AGRICULTURAL DEVELOPMENT IN NEPAL.

By

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PREFACE

This report has been written at the request of Dr. Wilhelm Anderson, Head, Far East Division, Foreign Agricultural Service, United States Department of Agriculture. In his request, Dr. Anderson stated that very little information is readily available on the long-isolated country of Nepal. He further pointed out that a brief story was needed which could be used for orientation purposes, and for generally informing those interested in the country.

Much of the information has been previously submitted in various forms from our Point Four office in Nepal. Some agricultural material came through our close association with the members of the Food and Agriculture Organization group during their assignment in Nepal. There is little statistical data on the country, and much that is available is conflicting.

I take no special credit for authorship. It could have been written by any member of our Point Four staff in Nepal. The pictures, however, are my own. Much more information is needed. Future reports should be prepared covering the various problems and programs in detail.

I feel very fortunate to have been assigned to Nepal and to have been one of the first Americans to have had an opportunity to live in the country. It has been a rare experience, one not soon to be forgotten. The people and the government officials have cooperated in the Point Four program, and from the very start, there has been a friendly working relationship on every joint undertaking.

I would like to thank Mr. Louis Lazaroff and Mr. Terence Todman for reading this manuscript in rough draft and for their suggestions. I would also like to thank Mrs. Mary P. Langford for her helpfulness, patience, and untiring efforts in assisting in the preparation of this report.

FOREWORD

George V. Bowers was born and reared on a farm near Waupaca, Wisconsin. He graduated from the College of Agriculture, University of Wisconsin, in 1932.

Before going to the Far East as an Agricultural Advisor, Mr. Bowers served fifteen years with the Soil Conservation Service in the Upper Mississippi Valley Region. Eleven of those years were spent in various field positions in Wisconsin, Iowa and Minnesota. In 1935 he started to work on the original Soil Conservation Project at Coon Valley, Wisconsin, where he spent three years as an Extension Specialist and Farm Planner. After a brief assignment to Des Moines, he went to Minnesota, where he remained seven years in planning and supervising Soil Conservation District programs. Later he became Regional Economist with headquarters in Milwaukee, where he served four years on agricultural phases of the Flood Control Program.

In February 1950 Mr. Bowers went to Japan as Land Development Advisor, Natural Resources Section, SCAP. In this capacity he assisted the Japanese Government with irrigation, drainage, soil conservation and related land use problems. He next was sent to Okinawa, where he served in a similar capacity throughout the Ryukyu Islands.

Soon after the Point Four Program was started, Mr. Bowers joined the staff of the Foreign Agricultural Service and went direct from Okinawa to Nepal. While home on leave he has prepared the attached report.

Wilhelm Anderson

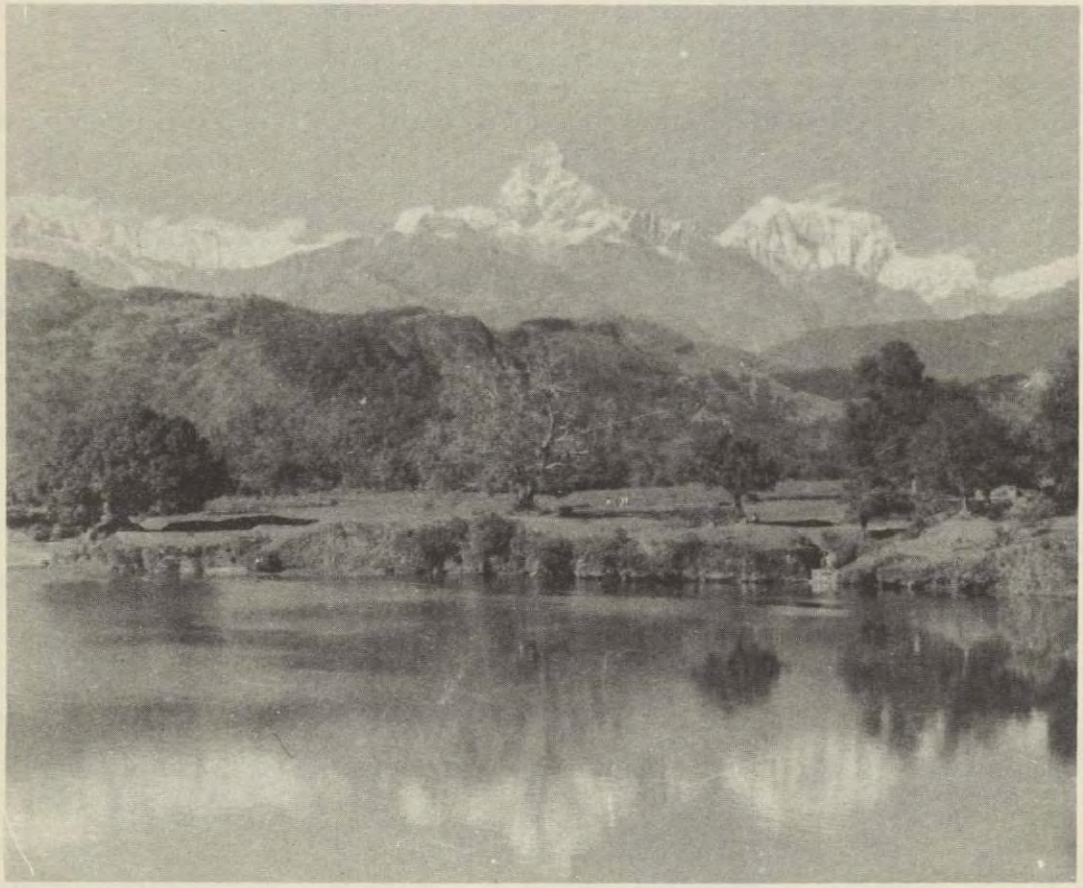
Wilhelm Anderson, Head
Far East Division
Foreign Agricultural Service

October 15, 1953

THE LAND AND PEOPLE

Location and Size

Nepal is an independent kingdom lying along the southern slope of the Himalaya Mountains, northeast of India, between the Tibetan highland on the north and the Ganges plain of India on the south. Katmandu, the capital, is located at 85° 20" longitude and 27° 45" latitude. This is about the same latitude as Tampa, Florida. Nepal is a beautiful and scenic country. It is approximately 100 miles wide and 500 miles long, covering an area of 56,000 square miles, which is about the size of the state of Wisconsin.



Famous Annapurna, left, and Machha Puchharay, center. Great mountains like these dominate the scene in Nepal.

Topography

A portion of the country lies along the Ganges plain next to India. Approximately 80 percent is very rough and mountainous, with steep ranges crossing from east to west, beginning with low hills in the south and with each succeeding range becoming higher and higher. Along the northern border are several of the highest peaks in the world, topped by Mt. Everest, which is 29,002 feet high. Many streams, some originating in the perpetually snow-covered mountains, flow south across the country into the Ganges system. It is estimated that only 14 percent of the total area is now cultivated, with possibly two-thirds of this area lying in the Terai region of the Ganges plain, bordering India.

Climate

Rainfall and altitude are the two most important factors affecting the climate of Nepal. The monsoon season usually starts about the middle of June and lasts until the first half of September. During the period between 50 and 100 inches of rainfall can be expected. During the rest of the year there is very little precipitation. Because of the extreme variation in altitude, the climate ranges from tropical to arctic, all within the space of a few miles. The climatic zones are considered to be about as follows:

Tropical up to 3,000 feet elevation
Subtropical 3,000 to 4,400 feet
Temperate 4,400 to 11,000 feet
Alpine 11,000 feet and up

Humidity is not excessive with the exception of short periods during the monsoons. Except for occasional storms, there is very little wind. The climate at Katmandu is nearly ideal. In summer the temperature seldom gets above 90°. The nights are reasonably cool. During the winter there are night frosts, but the ground does not freeze; the days are sunny and warm for the most part.

Manpower is the prime mover of loads in Nepal. Men and women carry as much as 80 pounds for long distances over steep mountain trails.

