



THE JOINT COMMISSION ON RURAL RECONSTRUCTION

1948-1968

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行政院農業發展委員會
圖書室
COUNCIL FOR AGRICULTURAL PLANNING AND
DEVELOPMENT, EXECUTIVE YUAN
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Editor: Cecilia B. Hoh

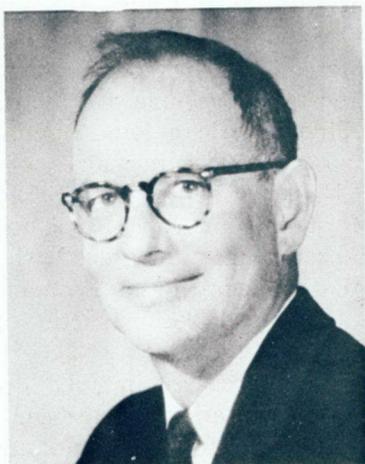
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The Joint Commission on Rural Reconstruction
37 Nanhai Road, Taipei, Taiwan
Republic of China

MEMBERS
OF THE
JOINT COMMISSION ON RURAL RECONSTRUCTION



Dr. Tsung-han Shen
Chairman



Dr. Bruce H. Billings
Commissioner



Dr. Yien-si Tsiang
Commissioner

By authority of the 1948 ECA China Aid Act Section 407 of Public Law 472 of the 80th U. S. Congress an agreement was entered into by the Government of the United States and the Government of China for the establishment of a Sino-American Joint Commission on Rural Reconstruction which was formally convened on October 1, 1948 in Nanking, China. The Commission was authorized to formulate and carry out a coordinated program for reconstruction in rural areas in China. The Act specified that ten per cent of the Economic Aid to China be used for this rural reconstruction program.

U. S. economic aid to China ceased in July 1965. Since then, the Commission's operations have been financed by the Sino-American Fund for Economic and Social Development which was created by a Diplomatic Exchange of Notes between China and the United States.

IN COMMEMORATION
OF THE TWENTIETH ANNIVERSARY
OF THE
SINO-AMERICAN
JOINT COMMISSION ON RURAL RECONSTRUCTION

PAST MEMBERS
OF THE
JOINT COMMISSION
ON RURAL RECONSTRUCTION

Dr. Chiang Monlin
Chairman 1948-1964

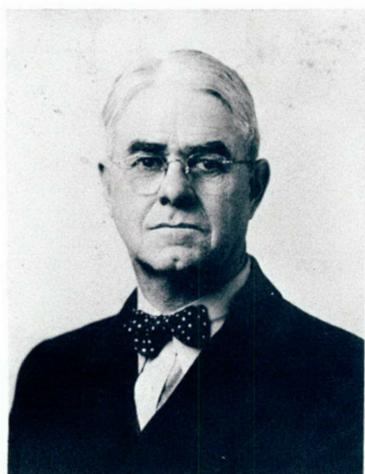


Dr. Raymond T. Moyer
Commissioner 1948-1951



Dr. Y. C. James Yen
Commissioner 1948-1951





Dr. John Earl Baker
Commissioner 1948-1952



Mr. William H. Fippin
Commissioner 1951-1957



Mr. T. H. Chien
Commissioner 1952-1961

Mr. Raymond H. Davis
Commissioner 1952-1959



Mr. Clifford H. Willson
Commissioner 1959-1961



Mr. Gerald H. Huffman
Commissioner 1962-1968



OFFICERS
1968



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- | | |
|-------------------------|---|
| 1. Mr. Hsui-shwen Chang | Secretary-General |
| 2. Mr. Yang-kao King | Consultant |
| 3. Mr. Stephen Tsai | Consultant and concurrently Acting Controller |
| 4. Mr. Tung-pai Chen | Consultant and concurrently
Acting Chief, Fisheries Division |
| 5. Dr. Ting-wei Lew | Consultant |
| 6. Mr. Sze-ken Koo | Administrative Officer |
| 7. Mr. Wei-ming Ho | Chief, Office of Planning and Programming |

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|------------------------|--|
| 8. Dr. Shih-chu Hsu | Chief, Rural Health Division |
| 9. Dr. Robert C.T. Lee | Chief, Animal Industry Division |
| 10. Mr. Chi-wei Yang | Chief, Forestry Division |
| 11. Mr. Chien-yu Hsu | Chief, Agricultural Credit Division |
| 12. Mr. Yu-kun Yang | Chief, Farmers' Service Division |
| 13. Dr. You-tsao Wang | Chief, Rural Economics Division |
| 14. Mr. Hsien-jen Teng | Chief, Irrigation and Engineering Division |
| 15. Mr. Chi-lin Luh | Chief, Plant Industry Division |

12



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A STATEMENT FROM THE CHAIRMAN

By October 1968 we shall have reached another milestone in the history of JCRR. It seems only a short while ago that Dr. Chiang Monlin, Dr. Raymond T. Moyer, Dr. Y. C. James Yen, Dr. John Earl Baker and myself met to convene the first meeting of the Joint Commission on Rural Reconstruction at Nanking, China, on October 1, 1948. The five of us sat down to a challenging and urgent task. We were eager and anxious. The atmosphere was charged with enthusiasm and expectancy. We looked for better and new solutions to the old problems; we wanted to do things that were most helpful to the farmers. It was a concerted American and Chinese effort to find a way to fulfill the felt needs of the rural masses—a joint venture.

Unfortunately, time was against us. The political and military situation declined so rapidly that before the impact of our program could be felt we were compelled to leave the mainland of China.

With a team of 36 staff members, we set up headquarters in Taiwan in the fall of 1949. Although our program on the mainland was short-lived, the years spent in Taiwan have been most gratifying. We have been fortunate in acquiring the group of dedicated Chinese and American experts who have served with JCRR. Whatever success we have achieved is due entirely to their technical know-how and hard work. The wholehearted cooperation of the counterpart agencies which carry out the programs at the action level has also been a great factor in the success and realization of our aims.

We have travelled a long way since that first meeting in Nanking and the trends of our program have changed to meet the needs of a changing economy. The current goal of JCRR is no longer confined to the solution of problems of food shortage. The requirements from the agricultural sector have become more complicated; the programs more sophisticated. From a period of dire need we have arrived at an era of innovation. The situation has changed but the spirit of jointness—the cooperation between two peoples—remains, and we continue our work with the same zeal and faith as we embark into the third decade of a very unique Sino-American undertaking.

T. H. Shen

THE PROGRAM
OF THE
JOINT COMMISSION ON RURAL RECONSTRUCTION



OBJECTIVES AND PRINCIPLES

There must be a felt need for JCRR services and activities on the part of the rural people

There must be fair distribution of accrued benefits

There must be a sponsoring agency qualified to utilize effectively the JCRR assistance

There should be a demonstration of feasibility of any particular project or activity before undertaking its broad expansion



In 1949 the Government of the Republic of China took a drastic step to rid the farmer of the burden of paying an exorbitant rental of one-half of the total crop yield for his land. The land reform program reduced the rental to 37.5 per cent of the total annual crop yield assessed on the productivity of each land grade and the tenure was a minimum of six years renewable by tenants consecutively. A total of 256,000 hectares of privately tenanted holdings and 300,000 tenant families respectively were affected.

Structural defects in farm tenancy was remedied by the Government selling some 111,000 hectares of public farmlands to 243,000 families of former tenants. Also, some 140,000 hectares of private tenanted holdings were purchased by 195,000 families of former tenants under the Land-to-the-Tiller Program in 1952. These two measures reduced the farm tenancy in Taiwan to 88 per cent in terms of the number of tenantry and 92.5 per cent in terms of the area of tenanted holdings. Taiwan's agriculture was thus made to rest predominately on owner-cultivatorship.



Farm lands in Taiwan were fragments of 10 to 15 pieces of irregular and scattered plots without adequate irrigation, drainage and farm roads. A consolidation program has remodelled the original farm plots into 0.25 hectare plots and simultaneously provided means of direct irrigation and communication



A total of 160,000 hectares of farm lands of which more than two-thirds were irrigated paddy fields have undergone consolidation. As a result, production has been raised by 30 percent and costs reduced by 20 percent. The total area of farm lands consolidated will reach 300,000 hectares by 1971.



A water conservation program known as "rotational irrigation" carried out on 77,000 hectares of farming land of 17 Irrigation Associations has promoted well scheduled water conservation for rice irrigation. This canal improvement project promotes the use of common seedling beds and common irrigation systems.

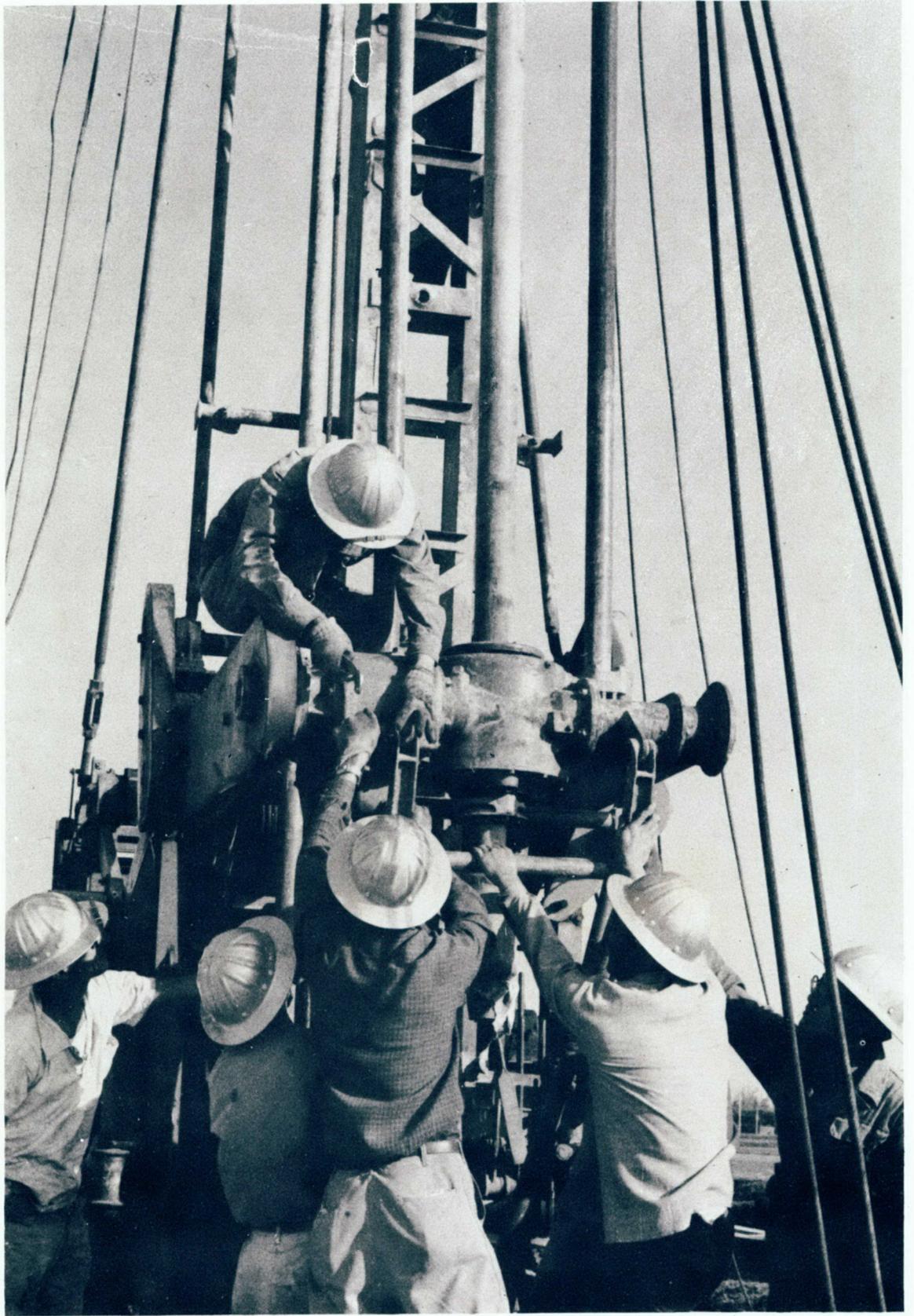


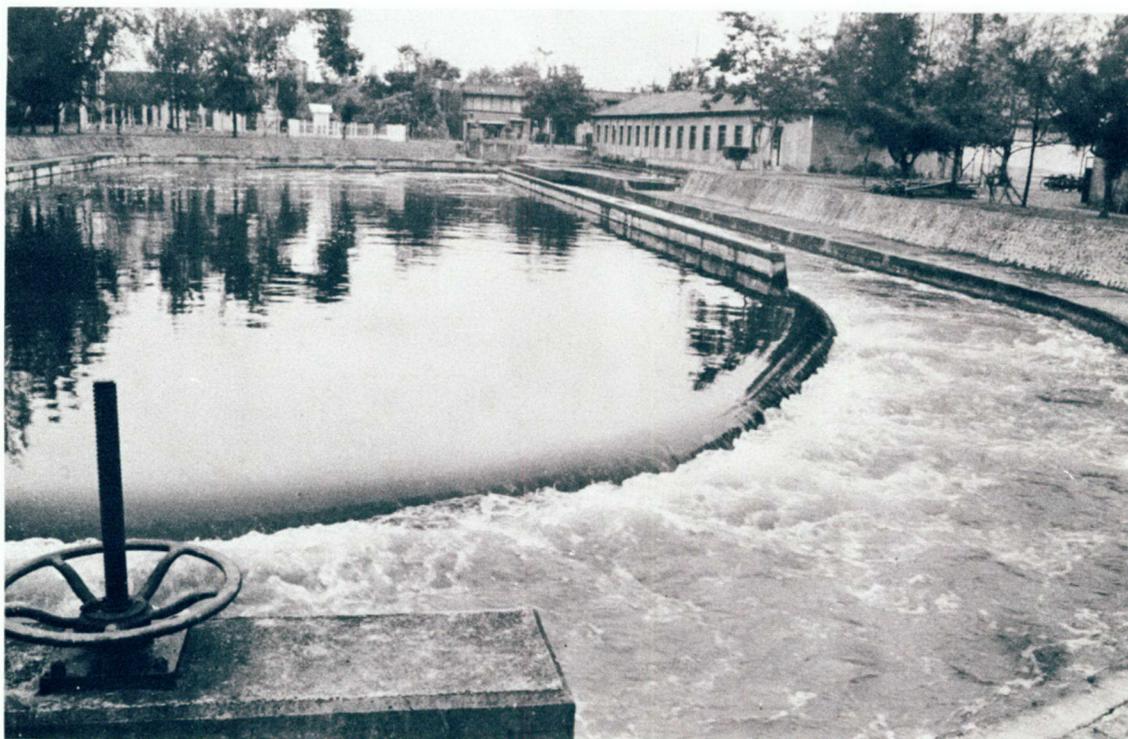
The concept of rotational irrigation of paddies has been accepted and is embodied in the engineering planning of new irrigation projects and the islandwide land consolidation program. Research being undertaken to refine this practice may lead to the unification of irrigation practices for paddy and upland crops.

Uneven distribution of monthly precipitation and shortage of surface irrigation water occur on Taiwan in early spring and late fall when water is urgently needed in the paddy fields. Ground water pumped from shallow wells as supplementary irrigation was inadequate because of the seasonal fluctuation of the water table.

Following an investigation in 1954 and based upon the recommendations of a consultant from the U. S. Bureau of Reclamation, the first large scale ground water development program in Yunlin Hsien was completed in 1961. With total financial support from JCRR 252 deep wells were constructed resulting in an increase of 15,975 crop-hectares and an annual increase of brown rice production of 55,453 metric tons. The achievement of the Yunlin ground water development program has stimulated interest for the implementation of the same program in Changhua, Kaohsiung and Pingtung areas.







The Tsaokung pumping station at Kaohsiung is the biggest pumping irrigation project in Taiwan, capable of

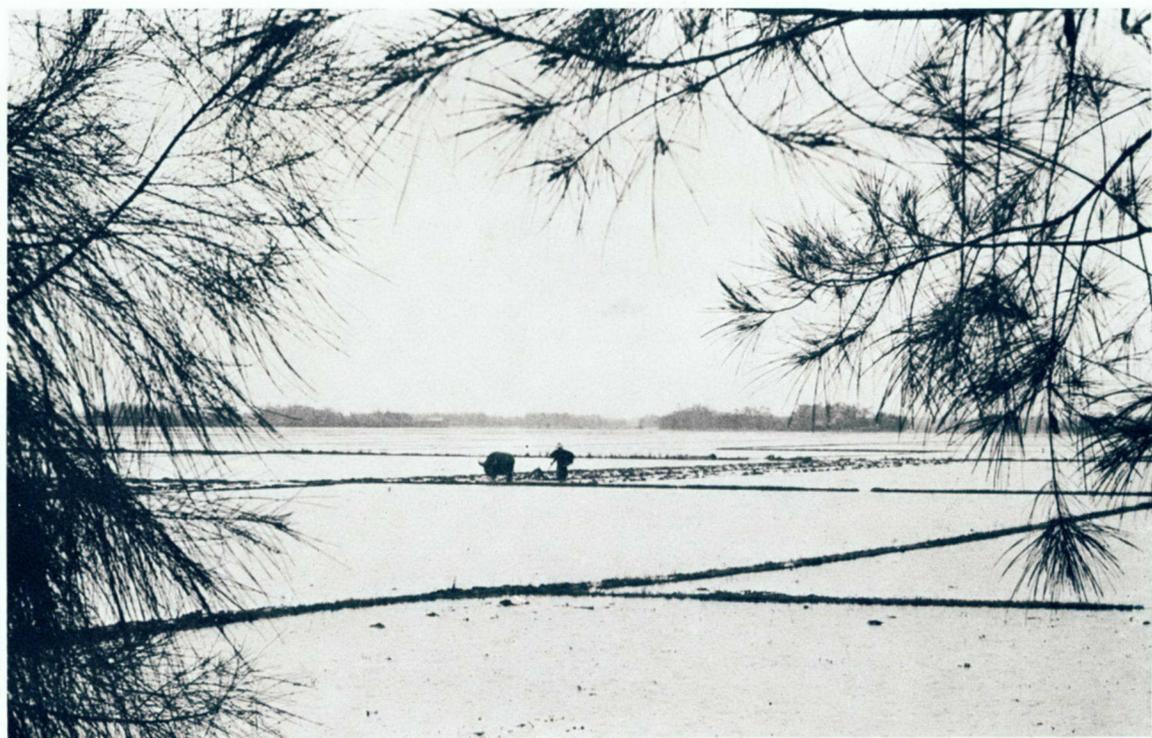
pumping a total discharge of 19.64 cubic meters into the Tsaokung Canal to secure irrigation water for 11,570 hectares of land.

