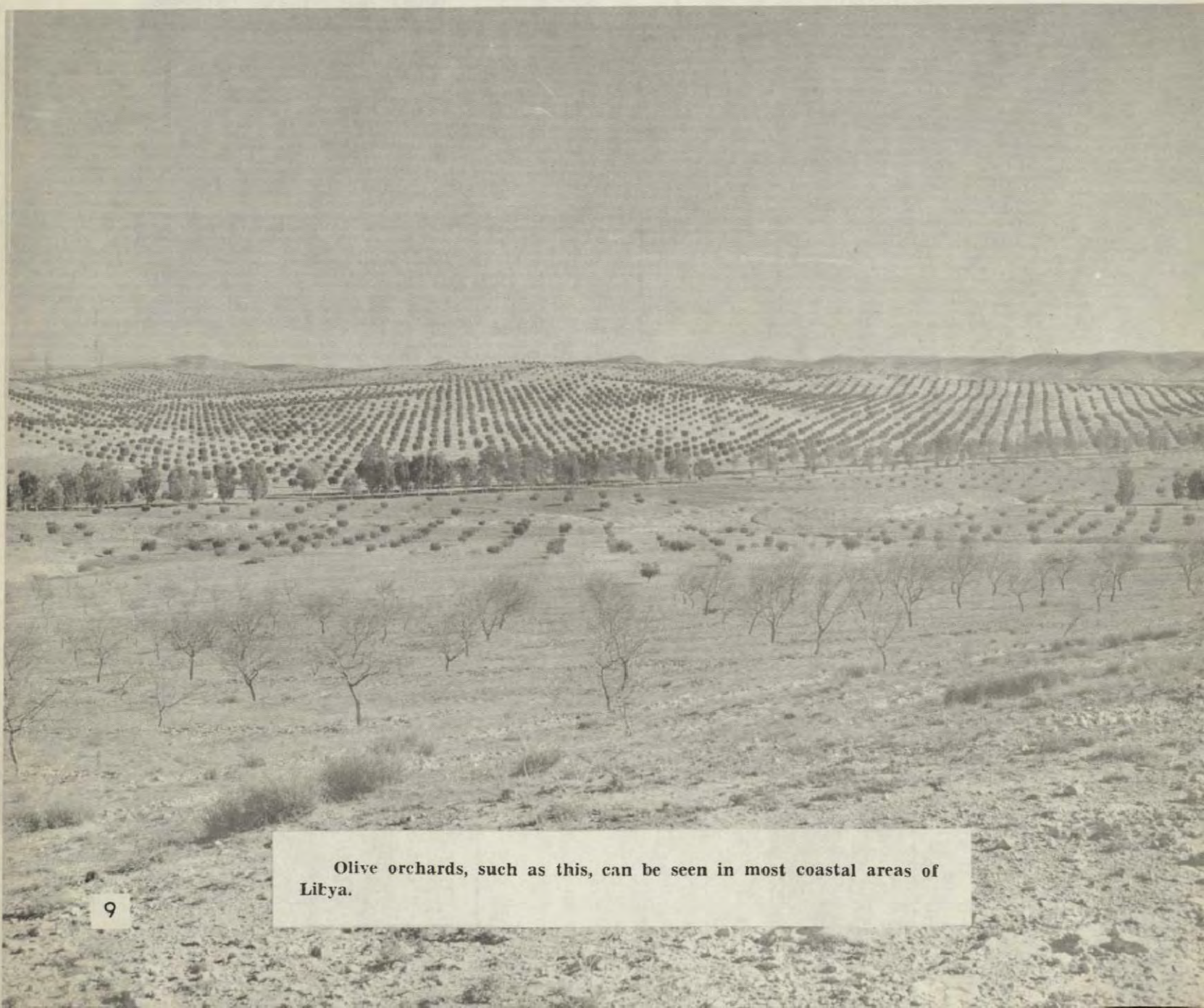
Greater amounts for other agricultural activities also were provided in 1959. Agricultural Extension (Guidance), and Crop Improvement appropriations for that year were $744,000, or twenty times the amount allotted in 1955.

Forestry, Cooperatives, and Agricultural Credit reached $526,000 in 1959 as against $72,000 in 1955.

The Livestock Improvement and Range Management fund, at $350,000 was nearly four times that of 1958.

So as to make the greatest possible use of the funds, a self-help system has been integrated into most of the agricultural development projects — farmers furnishing the labor with the project supplying materials, tools, and technical advice. This has greatly curtailed expenses and proportionately enhanced the value of benefits derived from the projects.

Staff members of the Libyan Nazarates of Agriculture in all provinces have worked cooperatively with USOM technicians and deserve much credit for the accomplishments mentioned in the following pages of this report. Also assisting and cooperating in many fields have been technicians of the United Nations Food and Agriculture Organization (FAO),



Olive orchards, such as this, can be seen in most coastal areas of Libya.

EXTENSION SERVICE

The Educational Arm of Agriculture & Water Resources

AGRICULTURAL Extension Service, called « Agricultural Guidance » to facilitate Arabic translation, started in Libya in a small way during 1952, the first year of technical cooperation by the United States in Libya.

From the beginning the purpose of this type of service was to assist Libyan farmers in learning and adopting techniques and procedures that will improve their farming methods and thus increase their income, advance their standards of living, and generally aid the economy of the country.

Backstopping all projects of the Agriculture & Water Resources Division of USOM, Agricultural Extension is the educational arm of the division and « extends » information regarding recommended practices of farming and livestock production to farming communities through various means.

Before the organization could be of service to farmers, a staff of trained Libyan technicians was needed. A small staff of American Extension technicians undertook this task in the early days of USOM in Libya. But, it was after 1957 before many Libyans were available for this particular field.

Eight Libyan students, the first class to complete the four-year course in agriculture at the Vocational Agricultural Training Center (VATC) in 1957, were employed by Agricultural Extension. They were then given two additional years of Agricultural Extension training.

Thereafter Extension work in Libya took on more duties and it was not long until the Nazarates of Agriculture became actively interested in cooperating. This gave impetus to the organization and today Agricultural Extension Service takes part in every phase of all agricultural projects in Libya.

A great many farmers have been contacted by the Extension Service through demonstrations, farm meetings, visits to farms, and farmer visits to Extension offices. But when considering the large numbers of farmers living off the highways, far from villages and cities, only a small percentage could be reached with this personal type of contact.

INFORMATION SECTION HELPS

Augmenting the services of Extension, are province Agricultural Information offices which work closely with Extension and the Nazarates of Agriculture. An information office in the Ministry of National Economy works on a federal level for the entire country. Among other things, it publishes a magazine, « Libya Economy ».

Personnel of the information offices are specialists in writing ,editing and conducting an information program tailored to fit all classes of farmers. The information is carried to farming communities through newspapers, magazines, posters, leaflets, pamphlets, hand bills, photographs, film strips, display boards, exhibits, motion pictures, tape recordings and radio programs.

Advisory groups, specialists in various branches of the Nazarates of Agriculture, FAO, and USOM, assist information personnel in the selection and treatment of technical subjects so that they may be easily understood by farmers. These groups serve as a « clearing house » for agricultural information.

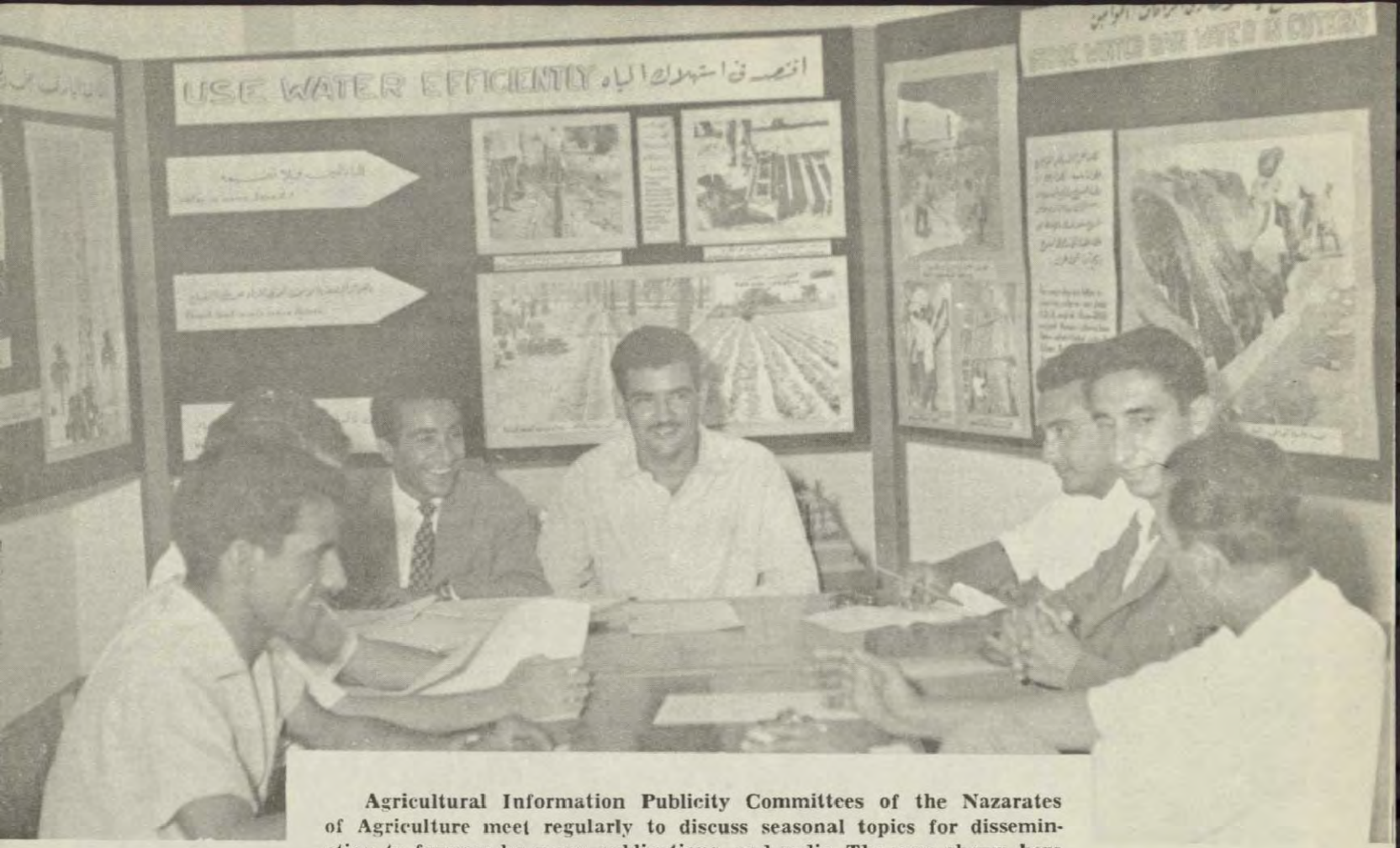
In cooperation with Audio-Visual, monthly bulletins, such as the « Libya Farmer », illustrated pamphlets, leaflets, posters and displays are printed. Radio stations cooperate generously, and in Tripoli, the Nazarate's «Publicity Committee» prepares agricultural programs on its tape recorder for broadcast by radio twice weekly.

Through these media, and through an organization of murshedine (agricultural agents in the country), Extension carries information to the doorsteps of farmers.

67 EXTENSION OFFICES

In all of Libya today there are 67 Agricultural Extension offices with main headquarters at the province capitals of Tripoli, Benghazi, and Sebha. Virtually every farming community, including oases in remote parts of the nation, are being served by Extension agents. Staffing these Extension offices are 67 trained murshedine with assistants at 10 of the larger centers. New Extension branches are being established as needed.

Each summer a group of vocational agricultural graduates attend a six-week training course in Extension Methods. They then are given jobs in the various sections of the Nazarate of Agriculture.



Agricultural Information Publicity Committees of the Nazarates of Agriculture meet regularly to discuss seasonal topics for dissemination to farmers by press, publications, and radio. The men shown here are officials of various sections of the Tripolitania Nazarate of Agriculture and are specialists in various fields of agriculture.

In addition to the 77 trained Extension workers, 16 specialists are constantly helping to answer farmers' questions.

Extension schools, special training short courses, and educational programs are frequently held to increase the numbers of trained Libyans to carry on extension and agricultural information work.

Accomplishments of Extension are widespread and varied.

Ninety Extension agents have been trained. Some subsequently have merited better jobs with the Nazarates of Agriculture.

Seven cooperative managers and directors have been trained.

Sixteen specialists have completed their training and are now employed.

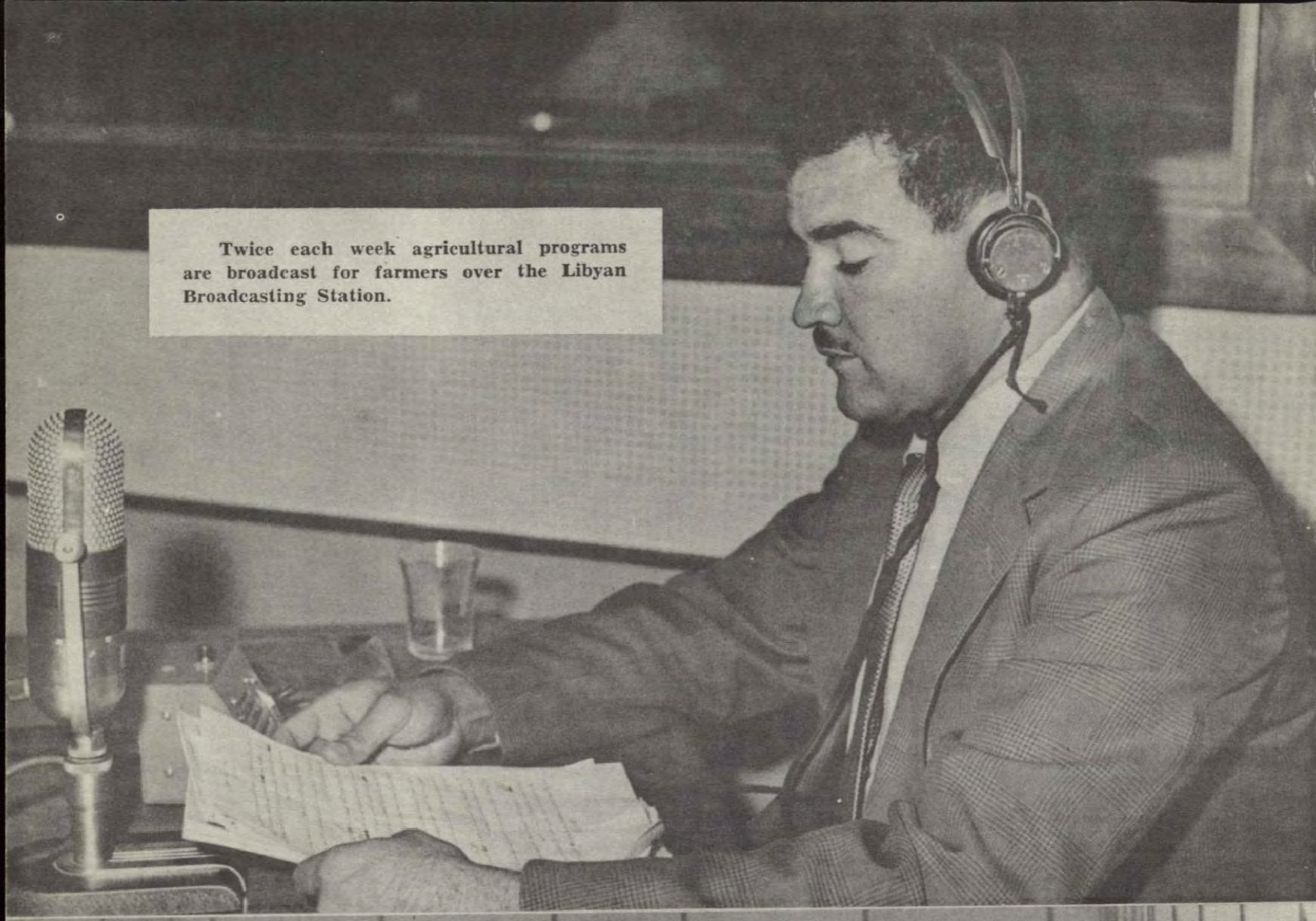
Eleven Libyan Extension workers have, within the past two years, received training in the United States in addition to 23 officials who received special agricultural policy-training in America.

Simple animal-drawn plows and grain drills have been demonstrated, developed and utilized as an improvement over those commonly used.

Organization of farm youth clubs and training Libyans in home economy are just beginning as the Fiscal Year 1960 ends. Interest is running high in these fields, however. A Boy's and Girl's Garden Club, organized in Cyrenaica in recent months, has started a chain reaction of interest for youth clubs in neighboring communities and districts. And farmer cooperatives are gradually becoming more in demand.

During the last two years, ending June 30, 1960, other Extension activities in Libya are shown statistically as follows.

Farm visits by Extension workers	34,092
Farmer visits at Extension offices	157,932
Field demonstrations	1,251
Farmer attendance at demonstrations	16,636
Farmer meetings	614
Attendance at meetings	12,385
Agricultural literature distributed (pieces)	279,779
News articles printed	356
Farm radio programs broadcast	129



Twice each week agricultural programs are broadcast for farmers over the Libyan Broadcasting Station.

Questions are answered and new ideas discussed at the regular monthly meetings of agricultural agents (murshedine) and officials of Agricultural Extension.