Transportation

The topography of the country is such that transportation is exceedingly difficult. At present there are reported to be only 279 miles of motorable roads, of which 158 are in the Terai region and 79 in Katmandu valley. There are several rail lines approaching the border from India. These include one in the eastern part of the country at Jogbani near Biratnagar, one at Raxaul near the center, and one south of Butwal towards the west. Inside Nepal in the Terai there are two short, narrow-gauge (2' 6") railroads, the most important extending from Raxaul to Amlekgahj, a distance of 29.3 miles. In addition, there is an aerial cable-way from Bhimphedi above Amlekgahj to Katmandu covering a distance of 13.7 miles. This so-called ropeway carries only freight into Katmandu valley and has a capacity of 8 tons per hour. Most of the freight and some people, however, are still moved on the backs of coolies, who walk up and down steep slopes along rocky mountain trails, which lead to various villages throughout the country.

A porter carries one small passenger. A more common conveyance is the "dandy," a carriage that requires a porter at each of the four corners. Only those who can afford to ride and those who are ill are carried.

With India's help, the first motorable road into Katmandu valley is now under construction. This road starts near Bhimphedi, the bus and truck terminal, where the present road to the foot of the mountain ends. From this point it is necessary to follow an irregular course over extremely rocky rough terrain reaching elevations as high as 7,000 feet. Construction is difficult and costly. In order to locate feasible passageways, it has been necessary to extend the travel distance to approximately 60 miles. From the same starting point, Katmandu can be reached by footpaths in approximately 18 miles. This road should be ready for limited traffic in 1954.

Animals are used by comparatively few people for transportation purposes. The government maintains a small stable of ponies for mountain travel and elephants for use in the Terai and mid-Terai regions. These animals are available for Government officials and are also used by guests of the country. Travel in the mountains is slow and hazardous. Point Four technicians have found they can cover about 10 to 14 miles a day in the mountains. Even with the sure-footed Tibetan pony, it is necessary to do much walking and climbing. There are no suitable restaurants and hotels; consequently, it is necessary to carry tinned foods, cooking utensils, sleeping bags and tents. Coolies pack the equipment on their backs in loads ranging from 50 to 80 pounds. Usually the distance one travels in a day is dependent on how far the sturdy porters are willing to walk.

At Pokhara airport a plane is just in from Katmandu. By trail the two cities are 10 to 14 days apart; by the new air schedule, less than an hour. Air travel within the country is just beginning.

During the last three years the Indian National Airways has been making regularly scheduled flights from Calcutta via Patna, India, to Katmandu five days a week. This has reduced the travel time from Patna to Katmandu from approximately 2 1/2 days to 55 minutes. About December 1, 1952, the Himalayan Aviation Corporation started making regular flights from Katmandu to Biratnagar, Simra, Pokhara and Butwal. If this proves profitable other Nepalese cities may be added. During the summer of 1953 the Government of India nationalized all airlines. Both Indian National Airways and Himalayan Aviation Corporation are now a part of the Government of India Airline Corporation.

The travel time from Katmandu to Pokhara walking over the trail requires from 10 to 14 days. It takes less than an hour by plane. Although the airplane will make its impact, only a small percentage of the Nepalese will be able to make use of it now or in the near future. The planes now in use are the American-made DC-3.

Communications

Most of the Nepalese mail within the country is carried on the backs of men. Their postage stamps do not have international recognition and are not used outside the country. India maintains a postoffice in the capital and Indian stamps are used for all mail leaving Nepal. The foreign embassies and the American FOA mission use an air pouch for nearly all their mail. Arrangements are being made for a regularly scheduled accompanied air pouch to and from the American consulate in Calcutta to the FOA headquarters in Katmandu. There are a few telephones in Katmandu. Service is not good. Most messages are transmitted from one office and one home to another by messenger or peon. Long-distance calls to cities in India, while possible, are rather time consuming and often unsatisfactory. A radio contact is used as far as Patna, India, and there picked up by telephone line. A radio voice contact is used by Government officials for reaching some of their district offices in the country. Telegraphic services are available to India, but are slow. Often written confirmations reach the FOA office in Nepal before the original wire.

Hydroelectric Power

There are two small hydroelectric generating stations in Katmandu valley, built by the Nepalese Government, one at Pharping and one at Sunderijal. These two stations produce only enough electricity to provide about one-half of the minimum requirements of the capital valley. This represents a handicap to future progress. Before additional household electrical units can be added, a government permit must be obtained. The current is alternating 240 volt, 60 cycle. In some sections of Katmandu 120-volt current is provided.

The only other small hydroelectric plant is in the District of Morang at Biratnagar.

Nepal has very large possibilities for hydroelectric development; however, funds and technical assistance are needed to go ahead. There are two main projects under consideration. One is the Kosi River which is now under survey by Indian engineers. This project would not only provide electricity to Nepal and to parts of India but it would also control flood waters, thus protecting thousands of acres of good land in both countries from damage. The other proposed project is on the Kali River. It is believed that either would provide more electricity than could be effectively utilized in the near future.

Main Geographic Regions

Nepal is frequently divided into three main regions based on topography. These include the Terai, the more level area of the Ganges plain; the mid-Terai or transition area; and the mountains. A fourth area, Katmandu valley (also called Nepal valley and capital valley) is frequently added, largely because of its importance.

Terai - The Terai is that portion of Nepal lying within the Ganges plain. The land although comparatively level is frequently dissected by streams and rivers. The soils, although generally quite fertile, are often sandy and gravelly in spots. Recurring floods have caused severe erosion and sedimentation damage in many places. While the area represents only about one-fifth of the country, it has been estimated to have about two-thirds of the arable land. However, the climate, type of agriculture,

Terai girls resemble their Indian neighbors in appearance and dress just as Terai resembles India in climate, agriculture and customs.

customs and people themselves here more closely resemble India's than the rest of the population of Nepal. Indian currency is preferred and frequently demanded. There is, however, some indication that the Nepalese Government is now interested in introducing a single currency system in Nepal. There is considerable movement of people back and forth across the border. Although the area is somewhat better developed and more accessible than the rest of Nepal, its people are not as healthy as those living in the mountains. This is primarily because of a more dense population and because of the prevalence of malaria and other diseases.

The excellent Terai forests are being rapidly and dangerously depleted to provide timber for export to India. There are some

trained Nepalese Government foresters, who are attempting to introduce sound forestry-management practices.

Members of a mountain family standing outside temporary winter quarters in mid-Terai; in summer they will return to higher altitudes to escape malaria.

Mid-Terai - The mid-Terai is a transition area characterized by swamps, jungles and hills. The soils are not as good as the Terai. Malaria, a serious problem throughout this territory, has all but prohibited development and has extremely limited settlement. Many mountain people come to this area during the winter months, when the danger of malaria is lessened, partly to escape the cold winter weather at the high altitudes.

Small isolated valleys like this can be reached only by steep mountain trails.

In this mid-Terai some very good forests still remain although they are rapidly being depleted to provide fuel and salable timber. In the jungle, tigers, leopards, rhinoceros, wild elephants, wild boars, crocodiles and many other wild animals abound.

Mountain Region - This region covers perhaps 75 percent of Nepal including the so-called Lesser Himalayas and Inner Himalayas. The area has steep slopes and poor soils. Some

A Nepalese rests beside his basket of split bamboo. Mountain people move all their goods on their backs, much of it packed in baskets like this.

crops are grown up to as high as 13,000 feet. Although crop yields are low, the area supports a large population. Because of the high altitude the climate is good and the people are somewhat more healthy than those living in other regions. Narrow bench-type terraces cover the mountainsides. Overcutting has left timber stands of commercial value in only a few isolated, almost inaccessible areas. This is a serious problem for the people of Nepal because the pressure of population makes reforestation extremely difficult and even firewood is becoming expensive.

Katmandu, capital and the country's most modern city, is surrounded by mountains. It was founded in 723 A. D.

Katmandu Valley - The Katmandu valley, although the largest in Nepal, is comparatively small, covering about 230 square miles. It was at one time a lake and its soils are fertile. It has a population of approximately 500,000. The valley lies at an elevation of about 4,400 feet. Katmandu is the only modern city in the western sense in the valley, and for that matter within the country. Nearby Patan and Bhadgaon possess countless interesting old Hindu and Buddhist temples. Katmandu is the center of government, the home of the royal family, and the Rana family. The entire valley is interesting and picturesque.