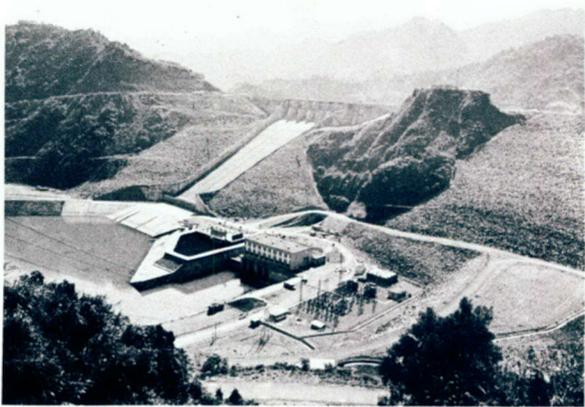


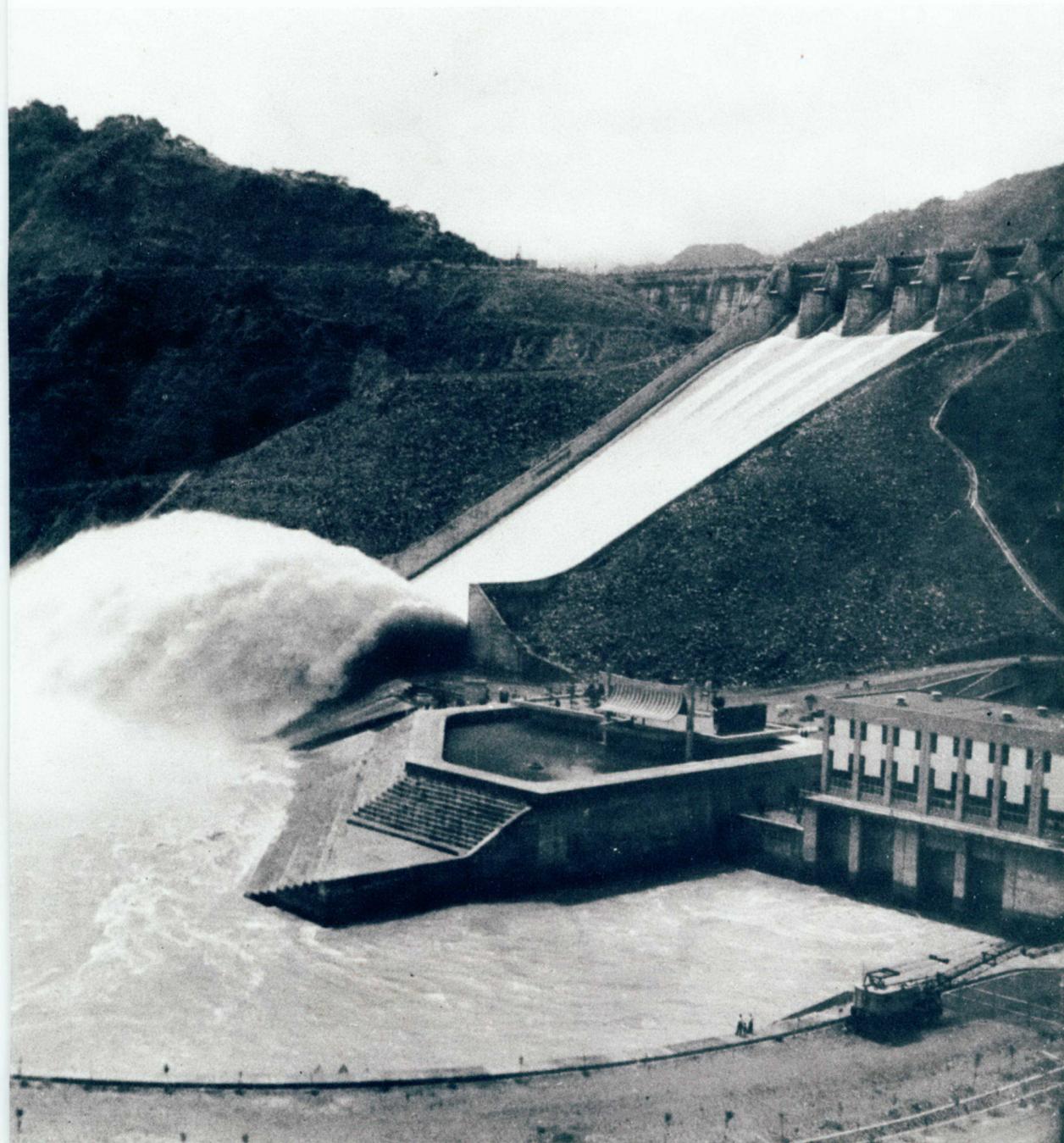


In the Chianan area where the three-year rotation cropping system is practiced, total length of the network of main canals and laterals is 1,177 km. with

seepage loss at 40-50 percent of the total water conveyance. Lining of the Chianan Canal, with cost estimated at NT\$300,000,000 will be completed in 1968.



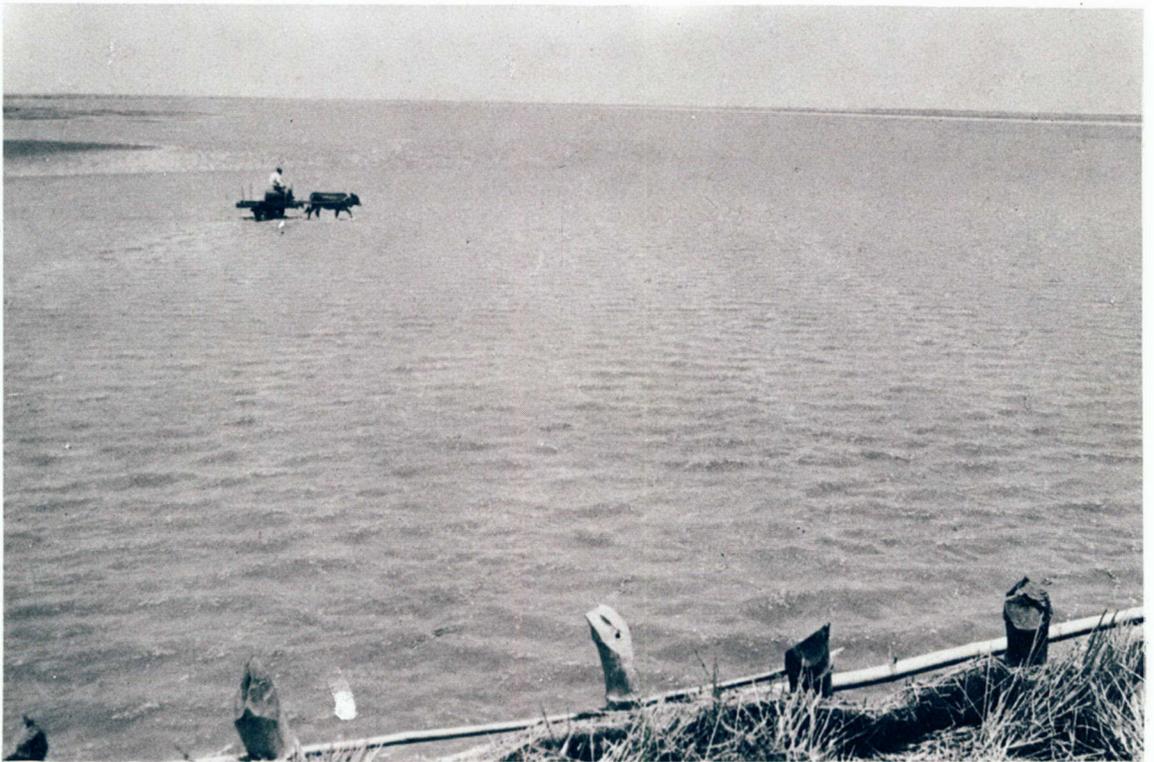




The Shihmen Reservoir is a multi-purpose water resources development with four major functions of irrigation, power generation, flood control and public water supply. The project was initiated by JCRR which financed the planning work. The Shihmen Development Commission was later established to assume responsibility for designing and construction. The project was completed in 1964. It serves 50,000 hectares of irrigable plateau land in Taoyuan. Besides development of 900,000 kw. of peaking power, it reduces the flood level downstream and provides an improved public water supply for a population of 340,000.



The importance of the tidal land reclamation program cannot be over-emphasized because land for agricultural development is limited in Taiwan and tidal land development is one of the positive measures for providing more food and more land for the growing population.



Along the west coast there are tidal land or sand flats formed by the sediments from river estuaries which may be reclaimed for potential farming. The first reconnaissance survey on tidal land was initiated by JCRR in 1959 and it revealed that a total area of 53,800 hectares would be substantial land for agricultural production.

Following investigation, experimentation and planning, the Hsinchu Tidal Land North Polder of 227 hectares and the Tsengwen Polder of the Tainan Tidal Land of 1,200 hectares have been completed. The Government has begun the construction of 1,000 hectares on the Aoku Polder of the Chiayi Tidal Land and 462 hectares on the Wangkung Polder of the Changhua Tidal Land.





Sedimentation and flood damages are severe in Taiwan. Opening up mountainous country due to population pressure has impaired many good watersheds. Illegal and abusive cultivation amounts to about 120,000 hectares. The soil conservation program aimed at conserving the natural resources of soil and water for permanent agriculture and sustaining farm production has been carried out on 75,000 hectares of slope farmland.



An integrated soil conservation and land use program including development of farm roads, irrigation systems, crop pattern and soil management is carried out in 11 areas ranging from 60 to 560 hectares. Watershed management activities are carried out in important watersheds of Shihmen, Tsengwen, Tachien, Wucheh, Paiho and Houlung. New activities have also been introduced by JCRR to overcome problems of water pollution.



JCRR initiated an integrated program of improved rice cultivation techniques in the fall rice crop of 1963 with participation of 116 townships, each with plots of 5 to 10 hectares in size. Owing to the marked achievement of the demonstration, the program has been extended to 2,907 hectares in the fall crop of 1967, and more than 4,000 hectares in the spring crop of 1968.



Average field increase in the 1967 fall rice crop was 25.8 percent or an average additional net income of NT\$4,000 per hectare. This integration program proves there is definite potential for further rice yield increase and the joint farming operation provides effective exchange of labor in time of need and more and efficient usage of farm machinery.

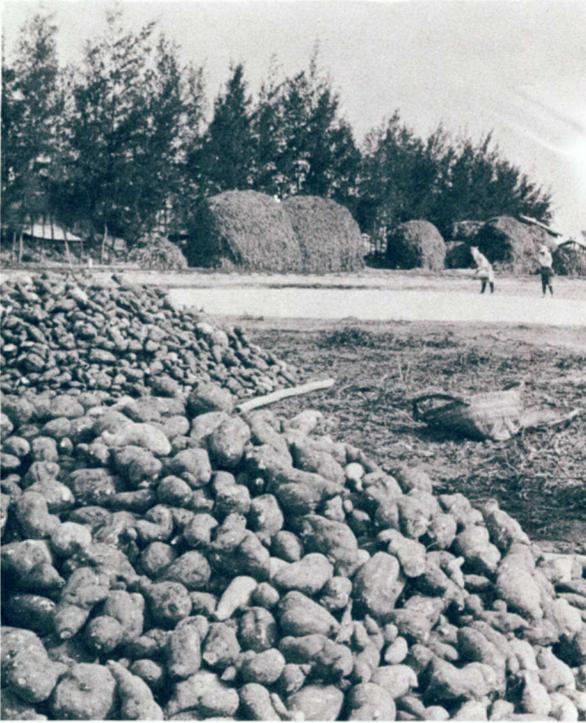


The most significant accomplishment of rice varietal improvement work in Taiwan is the development of the high yielding, wide adaptation and photo-intensive *indica* variety, Taichung Native No. 1, officially released in 1956. This new superior variety is non-lodging, highly responsive to fertilization, resistant to blast but susceptible to bacterial leaf blight disease. Its planted acreage reached 77,456 hectares in 1966, occupying 38.2 percent of the total acreage under Taiwan native rice. This variety is now being commonly used as breeding material, or even directly multiplied for extension in many Asian rice-producing countries.



The program to maintain the production of high quality seeds by replacing farmers reserved seeds with improved certified seeds once every three years cover important field crops such as rice, peanut, wheat, sorghum, soybean and sweet potato, corn, jute, flax and cotton as well as several kinds of vegetables.

Vegetable seed production is an upcoming industry. The first seed growers' organization was established in 1967 and rice and vegetable seeds for export are tested by the Provincial Seed Testing Laboratory. The International Seed Exchange Center of the Taiwan Agricultural Research Institute was founded in 1960 and seed samples are exchanged with more than 60 countries.



The release of Vitamin-A-rich sweet potato variety, Tainung No. 57, is of significance since all varieties previously planted were white in color and good only for livestock feed and starch.

Also planted are two high-yielding colored new strains, C41-5 and C41-74, surpassing the quality and carotene content of Tainung No. 57 and suitable for canning because of their rich flavor.



Improved varieties of soybean have made possible better use of land for maximum crop production. Soybean with early-maturing characteristic can be grown in double-cropping paddy fields as a fall crop, thus enabling farmers to raise three crops a year.

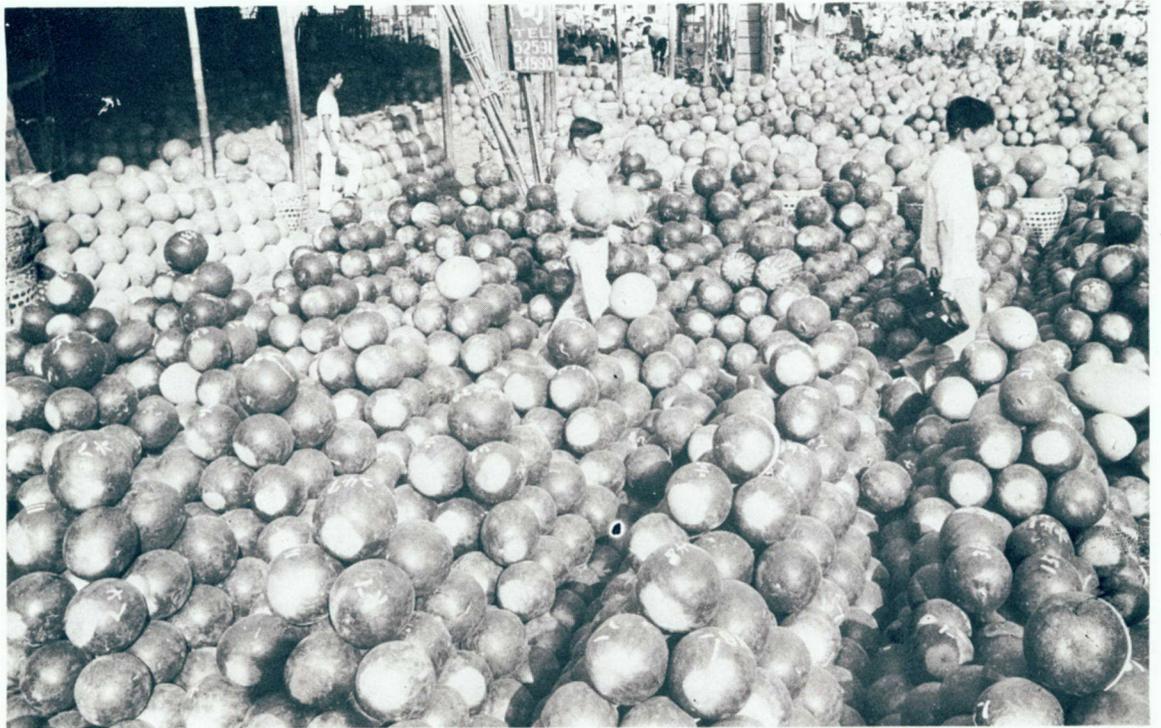
The corn improvement program has scored unprecedented success in the development of the early-maturing hybrid, Tainan No. 5, which yields 78 percent more corn than the native open-pollinated varieties. Corn production has increased fourfold to 64,300 metric tons in 1967. A highly resistant hybrid, Tainan No. 8, was released in infected areas during the fall of 1966 to check the spread of downy mildew disease. These hybrid varieties have made corn a major crop.





Watermelon is a special crop grown all year round in Taiwan. The main variety is the Sugar Baby. The Fengshan Tropical Horticultural Experiment Station

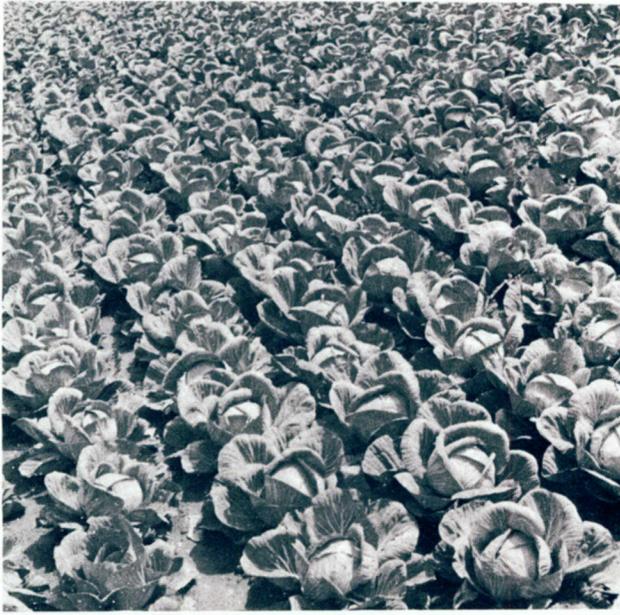
has bred nine triploid seedless watermelon varieties and Taiwan has become the only country producing seedless watermelon for the international market.