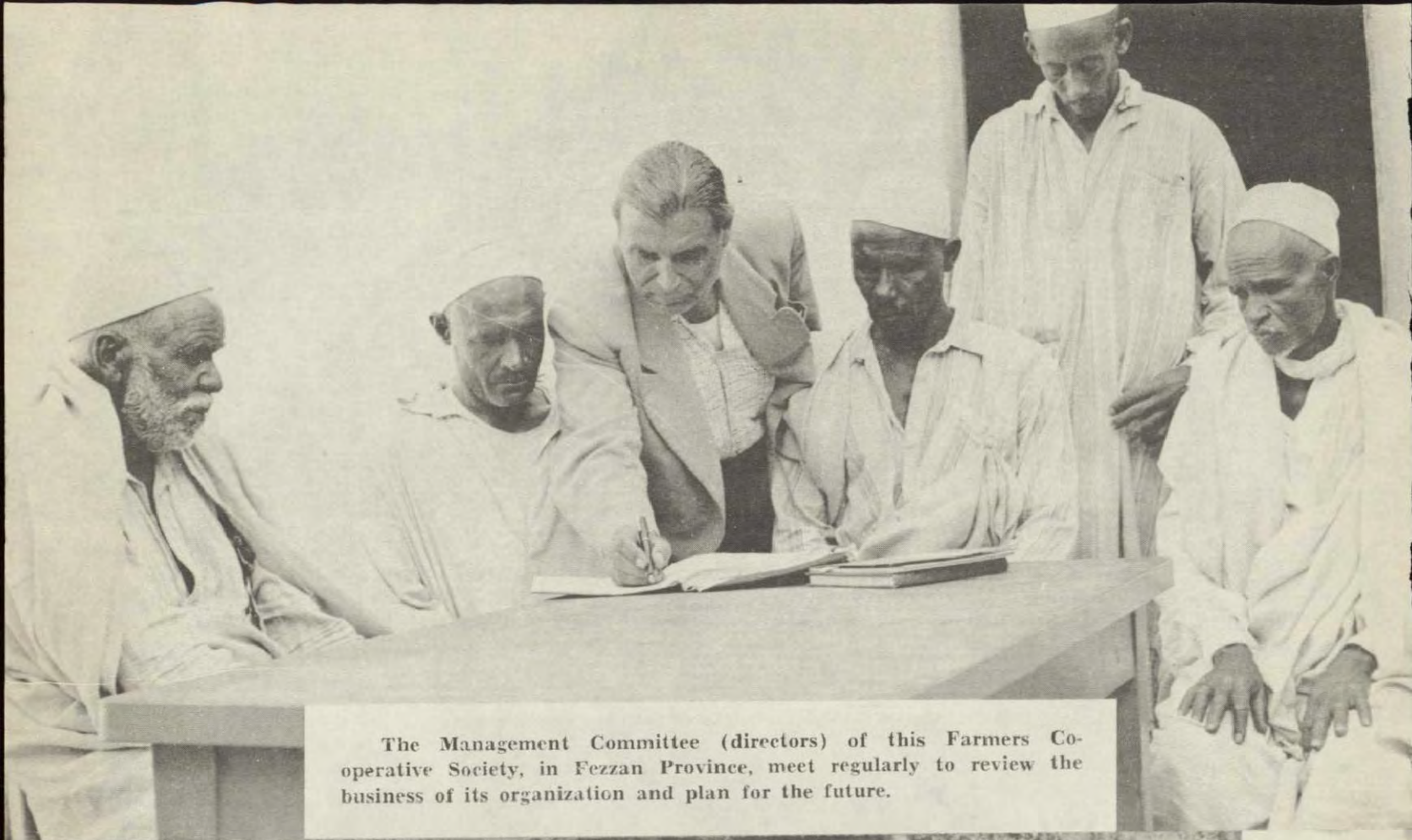
Information on all phases of agriculture is given to farming communities through motion pictures.

Advantages of using improved seed varieties, proper cultivation, irrigation, fertilization, and control of disease and pests, are shown in demonstrations like this.

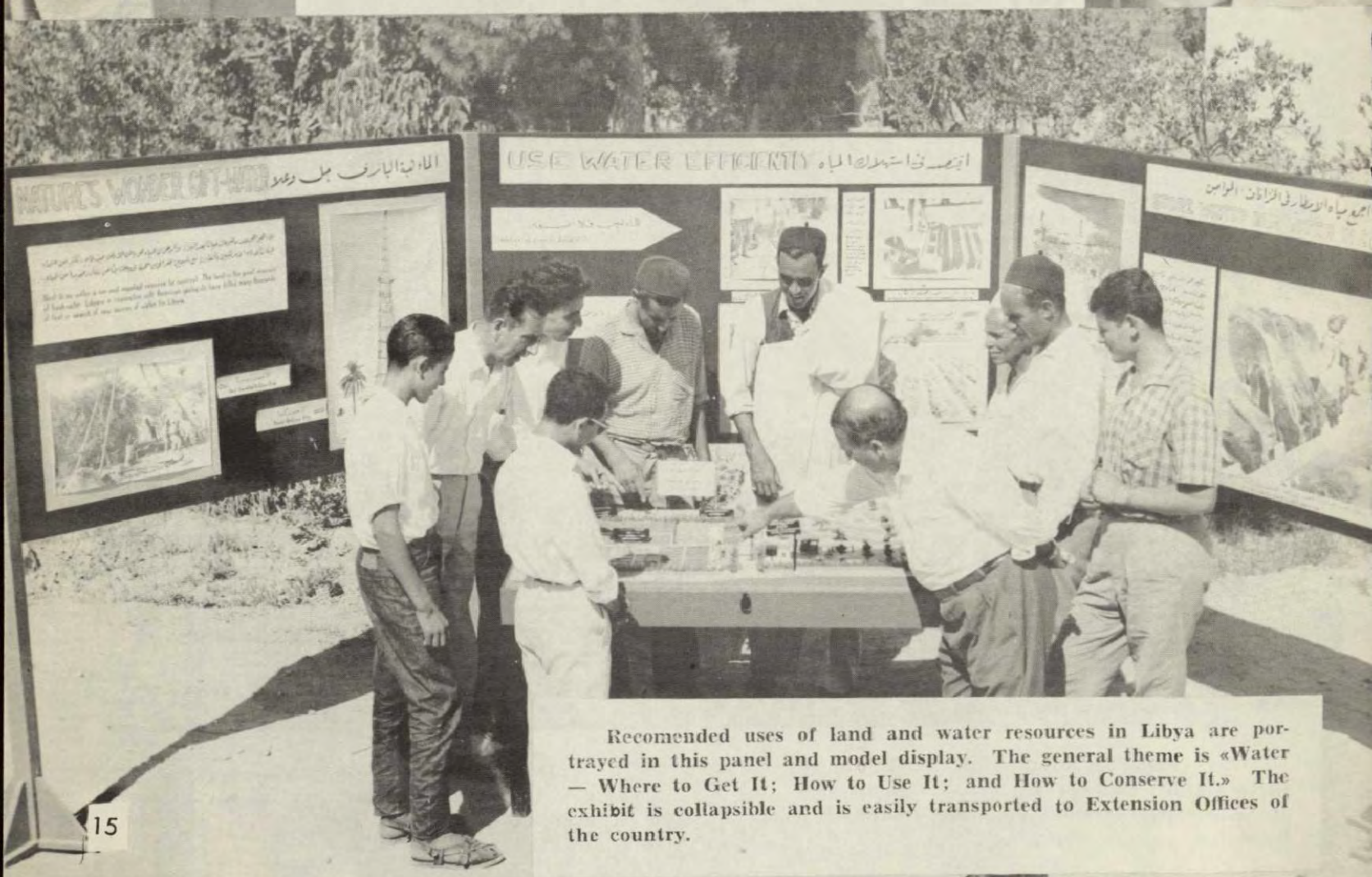
Agricultural Extension leaders answer questions and explain recommended methods of farming to many farm groups.

This group of farm youth, Boy's and Girl's Garden Club of Lathroun, Cyrenaica are enthusiastic over the promising results of their first season's work.

Demonstrations have convinced this farmer that the steel plow has its advantages over the old, wooden type.



The Management Committee (directors) of this Farmers Co-operative Society, in Fezzan Province, meet regularly to review the business of its organization and plan for the future.



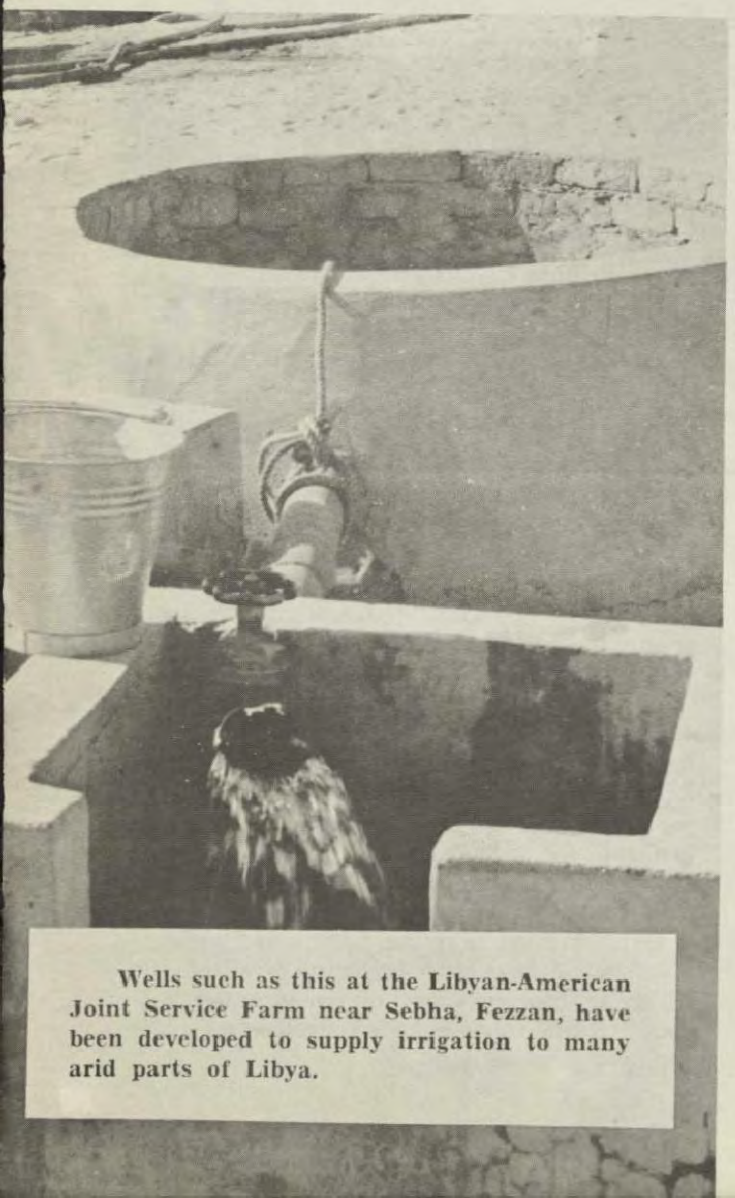
Recomended uses of land and water resources in Libya are portrayed in this panel and model display. The general theme is «Water — Where to Get It; How to Use It; and How to Conserve It.» The exhibit is collapsible and is easily transported to Extension Offices of the country.

Ground Water Investigation

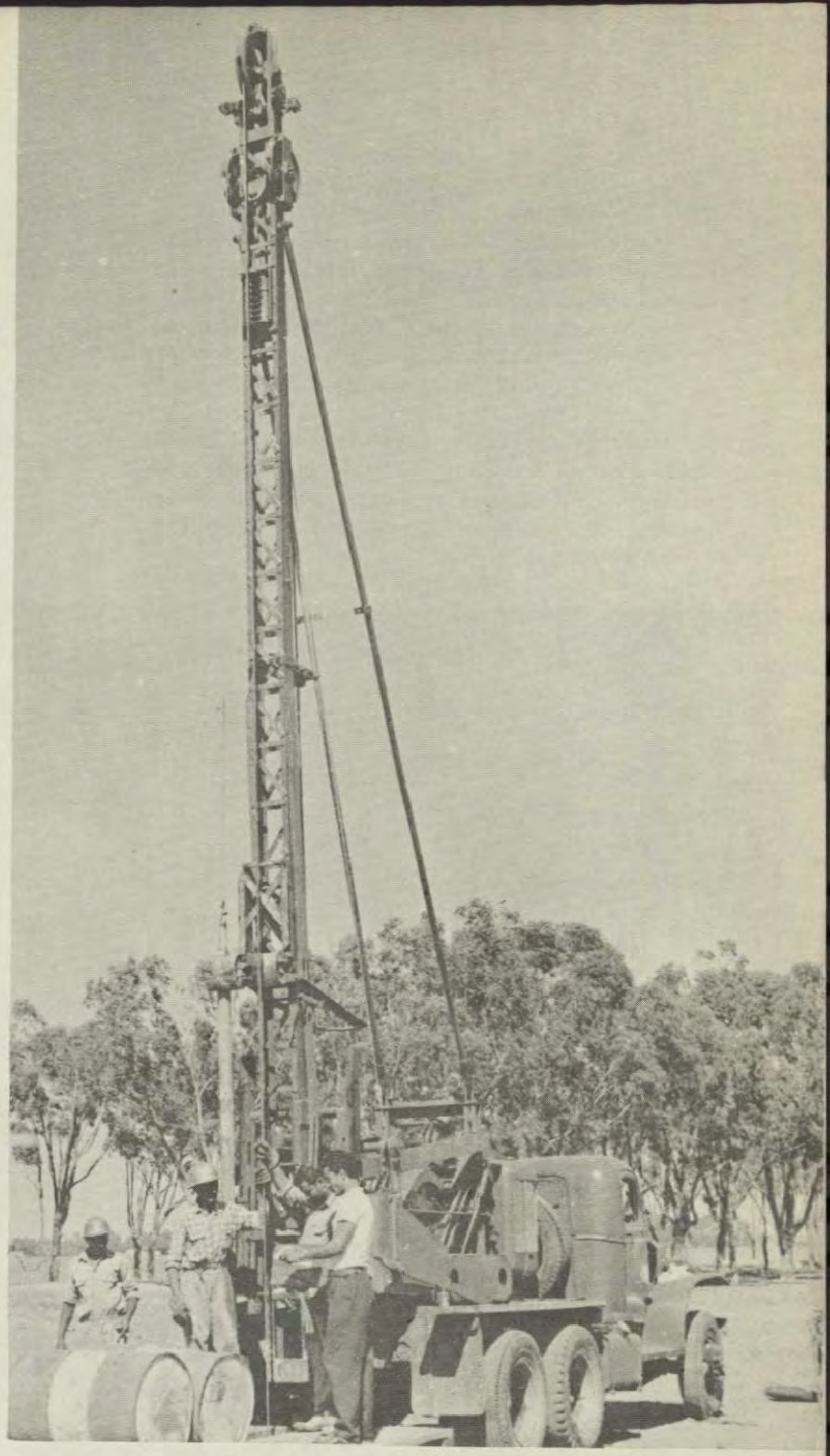
SINCE the scarcity of water was one of the biggest problems confronting agricultural development in Libya, one of the first activities in USOM's program of assistance to the Libyan Government was that of Ground Water Investigation. This started in Tripolitania in 1952 and in Cyrenaica and the Fezzan in 1957.

The purpose of this project was to obtain and appraise basic geological and hydrological information of Libya's water resources, their potential, and limitations for use. In simple language the objective has been to gather information, through various activities, which would be of value in determining where water could be « found» and where it could « not be found ».

Therefore, activities have been purely of an investigational or exploratory nature, for the purpose of:



Wells such as this at the Libyan-American Joint Service Farm near Sebha, Fezzan, have been developed to supply irrigation to many arid parts of Libya.



Mobile cable-tool and rotary drilling rigs are constantly searching for new sources of ground water.

1. Securing and understanding of geological control of water-bearing formations.
2. Determining the amount and quality of groundwater in water-bearing formations, and changes in water levels and water quality.
3. Training sufficient numbers of Libyan technicians and well-drilling crews to continue ground water investigations in each province.

Drilling test holes, measuring water levels periodically, obtaining samples of water and analyzing them for chemical quality, were among the activities necessary to accomplish these objectives.

The « sweep method » is one way to lift water from a well. It is inexpensive and used in many areas. This photo was taken near Cufra of Southeastern Cyrenaica.

Primitive wells are still to be found where water is lifted by hand-woven ropes.

In Tripolitania the well-drilling section, already a part of the Nazarate of Agriculture, is being assisted by USOM in training, transportation, and procurement of supplies and equipment.

In Cyrenaica and Fezzan in the past two years 112 wells (test holes) have been drilled, several hundred have been inventoried, and logs developed for 200. Samples of water analyzed total well over 600. A province well-drilling section is now in the advanced stage of training and the drilling unit has been turned over to the Cyrenaica Nazarate of Agriculture.

Data obtained from the past several years of investigation are now becoming available on which to base decisions on many water problems relating to agriculture as well as to public supply and industry.

Irrigation

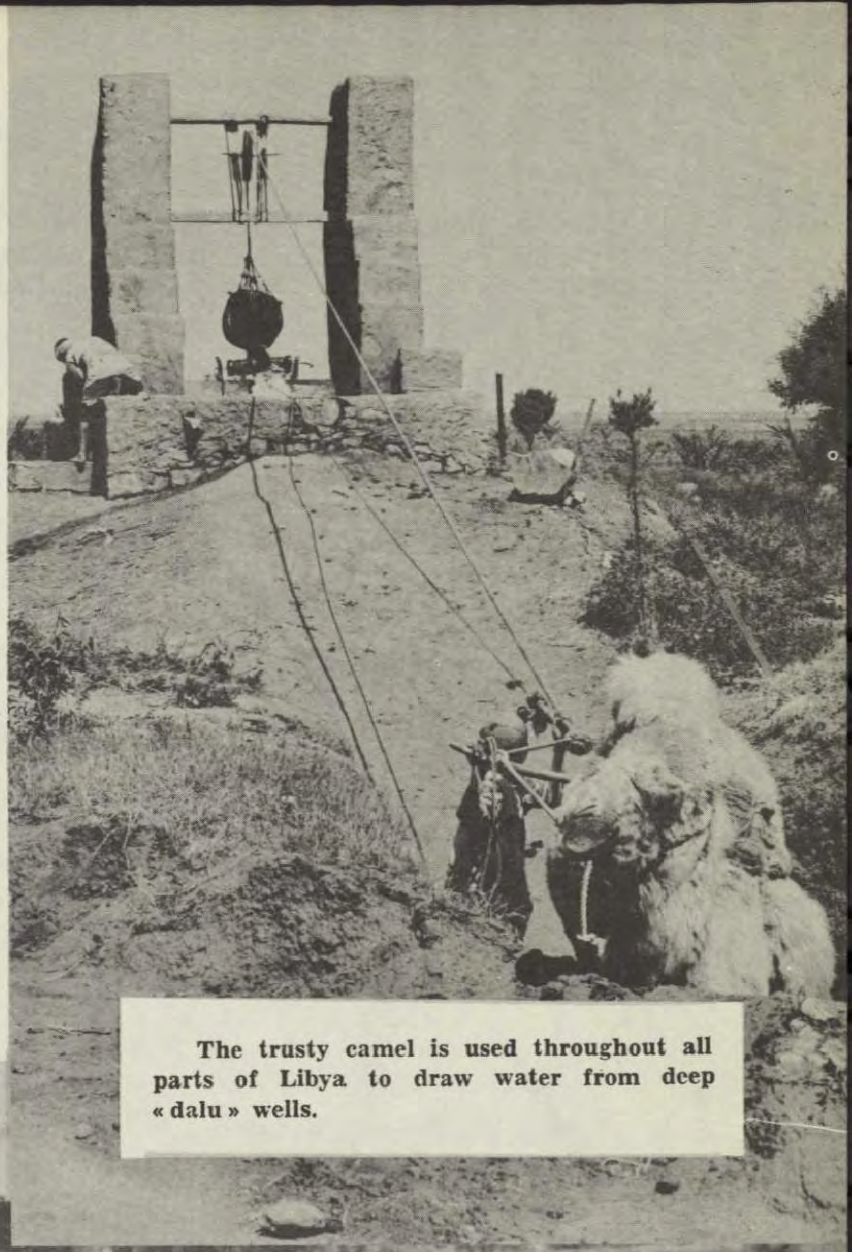
THE first Libyan-American cooperation on irrigation improvement started in Tripolitania in 1953, with other irrigation systems developed and improved in 1954 to 1957.