Because of its scenery, its climate, its native architecture and its people, it would undoubtedly be a great tourist center, were it more accessible to the outside world.

People

The population of Nepal is not definitely known although it is estimated that there are between 7 and 9 million . A census of questionable accuracy taken in 1941 showed 6, 282, 000. Approximately two-thirds of the people live in the hill and mountainous areas, the remaining one-third in the Terai.

People are religious, friendly and cooperative. Their existence is a constant struggle with nature to obtain the barest necessities of food, clothing and shelter.

The Nepalese are very religious. It is believed that about one-half are Hindus, and the other half are Buddhists. Both types of shrines and temples are found. Lord Buddha was born in Nepal.

There are many different tribes, each of which has its own customs and beliefs. Two of the more important tribes are the Gurkhas and the Newars. The Newars originally inhabited Katmandu and still remain an important group. The Gurkhas, from the western hills, conquered Katmandu about 150 years ago and founded the Rana dynasty of hereditary prime ministers, thus furnishing the leadership for bringing together the widely dispersed tribes under one government.

The Gurkha soldier has since become famous as a fighting man. He is especially well known for his exploits in World War II. Gurkha soldiers have been Nepal's most important single contact with the outside world. Money earned by Gurkha soldiers for their services outside the country, largely with the British, has made it possible for Nepal to add considerably to its foreign exchange.

More than 90 percent of the people are engaged in agriculture. Cultivators are for the most part poor, illiterate and hard working. Most cultivators live the same today as their forefathers did hundreds of years ago. Even the wheel is not used in many sections and tools are of a crude sort. Tradition, the caste system, and superstition have and will cause a natural resistance to change. The existence of the Nepalese cultivator depends upon constant struggle for food while fighting against disease. His clothes are of poor quality cotton or wool, wrapped or tied around his body and worn usually day and night as he seldom has enough clothing for a change. In the winter he keeps warm by sitting and sleeping around a wood fire. The Nepali home is usually a small two-story hut, divided into two or three rooms with grass-thatched roof. It seems always filled with smoke because even simple stoves and chimneys are not used. Livestock are often kept in the dwelling. Grains and other foods are also stored in the huts. There is little if any furniture. Meals consist of a gruel made from rice, corn, millet and other available grains mixed with vegetable leaves. They have very little protein in their diet. Meat is seldom eaten. There is only a limited amount of beans, fruits and vegetables.

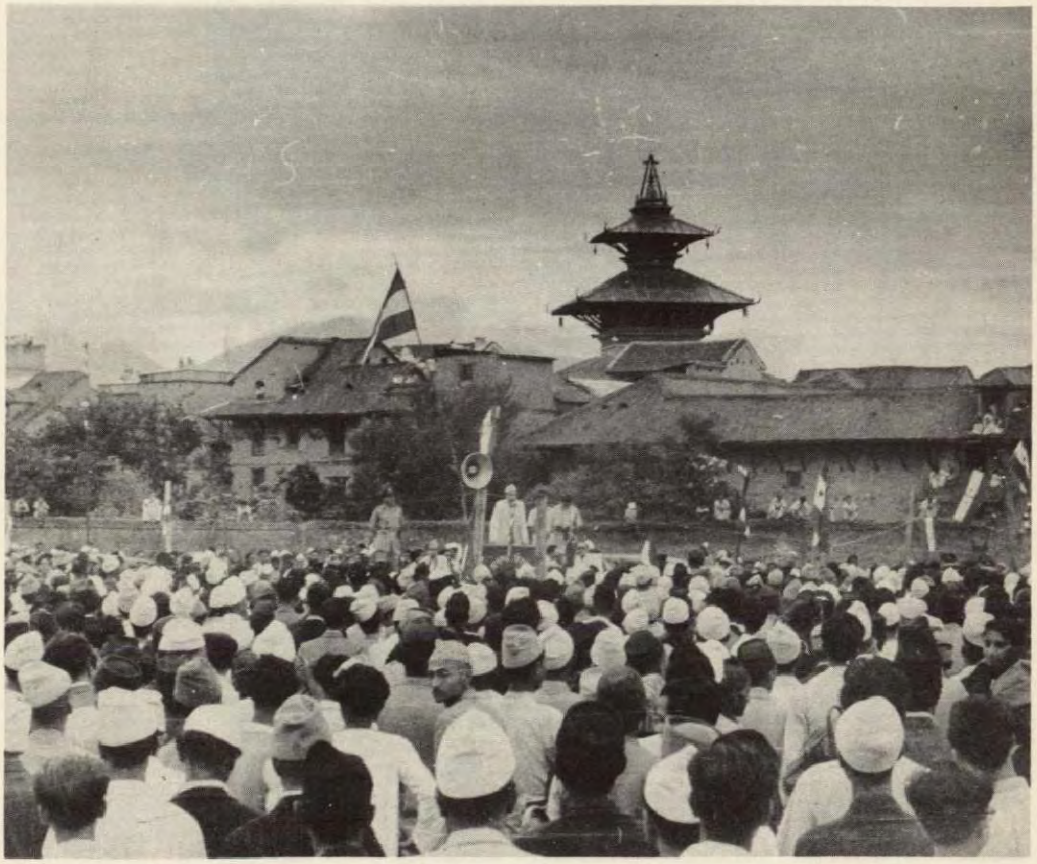
Government

Nepal has had an independent government throughout its history. Up until the last few years it was a complete autocracy. Although Nepal has a hereditary king, it was actually ruled by a senior member of the Rana family. This ruler, who had almost absolute power, was called a Maharaja. He collected and dispensed the funds as he saw fit. Much of the tax was used for the expenses of his own family. Little if any travel was permitted in or out of Nepal. It is believed that up until 1947 perhaps no more than fifty foreigners had entered the country. There was little opportunity for the Nepalese to have contact with the outside world. Even the king had little if any freedom. The king was without power, except perhaps that which respect for his position gave him. During and after World War II the outlook of many people within the country began to change. Gurkha soldiers traveled throughout Asia and the Middle East and to some extent in Europe. They returned to their country with a new point of view. After the War many Nepalese officials visited European countries and some came to the United States.

After India obtained its independence in 1947, pressures within Nepal began to build up. More contacts with the outside world and more freedom within the country were demanded by the people. Organized resistance to the Maharaja, some of it led by members of his own family, forced several quick changes in that position between 1947 and 1950. In November 1950 the Maharaja relinquished control of the government and a Cabinet was formed, composed of certain influential members of the Rana family and leaders of the Nepali Congress Party. This coalition Cabinet resigned in November 1951, a new Cabinet was appointed by the king. Mr. M. P. Koirala was named Prime Minister.

In the summer of 1952, division, largely among leaders of the Nepali Congress Party, made the Cabinet ineffective and it fell on August 10, 1952, with the resignation of the Prime Minister, Mr. M. P. Koirala. The King then took over the leadership of the government and was faced with the staggering task of holding his country together while maintaining the recently acquired gains toward a democracy. This was the first time

in his 41 years as king that he had been faced with responsibility for governmental leadership. The king immediately appointed an Advisory Council composed of five men to assist him with active administration. This group served like a cabinet, with each one assuming responsibility for several departments. The Council for various reasons proved ineffective, and much criticism was levelled against it. On June 15, 1953, the king again appointed Mr. M. P. Koirala as prime minister. Mr. Koirala's present Cabinet consists of five men, three from his own National Democratic Party and one Independent. This most recent group is presumably a temporary arrangement, which is to serve only until general elections can be held.



Open public meetings are held to discuss important issues.

A general election is being widely discussed, and, although definite steps are being taken toward this goal, no date has yet been set. Before such an election can be held, however, the necessary machinery must be set up, election boards and other officials trained and the people informed. Tasks like these are not easy, with only about 2 percent of the people literate and with only a few newspapers, radios, and other means of spreading information. Even so, the Government of Nepal, with advice from India's Election Commission, has already begun to set up election machinery, and the country is anticipating an early election.

The Government has three levels of administration, viz., national, district and village. There are 32 districts, each headed by an appointed Governor. Their primary responsibility is to collect taxes, provide some police

Three members of the Planning and Development Department, through which all technical assistance plans are coordinated.

protection and act as general representatives of the central government. Most villages have a zamindar as Head. His first responsibility is to collect taxes from the cultivators.