The introduction of new kinds and new varieties of fruits from abroad is done periodically. Besides banana, pineapple and oranges, the important tropical fruit crops of Taiwan include mango (Haden and Irwin), litchi and longan. New items in the improvement program are grapes, macadamia nut and avocado.

In 1967, the export of banana reached 426,771 metric tons netting US\$ 63.4 million; canned pineapple earned US\$19 million; the production of sweet oranges registered 15,000 metric tons.



Vegetable production in Taiwan has had remarkable progress both in variety and quantity. More than 400 vegetable varieties have been introduced and another 30 varieties successfully bred.

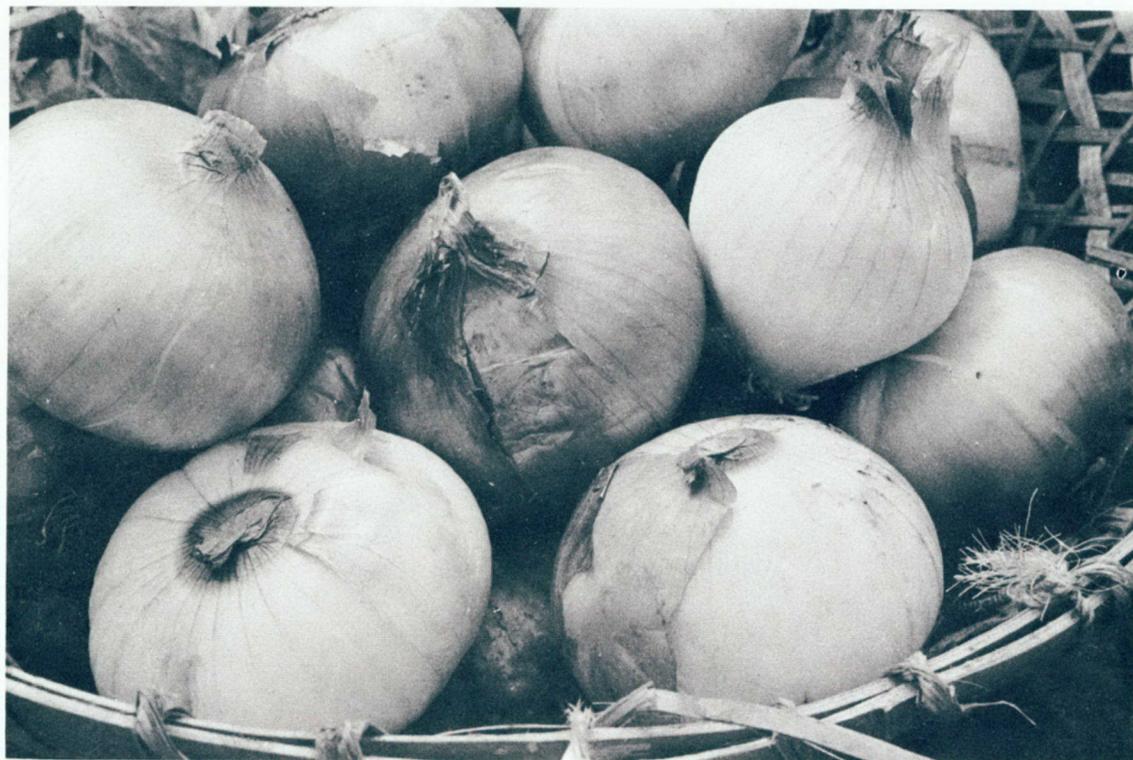
The main vegetable varieties bred include melon, tomato, sweet pepper, potato, cucumber, kidney bean, pea, radish, carrot, asparagus lettuce, kohlrabi, cauliflower, and Chinese cabbage.





Since the planting of the two adaptable and high-yielding varieties, Early Grano and Excell Bermuda, onion has been produced in such quantity that it has become an export commodity.

Asparagus, a temperate zone perennial crop, has been successfully raised in the subtropical climate of Taiwan. Over 1.7 million cases of canned asparagus was exported in 1967.





New varieties of jute, kenaf, flax, ramie and sunn hemp have been successfully developed by the Tainan Fiber Crops Experiment Station and extended for commercial planting. A new jute variety,

Tainung No. 1, selected from among 11,037 individual plants was released in 1962. With the extension of this variety, the unit yield of retted jute has steadily increased from 1,246 to 1,870 kg/ha. in 1967.



New cultural methods conducted on 10,000 hectares of selected tea plantations have elevated the average unit yield of made tea to more than 700 kgs. Tea export has earned US\$15,000,000 in 1967, a gain of 122 per cent in ten years. Technical activities include renewal of 3,000 hectares of degenerated tea plantation with improved tea varieties; propagation of 1,500,000 seedlings a year by the cutting method (a change from the traditional seedling method); establishment of additional 100 hectares of Assam tea farms in east Taiwan; cold storage trials to preserve flavor.





The climatic conditions in Taiwan are favorable to pest occurrence and disease. The present intensified cultivation systems have also predisposed the rice crop to rice pests. Aerial application of pesticides is being used for the control of highly transmissible and destructive pests. Two important virus diseases, yellow dwarf and transitory yellowing, causing serious damage to rice plants of the second crop, and blast, the most destructive disease of rice in the first crop, has been effectively eliminated by this practice. This method has also proved effective against the rice borer and banana Sigatoka disease.

A pesticide residue program and an educational system for the proper usage of pesticides are in operation. Spot-checks are made of the toxic level of pesticide residue in/on vegetable samples and other farm products collected from wholesale markets or from the field. The Taiwan Agricultural Research Institute has a pesticide bioassay laboratory, the Bureau of Commodity Inspection and Quarantine is equipped with a laboratory to determine the physical and chemical properties of pesticides, and a third laboratory for the testing of pesticide residue is established at the Taiwan Provincial Health Research Institute.



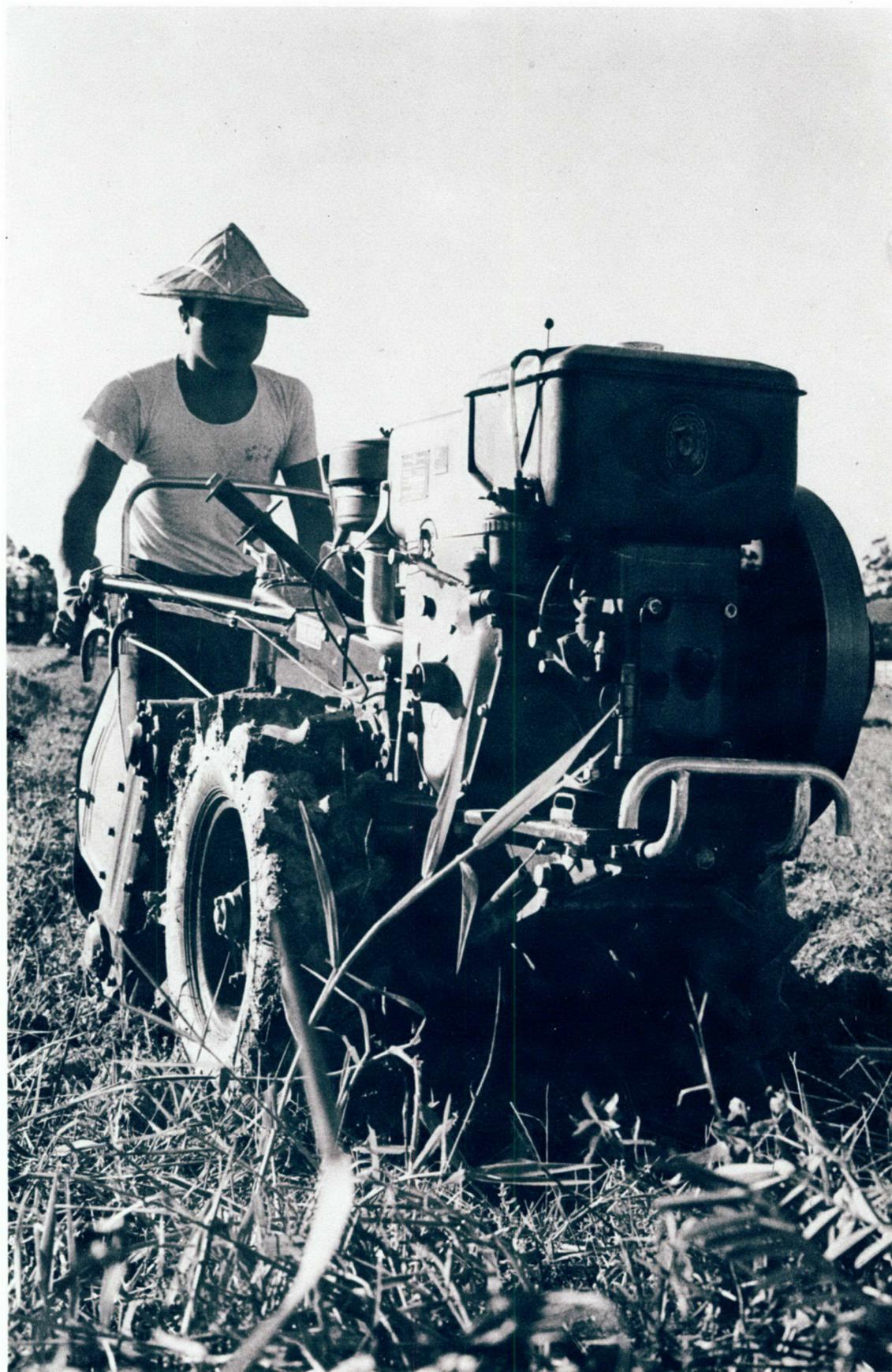


Over 10 per cent of the total cultivated area of Taiwan are handicapped by inherent soil problems. Deep loose sand and light-textured saline soils on the central plain total about 30,000 and 20,000 hectares respectively. JCRR initiated a project patterned after the device of Dr. A. E. Erickson, professor of soil physics of Michigan State University, for the reclamation of sand soils and elevating the land productivity to the level of normal soils by laying underground asphalt barriers. The asphalt barriers increased moisture retention, reduced leaching losses of available nutrients and prevented soluble salts from recurrence (after washing). Modified techniques are being tested to reduce costs to a level within the reach of the average farmer.



To evaluate the fertility status of island-wide cropland, composite soil samples taken systematically from every 10 hectares in agricultural use has been subjected to soil analysis to determine soil texture, pH, organic matter, available phosphorus and potassium. More than 78,000 soil samples, covering 90 percent of the total cropland, have been collected and analyzed. Results provide the basic information essential to soil improvement programs and fertilization allocation.

JCRR assisted the Taiwan Agricultural Research Institute in setting up a Soil Fertility Research Laboratory to develop a soil testing system in Taiwan for more economic use of fertilizers and improved soil management practices.



The era of farm mechanization in Taiwan began in 1954 when JCRR imported seven garden tractors of 1.5 to 10 h.p. from the United States and introduced two small Japanese power tillers of a tractive and a rotary type. Power tillers now in use number 18,500 units of which 79 per cent are locally manufactured. The local manufacture of the corn sheller, jute decorticator, sweet potato digger, grain dryer, soybean planter, peanut thresher and sheller and tea cutter is paving the way for large scale mechanization of agriculture. The rice transplanter has revolutionized the method of rice planting.



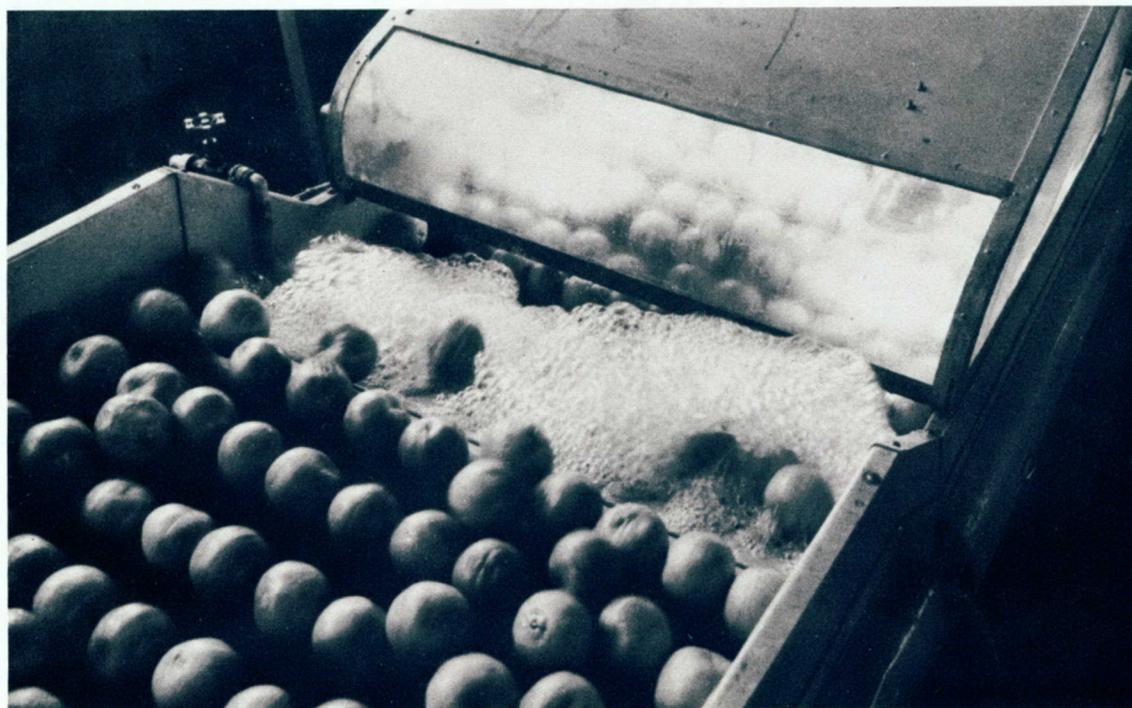


Vegetable wholesale markets operated by farmers' organizations and/or local governments have been set up to enable centralized transactions by both the selling and buying parties. By this means, the farmer will not suffer the consequences of inaccurate market information, underweighing of crops and delinquencies in payment for products.



A total of 438 banana and orange packing houses have been constructed in the producing areas to serve as collecting stations. These stations

provide the facilities and make use of local labor for the grading, waxing and packing of the huge quantity of fruits being produced for export.



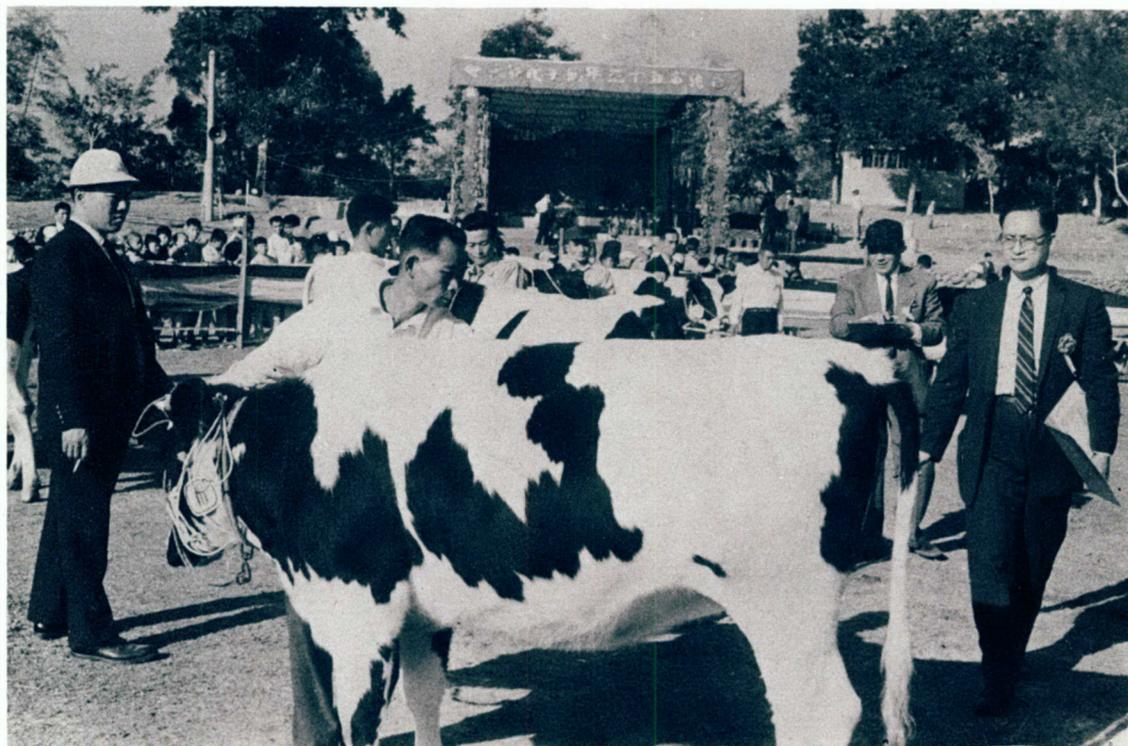


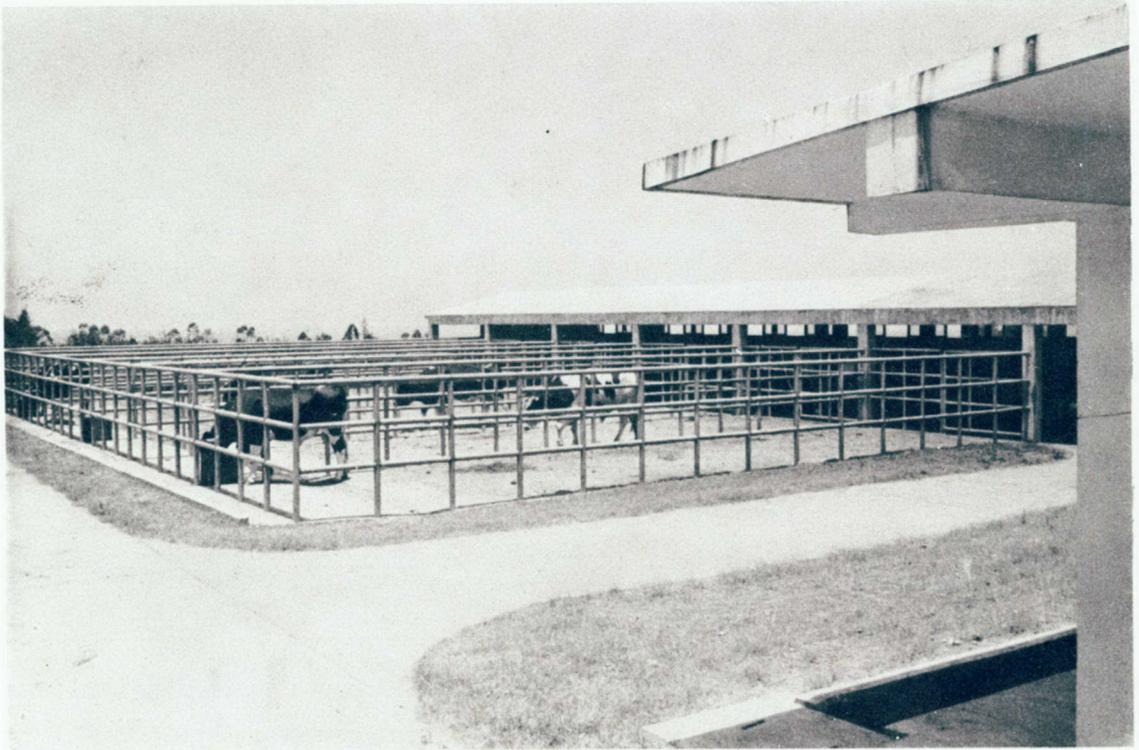


Cattle raising for beef is a new industry. There were no beef cattle breeds on Taiwan until 1962 when JCRR imported ten Santa Gertrudis bulls to improve the native yellow cattle. Santa Gertrudis has proven to be the most suitable of exotic breeds and thousands of native cows have been bred. The young hybrid calves show the improved beef characteristics of the Santa Gertrudis.