Broadly speaking, the purpose of USOM assistance in irrigation is to make the maximum use of underground water and to store sufficient water in reservoirs to permit irrigation with proper head of water.

To reduce water losses resulting from leakage and evaporation, existing irrigation systems were first renovated. Then proper irrigation techniques were demonstrated on farms.

Vast amounts of water were lost through seepage as it traveled along the sandy canals to the ends of irrigated fields. Engineers deemed the best solution for this was to line canals with cement.

A demonstrational training program was started on canal lining for Tripolitania two years ago. Cyrenaica started the lining program in February, 1960 and has concentrated on making pre-



The trusty camel is used throughout all parts of Libya to draw water from deep « dalu » wells.

Water is the « life-blood » of agriculture, and without irrigation, crops in Libya would be limited.

fabricated canal sections for installation on old canal beds.

To date, more than two-thirds of the objective of 100,000 meters for Libya has been achieved with 67,000 meters lined. Benefiting from this work are 647 farms on 1,017 hectares of land.

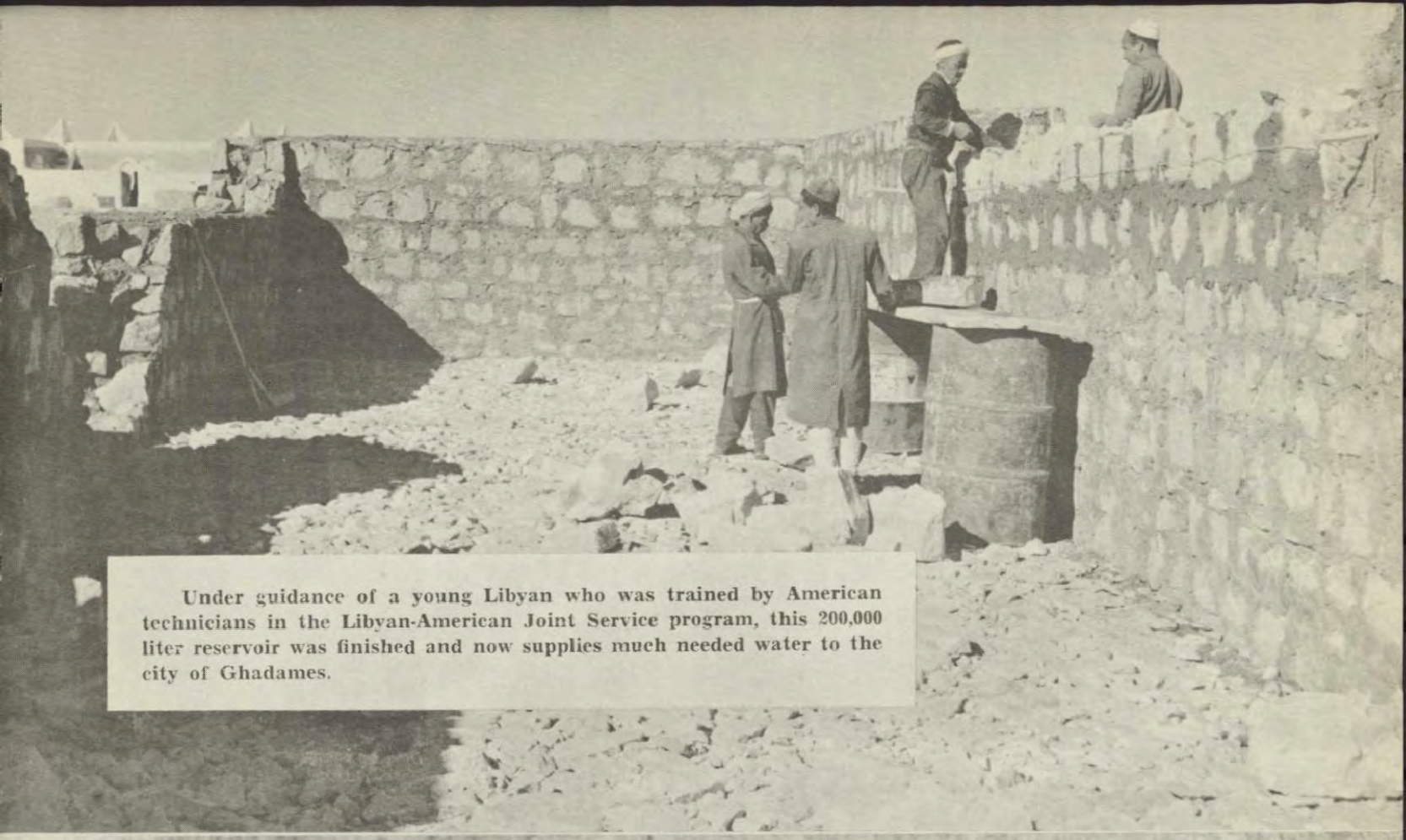
The project has operated on a self-help basis. Libyan-American Joint Service furnishes the necessary tools and equipment, and cement, while farmers furnish sand and labor. Thus far over one-third of the irrigation farmers have been reached with canal-lining demonstrations. The project is striving for 100 percent adoption.

Since the installation of cement lined canals, an increase of up to 60 percent in water delivered to gardens and other crops has been noted. Many enthusiastic farmers have lined their canals on their own initiative and expense for materials.

In connection with canal lining, 259 reservoirs have been constructed or renovated with a capacity of 7,400 cubic meters. Rehabilitation of 60 springs has increased the flow of water 75 to 100 percent.

Near Sebha, in Fezzan, the agricultural agent explains how the reservoir is filled from a near-by well. This creates enough pressure to carry water through canals to all parts of the field.

This photo shows the most important step in making prefabricated canal sections. Proper mixture and tamping cement into the «forms» is necessary for good results. When the form is removed, the canal section remains. Canal sections must be sprinkled with water and kept damp for ten days. After complete hardening, they are ready to use.



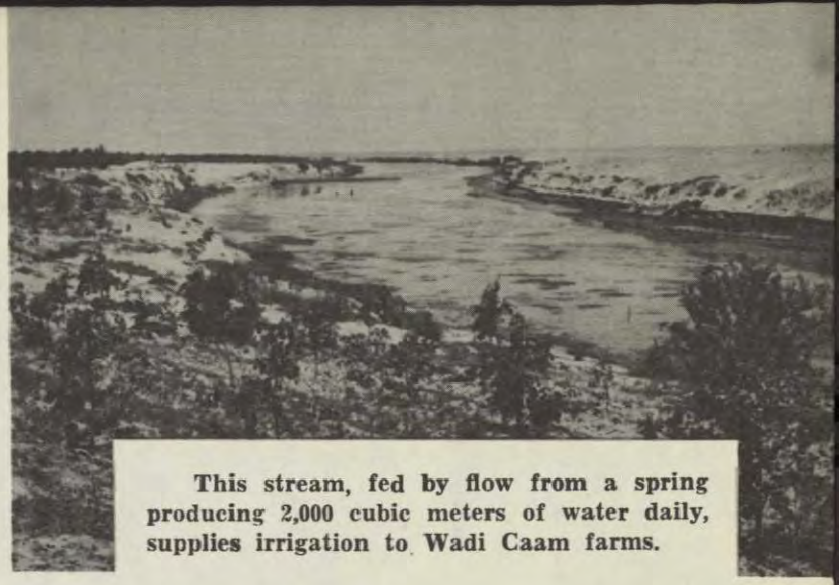
Under guidance of a young Libyan who was trained by American technicians in the Libyan-American Joint Service program, this 200,000 liter reservoir was finished and now supplies much needed water to the city of Ghadames.

After canal sections are placed on a sound, graded base, the joints are then sealed and the water-tight canal is ready for use.

(Above) Cement-lined canals carry water long distances without loss from absorption as in earth or sand canals. Over two-thirds of the objective of 100,000 meters of lined canals have been installed in Libya. This work has all been done on a self-help basis and the project will closely approach the goal by the end of 1960.

(Below) This canal is receiving a permanent «in-place» lining of cement which eliminates sealing of joints. Farmers of Tripolitania like this method and many throughout irrigated sections have learned how to do the work unassisted. The project is striving for 100 percent adoption.

Land Settlement



This stream, fed by flow from a spring producing 2,000 cubic meters of water daily, supplies irrigation to Wadi Caam farms.

AT Wadi Caam, a few kilometers west of Zliten in Tripolitania, 2,000 cubic meters of spring water flowed into the Mediterranean Sea every hour.

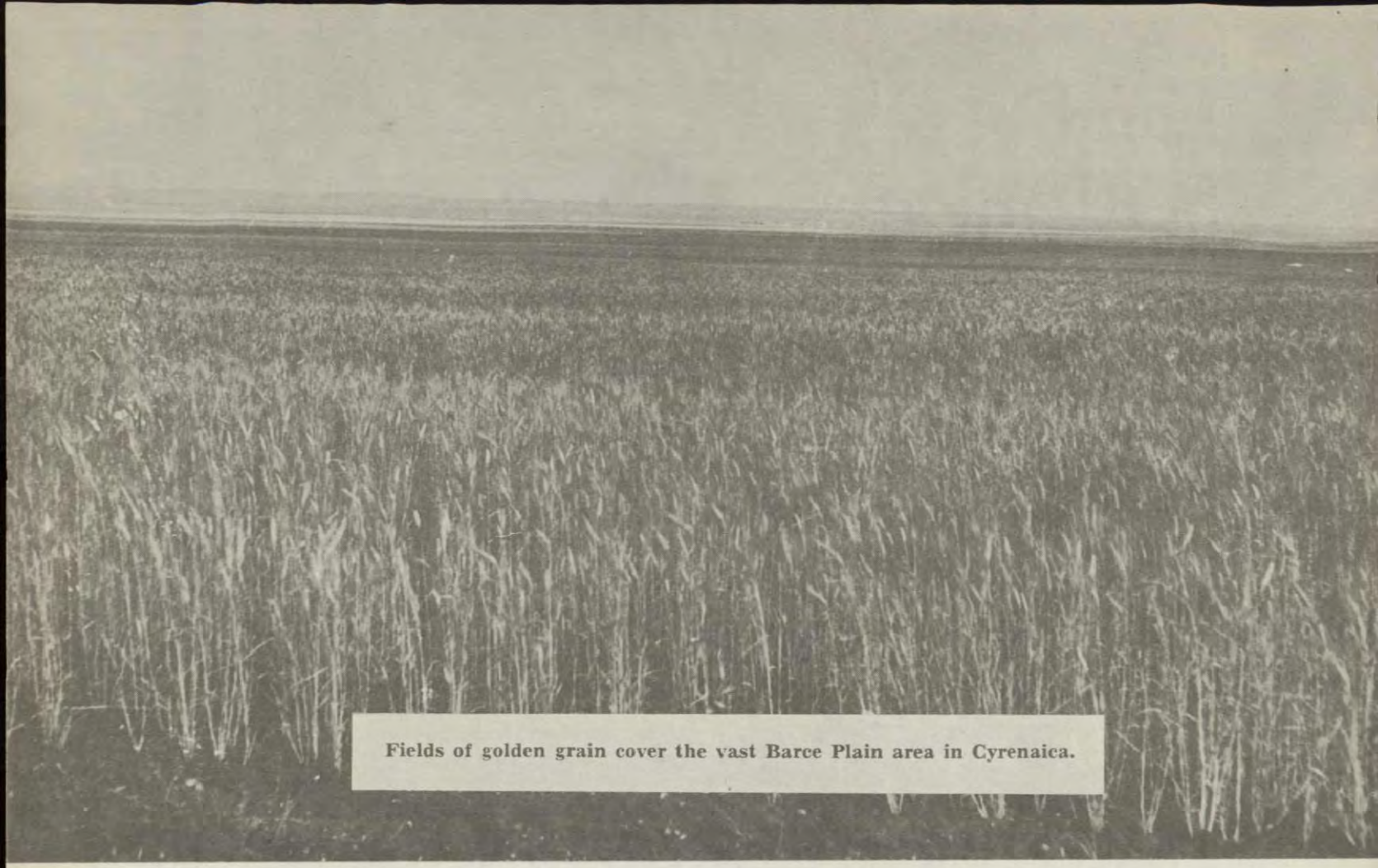
Two thousand years ago this water was harnessed by the Romans and conveyed in aqueducts for use in the city of Leptis Magna (now in ruins).

When American irrigation engineers came to Libya to assist in developing efficient irrigation practices, they saw this water going to waste. To utilize it, an adjacent area of 268 hectares was leveled and reclaimed in 1955-56 for farming. Three pump houses were erected, 4,000 meters of mainline canal, and 30,000 meters of lateral canals were constructed.

Landless Libyans in the communities of Homs, Zliten and Misurata were selected to farm this area on a long-time payment basis.

Houses were built and at present 120 families are farming two hectares each.

The cabbage crop is usually a big one at Wadi Caam and one which is easily marketed.



Fields of golden grain cover the vast Barce Plain area in Cyrenaica.

The Wadi Caam project also includes an office, a warehouse and a market shed. An active farmers cooperative association has been organized to assist farmers in helping themselves through group purchases and marketing of crops.

In Cyrenaica another land settlement project was started in 1958 on a large area of 25,000 hectares of fertile land in the Barce District which formerly comprised the Italian-owned ENTE Farms Corporation.

About 95 percent of the area is suitable for dry farming crops. Farms are mostly 25 to 35 hectares each. About 110 ENTE houses are in the Barce Plains, and 1096 in the rest of the Barce District.

The question of land ownership in the area has hindered progress. Without actual title to the land, farmers lack incentive to improve their land or homes.

An attempt was made to settle the question of whether the land was owned by Bedouin tribes or the Government, by establishing boundary markers on farms.

About one-third of the 1850 ENTE Farms have been surveyed and boundaries established. Thus far no definite land tenure law has been enacted.

Both projects, Wadi Caam and ENTE farms operate through Libyan-American Joint Service furnishing technical and material assistance to farmers. This has been provided for 30 percent of the dryland ENTE Farms, and 90 percent of the Wadi Caam irrigated farms.

Libyan-American Joint Service is supplying equipment for developing projects designed to encourage land settlement in other areas of Tripolitania.

This is a typical farmyard scene at Wadi Caam where 120 such houses are occupied by settlers.

CROP IMPROVEMENT — Marketing

THIS continuing project, designed to improve production and marketing of horticultural crops, started in 1957. The main objective of the program was to assist Libya to become self-sufficient in production of fruits, nuts, and garden produce.

So as to increase the supply of food for domestic consumption, planting of orchards, vineyards, and vegetables have been stressed during the past two years.

Tripolitania oranges are famous for their delicious flavor.

The major activities and accomplishments of this project during FY 1959-1960 follow:

With the improvement of existing nurseries, a system of fruit stock nurseries and orchards to supply Libyan farmers has been established.

Experiment stations have conducted sufficient testing to indicate what kinds of fruits and nuts are best adapted to Libya soil and climate.

Major demonstrations have been conducted in the rehabilitation of over 10,000 wild olive trees in Cyrenaica Province. This included pruning, budding, and construction of catchment basins to hold the rainfall and the soil. Crews of trained Libyans now carry on this rehabilitation program.

In the Fezzan pruning of date palms has been a big project. Groves of unkempt, tangled clumps of palms have been transformed into 53,000 neatly trimmed palms which now put their energy into producing fruit rather than numerous unproductive sucker shoots.

In areas where feasible, farmers have been encouraged through demonstrations to plant orchards and vineyards. A total of 117,000 fruit trees, peaches, apricots, and apples, and 20,000 table grapes have been planted during the period under review.

Trial tests on the growing and storage of Mangel beets in Libya have shown yields which are little short of fantastic. Under irrigation during the winter season of 1959-1960 at Wadi Caam, a Tripolitania land settlement project, Mangel beets (green leaves and roots) produced

200,675 kilograms per hectare or around 200 metric tons per hectare, (about 80 tons per acre). Roots comprised 70 percent of that tonnage and leaves 30 percent. Storage and livestock feeding trials are now under progress.

The market for fruits and vegetables has been broadened through agreements with Wheelus Air Base representatives to buy all the produce from the Wadi Caam land settlement project, and a specified area of land near Tripoli. Wheelus representatives with USOM's agricultural advisors have visited local vegetable and fruit producers for the purpose of signing marketing contracts with growers. This not only helps Libyan farmers but also helps assure a supply of fresh vegetables and fruits for Americans at Wheelus Air Base.

A Tripolitania Produce Marketing Committee has been created to foster this marketing movement. The committee consists of members of the U.S. Air Force, local agricultural marketing officials, and USOM agricultural advisers.

In 1959 Wheelus Air Base (near Tripoli) bought about 540 tons of locally-grown fruits and vegetables. This year's purchases will be substantially increased.

Other accomplishments of this cooperative Libyan-American program for the two-year period (FY 1959-60) are shown statistically:

Fruit tree seedlings produced	162,009
Hectares of orchards planted	550
Survival rate after six months	78 to 80%
Table grapes planted	32,000
Survival rate after one year	51%
Wild olive trees pruned	10,481
Catchment basins contructed around trees	3,397
Percentage increase in productive capacity of trees	300%
Date palms rehabilitated	53,000
Percentage increase in production of pruned palms	300%
Vegetable plants produced and distributed	325,000

Mangel beets make yields little short of fantastic, - 80 tons per acre.