Education

Perhaps no more than two percent of the people in Nepal are literate. There are only a few schools, all of which are poorly equipped. Only a small handful of parents have sufficient means with which to send their children to school.

There are, however, many individuals, a large number of them in government positions, who have had a good education. A few have had an opportunity to attend schools in India. Most educated Nepalese, especially those who have travelled outside the country, speak and write good English.

Health and Sanitation

Poverty, isolation and lack of education have restricted medical care of any kind. According to the FOA public health officer, there are only ten accredited and licensed Nepalese doctors and perhaps 50 medical practitioners in Nepal. They are all in Katmandu valley. There are only ten trained nurses. Medical care of any kind outside of the capital valley is limited. Inside Katmandu valley there are ten inadequately equipped hospitals with a total of 355 beds. Along the border next to India there are 24 small hospitals with a total of 305 beds. Indian practitioners work under government contract in these institutions and are also allowed private practice. There are a few scattered dispensaries with inadequate supplies of drugs. It is estimated that 99 percent of the population do not have proper medical care. No accurate statistics are available on public health.

Malaria, however, is considered to be the number one destroyer of human life. This disease is also one of the major reasons for lack of development. Many potentially highly productive areas remain isolated because human beings cannot exist there until malaria is brought under control. Other wide-spread diseases include Kala-azar, tuberculosis, syphilis, gonorrhea and trachoma.

Most field work is done by hand. Here a farmer uses a kudali, a tool for hoeing and spading.

AGRICULTURE

Land Use

There is little reliable information on land use in Nepal. The following figures have been reported:

	Square Miles
Total area	56,000
Cultivated land	7,500 - 12,000
Productive forest area	14,000
Waste and reclaimable	6,000

It has been reported that two-thirds of the cultivated land is in the Terai. The remaining one-third is in narrow bench-type terraces on mountain slopes and on valley floors.

It is estimated that only 20 percent of the harvested land produces more than one crop annually. This is because of lack of irrigation facilities and partly because winter crops have not been part of the Nepalese tradition.

Crop Distribution

Of the harvested land, it has been estimated that 55 percent is in rice, 20 percent in corn and millet, 10 percent in wheat, 6 percent in potatoes, 5 percent in oilseeds, 3 percent in tobacco and 1 percent in jute. In addition, sugarcane, buckwheat and vegetables are grown.

Land Ownership

Strictly speaking, Nepalese land is owned by the State. The land has been distributed in two ways. About one-fourth of the land has been turned over to officials and others as rewards for some special service or because of their position in society. They are expected to pay a small fee to the government, which might be considered a land tax. These lands have been referred to as Birtha lands and have been the subject of much criticism in recent years because of the feeling on the part of many that the privileged few obtain additional wealth with no special effort. Birtha lands are not worked by the owners but are rented out to tenants who are required to pay a high rent.

About three-fourths of the land has been assigned to small cultivators for a stipulated amount as down payment with an additional sum to be paid annually. Land handled in this manner is known as Rayeton land.

Probably one-fourth of the small land holdings that was originally assigned to peasant cultivators has been taken over by larger landowners. This situation is probably caused by the taxing system. Taxes are charged at one rate regardless of the size of the area owned. The small cultivator often has nothing left for taxes after providing only a bare subsistence for his family.

It is believed now that about one-half of the land is rented and the other half is operated by the owners. Most of the larger holdings are in the Terai, where there is opportunity for producing more than just enough for the family subsistence. Many

Nepalese leaders are eager to improve the land tenure situation.

General Agriculture

With minor exceptions there have been few recent improvements in the general agriculture of Nepal. A few larger farmers in the Terai have added some modern equipment but anything approaching modern practices are yet to be adopted. Field work is done with crude hand tools. Only in parts of the Terai and in a few places in the hills are the bullocks and water buffaloes used as

Threshing and cleaning grain is a family operation done by hand.

beasts of burden. The land is intensively cultivated, particularly where bench-type terraces literally cover the slopes of the hills to the tops. Animal manures and some crop residues are composted and used as fertilizer. Commercial fertilizers are not used.

Good timber management is needed. Forests, once a valuable resource, are being rapidly depleted. Excessive cutting on steep mountain slopes is aggravating the serious erosion already under way.

Forestry

Only about 25 percent of the land area of Nepal is under forest. Much of this forest is unproductive except for fuelwood. Parts of the productive forest are currently inaccessible to economic operation.

The only commercial exploitation of timber is in the Terai, the lowest one-fifth of the country, bordering on India. Here occur sal (Shorea robusta), sissoo (Dalbergia sissoo), haldu (Adina cordifolia), and other species common to the northern sal forests of India, as well as bamboos and rattans. Lumber from these species, especially sal and sissoo, is turned out by the few small sawmills in the region. Sal is also exported to India in the form of railway sleepers, along with sal lumber.

Elsewhere in Nepal, cutting of trees is done with an ax, and the native-made products, lumber and posts, are shaped with chisel and mallet. These products are used locally for construction purposes.

Wood is the principal fuel, although some charcoal is made in earth kilns in the Katmandu valley and mountain region. Demand for fuelwood is enormous; the satisfying of it is responsible for denuding much of the forest stands in those areas.

Nepal's Department of Forestry is cooperating with FAO in developing a forestry program and the necessary legislation to implement it.

Rice paddy field near Pokhara. Only approximately one-fifth of Nepal's crop land is irrigated.

Rice

Rice is the most important crop. It is grown from the southern border up to about 5,000 feet elevation. Cultivators go to extremes to produce this crop. It is frequently grown at too high altitudes. Poor unirrigated soils are planted to rice where perhaps more food could be produced with some other crop such as corn or potatoes. Certainly irrigation is necessary if a reasonably high yield is to be expected. Even the monsoon does not supply sufficient moisture for the entire rice-growing season. If a good yield is to be assured, farmers must add supplemental water. There are always periods during the growing season when there is too long a time between rains.

There are three main rice varieties planted: the Marsi, Masino and Thapachini.

Corn

Corn has perhaps the widest distribution of any important crop. It is grown from the Terai up to the crop production border at 13,000 feet, but is most important throughout the hilly section. In spite of its importance, however, it is perhaps the most neglected crop grown. Little has been done to try to improve it. Consequently, yields are very low. Nepalese agronomists feel that much could be done to improve yields by improving cultural practices and by introducing new varieties.

Millet

Millet is the second most important crop in the hills. It is grown primarily because it does well under drought conditions. It is frequently grown in combination with corn.

Wheat

Wheat is an important winter crop but its acreage is largely concentrated in Katmandu valley and surrounding area. Yields are low and the cultivators make few attempts to increase them. Seed beds are poorly prepared, very little manure is used and only a small amount of irrigation is available. Barberry is a common shrub; thus blackstem rust is quite prevalent. Smut is doing much damage to wheat also.

There is evidence that much can be done to improve wheat production in Nepal. During the last crop season some 180 varieties were placed on field trial in connection with the programs of FOA and FAO (Foof and Agriculture Organization, United Nations), but more field trials will be necessary before the best varieties can be determined. If one or more varieties could be found that would be resistant to rust, production could be substantially increased. Under the cultural practices applied in the field trial, all varieties, including the local ones, looked superior to those grown by cultivators under ordinary field conditions. Evidently improvement in cultural practices and seed treatment also would do much to increase yields.

Nepalese agriculturists are interested in improving wheat, not only because they value the crop for itself, but also because they feel it could do much to stimulate winter cropping. It is now believed that no more than 20 percent of the cropland has

Wheat can be improved, as early field trials show.

more than one crop per year. This to many observers has been hard to understand, especially when the ground up to approximately 4,500 feet does not freeze. Shortage of water perhaps is the main reason although some irrigated areas have no winter crop. Another reason given for the small amount of winter cropping is the practice of grazing summer crop residues.