A pilot dairy farmer program was initiated by JCRR in 1958 in the Yang-mei demonstration area. Better feeding and management of the cow herd and the use of imported frozen semen from superior bulls for insemination purposes have brought about increase in the average milk production per cow from 2,228 kgs. to 3,721 kgs. in 1968.

With the organization of the Taiwan Dairy Development Committee in 1965, JCRR has promoted a number of programs to develop the fresh milk market including a school milk program to cultivate the habit of drinking fluid milk among school children.





The average number of dairy cows kept has increased to 6.1 head in 1967 as compared to 3.3 head in 1964. There are

288 dairy farmers, 1,756 dairy cows and heifers distributed in nine counties under the dairy farmer program.





A slopeland development program is being promoted to include livestock raising in the existing hillside farming system. This program combines farm road

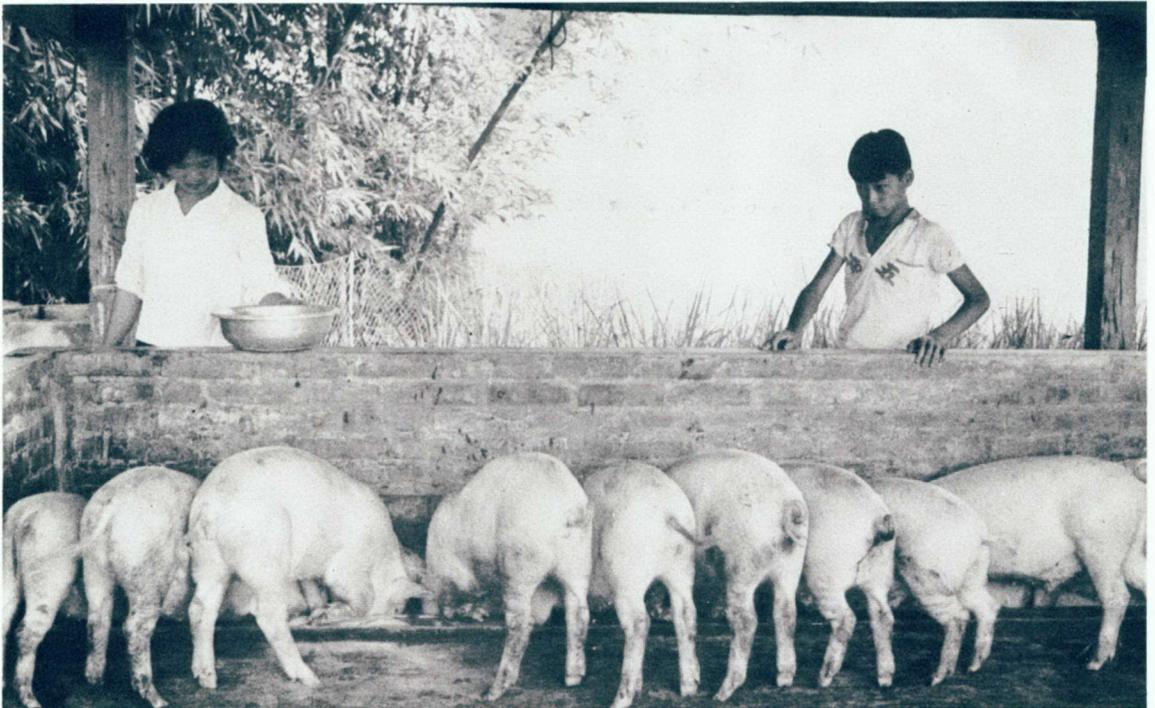
improvement, water system development, soil conservation, crop improvement, irrigation and raising of dairy cows and forage cover crops on the slopelands.





Improved breeds are developed by taking advantage of the hybrid vigor to produce hybrid pigs. The cross of three exotic breeds is practiced and pigs of more rapid growth and better meat quality are produced. To upgrade the quality of hogs, artificial insemination is being

conducted by 143 artificial insemination centers. Exotic breeds of swine imported from the United States and Japan are Berkshire, Yorkshire, Duroc Jersey and Landrace. Sows artificially bred total 56,000 head annually with conception rate at about 85 percent.





The traditional poultry industry of Taiwan is duck raising and the mule duck is the most common for meat purpose. Artificial insemination has solved the problem of mating the Muscovy duck with the Chinese mallard. Improvement of the duck performance has been observed after replacement of wet mash feeding with pellet feeding and duck feed pellets are being produced by the Putze Farmers' Association. Also, a duck research center at Ilan has been in operation since 1967.

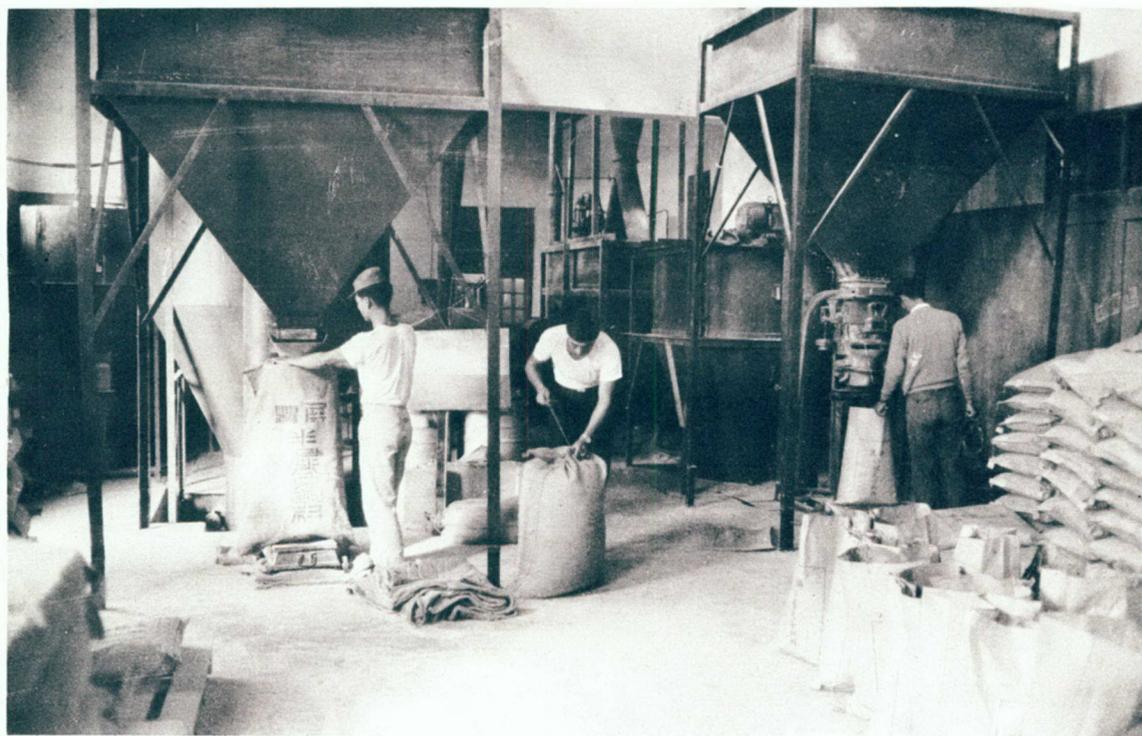


JCRR has promoted the breeding of hybrid chicken and has imported new breeds of the following strains: New Hampshire, Leghorn, Bared Plymouth Rock, Rhode Island Red, Cornish and White Plymouth Rock. The Provincial Livestock Research Institute produces breeding stock for supply to poultry farms.

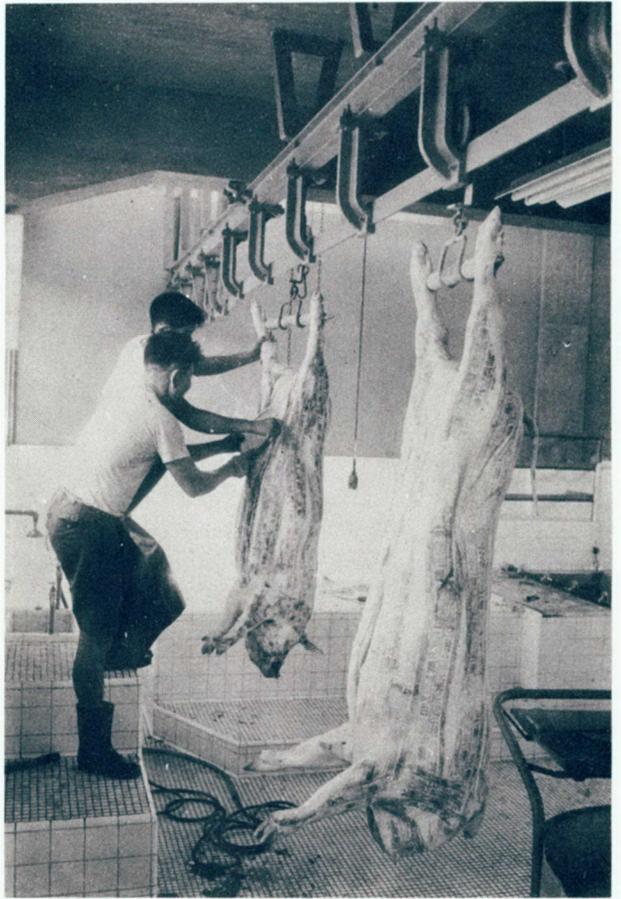
Newcastle disease and fowl cholera are the two most dreaded poultry diseases in Taiwan. In 1956 a program to inject all fowl with vaccine was most effective and the poultry population increased rapidly.

Pullorum is another serious chick disease which is a threat to the poultry industry. The Provincial Department of Agriculture and Forestry has set up a pullorum testing system and over 6 000 carriers have been destroyed.

Fifteen feed mills set up at 15 Farmers' Associations in different parts of the island are producing a pig starter feed and a semi-complete feed to be mixed with sweet potato on the farm. Feed efficiency has been improved with the balanced feed provided in dry form and the growth rate of hogs has doubled. The simplified feeding method and the supply of mixed feed on a loan basis have enabled farm families to raise up to fifty pigs at a time. For quality control, the feed mills have each established a laboratory for feed inspection by trained technicians.



A new abattoir has been set up in Kaohsiung City equipped with modern facilities and operating under a new sanitary slaughter system. This modern plant is aimed at changing the old marketing traditions and bad practices.







The fisheries program includes technical and financial assistance to activities in the production, processing and marketing of fish as well as research and extension work. It covers deep-sea, coastal and inland fisheries. Financial assistance to all phases of the fisheries program are in the form of loans except for those extended to research activities.

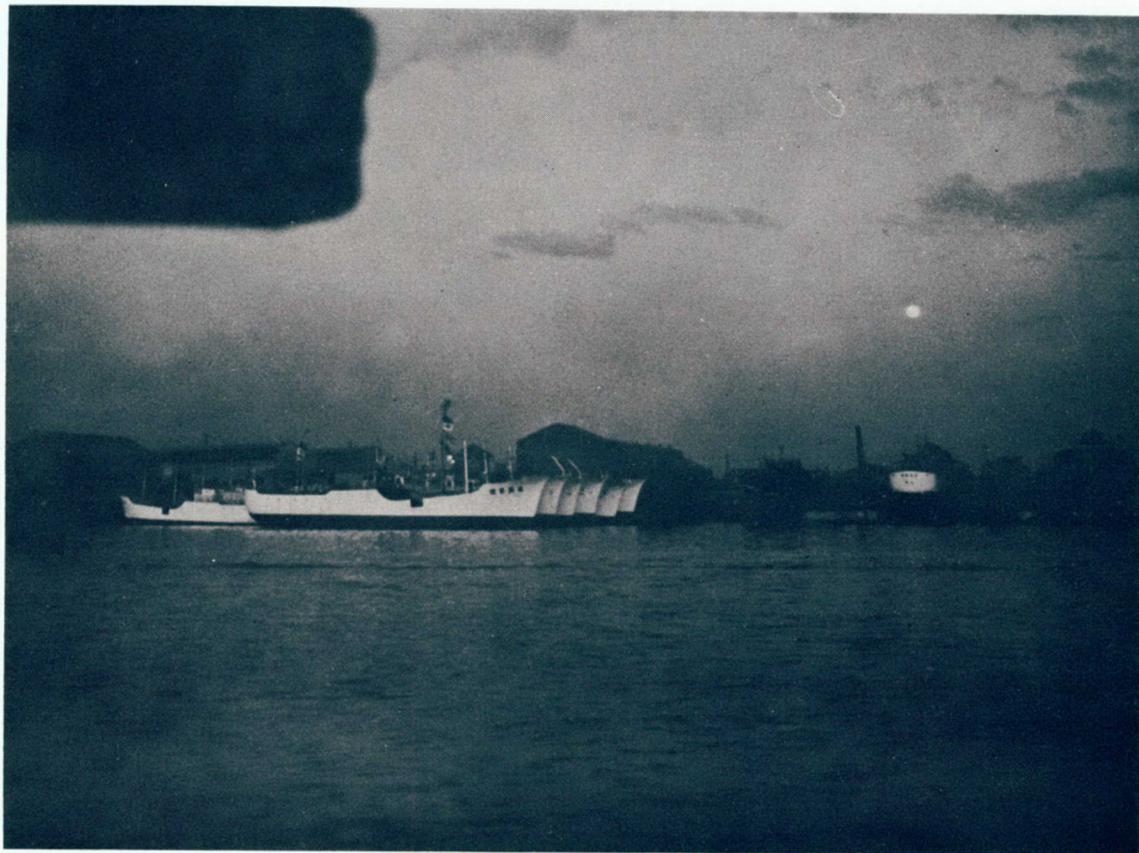
The Taiwan Fisheries Research Institute tested the efficiency of the Danish trawl and German herring trawl in comparison with the conventional otter trawl used in Taiwan. From this experiment, an improved trawl has been developed which catches 30 percent more fish than the conventional trawl. This improvement came at time when the trawling industry was at its lowest ebb because of poor catch and low fish price. It is rapidly being adopted by all fishing trawlers in Taiwan.

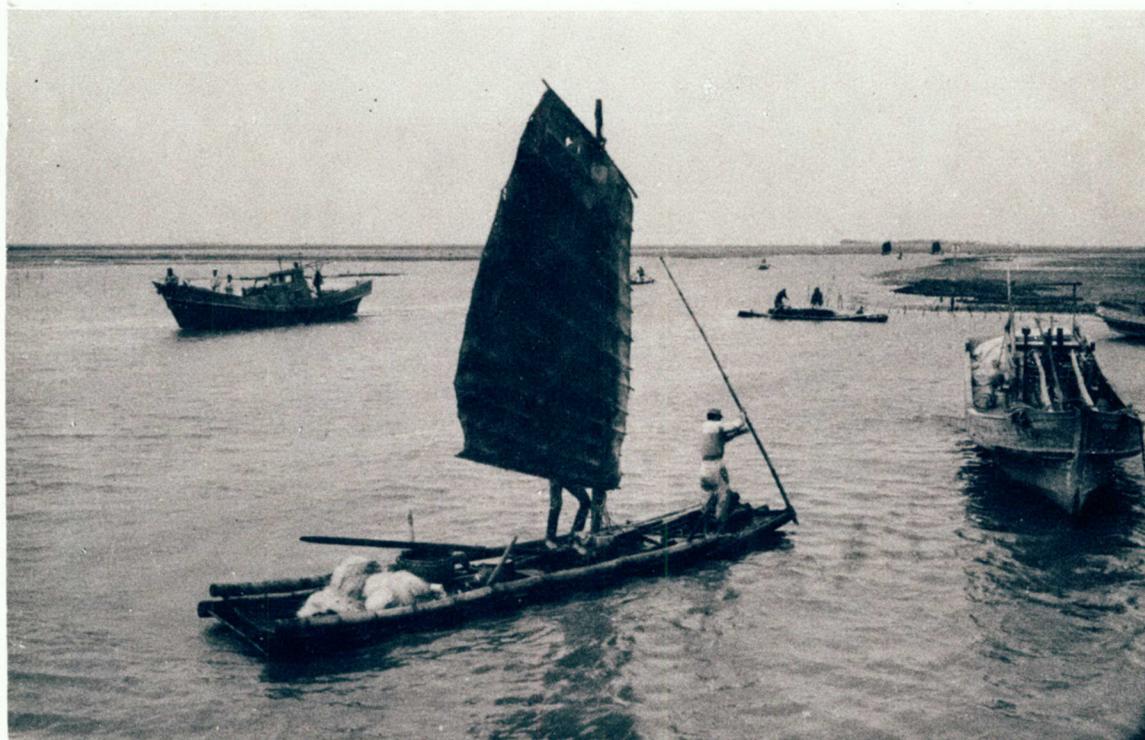


Tuna fishery is the chief foreign exchange earner of Taiwan's fishing industry. More than 200 tuna vessels are fishing in the Indian, Pacific and Atlantic Oceans. The export of frozen tuna amounted to US\$13.5 million in 1967.