American-trained Libyan technician demonstrates « budding » on olive tree.

Over 10,000 wild olive trees like this were pruned, with catchment basins constructed around most of them to catch rainfall and hold the soil.

Wadi Caam Co-op. President, Mufta Gaddami, and Co-project Leader, Mohammed Brahim Zlitni, select the best and ripest melons for shipment to market. Some of the largest weigh 12 to 15 kilograms (26 to 33 lbs.). With plenty of good fertilizer, (refuse from a fish canning factory), careful irrigation and pest control, certified seed, planted under supervision of an American technician, the cooperative produced a large tonnage of deliciously sweet melons.

Wheelus customers know good food when they see it, and Americans there are eager buyers of Wadi Caam melons.

All produce must be inspected before it is unloaded at Wheelus. Wadi Caam shipments pass rigid food inspection and draw praise from the inspectors.

Soil and Surface Water Conservation

Example of land terracing constructed by Libyan-American Joint Service to conserve soil and surface water.

TO help conserve Libya's soil from wind and water erosion, and to utilize the natural rainfall that occurs largely in the winter months, the Soil and Surface Water Conservation project was initiated by the construction of water-spreading dikes in the Sirte area of Tripolitania in 1954.

This demonstrated that run-off water from the hills and mountainous areas could be harnessed and spread over broad areas for range improvement. It also served to control flash floods. Thereafter dikes were constructed in many other areas of Libya.

In this connection, construction of terraces tied in with the Soil and Water Conservation program, concentrating the water on crop and orchard lands and controlling erosion.

Nearly 20,000 meters of dikes and 201,755 meters of terraces have been constructed in Libya improving thousands of hectares of crop and range lands. In drought years, about the only green patches to be found are behind dikes

To hold and spread water when it rains, is one of the important Soil & Surface Water Conservation objectives. Constructed of rock, the ends of this dike are keyed into the soil at tow and heel about one-half meter deep. The rock bed is one meter above the surface.

This 500-meter dike, in connection with dams, protect a spring development from winter flood waters.

or where terraces have helped to saturate the soil during winter rains.

Up to 300 percent increase in crop production has been noted on land behind dikes. Terraces are credited with increasing production up to 200 percent.

This project operates on a self-help basis, with farmers preparing sites for construction, and furnishing the labor, land, and gravel. The Libyan-American Joint Service provides materials, and technical advice.

In this category five irrigation and flood control dams have been constructed in Tripolitania, not only controlling run-off from watersheds, but also improving adjacent crop and range lands.

Over 100 Libyans have been trained in this field of work.

Cistern Rehabilitation

The first step in rehabilitation of old Roman cisterns is to clean out silt, rocks, and sand that have filled the cisterns during centuries of rain and windstorms.

WHEN American water conservation engineers came to North Africa to study Libya's water problems, they soon found evidence that the Romans had gone a long way in solving it two thousand years previously.

Many hundreds of ancient, rock-lined pockets in the earth, scattered over the hillsides and slopes, were remnants of an age-old water conservation system. Today we call these pockets «cisterns». Most of them have long been in disuse and are filled with sand and gravel from centuries of wind and rain.

With water being such an important part of the Libyan agricultural development program, there was a need for reservoirs or something to catch and hold water for use during the dry seasons.

The sandy, gravelly soil would not hold water for long, and it was not feasible to create reservoirs by constructing costly dams across valleys.

This was especially true in view of the rapid evaporation caused by the intense desert heat.

Ancient Roman cisterns, already located in suitable spots to collect runoff water during the winter rains, seemed to be the answer. All that was necessary was to clean them out, line them water-tight, with cement, curb them, and attach livestock watering troughs.

Thus the Cistern Rehabilitation project got under way in late 1956 in Tripolitania and 1957 in Cyrenaica. It now constitutes the largest project of the agricultural development program carried on cooperatively by the Libyan and American Governments. It is a self-help project in which the government supplies tools and cement, and the farmer furnishes the labor for cleaning and masonry work.

More than 2,800 cisterns have been rehabilitated and repaired since the project started. Some are small cisterns, with water capacity of less than a hundred cubic meters while others are cavernous, underground reservoirs ranging up to 4,500 cubic meters capacity. The program calls for rehabilitation of 4,000 cisterns.

SAVINGS EXCEEDS COSTS

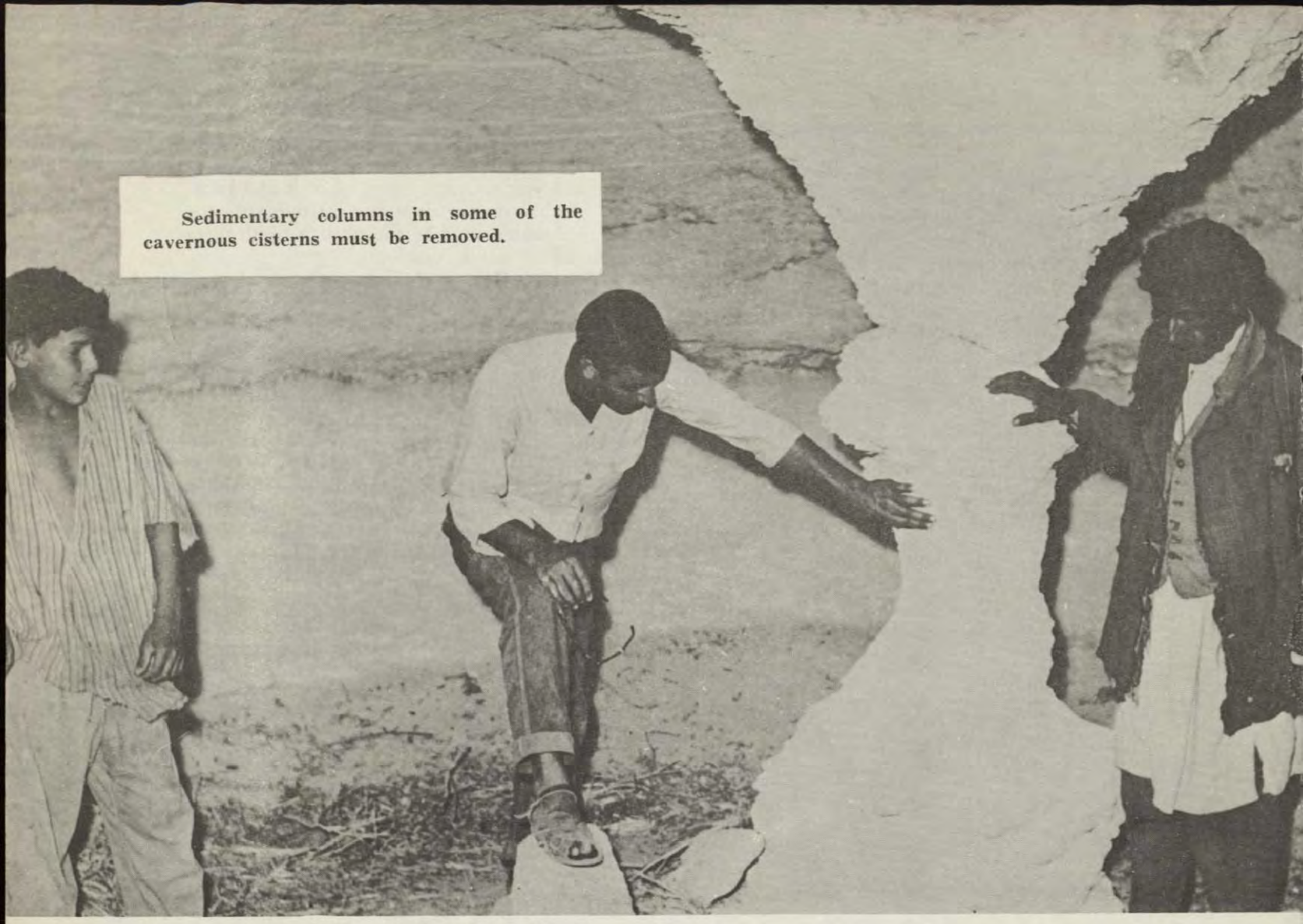
In the province of Cyrenaica, where ancient cisterns are much larger than in other parts of Libya, a year-end accounting of costs and benefits of the work reveals that in one year the value of water saved by the work is worth more than rehabilitation costs.

The 526 Roman cisterns that were cleaned and repaired in Cyrenaica during one year (FY of 1960) in the joint Libyan-American self-help cistern project, had the capacity for holding run-off water (which otherwise would be lost) to take care of 10 percent of the livestock in that province. The combined water-storing capacity of those cisterns was 191,558 cubic meters or 50,762,870 gallons.

It is doubtful that, in the history of livestock water development in any area of comparable livestock population, so much water has been provided in a single year in this manner for such a high percentage of the livestock as in the province of Cyrenaica.

That much water would cost an average of £L. 1.250 per cubic meter, or a total of

Picks are used to dislodge dirt between rocks in the recesses of some of the large cisterns.



Sedimentary columns in some of the cavernous cisterns must be removed.

£L. 239,447 ($670,452) *if owners had no cisterns and were forced to have it hauled to their stock as in the past.*

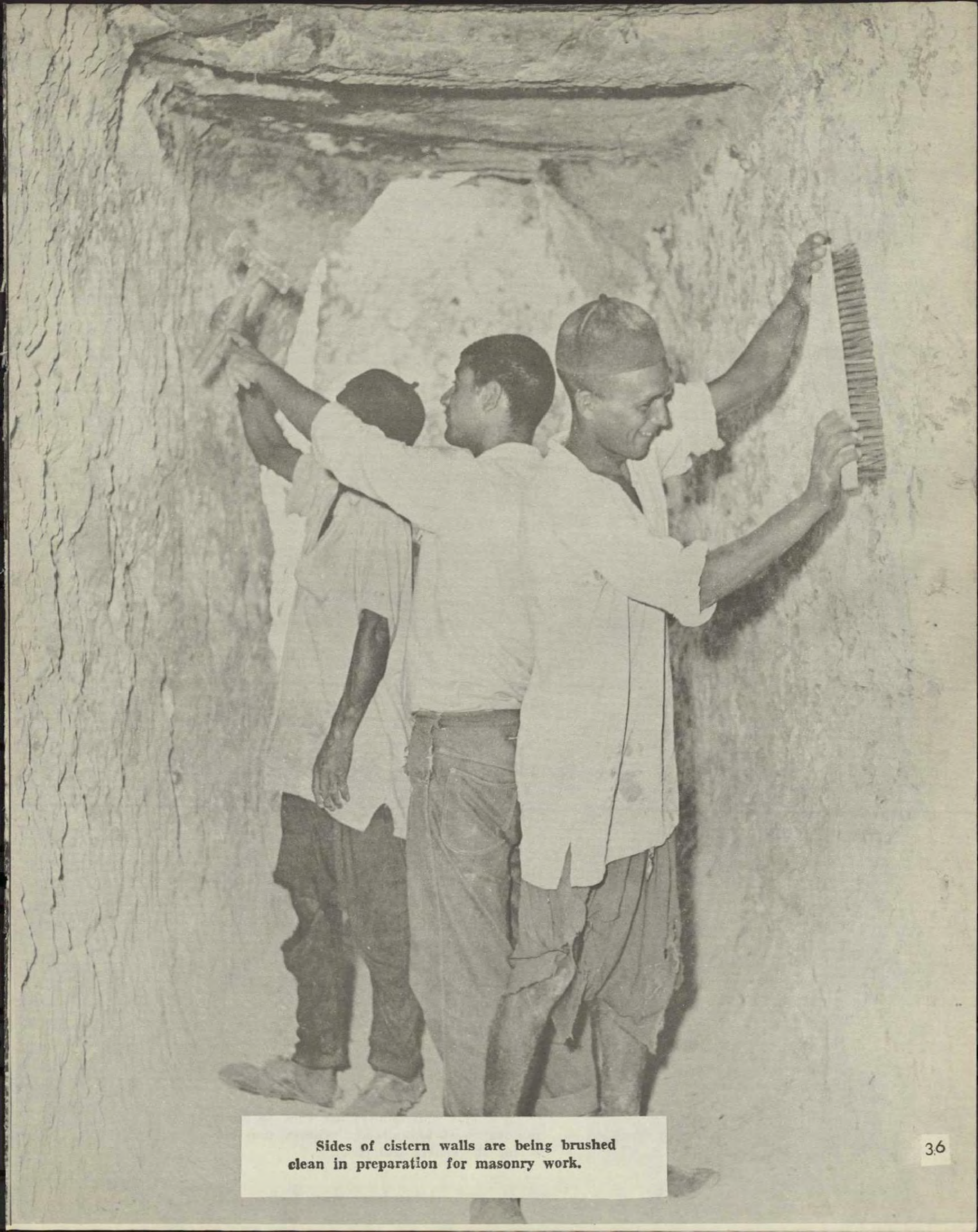
This first year's savings ($670,452) is equivalent to nearly twice the $360,669 cost of the year's Cistern Rehabilitation project. Total funds allotted for this project from July 1, 1959 to June 30, 1960 were $178,699, of which it is estimated that $360,699 were expended for cisterns and the balance for other long-time water saving devices. This figure does not include the farmers' self-help contributions of labor, masons and other costs. The Soil and Water Conservation program also includes dike and terrace construction flood control work, and purchase of equipment which will be used for many years to come.

So the question « will it pay? » that has disturbed some Libyan owners when planning to participate in the self-help cistern cleaning project, has definitely been answered — *rehabilitated cisterns will more than pay for themselves in one year.* Moreover, they will go on and on, every year, paying the same big dividends in savings. Every normal winter season will find cisterns being filled with water that runs off the slopes and holding it for convenient watering of livestock during the dry seasons.

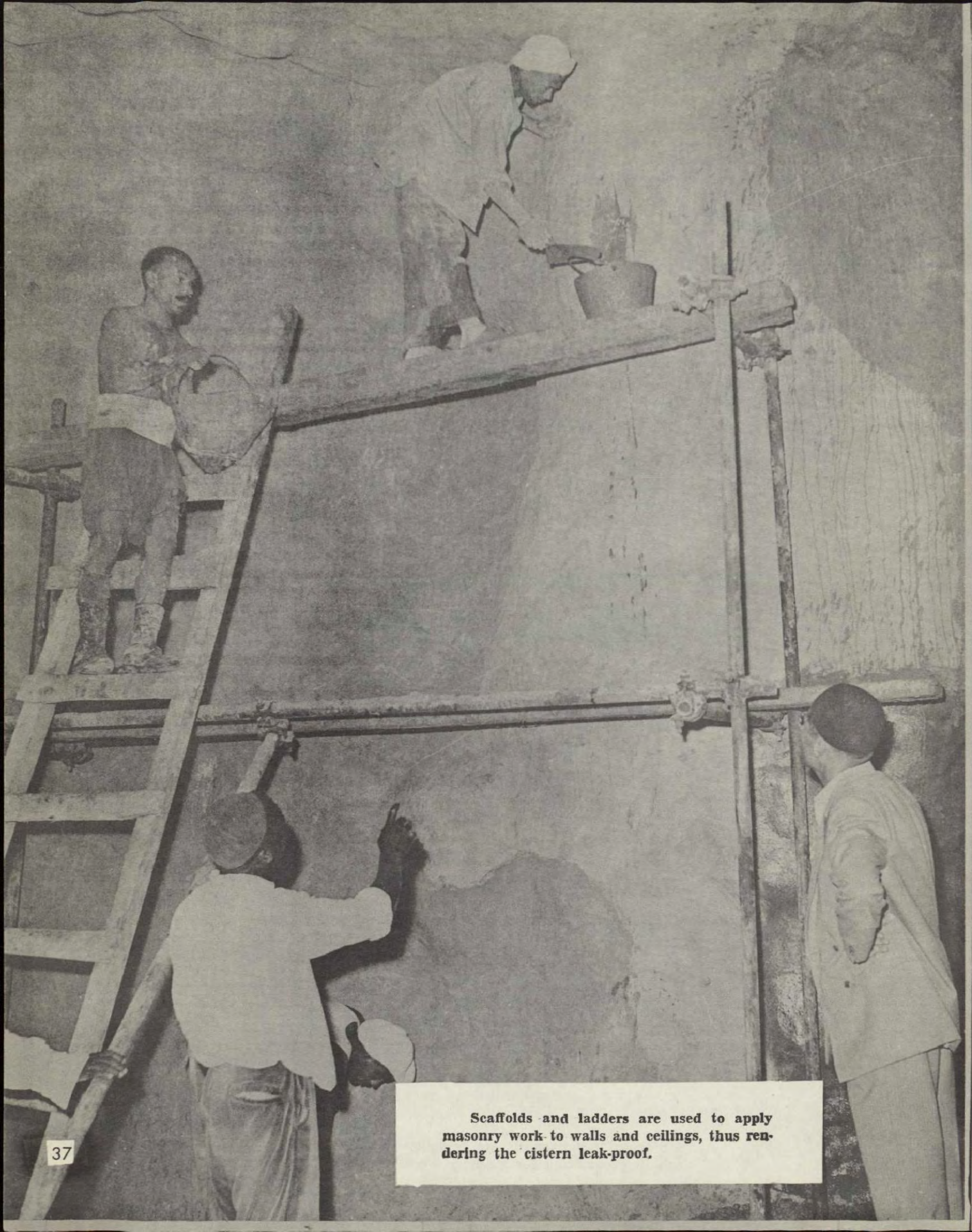
Increased efficiency in cistern work during the past year also is reflected in the following comparison. In Cyrenaica during the two previous years (1957-1959) 216 cisterns were completed or an average of 108 per year. This year 526, or nearly five times the previous annual production, were cleaned and repaired.

