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ASSISTING AGRICULTURAL DEVELOPMENT IN NEPAL

by

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PREFACE

This report includes my findings and conclusions about agricultural development in Nepal. It is based on substantial studying before visiting Nepal, a month visit to Nepal in August and September 1972, and additional analysis and study since the visit. The month in Nepal was used to review reference materials, and to meet with officials of His Majesty's Government, officials of AID, and other representatives of various agencies that provide financial or technical assistance to Nepal. Research facilities and coordinators located in the Kathmandu Valley were visited, as was a hill location where research trials were conducted.

A digest of the reference materials related to this study is appended. A detailed outline of this report was discussed informally with Dr. B. P. Dhital, the Director of the Economic Analysis and Planning Division, Ministry of Food and Agriculture, and with the USAID Mission Director and selected staff.

The report is based upon information and impressions gathered between July and September 1972, but primarily upon that obtained in Nepal during August. These data were partially analyzed before leaving Nepal early in September, and more fully on an intermittent basis over the subsequent 4 months.

It is hoped that this report provides a meaningful framework within which a specific program of assistance to agricultural development in Nepal can be developed and supported, both by His Majesty's Government and by the U. S. Government.

Howard W. Hjort
Washington, D. C.
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ASSISTING AGRICULTURAL DEVELOPMENT IN NEPAL

SUMMARY AND CONCLUSIONS

Nepal's development efforts over the past 17-18 years have generated an impressive list of results. A number of institutions have been created and a relatively large pool of manpower has been trained. Roads, ropeways, bridges, and trails have been developed. Air transport services to isolated areas are now provided. Power generating capacity has increased greatly and more people have access to electricity. Industrial enterprises have been established. A growing number are in school, and health facilities and services are more readily available.

Nevertheless, much remains to be done. The economic and social development programs still cannot operate in many geographic areas because the necessary infrastructure is not in place.

The primary agricultural development goal has been to increase agricultural production. Significant progress has been obtained. The cultivated area has increased. More land is irrigated. About 600 extension agents are helping the farmers. Four of the five research farms are nearly up to standard. The Agricultural Marketing Corporation and the Agricultural Development Bank have a growing capacity to provide the major farm inputs. Sales of farm inputs and credit extended have risen sharply since the mid-1960's, although still far below the optimum levels.

The sum total of the agricultural development efforts apparently has been limited, however. Even though the area used to produce the major crops has increased, production has not increased at the planned rate. In fact, crop yields have declined for several crops. The actual increase in cereal grain production has been well below 1 percent a year.

DEVELOPMENT PROBLEMS

The major development problems arise from rapid population growth and slow growth in food production. A continuation of these trends will lead to an intolerable situation, and top priority must be given to curbing population growth while accelerating food production.

Even under the best of circumstances, however, the rate of population growth cannot be curbed quickly. Family planning methods are not known, the capacity to provide family planning services is limited, and the task of motivating people to adopt the small family norm has not even started in much of the country. In short, the system for providing family planning services is not ready yet. Nevertheless, the rate of return on funds invested to prevent births probably will be higher than for any other program.

Cereals are of the utmost importance to Nepal. The adequacy of the diet depends primarily upon cereal production, since about 85 percent of the calories come from cereals. The agricultural sector accounts for two-thirds of the gross domestic product, with cereals comprising three-fourths of

agricultural sector's contribution. Therefore, fully half of the gross domestic product comes from cereals, and what happens to cereal production largely determines the rate of growth in the economy. Food exports, mainly cereals, accounted for three-fourths of Nepal's export earnings in the late 1950's and early 60's, and about half in the late 1960's.

The prospects for a significant rise in food production within the next 2 to 5 years appears more promising than does a significant reduction in the population growth rate. This opinion arises in part out of a belief that the weather has been on the unfavorable side in recent years, but also because the system for providing farm inputs, including technical advice, is in operation and should be able, given the proper encouragement, to expand its service capacity quite rapidly.

There are other development-related problems as well. Foreign assistance in Nepal is subject to greater leakage than in most countries. Most of the first round multiplier effect from foreign assistance to Nepal goes to a country other than Nepal. Technical assistance, equipment, and materials usually are imported; even labor for development projects has been imported in some cases. The funds for imported services, equipment, and materials flow to the exporting country, mainly India in this case, and the multiplier starts to work in that country, not in Nepal.

Since most of the initial funds flow out of the country, the payoff from foreign assistance has to come mainly from the use of the infrastructure and the performance of the organizations and institutions that have been created through foreign assistance. The fact is that much of the infrastructure has not been used, at least not effectively. So many institutions and organizations have been created, some for essentially the same task, that inefficiency, duplication, and lack of staff strongly reduce effectiveness. Financial resources for creating infrastructure, organizations, and institutions have been in relative abundance, while financial resources for using the things created have been hard to find.

Program priorities in Nepal are heavily influenced by the magnitude of and constraints on foreign assistance. In many cases foreign assistance can cover the foreign exchange component of a project but not the local currency costs. The result is that the Nepalese have to rely mainly on their own manpower and financial resources to repair the roads, develop the water distribution systems, and operate the plants, factories, institutions, and organizations that are created through foreign assistance. This can seriously distort the allocation of HMG revenues.