JCRR has helped the development of Taiwan's tuna fishery by granting loans for the construction of tuna clippers,

providing revolving fund for tuna vessels operating from overseas bases, training of crew and managerial personnel and study of the international market for tuna. The program started early in 1961 when a loan was extended for the construction of 12 tuna long liners of 160 to 200 tons in size to stimulate the interest of the fishing industry in distant waters tuna fishing.





JCRR has demonstrated and put into extension a number of plastic-made fishing equipment which are durable, economical and superior in performance. Among these are rafts made of polyvinyl chloride (PVC) pipes instead of bamboo pipes, bamboo beams on shrimp trawls are replaced with beams covered with reinforced fiberglass (REP) and polyethylene (PE) floats replace that of glass on tuna long liners.

JCRR has helped the Taiwan Fisheries Bureau carry out demonstrations and training on the use of fish finders. Loans have been extended for the procurement of this equipment and now over 1,000 fishing boats are equipped with finders. Loans are also being extended for the purchase of direction finders and radio buoys.



Thousands of sampans and bamboo rafts in Taiwan are propelled by manual labor. Since motorization of fishing craft is the effective way to increase fish catch, JCRR began extending loans for

the installation of engines on sampans. By 1966 powered sampans numbered 1,260. A promotion program has brought about the installation of outboard motors on more than 1,200 bamboo rafts.







JCRR has contributed considerable financial assistance for the repair and improvement of harbor facilities for the rapidly expanding fishing fleet. Important ones are the Chienchen, Tungkang,

Nanfang Ao, Chuwei and Makung which provide additional anchorage areas for fishing vessels, minimize loss of vessels during rough weather, and facilitate loading/unloading operations.



The Chinese major carp (five species) is the most important fresh water pond fish in Taiwan, particularly the grass carp, silver carp and the big-head carp. Discovery of the natural spawning of these fish in the Ah Kung Tien Reservoir led to experimenting by the Tainan Fish Culture Station of the Taiwan Fisheries Research Institute on induced spawning of the fish by hormone injection. In 1963 commercial production of four species of the Chinese major carp began on a large scale. Fish seeds are no longer imported. Taiwan has

become a supplier of fish seed to Hong Kong, The Philippines, Thailand, and to other Southeast Asian countries. JCRR also assisted the Taiwan Fisheries Research Institute and the retired servicemen's Taoyuan Fish Farm in demonstrating the use of chemical fertilizers in fresh water fish ponds. In low-yielding ponds where silver carp was the predominant species, fish production increased 200 to 300 percent with the application of superphosphate. Due to the impressive results, this application is now widely accepted.



The common method of oyster culture in Taiwan is to plant bamboo sticks in the shallow sea bottom to catch the spats and grow them to marketable size. However, bamboo sticks deteriorate rapidly and have to be renewed yearly. Also, no distinction had been made between spat collecting and fattening.

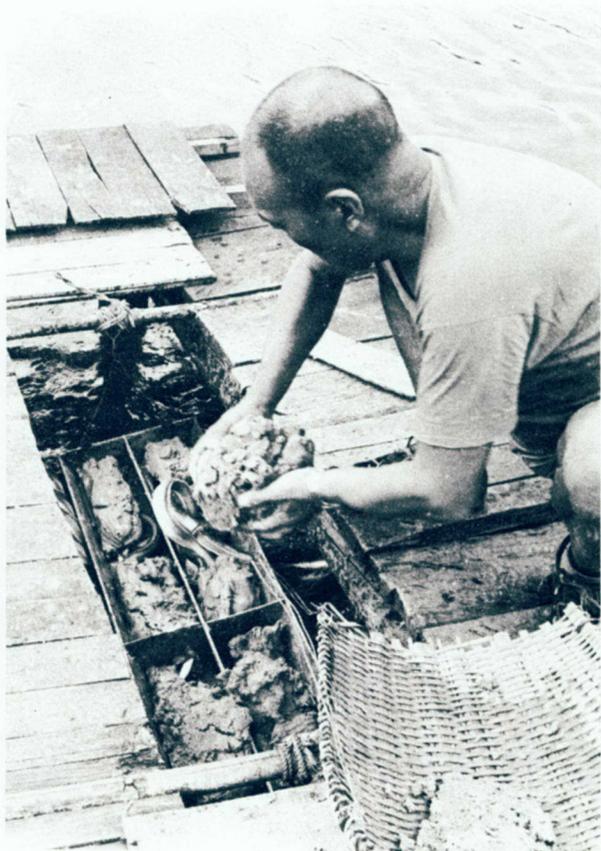
A demonstration has been carried out on the use of creosoted bamboo sticks which has a service life of five years. A large number of oyster growers have adopted this practice. Experiments are also being carried out on the raft and long liner method of oyster culture and the use of hardened oyster seeds as a means of producing larger and better quality oysters.





Eel farming has become an important industry in Taiwan, with recent annual production conservatively estimated at 500 metric tons valued at NT\$40 million. The chief problem in eel farming is that of feeding. Trash fish, which is still the main feed for eel, is unsanitary, difficult to handle and preserve and uncertain in supply.

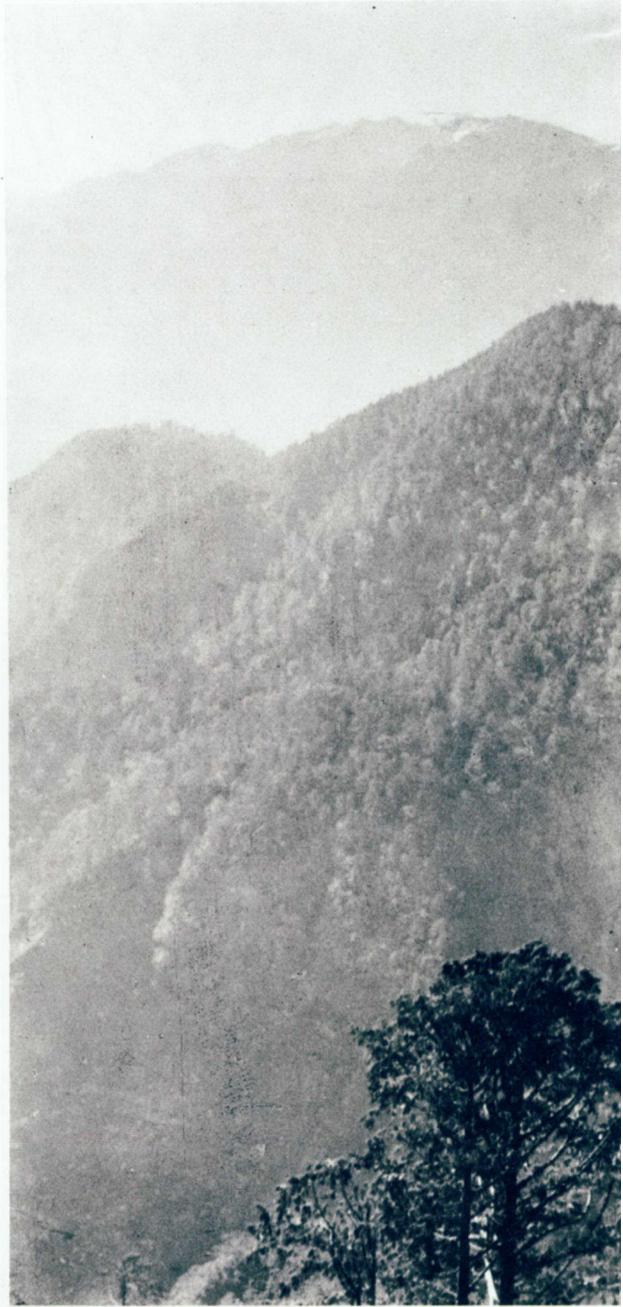
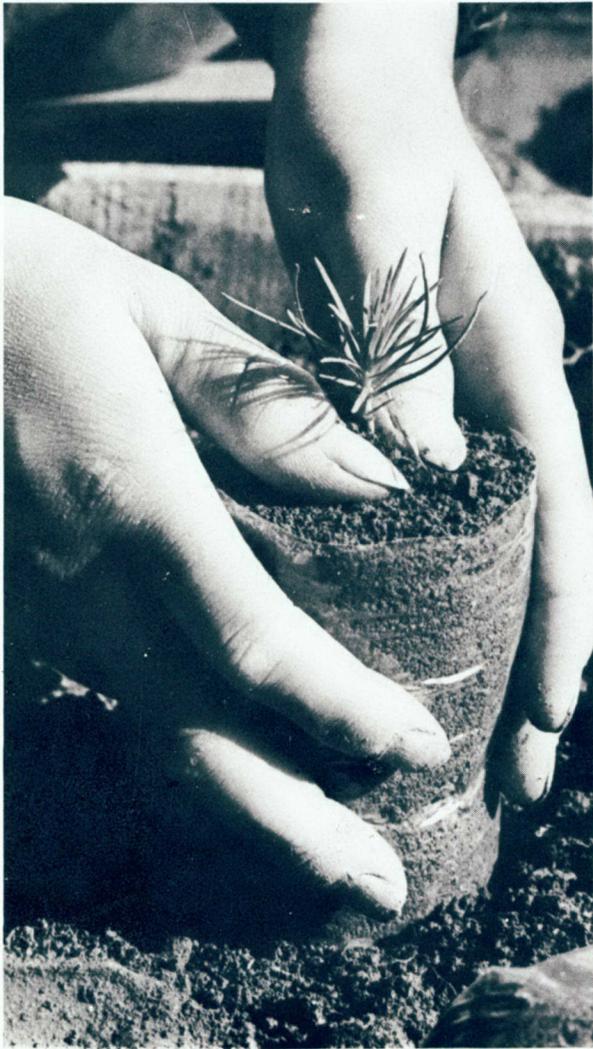
With the assistance of JCRR, the Kaohsiung Laboratory of the Taiwan Fisheries Research Institute has developed a powdered mixed feed having a feed conversion ratio between 2.15 and 2.45 kgs. of feed (to grow 1.00 kg. of eel) as compared to 8.5 to 13.5 when using trash. This mixed feed is now being produced by a commercial plant.







Large scale reforestation was started in 1953 and most of the tree crops planted during the first expanded reforestation program have been harvested and used for industry, construction, fuel and export. Areas of illegally cultivated land in public forests have been converted into tree/bamboo plantations that are supplying large quantity of timber for industrial uses.





JCRR has successfully introduced tree species of high economic value such as slash pine from the United States, Luchu pine from Okinawa, mahogany, rose tree and cashew nut trees from the Philippines and coconut

palm from Malaysia. The propagation and extension of fast-growing industrial species, both exotic and local, such as pine, scented camphor, paper mulberry, Paulownia, Albizzia, bamboo, etc., have also been undertaken and emphasized.



Bamboo is a versatile crop with high adaptability and over 40 species have been found in Taiwan. Loans have been extended to growers for fertilizing 40,000 clumps of giant bamboo annually, increasing yield of bamboo shoots per

unit area by 70 percent. Local consumption of culms is 150,000 metric tons and that of bamboo shoots 30,000 tons per year. Creosoted bamboo poles are used as stem supporters for banana and as propagation sticks in oyster beds.





Sixty-seven per cent of the total area of Taiwan are mountains. In order to make accessible the abundant forest resources in these mountains, 78 forest roads, totalling 400 km., have been built. The construction was financed with U. S. PL480 Title II surplus commodities plus the contributions from the local governments and communities.





The reorganization of 1953 brought the Farmers' Associations in Taiwan under the control of the bonafide farmer who are those with over one-half of their total income derived from farming operations. Programs undertaken to elevate the quality of farmers' association personnel and to strengthen the financial structure of the associations brought about increase in membership, business volume, deposits and loans, and services.





To insure adequate storage facilities for farm products the Farmers' Associations in Taiwan are equipped with 1,800 warehouses. They are provided with efficient hulling and polishing facilities for rice which can maintain brown rice recovery at about 80 per cent of the paddy in terms of weight. This is the highest ratio of rice recovery in rice producing countries of Asia.



The educational type of agricultural extension work was initiated by JCRR in 1952 and an agricultural extension education system was established in 1955. Special projects include assistance to 3,000 low-income families (with farms of less than 0.5 hectares) by making available low interest production loans, providing wage-earning opportunities, enabling them to improve farming practices, raise more hogs, engage in sideline businesses and offering them necessary services through farm extension activities.



A teamwork approach has been adopted in the farm extension program for improved practices in rice growing and field crops cultivation. Joint farming operations groups have been organized in eight selected land consolidated areas, each area of 300 hectares in size, to accelerate the adoption of rice integrated practices. Field days have been conducted at different localities to promote the farm teamwork approach.



Over 200 4-H farm management clubs have been organized for older members to undertake advanced projects. Members learn to work on farming operation activities and keep farm management records. Training workshops in special

skills for 4-H youngsters are conducted in rural townships. Subjects include wood carving, bamboo weaving and carving, vehicle driving, repairing of farm implements and electric appliances and the processing of farm products.





Home economics training workshops for extension field workers are the media of information dissemination. Subjects include food and nutrition, clothing, child development, home management, and handicraft. It is a means of providing the latest home economics and teaching instruction to local leaders and an opportunity for workers to learn of the daily living needs and problems of the area.



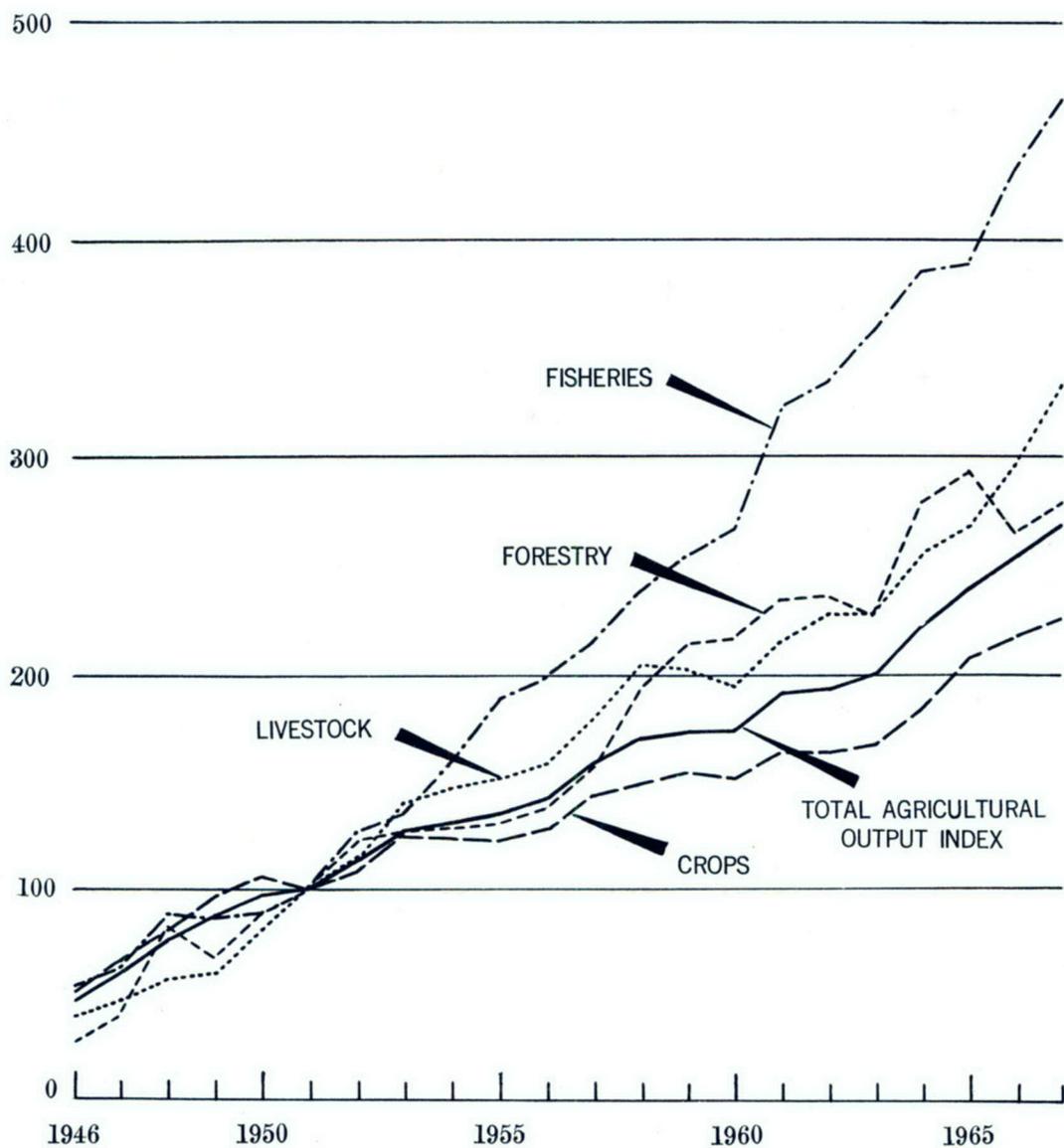
Agricultural statistics and economic investigations are necessary to an understanding of the agricultural conditions and problems and they have become an indispensable function for guiding economic development and planning. JCRR sponsors many activities in the field of economic research and has helped the Provincial Department of Agriculture and Forestry in securing accurate and timely statistics on crop and livestock production.