The extent that the Cistern Rehabilitation project has developed toward supplying the livestock needs of Cyrenaica province is shown as follows:

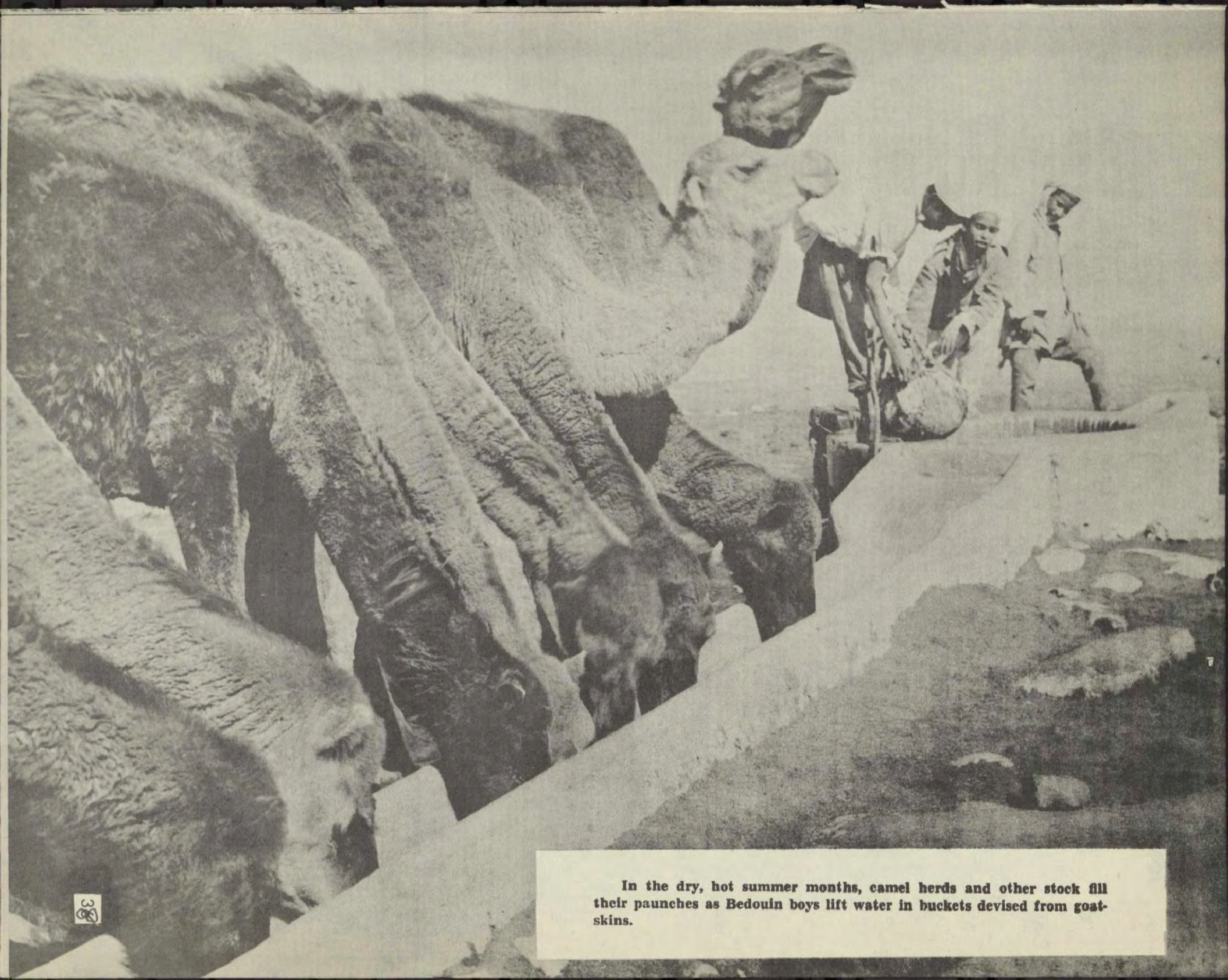
Animals normally watered from well and springs	50%
Animals watered from cistern prior to 1957	30%
Animal consumption capacity of cisterns (1957-1960)	13.5%
Animals remaining to obtain water on «catch-as-catch-can» basis	6.5%
	100%



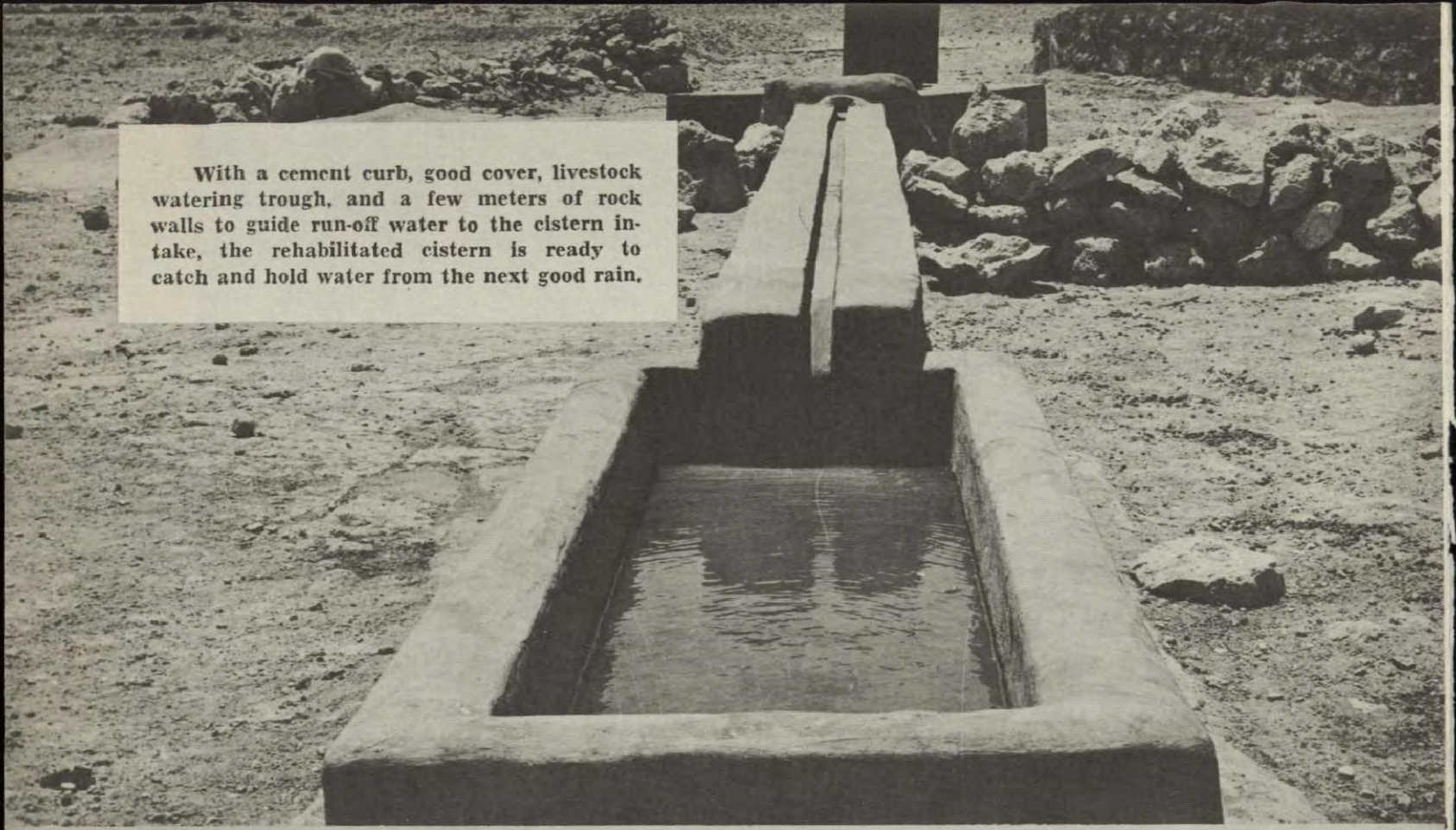
Sides of cistern walls are being brushed clean in preparation for masonry work.



Scaffolds and ladders are used to apply masonry work to walls and ceilings, thus rendering the cistern leak-proof.



In the dry, hot summer months, camel herds and other stock fill their paunches as Bedouin boys lift water in buckets devised from goat-skins.



With a cement curb, good cover, livestock watering trough, and a few meters of rock walls to guide run-off water to the cistern intake, the rehabilitated cistern is ready to catch and hold water from the next good rain.

It's a happy day when a Libyan livestock owner finds his cistern full. Benefits, of rehabilitatoin work are realized year after year when his herds take on «fills» of water without traveling great distances during the hot, summer months.

Forestry Development

IN the year 1952, when the basic agreement for providing technical cooperation by the United States was signed, one of the first requests by the Libyan Government was for Forestry assistance.

There was need for establishing forest cover on land not suitable for farming and to control sand dune encroachment on good, irrigated areas. Unless this was done, dunes would continue to move around with every strong, shifting wind and blot out many food-producing farmlands.

Also there was a need for fuelwood and charcoal for local use. Trees were needed to provide shelterbelts and windbreaks for farm protection. There was need for material with which to make domestic furniture, and for the building industries.

So the cooperative Libyan-American Forestry program was initiated eight years ago. A plan was made and steps taken to restore Libya's forest reserves and to introduce those principles of forestry management which are basic to the conservation of soil and water.

Technical and financial assistance was provided to expand and improve existing nurseries for production of seedlings for the planting program. Training schools were established, and Libyans learned while on-the-job.

As in other agricultural projects at the beginning, forestry workers were scarce and a staff of trained forest technicians had to be created.

Forest police were trained in the Forest Guard School .Some went to neighboring countries to learn from experience of others.

At the present time Libyan technicians are proficient in nursery work, and the process of «dissing», the first step in sand dune fixation. « Dissing » is the technique of placing vegetation in a network of trenches in dune areas to protect young seedlings until they take root. « Dissed» areas with a good stand of seedling trees constitute the process of sand dune fixation.

Libyans not only are taking care of local sand

Bare root stocks cannot be successfully transplanted in Libya. Individual seedlings are grown in pots or old tin cans and nursed along for a year or two before they are put into the ground. Libya's nurseries produce over eight million seedling a year.

dune problems but also they are training agricultural officials from neighboring Arab countries in the technique of dune fixation.

Agricultural Extension cooperates with Fortsry by giving demonstrations regarding the proper methods of planting trees individually on a large scale. Posters and other literature are distributed each tree-planting season explaining in simple terms and with diagrams and illustrations about the care of young trees. Motion pictures each season are shown at farmer meetings regarding planting and care of seedlings so as to obtain a high percentage of survival .

The winter seasons ordinarily provide sufficient rainfall to give seedlings a good start, and this is the time when tree-planting reaches the height of activity.

Libyan nurseries now have an annual capacity of 8,500,000 seedlings. Afforestation of government lands, in the steppes and mountain areas to help control soil erosion and floods, has been on a planting rate of 1,500 hectares per year.

Around 20 forest police guards are being trained annually in both Cyrenaica and Tripolitania and forestry officials are receiving training abroad, mainly at the Cyprus college of Forestry.

Lacking the natural forests that cover large areas of northeastern Cyrenaica, Tripolitania required most attention by foresters. In that province, alone, the past two-year progress is shown in the following statistics:

Afforestation	5,292,087	trees planted
Community and private forests	3,702,394	trees planted
Windbreaks and shelter belts	1,216,235	trees planted
Roadside protection	152,000	trees planted
Recreation areas	54,200	trees planted
Combined totals	10,416,916	trees planted
Sand dune « dissed »	3,181	hectares
Sand dunes planted and fixed	2,519	hectares
Fixed sand dunes maintained	20,724	hectares

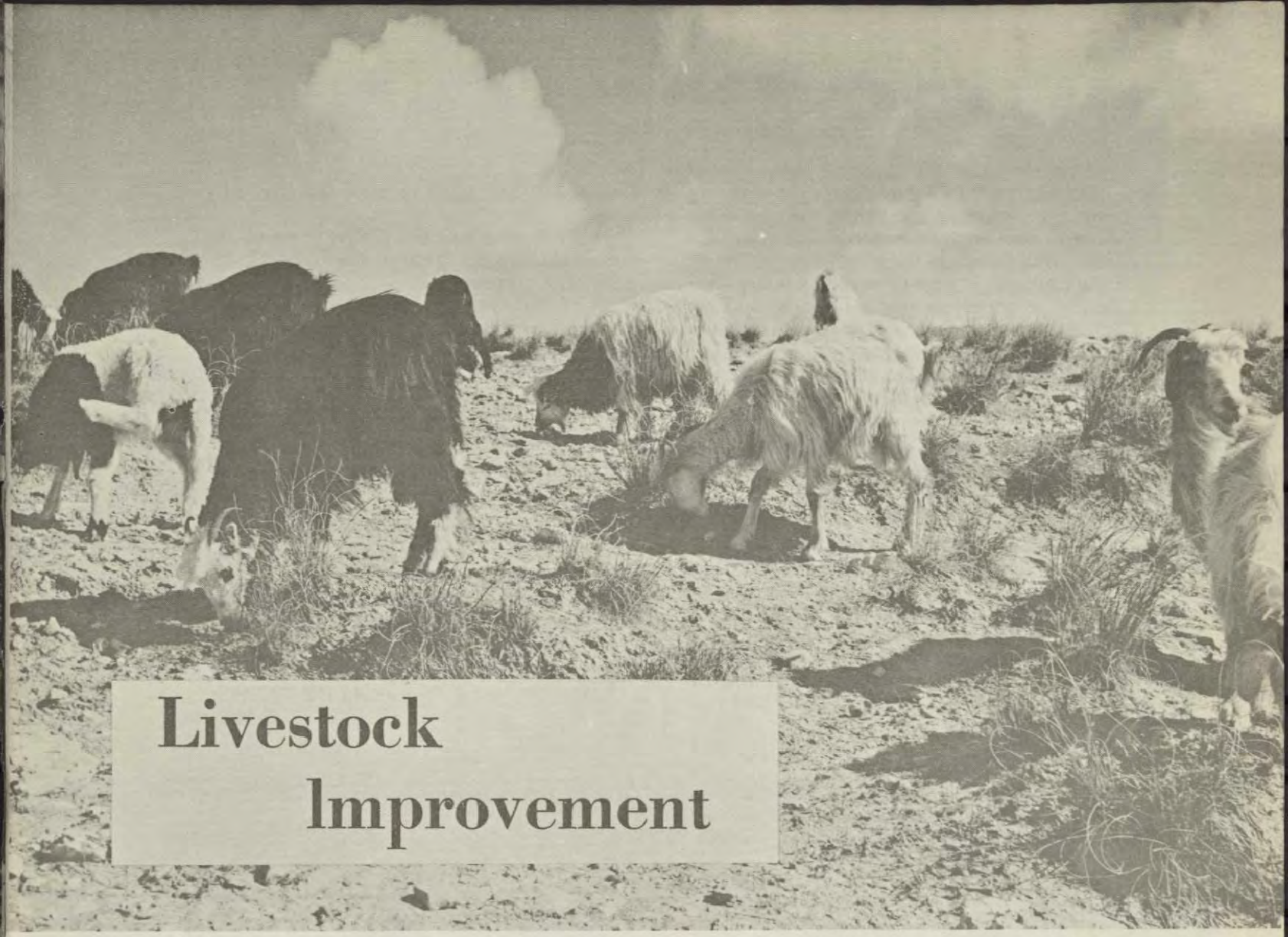
View of a sand dune area after « dissing » or placing vegetation in a network of trenches to protect young seedlings until they take root.

After « dissing », seedling are planted in the square plots where they are protected from wind and blowing sand until they become well-rooted. The process is called « sand dune fixation ».

After two years this Eucalyptus tree, planted in «« dissed » dunes, shows vigorous growth.

The Forest Guard (on the right) is proud of the outcome of this 28-year growth of pines in Cyrenaica. Vast areas of this province are well covered with forests which provide fuelwood, charcoal, material for making domestic furniture and for building. Moreover, these wooded areas help control sand dune encroachment on good, irrigated farms, and serve as windbreaks and shelterbelts.

(Below) Not long ago this area, near Agedabia, Cyrenaica, was a wasteland of sand dunes. Through the process of sand dune fixation («dissing» and transplanting seedlings), it now shows promise of becoming a healthy young forest.



Livestock Improvement

FOLLOWING a one-man survey of the Libyan livestock situation in 1952, USOM's Livestock Improvement program made its actual start in 1953.

Two-fifths of the country's population were nomadic and depended upon livestock grazing. Most of the animals were for home consumption but increasing numbers were being marketed as meat animals.

The overall purpose of the Livestock Improvement program is to help Libya increase livestock resources and income through introduction and distribution of improved breeding stock.

To do this it was necessary to increase forage production, improve watering facilities, expand veterinary services, and broaden markets for livestock and wool.

With these things in mind, a program was established and training started to build a well-staffed Livestock Improvement Section which could carry on the program without assistance.

The basic source of breeding stock used for breed improvement is from the Nazarates Livestock Farms such as Sidi Mesri, and Garabulli in Tripolitania, and Marzotti, Gubba and Benghazi Farms in Cyrenaica.

Supplementing this activity are well-bred imported stallions, jacks, bulls, and rams. The Nazarates of Agriculture maintain the breeding stock. Breeding services are provided free to farmers who bring their female stock to the 38 stud centers. These breeding stations are centrally located and convenient to the main livestock-producing areas of Tripolitania and Cyrenaica. Studs are rotated from one center to another to prevent inbreeding. Rams are distributed to growers during the breeding seasons to assist them in improving their flocks.

Dipping and drenching demonstrations for control of parasites are carried on seasonally through the Extension Service. Extension also trains demonstration teams to elevate Libya's reputation as a wool-producing country and thereby attract export demand for the product. To assist in this effort, a wool-washing plant is being established at Benghazi.

Demonstrations also are held to show farmers the proper methods of raising chickens. Small incubators and brooders are furnished rural schools and Extension offices, and hatching eggs and protein feeds are furnished by the Libyan-American Joint Service.

To actually see the accomplishments of the livestock program, it is necessary to motor through livestock-producing areas of Tripolitania and Cyrenaica and observe heavier mutton-type sheep with improved fleeces, the results of crossing the Karamans with native Barbary ewes; mules that can do much more work than native donkeys; crossbred cattle with better beef conformation; and others of more desirable diary type.

The following statistics portray some of the major achievements made in the Livestock Improvement program;

38 breeding centers and 4 veterinary centers have been established.

70 percent of the livestock breeding improvement and parasite control has been completed.

70 livestock watering facilities have been improved and hundreds of cisterns rehabilitated to provide stock water during the long dry seasons.