Barley

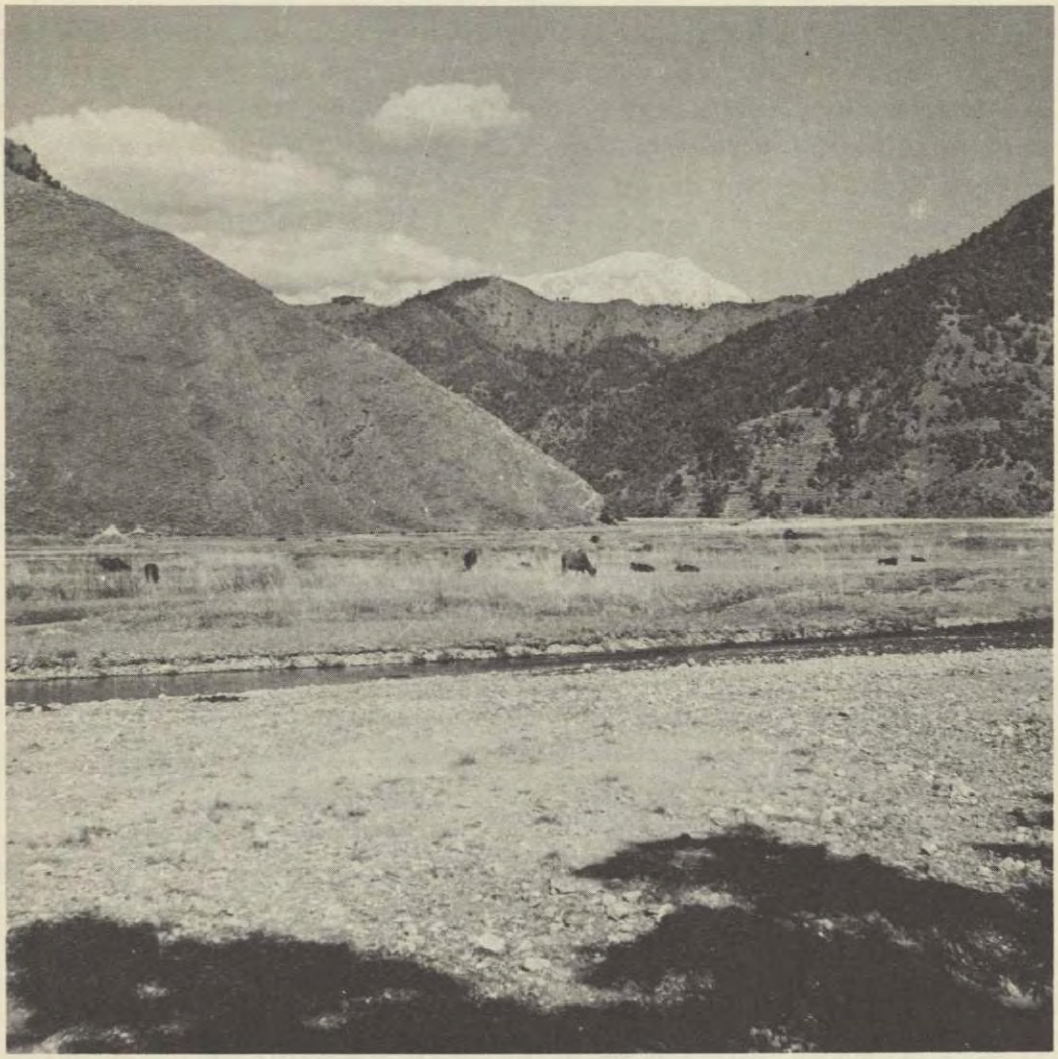
Barley is grown at high altitudes and on the poorest and more drouthy soils. It has been found up to 11,500 feet. It is not as important as it could be, since the people have not learned to prepare it well as a human food.

Potatoes

Potatoes are very important in the hills. If diseases could be controlled it is believed that more food could be produced by growing potatoes, than by growing any other one crop. At the present time the tubers are quite small. Although yields are reduced at high altitudes, even there potatoes are considered more productive than other crops. Many seed potatoes are exported to the plains of India each year. Indian agriculturists are eager that this enterprise be improved and expanded.

Mustard

Many years ago mustard was considered an important oil crop but its acreage was greatly reduced and almost abandoned shortly before the Second World War. This was primarily due to cheaper oils being brought in from India. This Indian source was cut off during the War. Since then cultivators have not been producing it in quantities comparable to former years. Not only are yields low, but methods of oil extraction are crude and inefficient. As oil is critically needed, consideration is being given not only to improving processing techniques and introducing better varieties but also to trying other oil crops such as rape.



Too many cattle and not enough grass presents a problem in reforestation and control of erosion. Even valley floors produce comparatively little pasture unless irrigated.

Forage Crops

There is seemingly no evidence of any effort to improve pasture and hay crops. During the rainy season cattle graze along trails, around buildings and in some public pastures. During the rest of the year livestock seem to exist on crop residues, weeds and grasses that grow in the fields after harvest. There are too many cattle and most of them appear thin and diseased. Even at very high altitudes, according to some authorities, there is little if any grass for pasture purposes. Grasses and legumes do have good possibilities however; judged by observations

in FOA and FAO trials during the winter of 1952-53. Forage crops can be grown, yet it will require recognition on the part of the people that livestock and livestock feed can be used in increasing the human food supply.

Vegetables

Vegetables are an important source of food, especially in Katmandu valley but acreage in these crops in the country is small. The Nepal Department of Agriculture is much interested in increasing this acreage. During the last year, many new varieties of such vegetables as peas, cabbage, carrots, tomatoes, radishes and beans were tried out with much success. Production of vegetable seeds for export to India should be an important source of cash.

Other Minor Crops

Such crops as jute, cotton, sugarcane and buckwheat are found in various sections of Nepal's countryside. Jute is an important crop in the District of Morang. It furnishes the raw material for the country's most modern factory, the jute mill at Biratnagar.

Fruits

There has been much discussion on the possibility of fruit production in Nepal. Some believe that its wide range in climate and unlimited variety of topography make it almost ideal for excellent orchards. What is more, India's huge population to the south could provide a market for all that would be produced. Any skeptics are referred to Kashmir's fruit as an example of what could be done under similar conditions. Mangoes, bananas, peaches, oranges, apples, plums, guavas and cherries are among the fruits found. At the present time, there are only a few well maintained orchards which are owned by members of the Rana and the royal family as well as officers in the Government.

Livestock and Poultry

The numbers of livestock in Nepal come close to equalling' the human population. There is reported to be 7 million head

in all, of which 30 percent are cows, 26 percent are oxen, 17 percent buffaloes, 25 percent sheep and goats and 2 percent hogs. In addition, there are 14,000,000 chickens and ducks. Almost all livestock is diseased and poorly fed. They produce a limited amount of milk, mutton, hides, eggs, and wool; but in general they are unproductive. This very unproductivity is a large factor in the low standard of living, for the feed the animals consume represents large losses.

The cow is sacred and is generally not considered as a source of food. Bullocks, in some areas, are used for draft purposes. Hogs and water buffalo are butchered for their meat; but although eating of this meat is not forbidden, it is considered suitable only for people of low castes. Manure from these animals is often used for fuel.

Much can be done to improve the productivity of livestock and poultry--reducing the numbers of livestock, improving the feeding and breeding practices, and controlling the diseases.

Some Major Problems Affecting Technical Cooperation

The number one obstacle apparent to all concerned, is the great shortage in trained personnel for the planning and execution of any cooperative program. This, coupled with the fact that only two percent of the population are literate, makes it essential that all activities remain simple, readily understandable and basic. A few individuals have had opportunity for good education outside Nepal. Some few others have by their own initiative and with the background obtained by attending their own schools, educated themselves in Nepal proper. These are all too few in number. There are not enough qualified men to staff the various departments of the government and to provide technicians and management personnel for shops and industries in a country that is eager to get ahead in the world. There is room for a program of education directed toward the women of Nepal.

There is little capital available for development of any kind. The national income is low and the sources of tax revenue are very limited. There is no income tax. The demands on the government for additional services are continuously increasing and government employees are requiring larger salaries. In addition, the value of their rupee has been declining in relation to other currencies.

Whenever proposals for development are submitted, they are carefully scrutinized because any new activity that is undertaken must be of basic necessity to their economy. First things must come first.