Cost of production surveys are conducted to analyze the structural changes of farm production costs. Islandwide farm income surveys are conducted every five years to provide a standard for measuring the economic status of farmers as well as the economic changes in the rural areas. The major items covered are: gross farm receipt, total farm expenditure, non-farm income, farm family expenditure, and farm assets

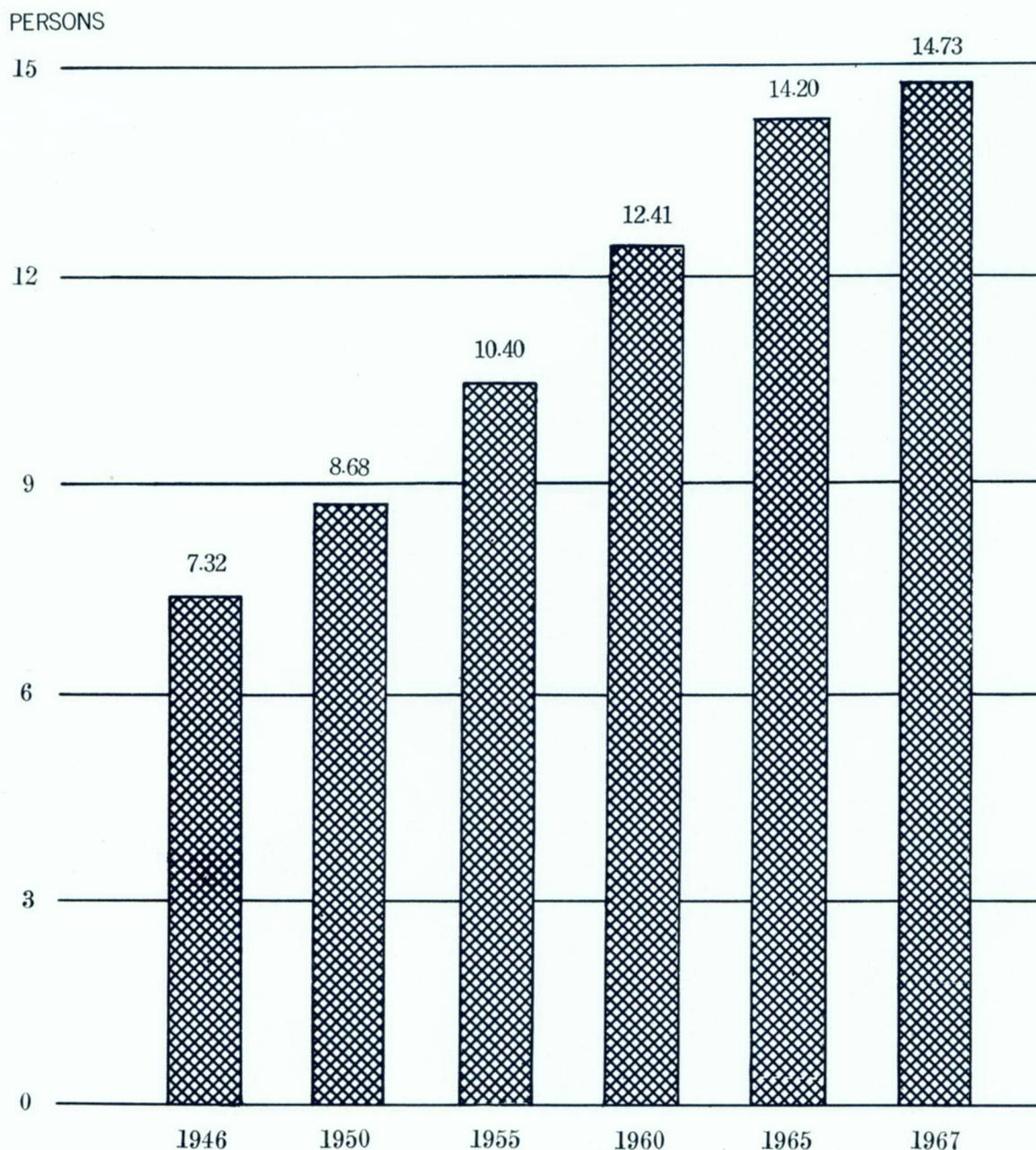
AGRICULTURAL PRODUCTION INDICES

1951=100

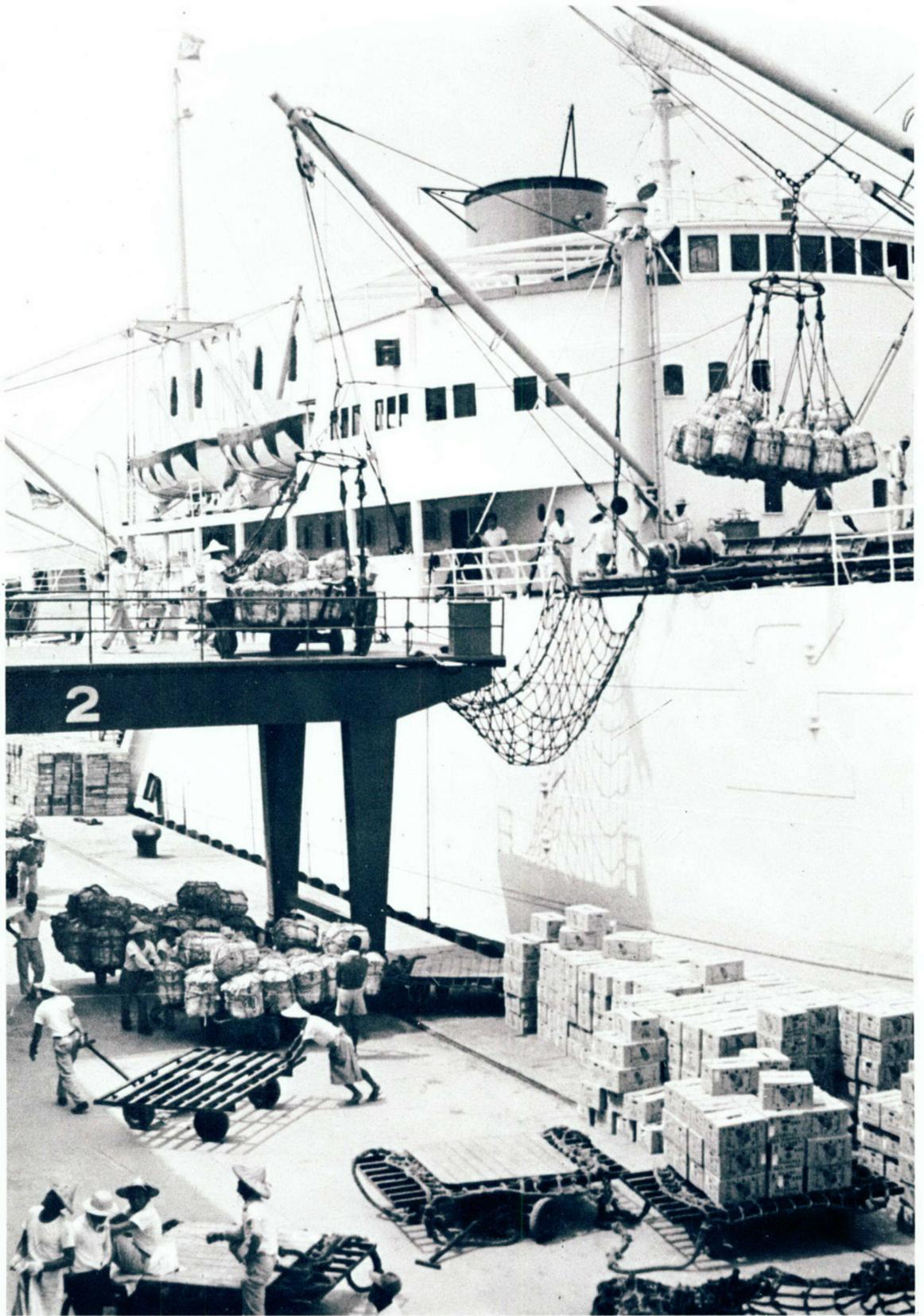


The first sample census of agriculture was taken in 1956. By use of five percent random sampling 40,000 farmers answered questionnaires on family number, farm size, tenure, labor, crops, livestock, irrigation and equipment. In 1960, the Republic of China participated in the FAO-sponsored World Census of Agriculture. The third census of agriculture was taken in 1966.

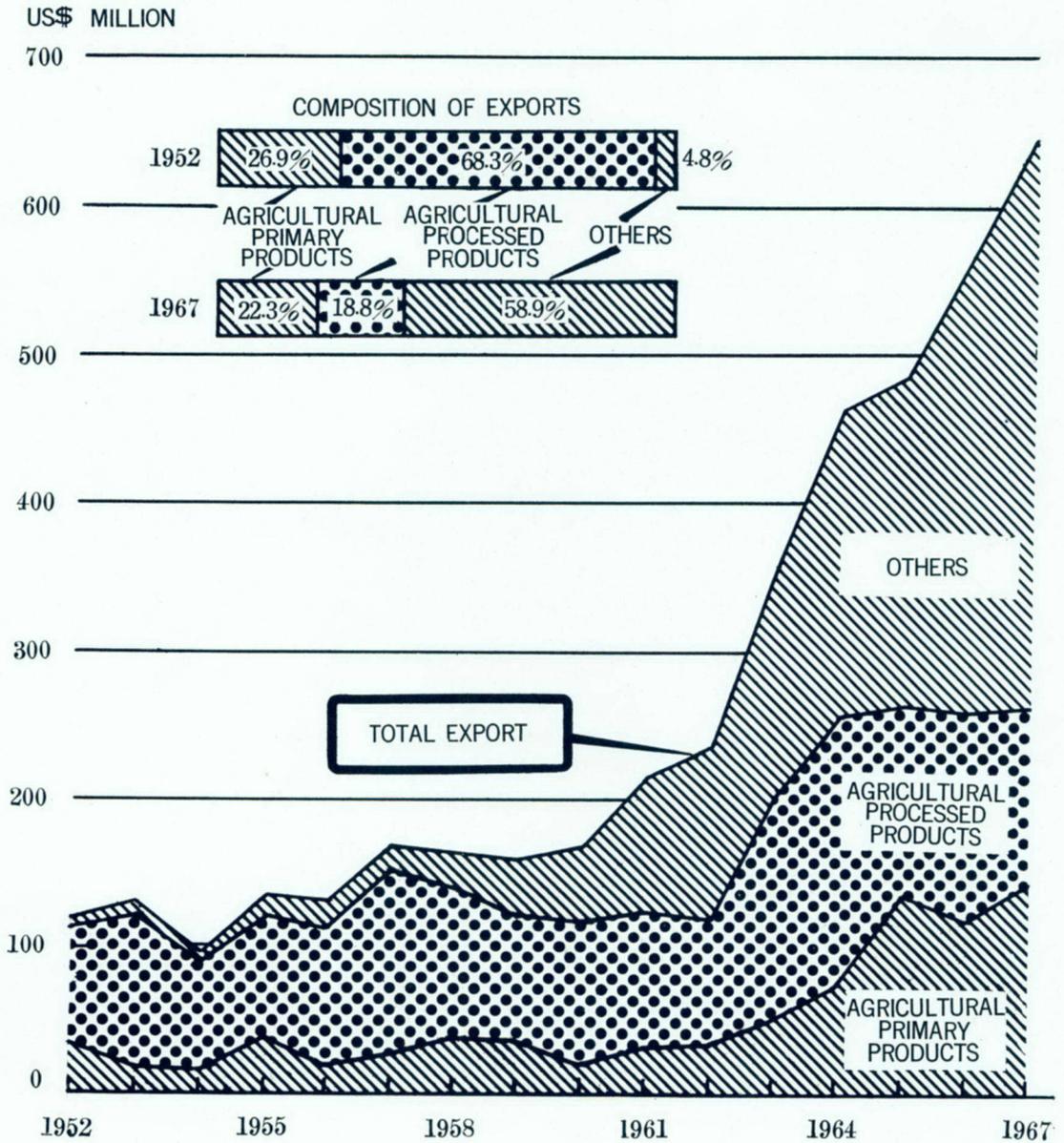
NUMBER OF PERSONS SUPPORTED BY A HECTARE OF CULTIVATED LAND



A farm record keeping program was initiated by JCRR 15 years ago to help farmers improve farm operations by keeping daily records of their activities and transactions. The information furnished by this program has been used by research workers for studies on farm management and is a main source of data in compiling national income statistics.

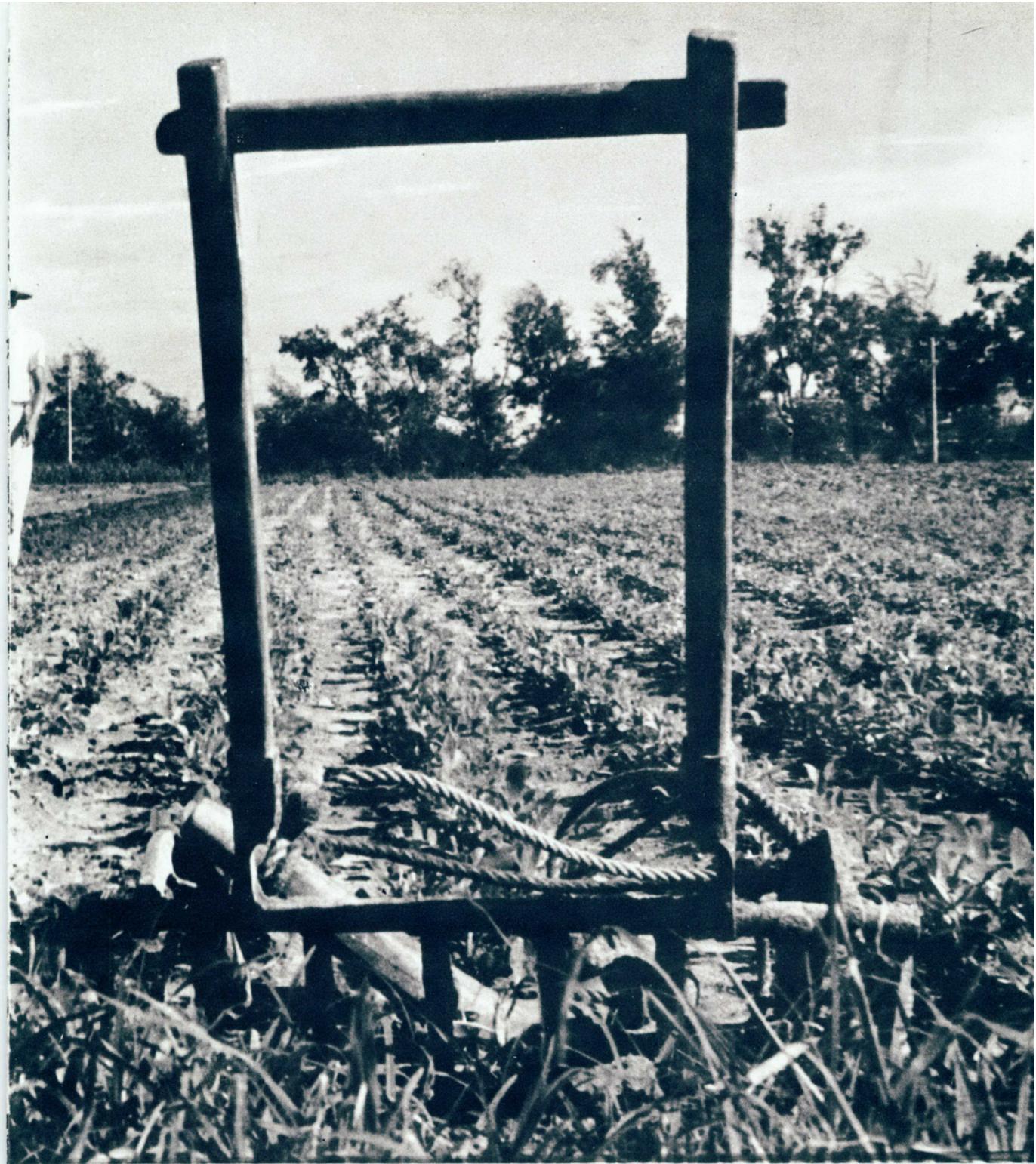


EXPORTS





An islandwide supervised credit project was started in 1961 for the purpose of providing a permanent and dependable source of lending funds for agriculture and strengthening the credit services of agricultural financing institutions. An Agricultural Credit Fund of NT\$300 million was established and an Agricultural Credit Planning Board comprised of representatives of central and provincial agencies was set up to administer the Fund.