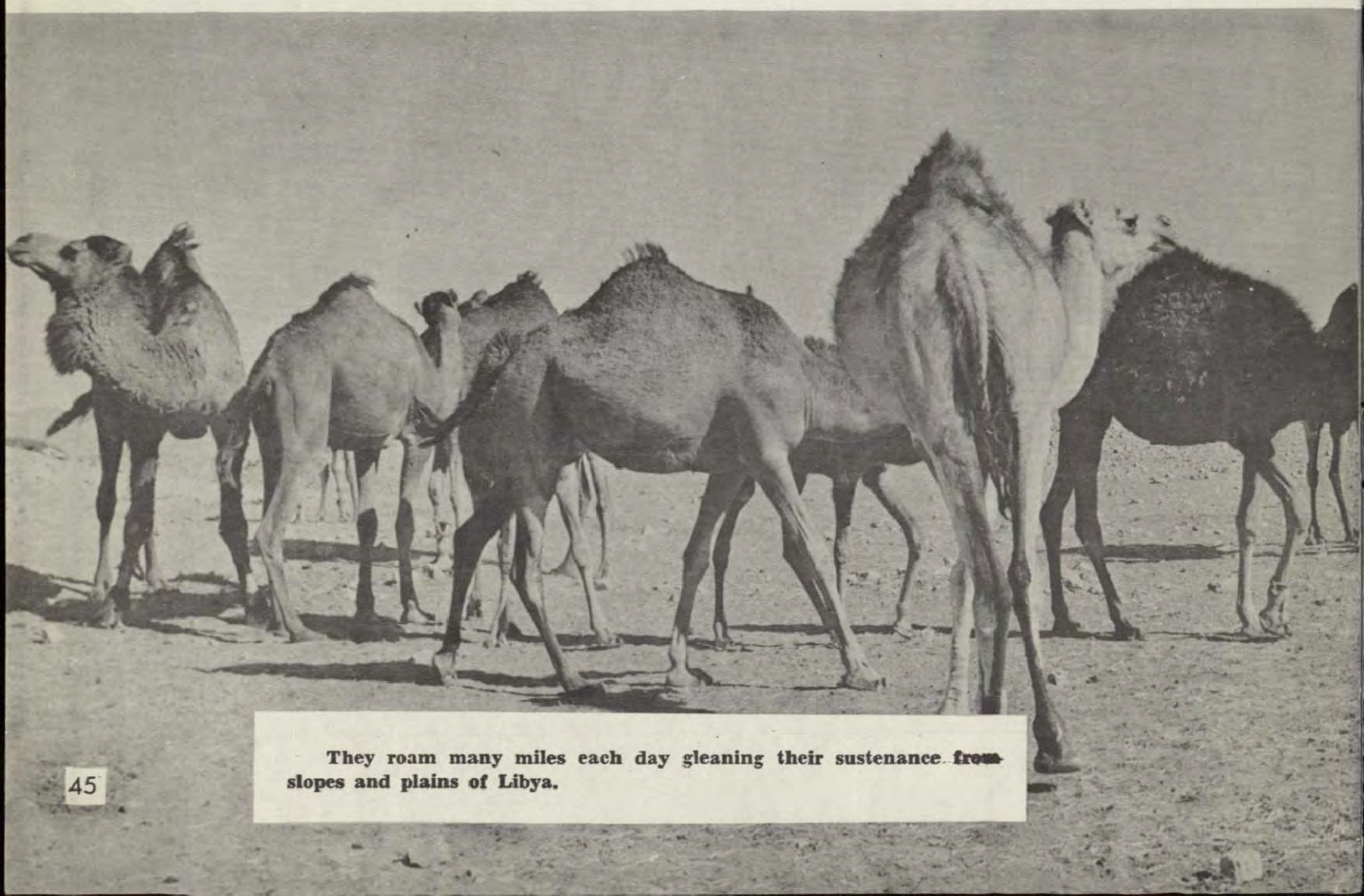
700 hectares of forage plots have been established.

41 dipping vats have been constructed, with annual average of 300,000 sheep and goats being dipped ,and 1,500 camels sprayed or dipped.

2 flock demonstrations and 2 poultry pilot demonstrations have been established.

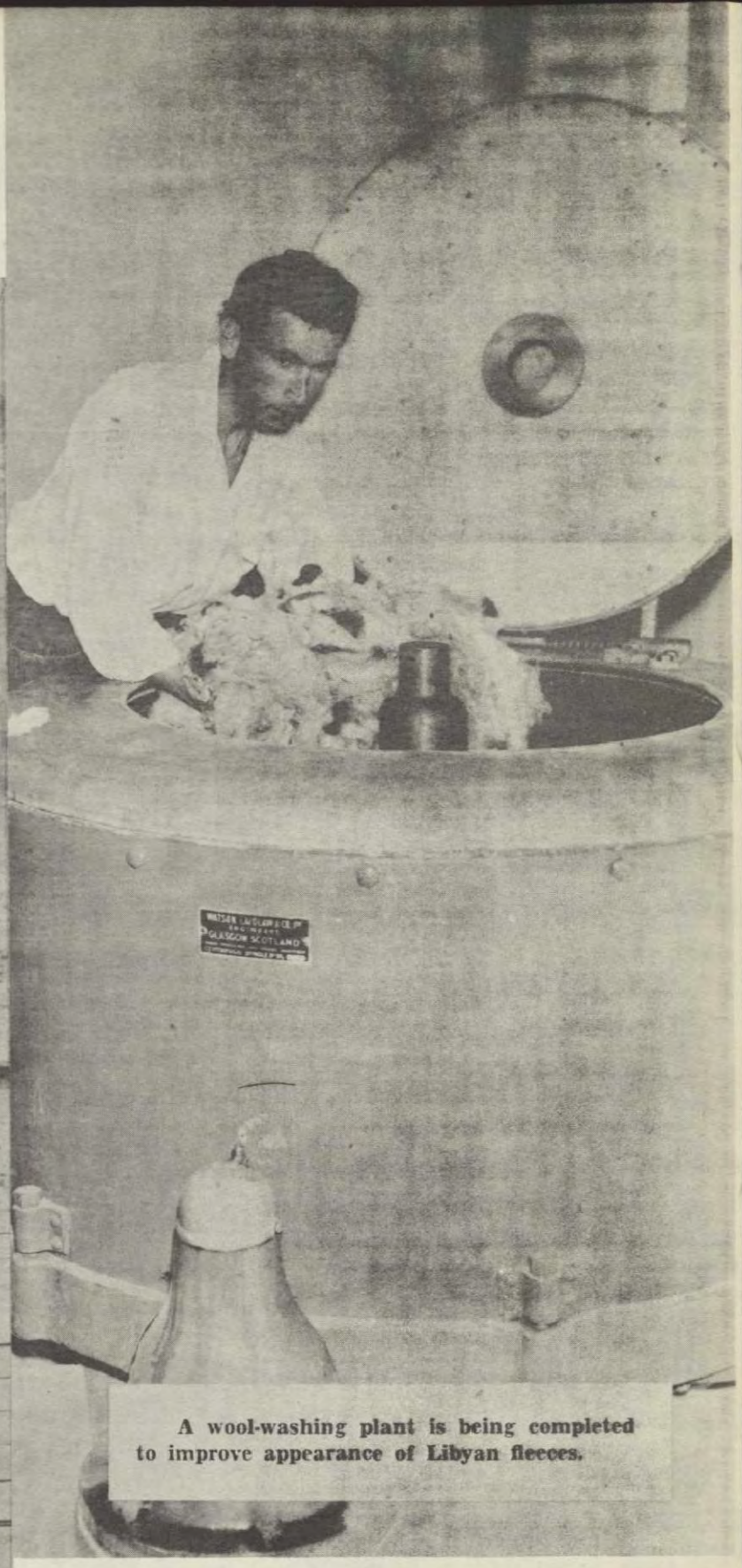
27 Libyans have been trained in livestock improvement activities.

1 wool washing plant is being constructed.



They roam many miles each day gleaning their sustenance from slopes and plains of Libya.

Libyans receive training in the proper methods of shearing sheep and the use of mechanical equipment.



A wool-washing plant is being completed to improve appearance of Libyan fleeces.

Many hundreds of camels are run through dipping tanks each year to rid them of external parasites.

Dipping helps external parasites that attack Libya's flocks.

This farm youth takes pride in showing his pet lamb.

Range Management

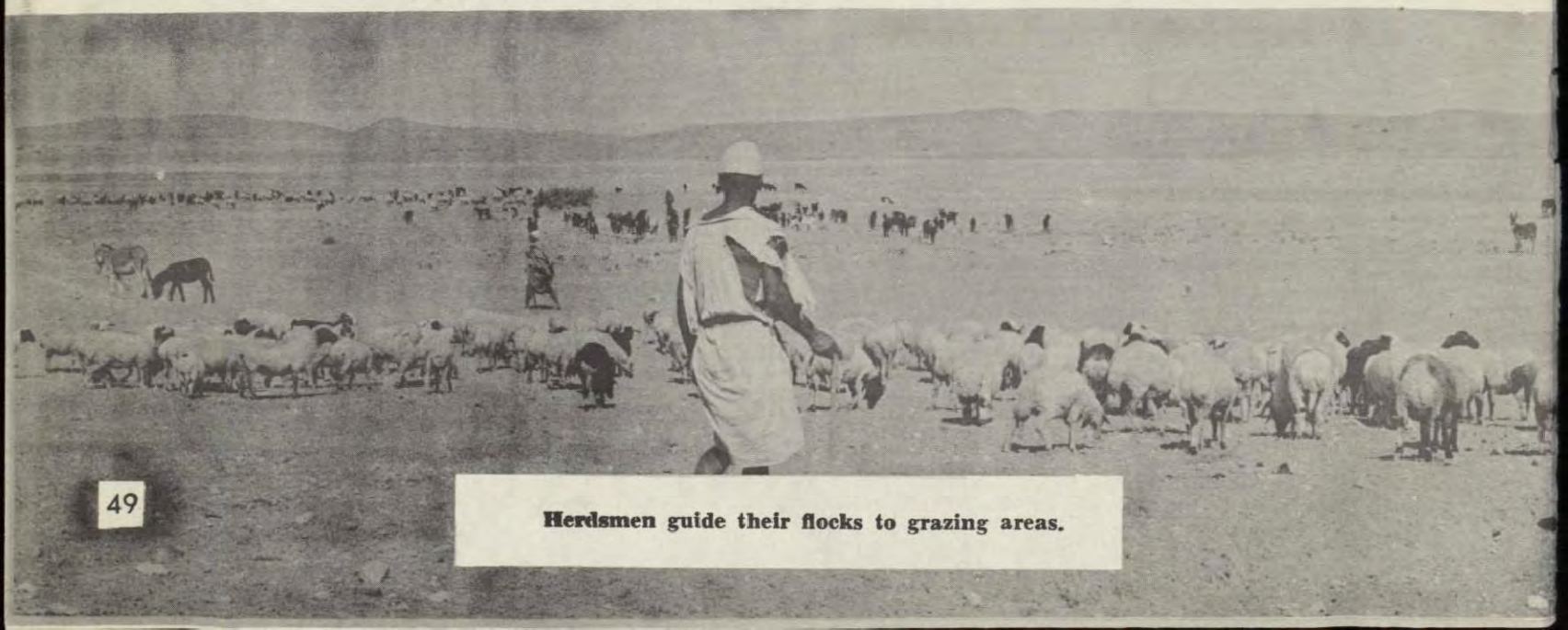
IN 1955 the first USOM Range Management technician came to assist in rehabilitation of Libya's pasture and range lands with a plan to restore grazing and forage production for maximum livestock production.

This project operates on a demonstrational basis through Libya's Agricultural Extension Service on large tracts of Government land. It ties in closely with the livestock, forestry, water conservation, and land tenure programs.

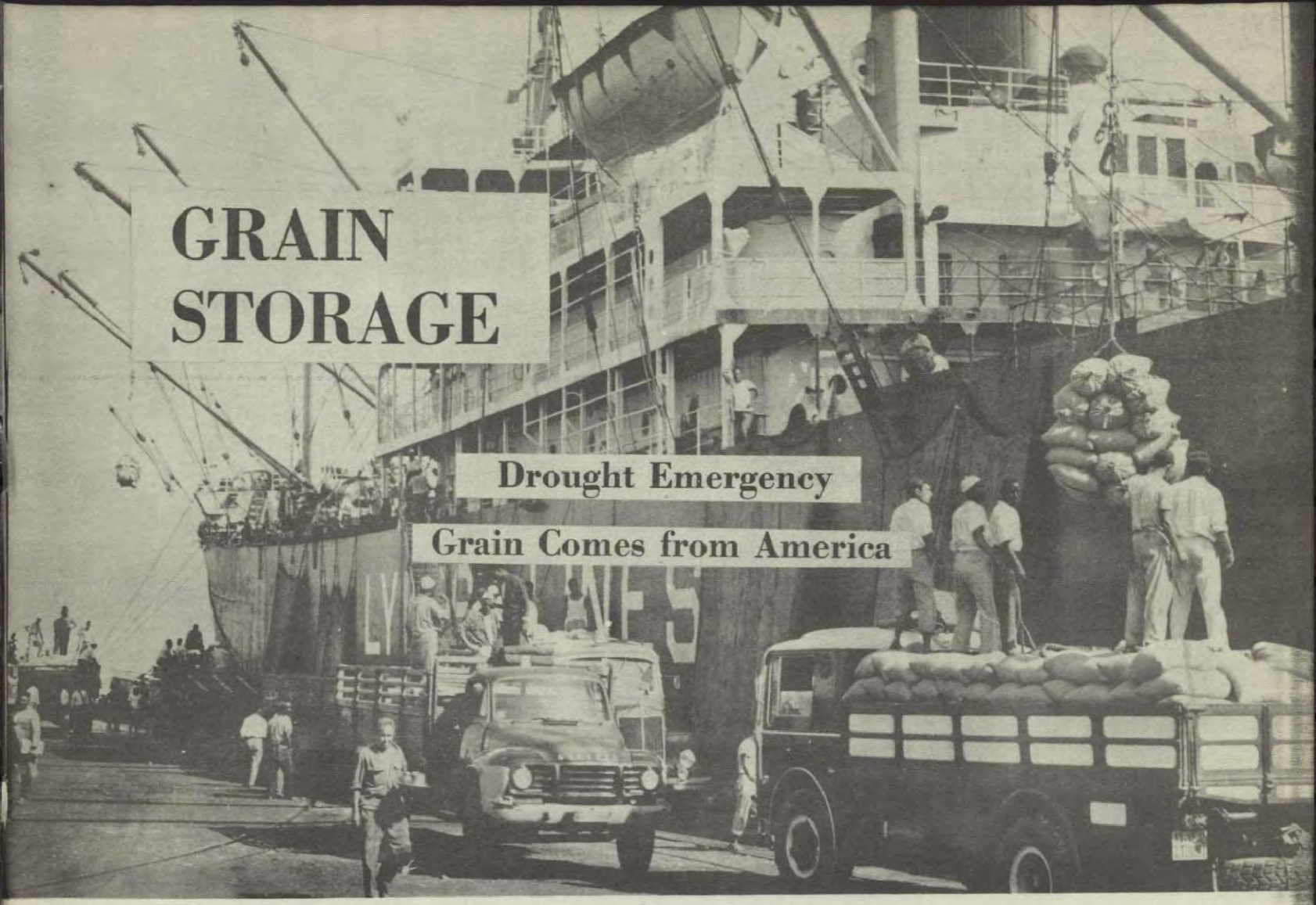
To restore large areas of pasture and forage, it is necessary to: (1) restrict grazing and obtain range management legislation and land tenure laws; (2) establish forage reserve areas; (3) demonstrate hay production and storage; and (4) train Libyans in range management practices.

During the first two years information was obtained on which to base future developments and a few projects were started. During the past two years however, some very definite developments have been made.

1. Eleven tribal leaders (sheikhs) went to America to visit range areas of western USA for six weeks to study methods of range management and use there. This helped pave the way for progress in this field in Libya.
2. Seven range recovery demonstrations and four range management demonstration units have been established.
3. Two hundred hectares of grass seed nursery have been established and four range forage reserves have been set aside.
4. A Federal Committee has been selected to draft new land tenure polices.
5. Experimental seeding of perennial grasses has helped to determine best varieties to use.
6. Demonstrations on 52 farms embracing 880 hectares have been held to convince farmers of the benefits to be derived from good range management.



Herdsmen guide their flocks to grazing areas.



GRAIN STORAGE

Drought Emergency

Grain Comes from America

WHEN the Federal-level Grain Storage Section was established in the agricultural program in 1956, little did anyone realize how much it would be needed in the « lean years » ahead.

During the past two years the job of handling large receipts of emergency gift-grain from the United States, under PL 480 Title II, fell upon this section which is now one of the most active of the Agriculture & Water Resources Division.

Several years ago existing warehouses were renovated and repaired. Additional storage space was constructed at points where needed. Libya's grain storage capacity was doubled. Men were trained in the methods of handling, storing, and caring for grain. Libyans learned these techniques while on the job under the instruction of an American technician. Several are now in America working and learning modern methods of storage and how to control weevils and other infestations that damage grain.

A Libyan Federal Director of Grain Storage was appointed. Similar offices and organizations for provinces were formed, and this set-up was of special importance in the distribution of relief grain in years to come.

DROUGHT REDUCES FEED

Since 1955 Title II grain (wheat) has been shipped from America to Libya to augment its short supplies. But in 1959, one of the worst droughts in the history of Libya caused an emergency situation in Cyrenaica and parts of Tripolitania.

During the winter months of 1958-1959, when rainfall is usually at its peak, scorching desert winds served as a warning of approaching disaster to Libya's flocks and herds. USOM's Agriculture & Water Resources Division re-

ported to Washington of the impending famine, requesting relief grain for livestock as well as for human consumption.

Numerous herds of cattle, sheep, goats and camels roamed the parched grazing areas in search of feed. A general movement of livestock on hoof and by truck took place from stricken areas to localities where there were still some grass roots undiscovered by previous herds. Hundreds of communities were in need of food and water.

AMERICA ANSWERS

ICA in Washington responded to the call for relief by arranging for shipments of wheat, barley, and grain sorghum in quantities and frequencies commensurate to the ability of the Libyan ports and transportation facilities to handle and distribute it.

In the meanwhile the drought situation of 1959 became more desperate and emergency demands increased. The original allotment of 45,000 tons was boosted to 60,500 tons.

When this grain started coming into Libyan ports, USOM's agricultural men devoted much of their time to the planning and preparation for speedy and fair distribution of the grain. In cooperation with Libyan officials, a schedule of rationing, based on the size of individual flocks and local feed conditions, was worked out and all grain concentration and distribution points received complete instructions.