Since the end of the Rana regime, the government of Nepal has been unstable. There has been considerable change in the top leadership, as one Cabinet has followed another, in rapid succession. Many in high positions have not had previous governmental administrative responsibilities and there has been an apparent lack of cooperation between ministries and departments. With few exceptions, all factions have been in favor of mutual assistance programs. Fortunately, at the departmental level there has been little change in personnel, so that it has been possible to follow a consistent development policy.

Lack of transportation and communications will delay development. The cost of construction of railroads and highways in the rough mountain terrain has been prohibitive. Even in the almost level Terai, the necessity for large bridges across the mountain streams flowing south has retarded road construction

Roads and bridges are needed before wheels can be used to relieve men and women from the task of carrying goods on their backs.

to date. With India's help a road into Katmandu valley is being constructed from near Bhimphedi. Additional highways such as the one to Pokhara are being planned. Actual construction for these highways is undoubtedly a long way off. However, it is recognized that the problem of moving and transporting goods over the country requires a disproportionate share of the nation's manpower.

There is little if any data available for planning purposes. There are no agricultural experiment stations and only a very few trials have been carried out with agricultural crops. There have been a few reliable public health surveys and for that matter only a rather simple population census has been taken.

Technical Assistance Programs

Nepal's recent history produced an atmosphere suitable to the recognition of a need for technical collaboration with other countries. The release from years of almost complete isolation coincided with the birth of technical assistance programs. Nepalese were eager to be in contact with the outside world. They were also eager to learn everything possible that would aid in Nepal's development. It is an interesting reflection to note that the general agreement for technical collaboration signed by the Government of Nepal and the Government of the United States on January 23, 1951, preceded by almost a month the date that Nepal became a democracy - February 18, 1951. Nepal has welcomed other technical assistance programs and has cooperative agreements with the Food and Agriculture Organization of the United Nations and participates in the Colombo Plan. Nepal was admitted to World Health Organization in May 1953.

The Government of Switzerland has felt a close kinship to Nepal because of the similarity in the topography of their two countries. Switzerland was the first to send a technical mission to Nepal. A Swiss forward team made up of a geologist, an agriculturist, an electrical engineer and an architect were guests of the Nepalese Government during the winter of 1950-51. This group made a survey and presented their recommendations to the government.

FAO had a field party for approximately a year beginning the first of April 1952. This group consisted of specialists in agronomy, irrigation, farm management, forestry and dairy processing. Much of the work of the specialists consisted of surveys. They supplemented the work of the Point IV staff. There was always a close friendly working relationship between the two organizations. It is unfortunate that the recent program of Food and Agriculture Organization had to be discontinued. An adult literacy program, worked out under the direction of Frank C. Lauback, World Literacy, Inc., is getting started. The Ford Foundation is now considering furnishing assistance with village improvement programs.

Point Four Program

The Point Four program began to take shape during the first half of 1952, when the staff began to arrive in Nepal.

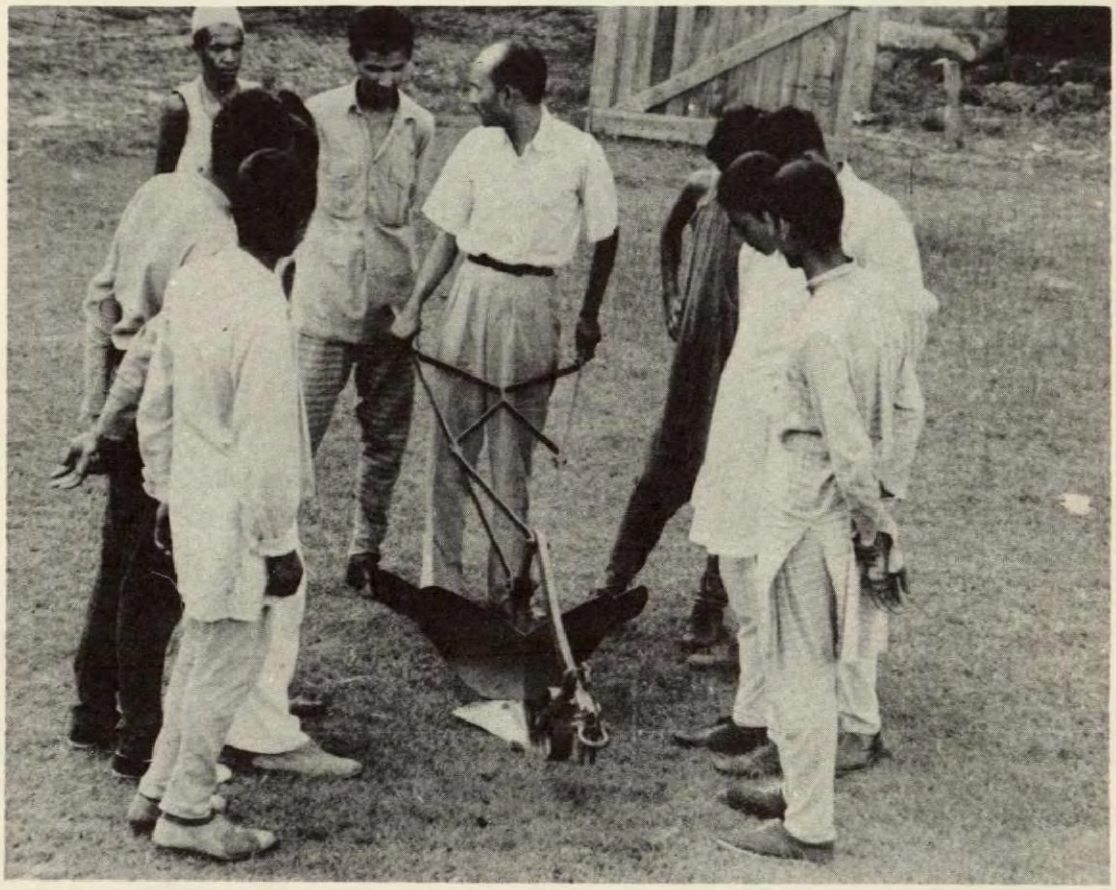
Most children need better food, more clothing and more medical care.

The program for technical cooperation with the Government of Nepal has been prepared by the American staff in cooperation with local officials. There was no plan available when the TCA (now FOA) group arrived, and the first step was to outline the work to be done. In the very beginning, the Chief Agriculturist, who has been Acting Country Director, met with the Prime Minister and various Department Heads and discussed the country's problems. As additional staff members arrived, they participated in the joint discussions, many of which were held in the evening in the Chief Agriculturist's home.

The children of Nepal urgently need more schools. At present the literacy rate is estimated at 2 percent.

The planned program was designed to meet some of the country's most pressing needs. This included a training program for additional personnel. Also included was a

national public health program to help reduce suffering from disease. Next came programs that would have a direct bearing on increasing the food supply so that the growing population could have a little more to eat. This included introducing new and improved varieties of crops, a program to improve livestock, control insects and plant diseases, improvements in hand tools and machinery and improvements to land, largely through irrigation.