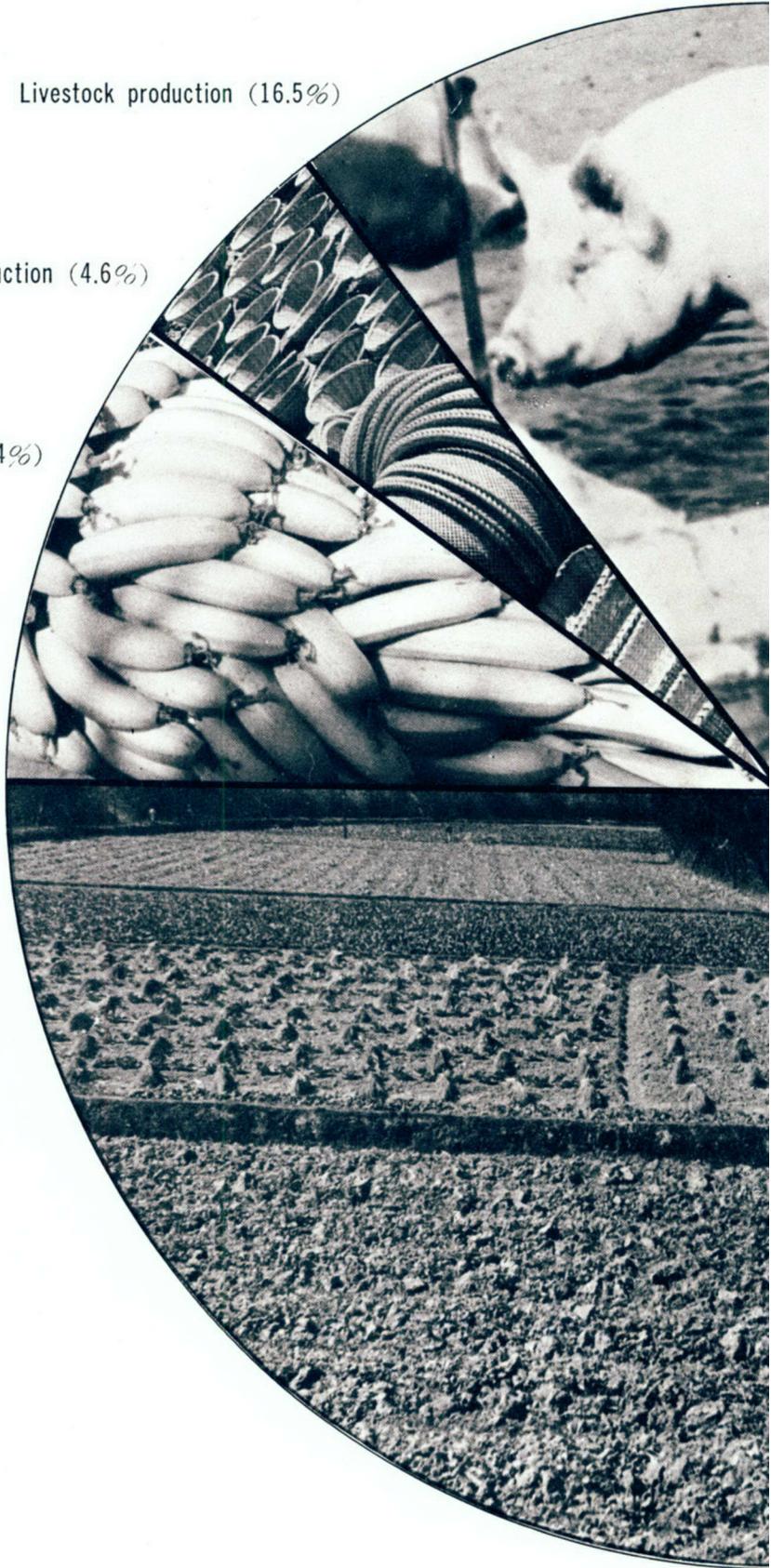


The capital reserves generated in the Farmers' Associations' credit departments reached NT\$262 million in 1967. The share-capital subscribed by the farmer-borrowers amounted to NT\$100 million. Contribution of credit funds by the Associations has increased to 80 per cent of the Fund. This growth of financial strength on the part of the Associations has enabled them to assume greater responsibility in the financing of agricultural development.

Livestock production (16.5%)

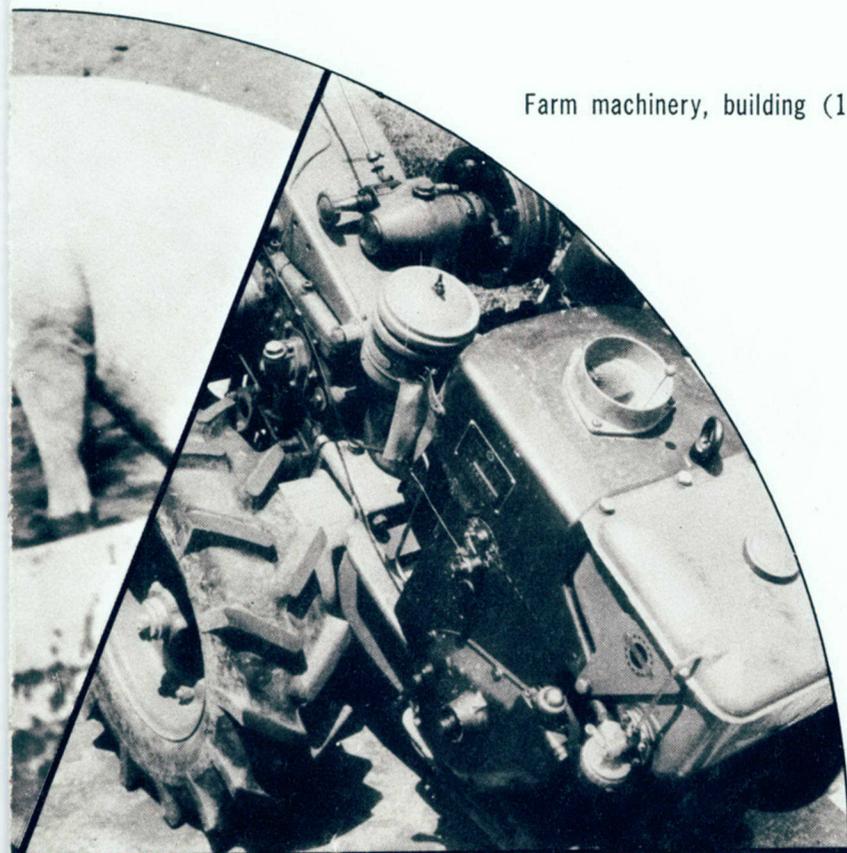
Sideline production (4.6%)

Crop production (9.4%)

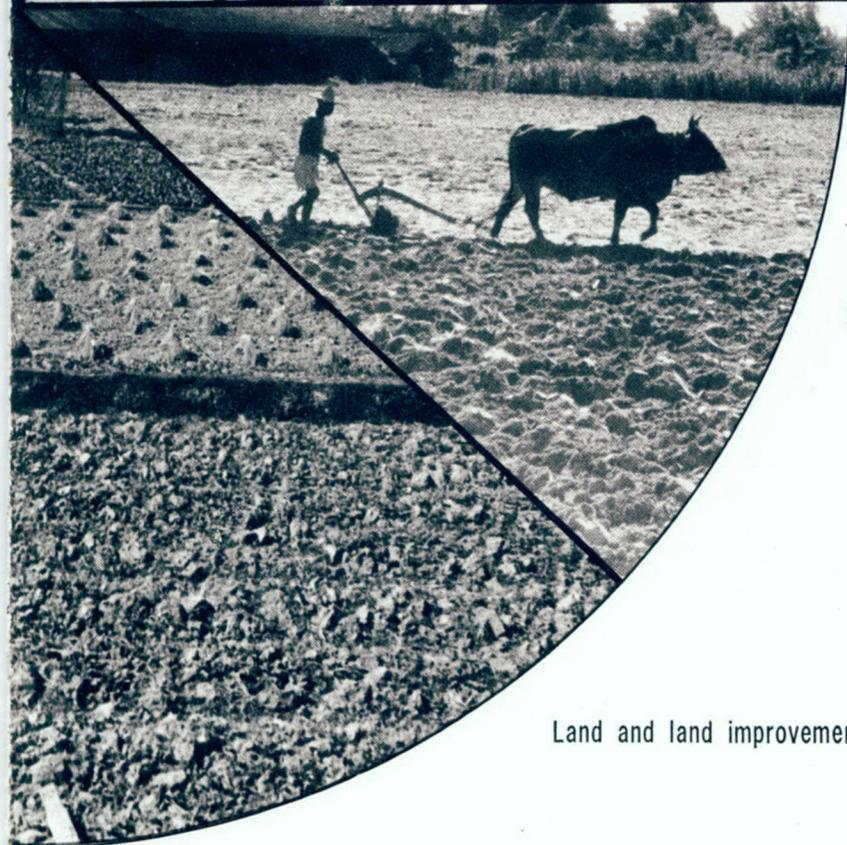


A total of 259 township Farmers' Associations (88 percent) take part in the credit program and one out of every three farm families in Taiwan has benefitted from the credit service provided. Since loans are made on the basis of production potential of the farm rather than collateral security the record of loan repayment by the farmers has been as high as 95 percent. Loans have been used for the purchase of land and land improvement, farm machinery, draft cattle, construction and repair of farm buildings, and for the production of crops, livestock and sideline industries.

Farm machinery, building (18.9%)

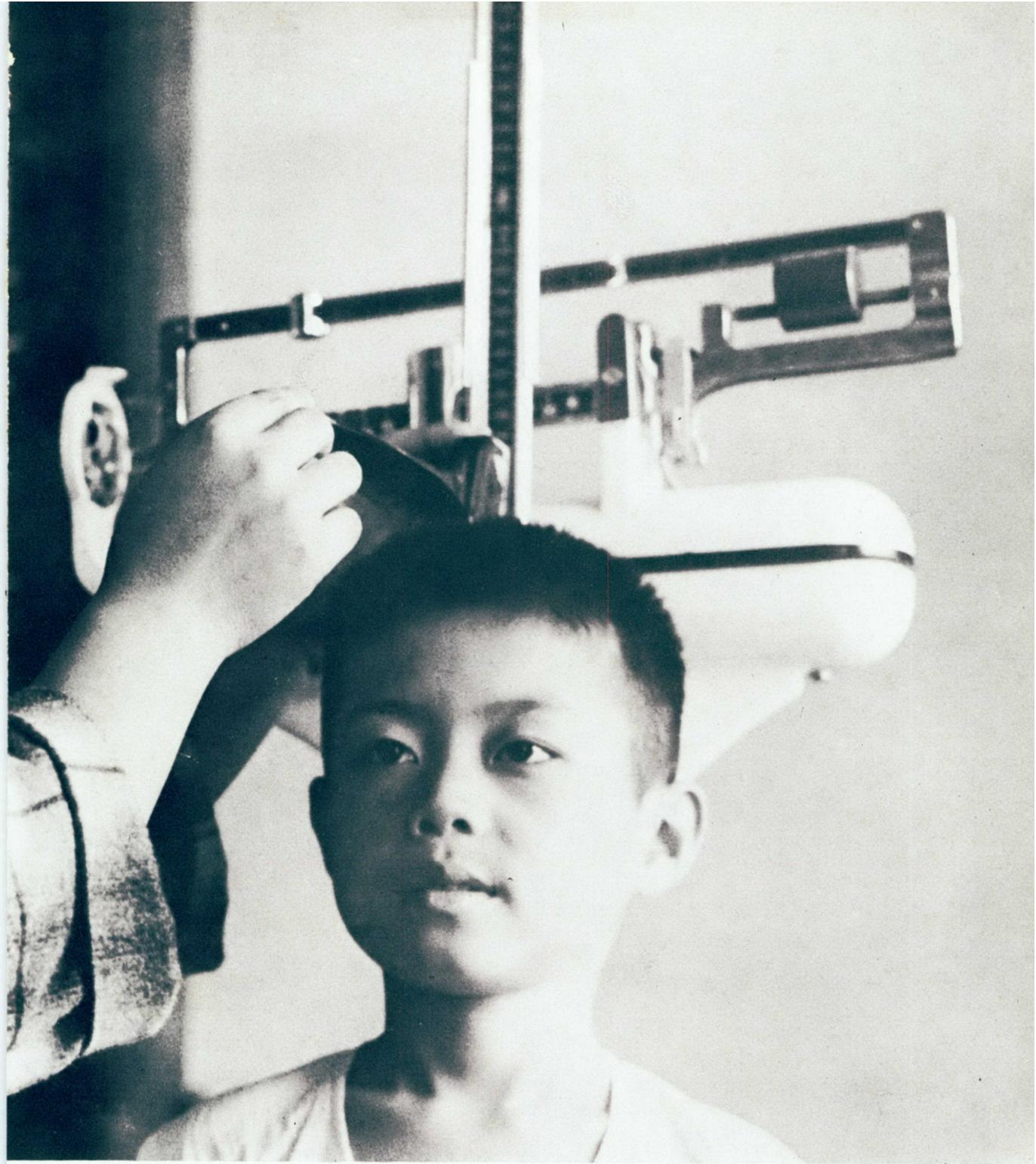


Draft cattle (12.1%)



Land and land improvement (38.5%)





A network of 361 health stations, one in each township, serves as the base for implementing various health programs. They are housed in buildings of a standard design provided by JCRR. The health stations have been active in the control of special diseases. Malaria has been entirely eradicated and the intensive program for the control tuberculosis and diphtheria continues. Plague on Quemoy and rabies on Taiwan, both endemic diseases, have also been successfully eradicated.

This is the fifth year of a family planning action program to which the Population Council of New York has made sizeable contributions annually.

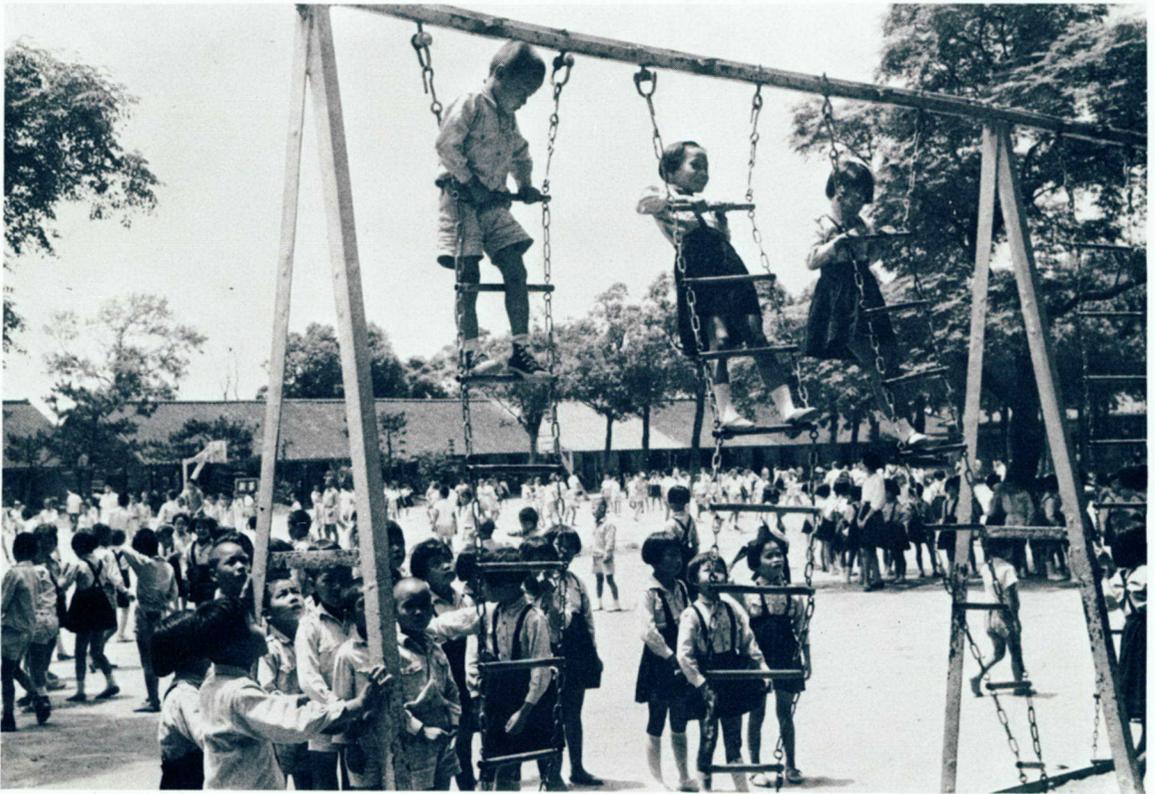
A total of 440,000 or 27 percent of the married women between the ages of 20-44 has accepted intra-uterine devices. Monthly acceptances continue at more than 10,000. Oral pills are now also available. The birth rate has dropped from 36.3 in 1963 to 28.5 in 1967 and the natural increase rate from 3.0 percent to 2.3 percent in the corresponding years.

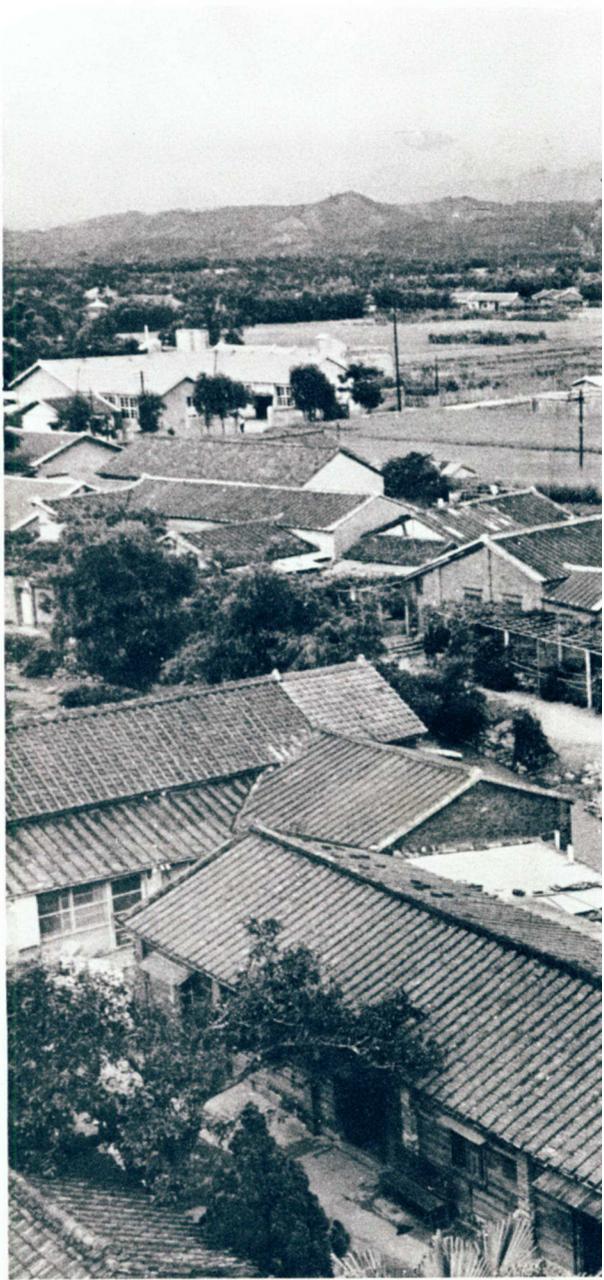
On May 3, 1968, the National Government gave official indication of its policy by announcing a set of regulations governing the implementation of the family planning program in Taiwan.