Agriculture's cistern rehabilitation work was intensified. Development of springs was hastened. Groundwater and Surface Water Conservation men worked long hours each day in search of new sources of water and in devising means for more efficient use of the limited available supplies. Cisterns were low. Wells were taxed to the limit by constant pumping. There seemed to be nothing left for livestock to feed upon except barren stretches of rocky, sandy land and limited rations of water.

Nineteen ocean-going vessels were scheduled to bring grain to Libya from four major American ports. Grain was on the way, but livestock were dying from starvation by the hundreds.

FEED FROM TUNISIA

To obtain livestock feed as soon as possible, a representative of Agriculture & Water Resources went to Tunis where, in cooperation with the Governments of Libya and Tunisia, arrangements were made for an immediate loan of 1,200 tons of barley to be repaid later with an equal amount of emergency grain when it arrived from America.

The initial shipment helped to alleviate the emergency feed situation. It was not long until

Little space was left on the Benghazi docks for regular cargo when arrivals of American gift-grain were at their peak.

Libyan ports, especially Benghazi, were busy unloading grain from ships and loading it on rail cars and trucks for transportation to interior distribution centers.

MORE GRAIN COMES IN 1960

Before the docks at Benghazi had been entirely cleared of 1959 drought-relief grain, a new emergency program started in Tripolitania. Limited rainfall in that province during the winter of 1959-60 resulted in crop failures and three shiploads, totaling 12,000 tons of livestock feed (barley and sorghum), were diverted to Tripoli port during February and March, 1960.

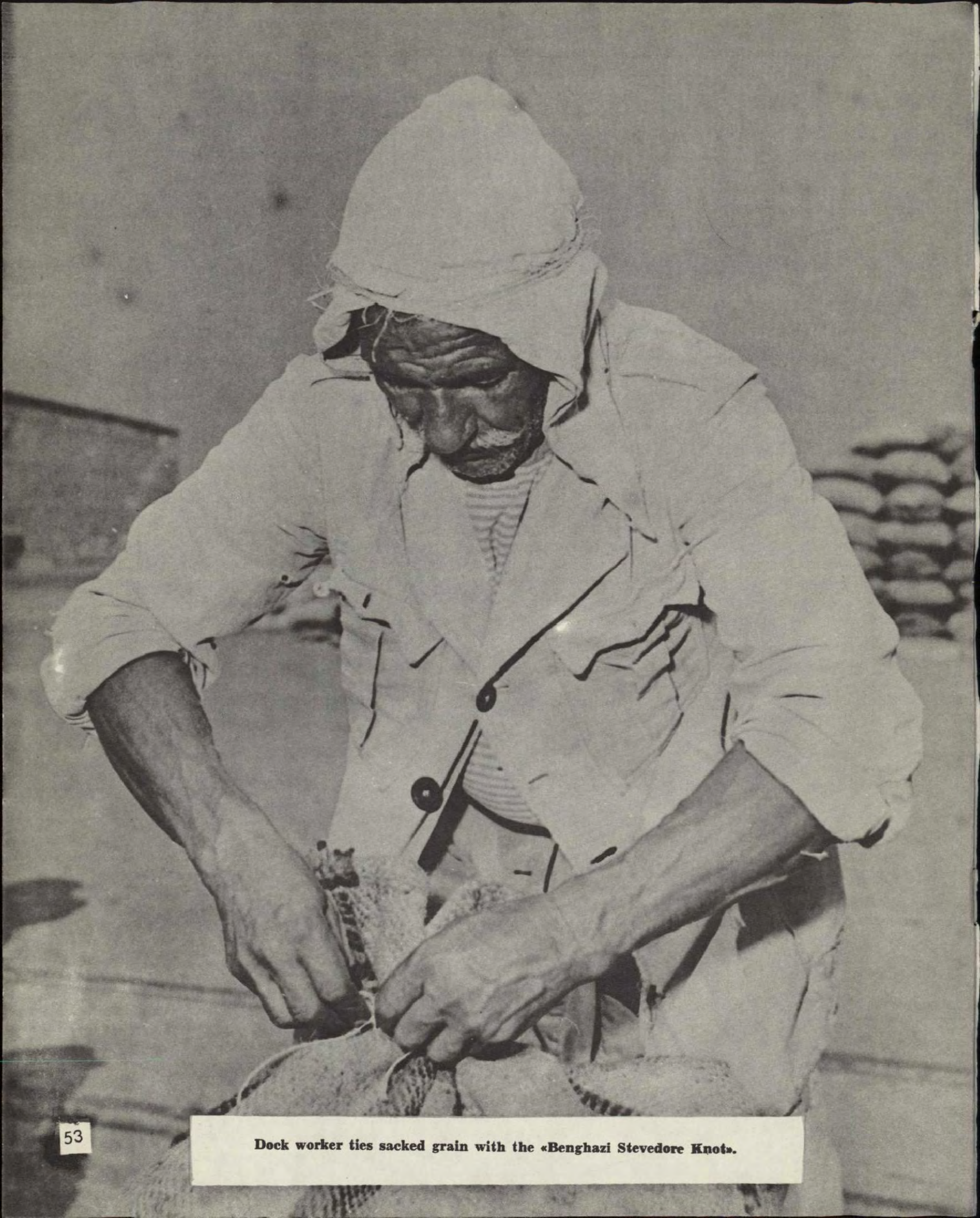
When weather conditions during the spring months indicated further drastic reduction in crop yields for Tripolitania farmers, the quota of Title II relief grain from America was raised 50,000 tons, making a combined total of 62,000 tons for the entire year 1960.

In the past five years (1955 through 1960) a total of 199,066 tons of gift-grain valued at £23,950,000, has come from America to Libya for distribution to drought-emergency communities.

During the last six months of 1959 gift-grain from America was distributed to needy communities as follows:

	Wheat Tons	*Barley Tons*	*Grain Sorghum Tons*	*Total Tons*
Cyrenaica province	16,956	15,000	13,000	44,956
Tripolitania province	5,060	5,000	5,000	15,060
Fezzan province	550	—	—	550
Totals	22,566	20,000	18,000	60,566

Grain-laden trucks line up at the scales to check weights before starting out to distribution points. In the upper right-hand corner ships can be seen unloading at the Tripoli docks.



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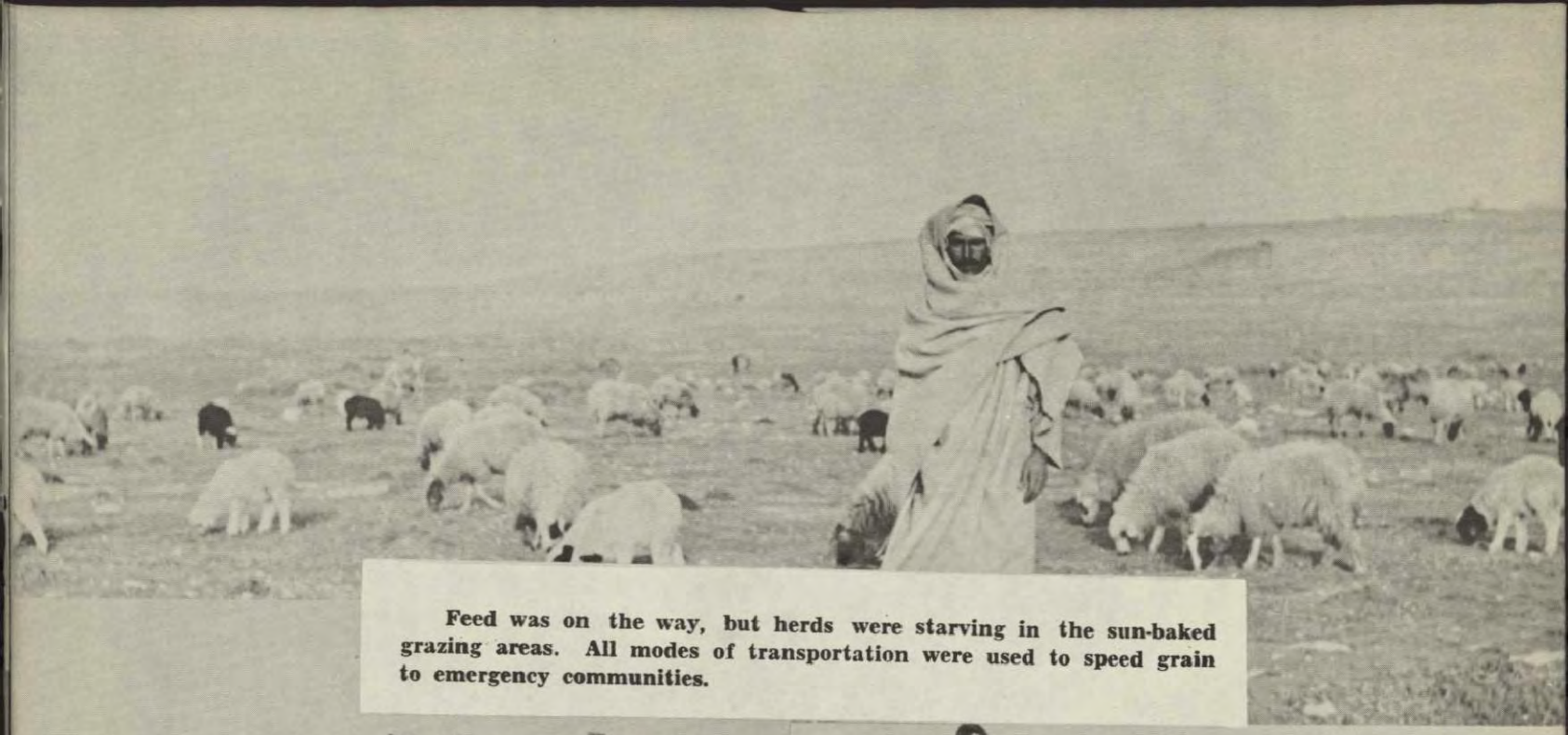
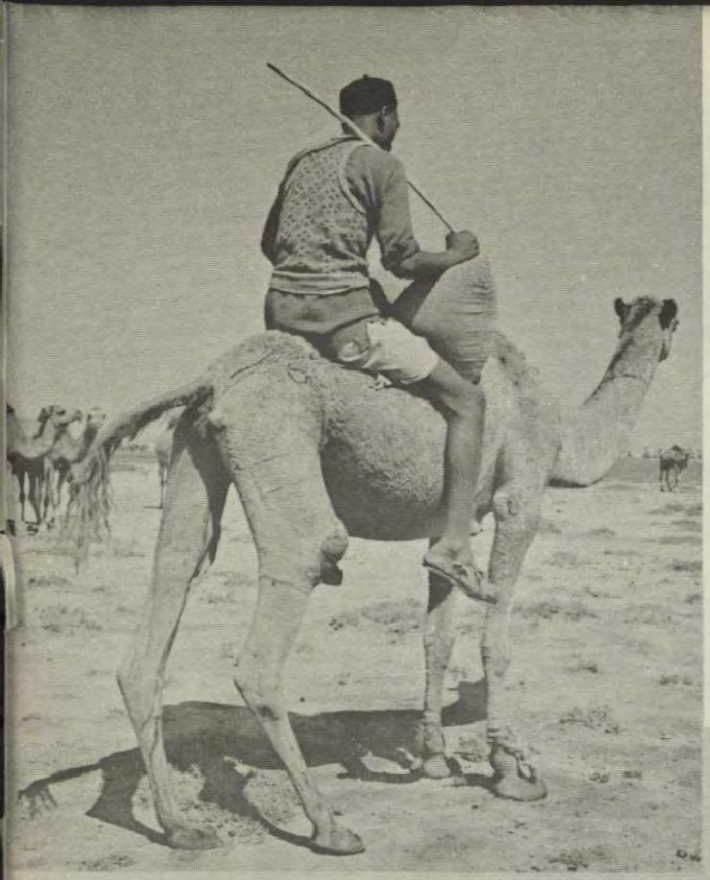
Dock worker ties sacked grain with the «Benghazi Stevedore Knot».



Feed was on the way, but herds were starving in the sun-baked grazing areas. All modes of transportation were used to speed grain to emergency communities.

Hungry children greet grain trucks as they arrive at distribution points.

Donkey carts are kept busy delivering relief grain to villagers.



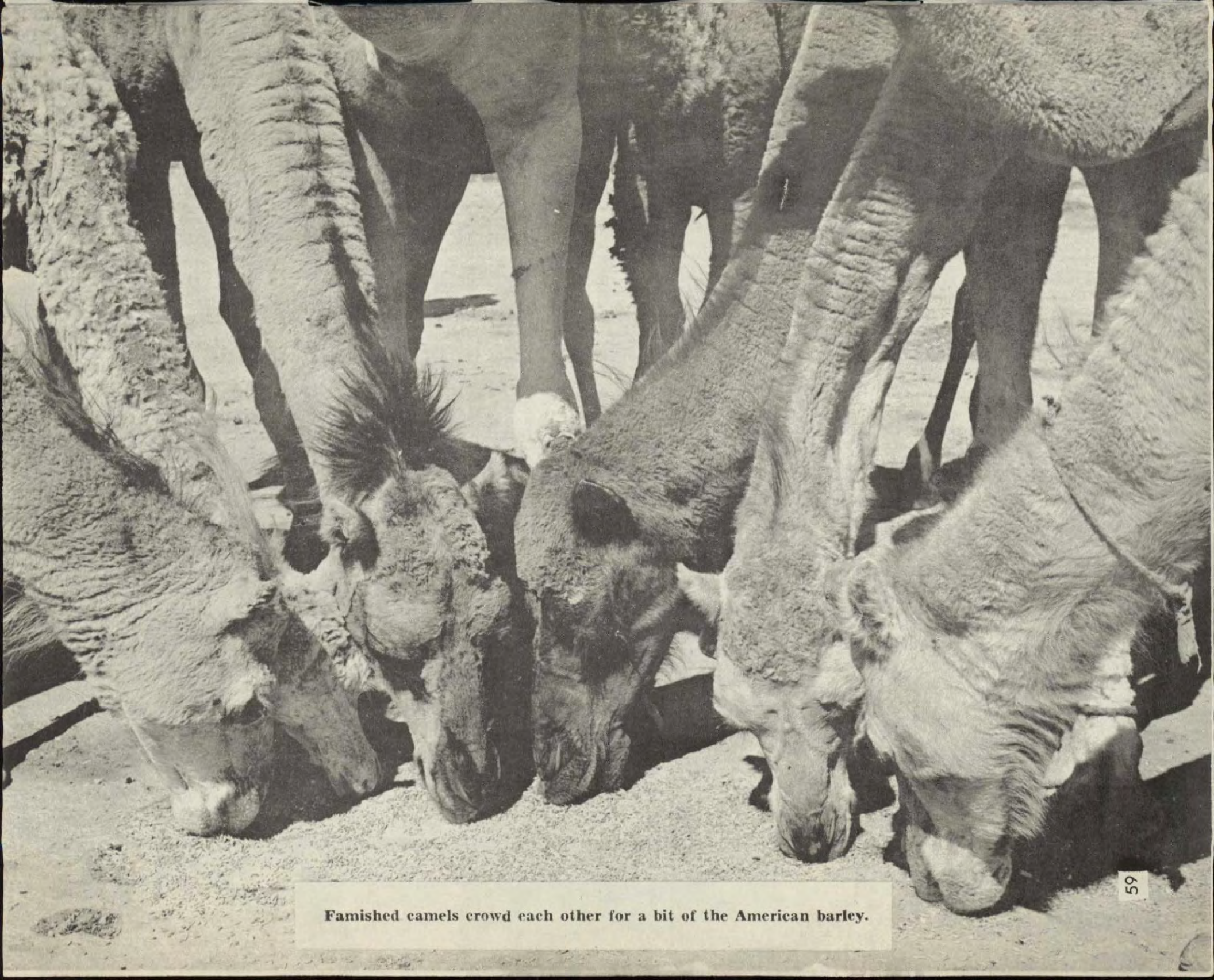
This happy Bedouin and his hungry mount, which shows definite signs of malnutrition, are headed for home with a sack of American relief grain. Many travel long distances for their quotas of grain which are rationed at distribution centers. Eventually, however, the emergency wheat, barley, and grain sorghum reaches into remote areas to help sustain the people and their livestock until the rains come and new vegetation starts, and a new crop is harvested.

As shown below, a group of food-destitute people in the extreme southeastern part of Libya are waiting at the Cufra distribution point for their quotas of relief grain.

Patient Libyan donkeys and the children of Libyan families are doing their part to help convey relief grain from distribution point to their homes.

A mixture of water and ground wheat is kneaded into well-rounded loaves and put into community ovens for baking. Later the happy baker retrieves them from the dark oven on a long wooden paddle as golden, crisp loaves of Arab khubz (bread).

The Libyan boys above are enjoying the freshly-baked khubz made from American Title II wheat.



Famished camels crowd each other for a bit of the American barley.