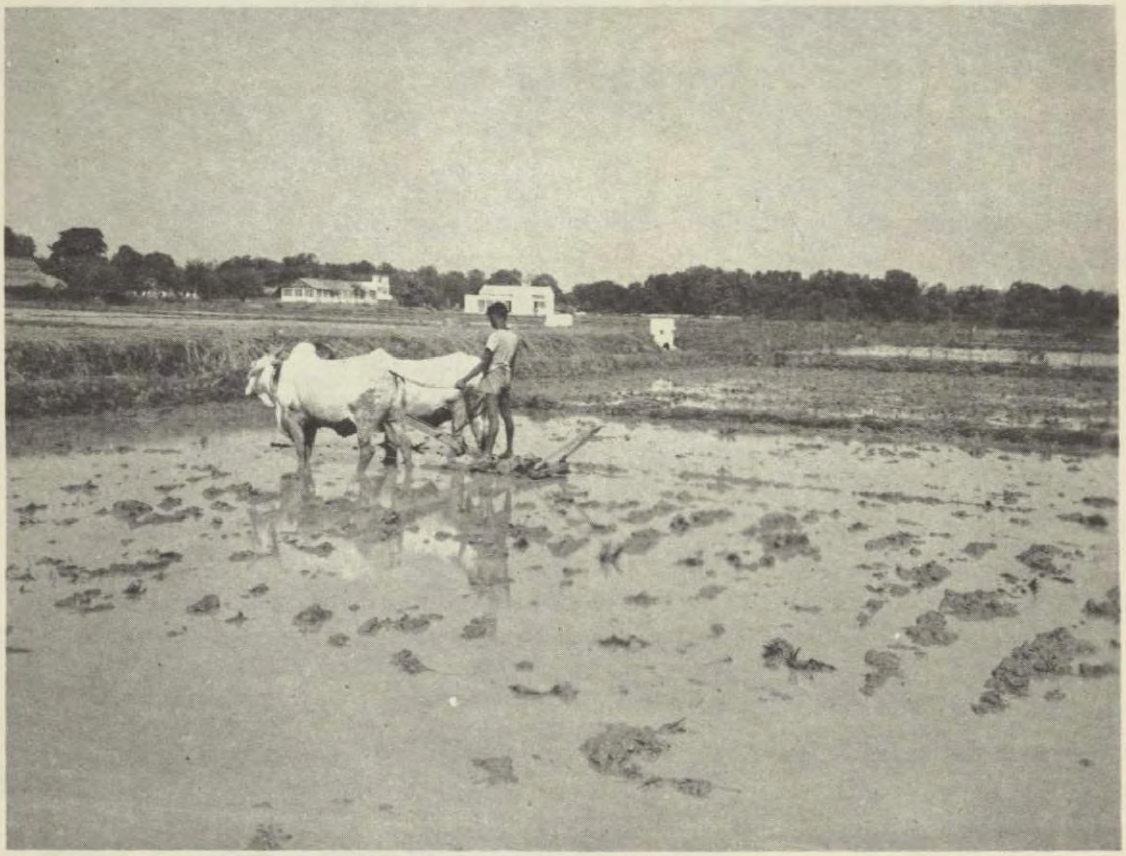


Village improvement workers receive practical training in the use of simple machinery.

Village Development

It was decided in the beginning that if the programs were to be successful, some method must be worked out so that the benefits of the program could reach the many villages throughout the country. If this were not done, little would be accomplished outside the capital valley. There were , however, no nation-wide programs in existence. There were few trained administrators or technicians to carry on such programs, which meant that if anything was to be accomplished, village workers and village work supervisors must be trained.

The Village Development program was meeting with success in India under somewhat different circumstances. It was felt that a local adaptation of the same basic idea could be used. Its acceptance was not easy. There were no funds budgeted and the idea was new to all concerned.



Rice is an important crop. Production has been greatly increased where farmers have followed approved practices. Puddling to prepare paddy seed bed.

Training Center

The first training center for village improvement workers was started at Katmandu, on July 27, 1952. Fifty trainees were enrolled for the first intensive course which lasted four months. The trainees were selected by the Nepalese Director of Agriculture and his staff from young men who applied after radio and newspaper advertisements and requests to the District Governors for candidates. The educational background of the trainees selected was limited, by outside comparisons, but under the circumstances it was considered a rather high caliber group. The reviewing committee gave preference to experienced men and to those who had had an opportunity to observe agriculture in other countries, and required each trainee to --

> Be able to read, write and do simple arithmetic.
>
> Have recognized qualities of leadership.
>
> Be a "son of the soil," with knowledge of rural living and a desire to work among rural people.
>
> Be selfless and, as the Nepalese put it, philanthropic in outlook.

The training school was set up in separate quarters in the main office building compound in Katmandu. Three young Nepalese agriculturists with training in India were assigned to take charge of the school, which included not only part of the teaching but administration and supervision of the trainees. The government pays for room and board for the trainees during the training period.

The school curriculum was jointly prepared by Nepalese technical staff and Point IV specialists. Emphasis was placed on practical application, and classroom work was held to a minimum. About one-third of the time was devoted to the

How to use small tools is part of the village improvement worker's training - assembling a small harrow.

study of agronomy and soils. The remainder was devoted to the study of extension methods, horticulture, livestock improvement, agricultural engineering, plant diseases and insect control, and public health. The training sessions started before seven in the morning. The trainees were divided into groups and sent to the villages for their practical training.

It was necessary to give the training school a considerable amount of supervision. All Point IV staff members have in varying degrees participated. This is because there are not enough trained Nepalese technicians to provide the necessary teaching and administrative staffs.

The first class graduated December 3, 1952; another group entered immediately after. The training period was extended to six months, the second group graduating in June 1953. In addition, a training class for village improvement specialists was established in April. This group of specialists is receiving specific training in various fields such as livestock improvement, entomology, better use of irrigation water and extension methods in order to provide the village improvement workers with much needed technical assistance.

Nepalese Director of Department of Agriculture who is determining depth of top soil.

As the trainees graduate they are placed in villages around a main central location called a village improvement center. To date there are five village improvement centers, located at Biratnagar, Pokhara, Hitaura, Butwal and Katmandu. As the program expands, it is planned to add more centers.

These workers are helping the villagers improve their farming techniques, safeguard their health and learn to read and write. They form the beginning of a nation-wide improvement program and a channel through which new and improved techniques can be carried to the villagers.

In experimental plots some 500 varieties of plants are on trial in a search for plants that yield well and resist disease.

Plant Introduction

Plant introduction was one of the first projects undertaken in the valley of Katmandu. More than 500 varieties of grains, grasses, legumes and vegetables have already been on trial from 33 different countries. The objective is to find new higher producing, disease resistant varieties that are adaptable. This is a comparatively inexpensive program. It has stimulated much interest among the Nepalese. The plots and varietal trials are also used in connection with the training of the village improvement workers. If, for example, a better variety of wheat or or rice could be found, it would have possibilities of increasing yields considerably. This program will be expanded this next year. In addition to this work in the Katmandu valley at an elevation of approximately 4,400 feet, it is anticipated that trials will be started at Parwanipur in the Terai, at less than 1,000 feet elevation, and at one of the mountain sites, Kakani or Nagakot, at about 7,000 feet.

Irrigation

There are greater possibilities for increasing food production through irrigation than perhaps through any other practice. It has been estimated that not more than 20 percent of the land has been irrigated. It is believed that up to 50 percent could be watered by using flow irrigation alone. Other areas could be served with tube wells since the water table through much of the Terai is close to the surface. In the Morang District, where engineers are making surveys in connection with the Kosi Dam project, they have found that the water table ranges from about 4 to 19 feet from the surface with an average of 10 feet.

The Government of Nepal considers that improvements in irrigation are of primary importance and has requested assistance in this field. Three agreements have now been signed; when carried to completion, they will represent a real contribution to the country's economy. These include:

> Two gravity or flow irrigation projects on the Tilawe and Sirsia Rivers near Birgunj. These will require about two years to complete and will irrigate an estimated 22,000 acres.

Ten tube wells in the vicinity of Simra that when installed will irrigate approximately 4,000 acres.

Irrigation surveys and plans for four proposed new projects, covering a combined area of approximately 104,000 acres in the areas of Sarda, Chepe, Rampur Tar and Chitwah. This includes all of the necessary work required to prepare designs, lists of materials and equipment required.

In the fiscal year 1954 program, plans have been made for securing up to 120 portable diesel pumping sets for irrigation purposes. These will be placed in different sections of Nepal where water can be lifted from rivers and streams to irrigate adjoining areas. Also the 1954 program calls for ten additional tube wells.