A province-wide school health and sanitation program has been conducted in primary schools. More than 800 schools have constructed standard latrines and 280 schools supplied with piped waterworks. A school lunch program undertaken in indigent areas benefitted 250,000 pupils with wheat, milk powder and edible oil contributed by the United States Government.

A total of 5,000 primary school children of ages 6 to 12 take part in a program of cheese feeding, a study on the physical growth and development of children fed supplemental high protein food as compared with those on ordinary diet. The processed milk cheese and milk biscuits for the study are donated by the New Zealand Dairy Production and Marketing Board.



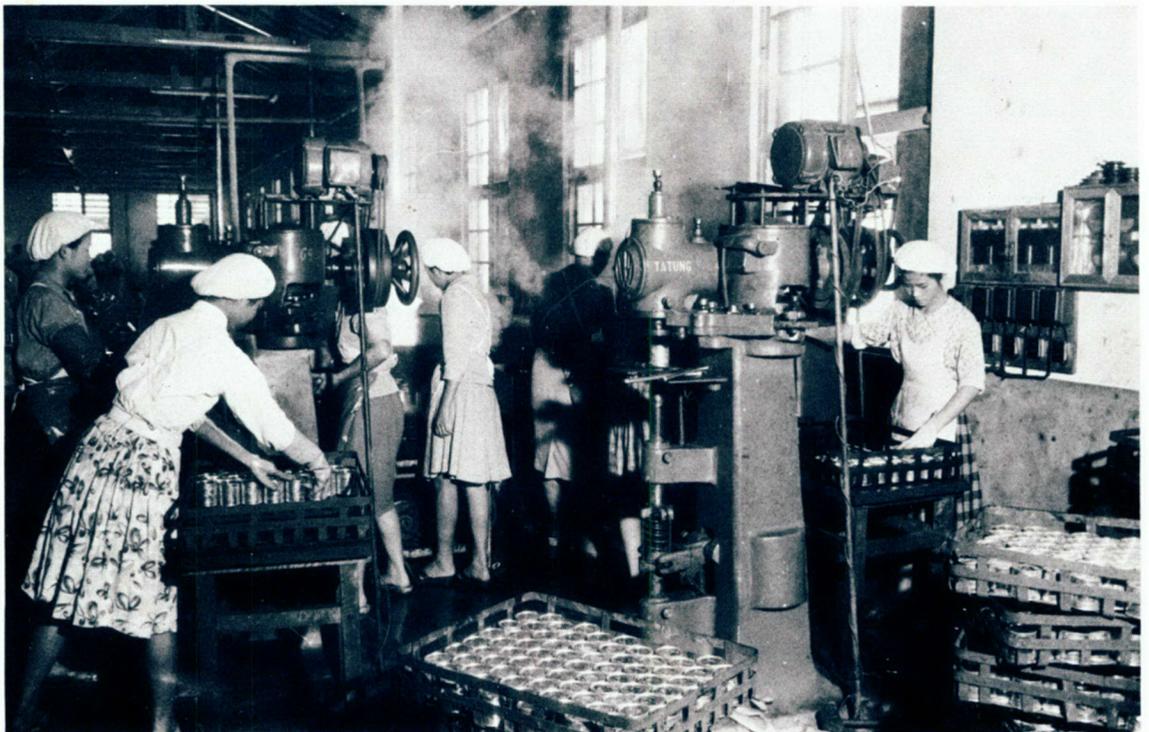




JCRR has initiated a concerted approach of local government organizations, voluntary agencies, and the people in carrying out an intensive program of sanitation improvement in the village. Local governments work with local organizations in cleaning public

places, remodelling public latrines, paving village roads, constructing drains and educating village people in home sanitation. The program is gaining recognition and support from all levels of governments and is playing a leading role in community development.

The processing of agricultural products has made great progress. Activities in this field include improvement of processing techniques and sanitation management of food factories engaged in canning of vegetables and fruits, processing of quick-frozen mushroom, asparagus, pea pod, strawberries, and sterilized high protein soybean milk.





Taiwan canned asparagus is popular in foreign markets and the export value was US\$24 million in 1967. Frozen pea pod is also a budding industry.

Taiwan has become a leading mushroom exporting country. In 1967-1968 the foreign exchange earned from this product alone amounted to US\$32.6 million.

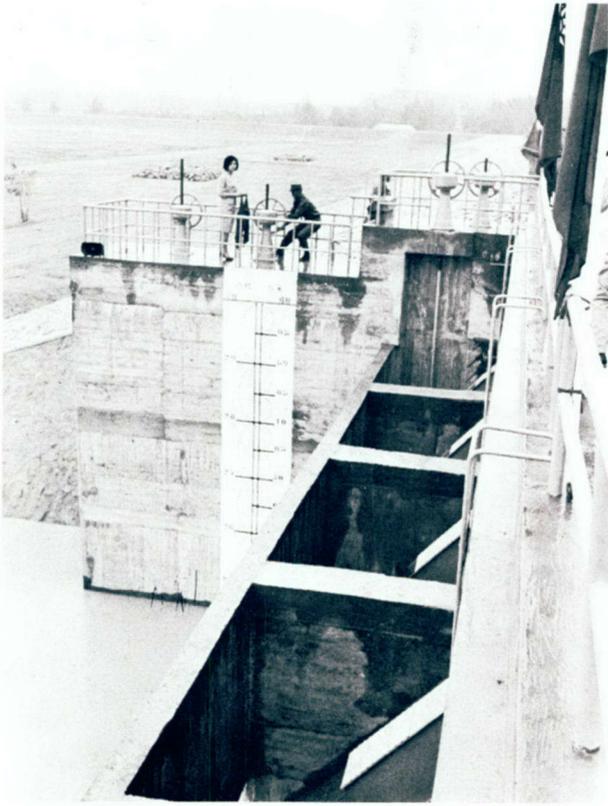






Kinmen (Quemoy) once a barren island, has become a green and productive land following years of afforestation.

Well-patterned farm windbreaks and seacoast forests have been planted and the roadsides are lined with trees.



Insufficient rainfall in Kinmen brings drought and natural calamities. The construction of Tai-hu and Lam-hu reservoirs with a storage capacity of 1.3 million m^3 have provided irrigation for 170 hectares of dryland. Together with 6,700 shallow wells, 12 deep wells, 79 check dams and 700 ponds, the water resources available is capable of irrigating two-thirds of the total land area of Kinmen.



Tree seedlings for the reforestation program are no longer shipped from Taiwan. Tree nurseries have been established and the Kinmen Forestry Station was organized for the tree planting program. Today the nursery area is capable of raising 3,500,000 seedlings annually. Casuarina, slash pine, Acacia, Eucalyptus spp., Chinese berry, bamboo are some of the successful species. Guava and mango also thrive in many areas. Planting is done by the voluntary efforts of servicemen, students and farmers.

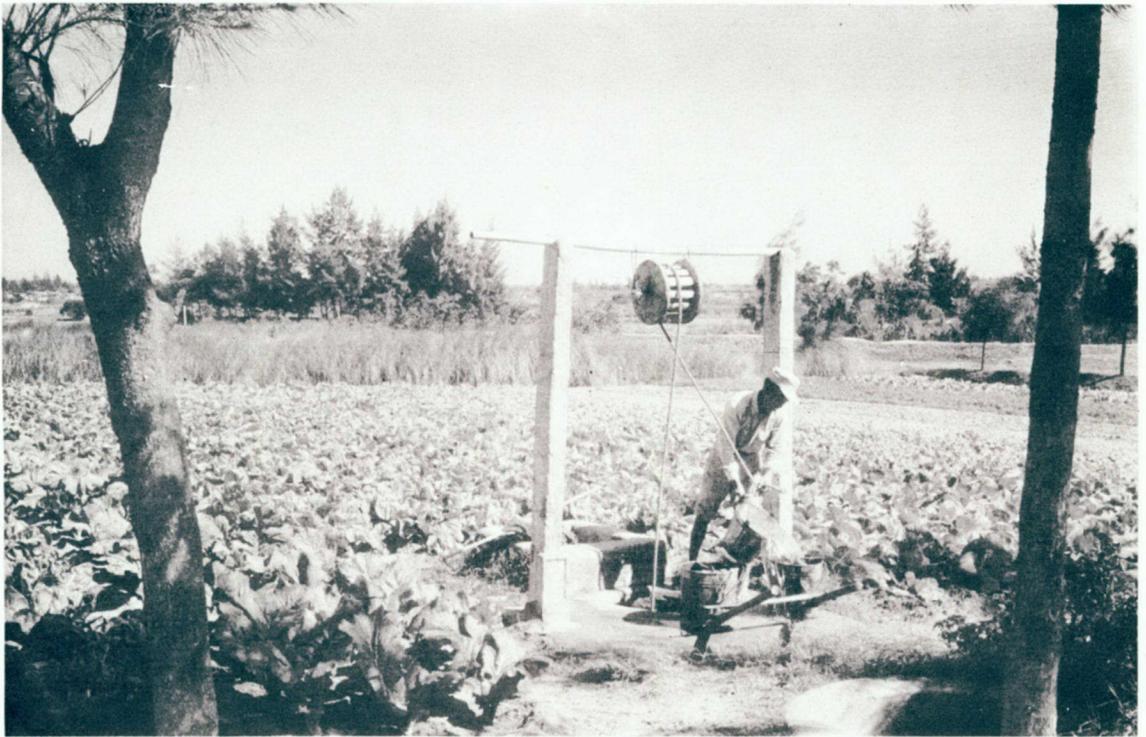




The livestock development program in Kinmen was started in 1953. Activities include disease control, artificial insemination of hogs, improvement of breeding stock, establishment of feed plant. Total hog production in Kinmen reached 38,069 head in 1967, sufficient to meet local consumption needs.

The major crops in Kinmen are sorghum, corn, potato, and peanuts. The Kinmen Agricultural Research Institute undertakes breeding work of newly introduced varieties and improvement of local varieties. Picture shows experimental farm of the Institute.





The livelihood of Kinmen inhabitants has been greatly improved. The people lead stable and happy lives unperturbed

by the communist shelling which still continue on odd (every other) days. The total population of Kinmen is 58,304.



Industry on Matsu is predominantly fisheries. JCRR has equipped 130 fishing boats with 6-30 h.p. engines and has introduced the use of improved fishing gear and nylon fish nets.

JCRR has strengthened the work of the Matsu Agricultural Research Station in the extension of sorghum and corn and introduction of new varieties of vegetable crops. Livestock production has increased as a result of new breeding stock and artificial insemination of swine.





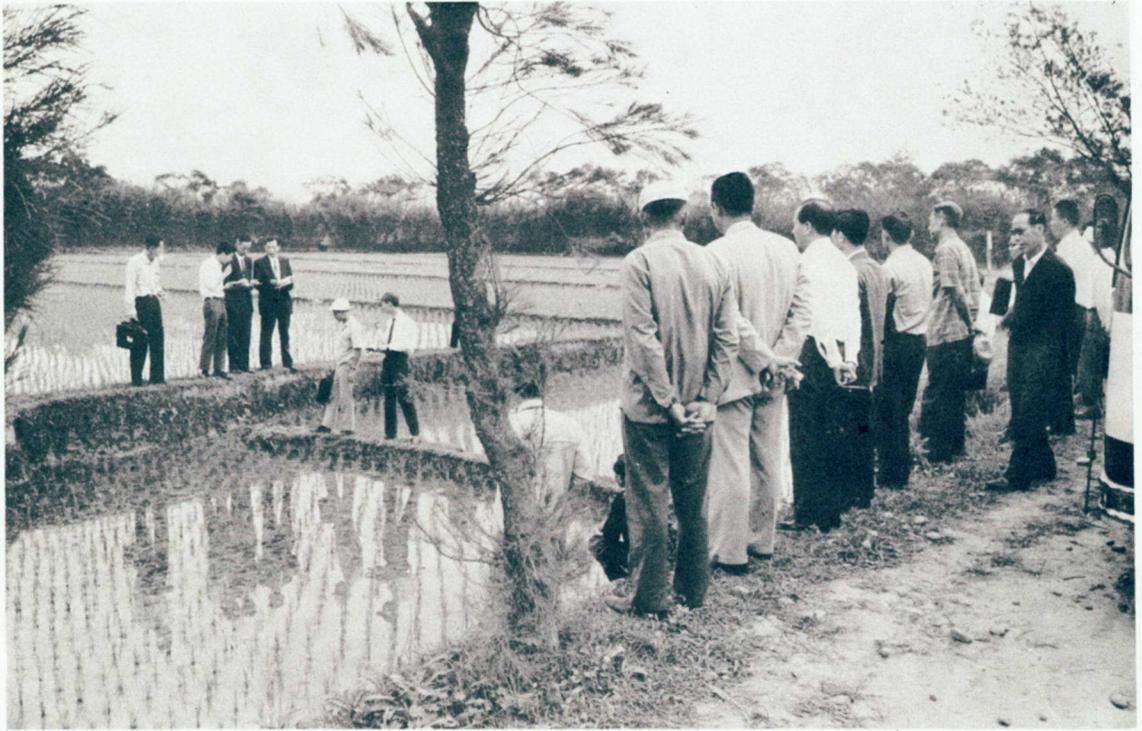


The progressive and successful agricultural development in Taiwan has attracted many visitors from foreign countries. JCRR has arranged briefings and observational programs for 7,348 agricultural officials of the policy-making level, scholars, technicians and farm leaders from Asia, Africa, Latin America, Europe, the United States and other parts of the world. Technical training programs have been conducted for 3,081 agricultural technicians, mostly from Southeast Asian countries.



The visits made by officials of friendly countries to Taiwan have resulted in requests for technical collaboration programs. In response to these requests the Government of the Republic of China, with the active technical advice of JCRR, has sent 18 agricultural teams to work in 18 countries in Africa, and seven teams to the following countries: Vietnam, the Philippines, Brazil, Dominican Republic, Chile, Saudi Arabia and Malta. These teams successfully demonstrated the adaptability of Taiwan's crop varieties and cultural practices to the conditions in the host countries and also extended them to local farmers.





Since 1959 JCRR has provided agricultural technical assistance to the Republic of Vietnam, with special emphasis on organization of farmers' cooperative associations, improvement of crop and livestock, and development of irrigation. An 80-member Chinese Agricultural Technical Mission renders expert consultation to Vietnamese technicians and extension services to farmers. In 1967, the addition of a 62-member rural reconstruction team was organized for the purpose of accelerating the programs in the Vietnamese villages.



FINANCIAL STATEMENTS

SUMMARY OF FUNDS SPENT FOR MAJOR CATEGORIES OF
ACTIVITIES CARRIED OUT ON THE MAINLAND OF CHINA

October 1948 to August 1949

Agricultural improvement	US\$522,609
Flood control and irrigation	1,482,761
Farmers' organization	151,320
Rural industries	34,240
Citizenship education	867,755
Rural health	85,897
Land reform	<u>293,680</u>
Total	US\$3,438,262

SUMMARY OF U. S. DOLLAR FUNDS SPENT
FOR MAJOR CATEGORIES OF ACTIVITIES

FY1951 Through FY1965

U. S. agricultural advisors	US\$2,070,000
Commodities	7,106,400
Participants training:	
In the United States	1,033,850
In other countries	<u>419,300</u>
Total	US\$10,629,550

SUMMARY OF NEW TAIWAN DOLLAR FUNDS
SPENT FOR MAJOR CATEGORIES OF ACTIVITIES

FY1951 Through FY1965

★Projects	NT\$4,025,113,000
Participants training local currency costs	23,050,000
U. S. technicians local currency costs	<u>37,855,000</u>
Total	NT\$4,086,018,000

★This figure includes NT\$20,008,000 programmed in FY1950

SUMMARY OF SAFED FUNDS SPENT FOR
THE JCRR PROGRAM

FY1966, FY1967 and FY1968

<u>Grants</u>	<u>523,112,415</u>
Crops	104,189,702
Livestock	39,219,687
Fisheries	23,770,193
Forestry	8,795,500
Forest land	7,763,200
Reclaimable land in slope area	52,478,337
Reclaimable land in plain area	50,647,700
Irrigation districts	36,556,793
Research and training	46,963,608
Investigation, planning and experiment	27,020,682
Farmers service	38,894,832
Rural community	18,119,539
Other supporting programs	42,034,665
Outlying Islands	26,657,977
<u>Loans</u>	<u>597,245,948</u>
Crops	10,050,000
Livestock	177,740,000
Fisheries	155,778,000
Forestry	4,400,000
Forest land	38,350,000
Reclaimable land in plain area	12,119,000
Irrigation districts	123,847,321
Research and training	3,950,000
Farmers service	49,752,627
Outlying islands	21,259,000
<u>Family planning</u>	<u>44,000,000</u>
<u>Unified agricultural credit program</u>	<u>53,780,000★</u>
Agricultural credit loan	52,000,000
Supervision of agricultural credit program	1,780,000
<u>Technical support and administration</u>	<u>90,142,000</u>
Technical support	46,240,000
Administration	43,902,000
GRAND TOTAL:	<u>1,308,280,363</u>

★ Appropriated from the accrued interest generated
by the Agricultural Credit Fund