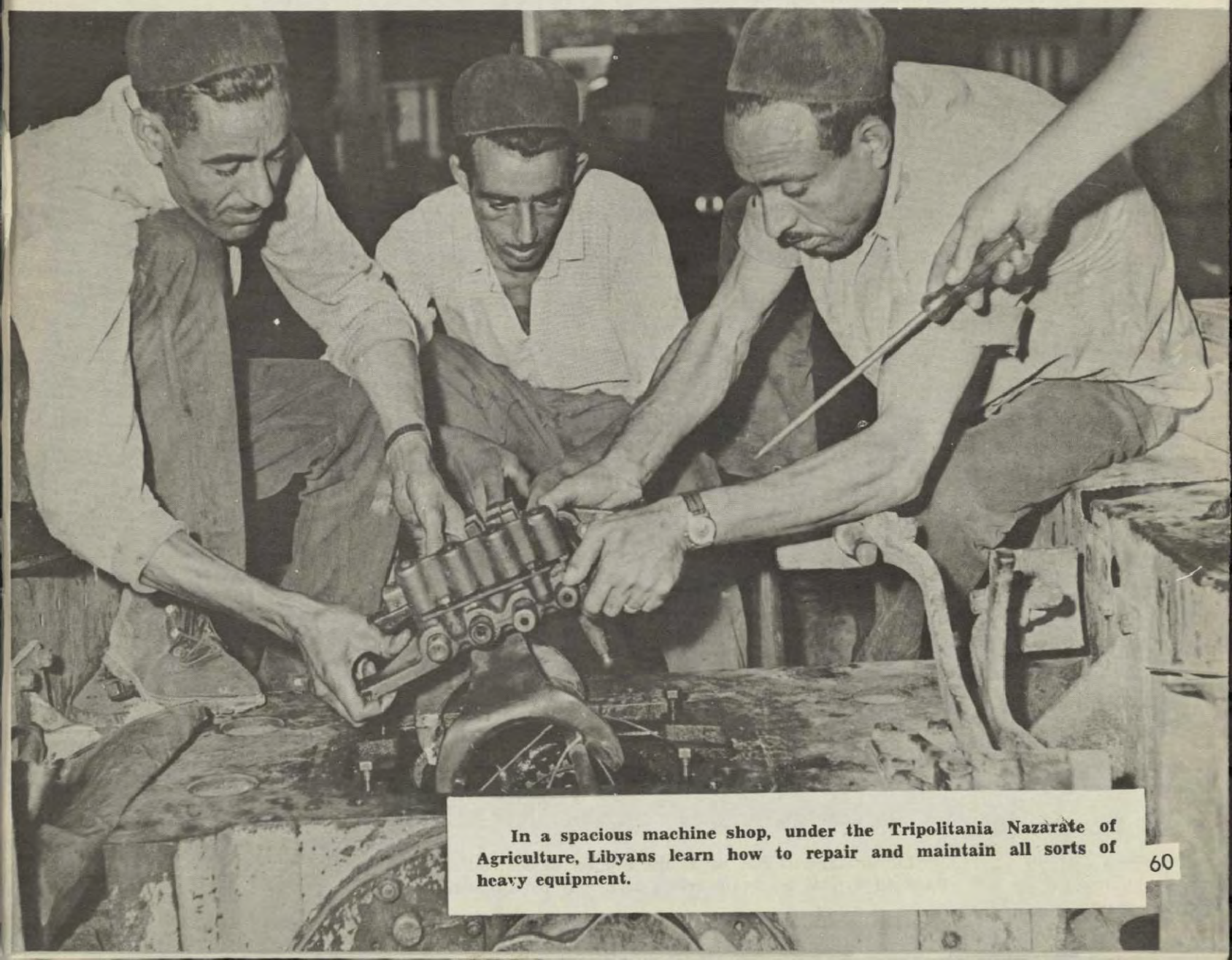
Heavy Equipment Maintenance

WHEN the agricultural program first started in Libya, much heavy machinery for construction of dams and flood control projects and road-building equipment was necessary.

In 1956 facilities were set up for repair and maintenance of this machinery. At present maintenance and repair shops are located in all three provinces of Libya.

All Libyan workers in this field are receiving training by an American technician. They learn the mechanical skills of repairing and overhauling all types of machinery, tractors, graders, bulldozers etc., while on the job. Continuous and special training in shop supervision is being given to those qualified. A few are now receiving special training in America.

This project is approaching the time when it will be ready to turn over to the Nazarate of Agriculture and operate entirely by trained Libyans.



In a spacious machine shop, under the Tripolitania Nazarate of Agriculture, Libyans learn how to repair and maintain all sorts of heavy equipment.

Agricultural Credit

AMERICAN advisers have been working closely with Libyan officials of the National Agricultural Bank of Libya to develop and implement loan practices and policies, and to train Libyan personnel within the Bank.

The first provincial branch of the Bank was opened at Tripoli on March 4, 1957. On August 18 of the same year the Benghazi branch opened. The Sebha branch opened November 27, 1958, and a local branch at Zavia opened October 1, 1959.

The purpose of the Bank primarily is to assist farmers and small industries, closely related to agriculture, by extending credit to them as needed.

Thrift is being promoted among farmers who are learning better farming practices as they relate to the use of credit. Borrowers in all provinces are learning to shoulder the responsibility for repayment of loans when due and to use proper procedures for meeting financial difficulties attributed to actual crop failures.

The Bank is having a favorable effect in Libyan agriculture by financing the purchase of seed, equipment, and other necessary items needed to carry on farming operations.

All loans are made on the basis of the ability to pay from the normal income of borrower's farms. Inability of borrowers to pay back their loans as a result of conditions beyond their control, such as droughts and crop failures, justifies granting of renewals. Legal action to collect is taken only as a last resort.

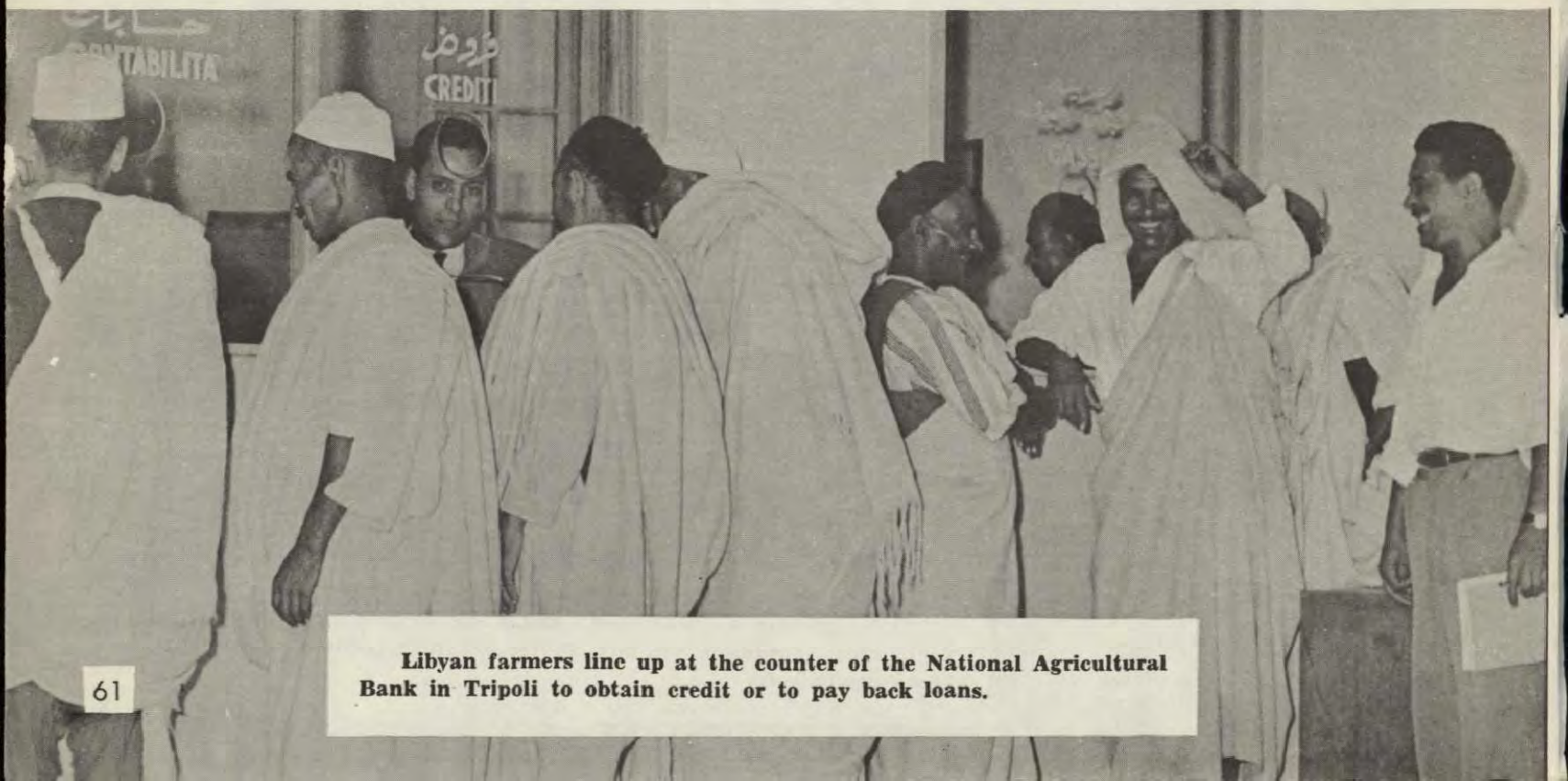
Since the beginning until March 31, 1960, the Bank has made 9,400 loans for a total of £L. 1,119,000. ($3,133.000.). Of this amount 59 percent has been repaid in full.

Most of the loans have been made to small farmers. In Tripolitania 93 percent of the loans averaged £L. 158. ($440). In Cyrenaica 99 percent averaged £L. 67. ($187).). In Fezzan all loans averaged £L. 54. ($151.).

The difference in size of loans in these three provinces reflects the difference in type of agriculture.

One of the most recent developments in the Bank's service to Libyan farmers was the GOL allocation of £L. 1,000,000. ($2,800,000.) for use as credit to purchase Italian-owned farms in Tripolitania. Seventy of the first applications which complied with the conditions laid down by the Board of Directors, were approved for a total of £L. 60,000. ($168,000.).

Sales agreements between buyers and sellers were purely voluntary. This type of credit tends to encourage Libyan ownership of land.



Libyan farmers line up at the counter of the National Agricultural Bank in Tripoli to obtain credit or to pay back loans.

Locust Control

HAD there been no trained units with equipment for controlling the huge swarms of lucusts which have invaded Libya from all sides during the past two years, virtually all vegetation would have been consumed.

A locust weighs only a fraction of an ounce, but it can eat the equivalent of its own weight in a day. And the hundreds of swarms that came into Libya from the South, the East, and the West had the capacity for consuming enormous tonnages of vegetation daily.

But such was not the case. Through the cooperative efforts of the Libyan Locust Control Center, the USDA Regional Insect Control Project, and USOM technicians, invasions were kept under control. Only minor damage was reported to crops.

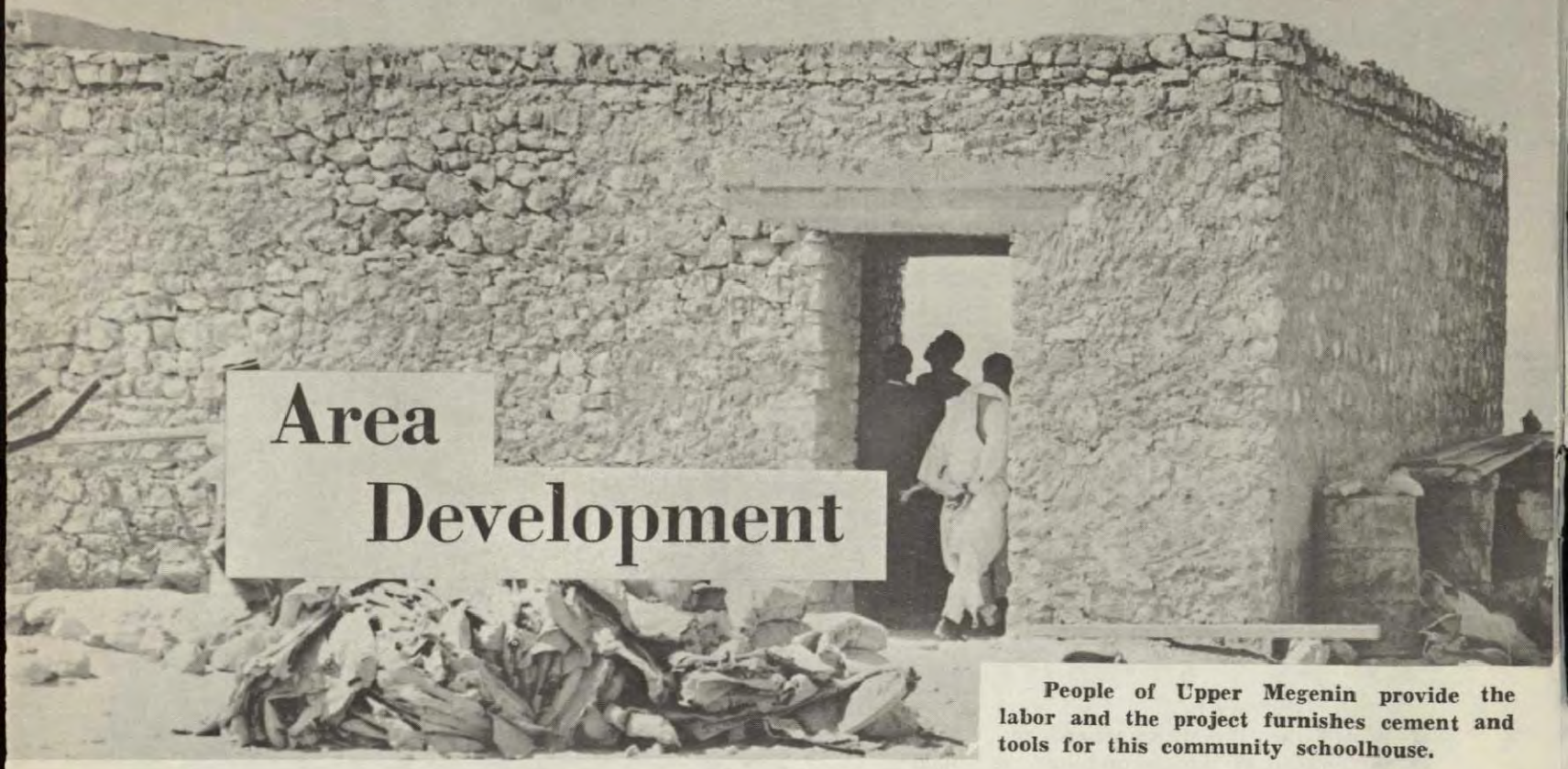
The largest swarms that came into Libya ranged up to 7½ miles long, 2½ miles wide, and 1,200 feet deep. Ordinarily swarms are less than one mile square and from 200 to 300 feet deep. Locust control men report swarms as large as 30 miles square in Central Africa.

Locust invasions were met by the control units through distribution of poison bran (bran mixed with Benzine Hexacloride). This mixture, spread by hand, and the same lethal mixture in liquid form spread by ground-operated sprayers, put early invasions out of business, but it was not harmful to animals or birds.

Large areas of infestation were sprayed with the Locust Control Aircraft, the most efficient and less costly method of exterminating the hoppers. A landing strip has been especially made for the aircraft near the Locust Control Center.

Hundreds of locust swarms like the one shown above, threaten Libyan agriculture annually. After treatment by the Locust Control Unit, they die by the billions.

Area Development



People of Upper Megenin provide the labor and the project furnishes cement and tools for this community schoolhouse.

SINCE Area Development projects supplement the general agricultural development program, this activity in Tripolitania is temporarily under the supervision of Agriculture & Water Resources Division. It includes such activities as now are under construction:

Twenty-five houses in the Umm El-Araneb to provide housing for refugees recently returned from the Lake Chad country.

A school in Upper Wadi Megenin to encourage settlement of nomadic farmers and to provide a place for educating the children.

Housing units for 41 destitute families of Blaa.

City reservoir at Cabao.

Farmers' Market Place at Giosc.

Villagers of Giosc are happy to see the fruits of their cooperative efforts rise up in 21 completed stores and 37 others under construction. A total of around 100 is expected to be built before the market place is completed.

These projects are on a self-help basis, the people involved supplying all labor, and the project supplying necessary materials.

At the end of Fiscal Year 1960, the Farmers' Market Place at Giosc, an oasis community 170 kilometers southwest of Tripoli, was more than half completed with 21 stores stocked and doing business, and 37 under construction. The plan calls for approximately 100 shops when completed.

Area Development participation includes a large well in the center of the Market Place, a spacious vegetable market, and on a site 160 meters to the side, a public slaughtering house. Costs of Area Development's participation amounts to only £L. 1,200. ($3,360).

The people of the community cooperated enthusiastically by building their own shops. One of the citizens stimulated the market idea by donating the 100 square meter area as a site for the market.

In 56 Countries

YUO have just read the two-year report on acitivities of USOM'S Agriculture & Water Resources Division and agricultural development made jointly through the cooperation of Libyans and American technicians.

According to a recent count, there are 55 other countries where similar programs are being carried on. Approximately 1,200 American agricultural technicians are daily transferring their «know-how» to country technicians in all 56 countries. They are men educated and experienced in solving farm problems and training others in various techniques of agriculture.

Also cooperating in this world-wide program are colleges and universities of America which have provided special training for 10,000 foreign agricultural participants under the ICA program.

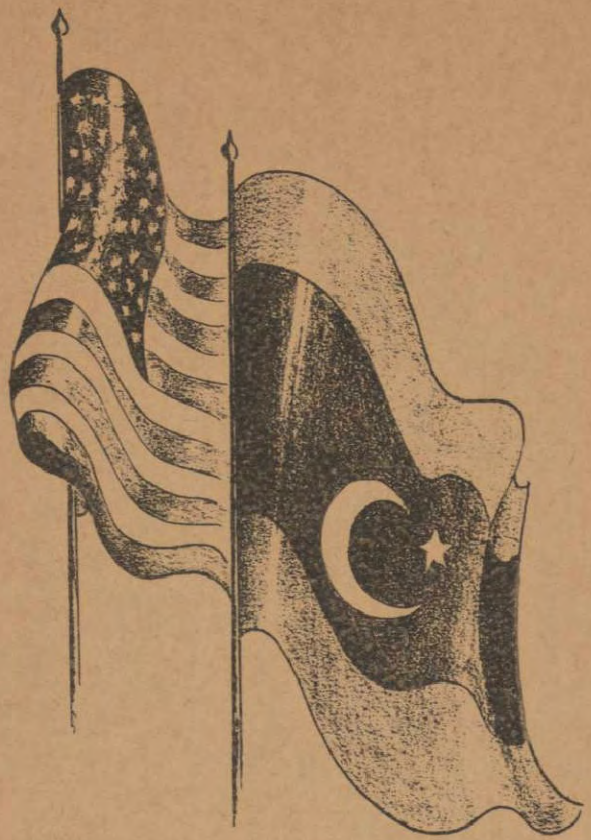
As a whole, it adds up to this:

Several thousand country technicians are receiving technical training directly from American technicians; many thousands are receiving indirect training from them; and they, in turn, are passing this technical information on to millions of farmers.

For all 56 cooperating countries, this means that many millions of farmers throughout the world have each had an opportunity to learn a few new farming practices which will increase food production. And this should add up to a sizable increase of food for the larders of those countries.

Achievements of the ICA agricultural program have been great. But it's not time to slow down. Farmers everywhere naturally want to produce. They need no incentive. But the governments of Libya and the other 55 countries cooperating with the ICA program must continue in their determined efforts to improve agriculture by making available to farmers all the information on better methods of farming, livestock production, and marketing.

Close cooperation between these countries and the ICA/USOM agricultural programs will not only facilitate the work but also will speed up attainment of greater results.



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