General Agriculture Programs

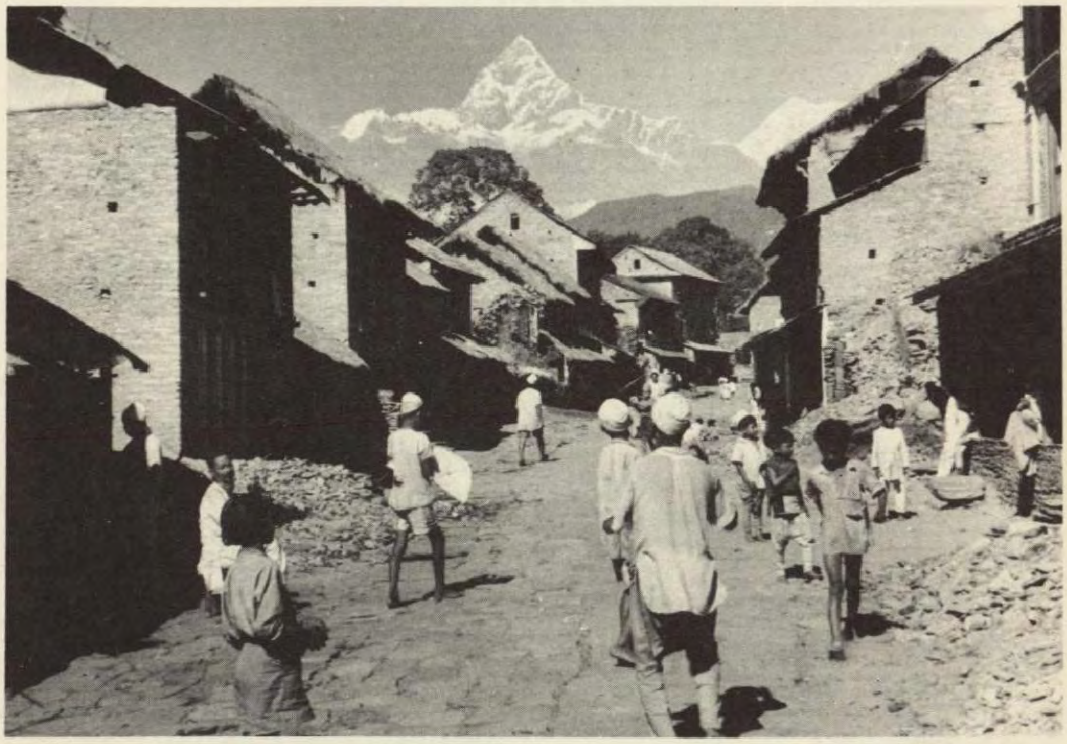
Plans have been made to develop an agricultural research center in the Terai near Parwanipur. Several years ago the government selected and purchased land for this purpose. The government has not had the necessary resources to carry on such a program up to this time. In the meantime the land has been rented to cultivators.

The improvement of small farm tools and equipment is necessary in Nepal. The very crudest implements are used with little change having been made through the centuries. Last year a few pieces of simple machinery were introduced on a trial basis and assistance was given on better methods of tempering steel, sharpening hoes and sickles. Work of this type is fundamental and has proven effective. Next year additional pieces of small machinery will be brought in for trial purposes. A loan service will be established to help reach more people. A training course for artisans will be undertaken to better qualify Nepalese workers to improve their own craftsmanship.

An approach to the livestock and poultry problems is being made in several ways, including demonstrations in better feeding,

better breeding, introduction of improved strains, widespread castration of scrub animals and improved methods of processing.

Plant disease and insect control programs have been initiated largely through village improvement centers. Equipment and supplies have been made available for demonstration purposes. Through centers set up for distribution, additional supplies and equipment will be made available. Some local specialists are being trained in the work so that they can be attached to the development centers to encourage control activities.



To villages like this the village improvement worker is assigned when his training is completed. There he works with the people to improve agriculture and health and to increase literacy.

Malaria

Malaria is said to cause more deaths than any other single disease in Nepal. In addition, numbers of persons are affected in varying degrees. It leaves many debilitating effects on those who survive and greatly impairs their health and vigor. There are also many areas of good land, much of it in the mid-Terai, that cannot be developed as long as malaria is prevalent. Control of this disease has been given top priority in the field of public health. With FOA assistance provided by a United States trained public health physician and sanitarian, local malaria technicians are being trained for field work. Areas of concentration have been selected. The FOA team will cooperate with the World Health Organization malaria group which is being sent to Nepal.

A public health officer examines a family for malaria. Malaria is Nepal's most serious disease.

Exploration of Mineral Resources

Of major interest to Nepal would be the possibility of discovering minerals of importance to the outside world. Such minerals could perhaps be exported to help pay for the country's development.

A mining engineer was the first TCA (now FOA) technician to arrive in Nepal. He has cooperated with the United Nations geologist who is making the first geological survey of Nepal. Surveys have been started to help determine the location and character of mineral deposits. When these have been determined, the United States mining engineer will advisè on methods of possible development.

Methods of Administering the Program

A pattern for administering each of the FOA programs in Nepal has been set by the three irrigation agreements signed in June 1953. These established three joint funds. The FOA Country Director and one officer named by the Government of Nepal are co-administrators. The obligations of each government are specified. The Nepalese Government is to deposit its contribution to the joint fund in the Nepalese Bank. Individual agreements will be prepared for other programs in a similar manner.

NORMAL TEMPERATURES, DAILY AVERAGE, MINIMUM AND MAXIMUM, AT KATMANDU, NEPAL AND NEARBY STATIONS. IN INDIA.

	Bahraich		Katmandu		Darbhanga		Darjeeling	
Elev.	407'		4,388'		161'		7,432'	
	(Degrees Fahrenheit)							
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
Jan.	47.1	72.6	36.2	64.2	49.8	74.3	35.4	47.0
Feb.	50.9	77.0	39.9	68.2	52.9	77.9	36.6	47.8
Mar.	58.8	88.7	45.4	77.4	60.5	88.9	43.0	55.4
Apr.	69.3	98.9	52.5	83.9	69.8	97.0	48.8	61.2
May	77.2	102.3	60.4	85.3	75.5	96.2	52.4	62.9
June	80.0	98.7	66.7	84.8	78.5	92.9	56.5	64.9
July	79.1	91.9	68.7	83.7	79.4	89.7	58.0	65.7
Aug.	78.4	90.1	68.3	83.4	79.1	89.1	57.7	65.6
Sept.	n a	91.2	65.7	82.6	78.5	89.2	56.0	64.6
Oct.	68.4	90.1	56.4	80.1	71.6	88.2	50.2	61.7
Nov.	n a	83.0	45.7	72.8	59.5	82.9	43.1	55.6
Dec.	48.2	75.0	37.7	65.9	51.8	76.4	36.6	50.5

Bahraich, United Provinces, India; Darbhanga, Bihar, India; Darjeeling, West Bengal, India.

Source: Government of India Meteorological Observatories, Monthly Weather Review.

NORMAL RAINFALL AT KATMANDU, NEPAL AND

NEARBY STATIONS IN INDIA.

	Bahraich	Katmandu	Darbhanga	Darjeeling
		(Inches)		
January	0.82	0.36	0.44	0.53
February	.91	1.67	.53	1.19
March	.39	.59	.51	1.88
April	.32	1.01	.68	4.14
May	1.21	5.10	2.51	9.63
June	6.20	9.68	7.58	24.18
July	12.24	14.69	12.12	32.92
August	12.79	13.68	13.51	26.56
September	8.59	7.16	9.24	18.90
October	1.58	1.44	2.30	5.41
November	.28	.06	.27	.81
December	.34	.33	.12	.27
	45.67	55.79	49.81	126.42

Source: Government of India Meterological Observatories, Monthly Weather Review.

SEEDING, TRANSPLANTING AND HARVESTING DATES FOR VARIOUS CROPS IN KATMANDU VALLEY.

Name of Crop	Time of Seeding	Time of Harvesting
Wheat	Nov. 16 - Dec. 15	Apr. 15 - May 10
Barley	Nov. 16 - Dec. 15	Apr. 15 - May 10
Oats	Nov. 16 - Dec. 15	Apr. 15 - May 10
Field peas	Oct. 15 - Nov. 15	April
Broadbeans	November	Apr. 15 - May 15
Mustard (Tori)	Aug. 16 - 30 and Nov. 1 - 15	Dec. 1 - 15 April
Paddy:		
Early	May 10 - June 10	Oct. 1 - 15
Late	June 15 - July 20	Nov. 1 - 15
Maize	Apr. 25 - May 16	Aug. 1 - 20
Soyabeans:		
Early	Apr. 25 - May 16	Aug. 10 - 15
Late	Apr. 25 - May 16	Oct. 15 - 30
Millet	May 15 - June 1 1/	Oct. 15 - Nov. 15

Source: Prepared from information obtained from Nepalese agriculturists.

1/ Time of transplanting millet is from July 16 - August 20.

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