The development strategy that was adopted in Nepal was to concentrate upon selected geographic areas, subsectors of selected sectors, and sub-groups of selected groups. The short-term payoff promised to be higher under this strategy. But the expected short-term payoff did not generate enough soon enough to permit mounting other efforts that would distribute the benefits more widely. Rather, past development efforts have produced a growing disparity from one geographic area to another, and even within areas.

There are large areas in the Hills and Mountains where development programs have yet to come. 1/ Almost all of the development funds and assistance has been allocated to the urban areas and to the Terai. Some sectors of the economy have received very little assistance. Frequently, it has been those with the highest income that are helped first with credit from the Agricultural Development Bank, advice from the Extension Service, or farm inputs from the Agricultural Marketing Corporation.

The relatively poor crops in the Hills in recent years have fueled the gradually growing discontent with development; political unrest has become more evident. Unless the program strategy is changed, one can expect people in areas where assistance is not being provided to continue to become more discontent and to express their dissatisfaction through the political system or whatever other avenue they can use to bring pressure to bear.

Planning activities in Nepal appear to schedule input and output flows according to a rigorously defined time path with little attention given to regular reporting of actual program performance. It is extremely difficult to manage development programs effectively without this kind of management information.

Development planning has centered on Kathmandu. The major barriers to development must vary considerably from one part of Nepal to another, however, and a set of development programs that "fit" one geographic area must, therefore, be quite different from the best package of programs for another area. Unless there is a geographic framework within which planning takes place, though, the chances are good that no geographic area will have a set of programs in operation that is "optimum."

DEVELOPMENT PROBLEM PRESCRIPTIONS

Several actions have been taken to begin resolving these development problems. Revised development plans are being forged for the major sectors. Development expenditures are to be accelerated faster than regular expenditures, even if it means spending cash balances. Future development plans are to give priority to the Hills. A regional framework for development planning and management has been adopted and is to be implemented. The number of organizations are to be reduced and their charters revised to make them explicit. Organizations are to be reorganized so that they can better assist the development process.

These all appear to be steps in the right direction, but it will take time to implement them. The revised development plans will have to be translated into programs, and resources will have to be allocated. Organizations will have to open branches; reassign staff; and obtain buildings, facilities, equipment and materials before they can operate.

1/ "Hills" refer to the area between the Himalayas and the Terai (a flat plain all along the southern border of Nepal). "Mountains" refer to the Himalayas and two lower mountain ranges south of the Himalayas.

In short, these prescriptions should, given time, lead to better development plans, a more realistic set of program priorities, more efficient organizations, better program management, and a better distribution of benefits from development. But, they are not likely to attack the major problems soon enough and with sufficient vigor.

Increasing Food Production

To increase food production, farmers must receive a price that makes grain production profitable and they must have access to the inputs they need to increase grain yields.

The Agricultural Marketing Corporation (AMC) has the responsibility for helping control the price of food grains through grain purchases in surplus producing areas and grain sales in deficit areas. The AMC is also responsible for getting inputs to the farmers (other than credit and technical advice -- the Agricultural Development Bank has the responsibility for credit, the Extension Service advises farmers on the proper use of inputs, and research determines what inputs should be used at various locations).

The decisions of any one of these separate organizational units has an impact on the others. All four organizations should be viewed as one integrated system, their objective being to increase the production of food grains. It is evident that this system has been structured in a manner that makes effective coordination nearly impossible and efficient and effective operation unnecessarily difficult. Even so, the present system is less complex than it was when the Land Reform Savings Corporation, the Agricultural Supply Corporation, and the Food Management Corporation were separate entities.

At the heart of the present food production system is the Agricultural Marketing Corporation. The responsibility for coordinating the entire food production system should be assigned to the AMC, with the General Manager having authority to allocate financial and manpower resources within the approved budget. The person selected for this position should be the best program manager in Nepal. The second best program manager should direct the population control program.

If these authorities and responsibilities cannot be assigned to the General Manager, some other HMG official should be appointed to coordinate the development of food production program plans and to monitor program operations.

In the meantime there are other steps that can be taken to improve the effectiveness and efficiency of the food production system. Joint planning should be required, especially with respect to the proposed extension of AMC and ADB operations into the Hills and Mountains. The ADB has started making arrangements to provide technical assistance to farmers. At the same time, the Extension Service, which now has this responsibility, is having difficulty keeping good technical assistants on their payroll. It may be advisable to assign the Extension Service Junior Technical Assistants to the ADB and make them a part of that organizational structure instead of the Extension Service.

Then, the JTA's would have a career path; the ADB would have a sales force and a deeper technical assistance capacity; and the Extension Service would be free to concentrate on other important tasks such as the massive technical assistance training job that needs to be done. This action would have an even greater impact if the AMC and ADB operated as a single organization.

The ADB will have to change its program strategy in order to more effectively pursue the objective of increasing production. A higher proportion of their credit will have to flow to farmers with lower income.

The research program will have to be linked more closely with AMC, ADB, and the needs of the farmers. The scope of the present research program should be broadened to cover inputs other than seed varieties and fertilizer trials and to look more closely at the barriers to increased grain production in the Hills. The trend toward local variety trials should be accelerated and research should shift its focus from the highest yielding varieties to the package of inputs that is most economical from the farmers point of view.

HMG institutions should be encouraged to provide training and assistance to ADB and AMC. The Nepal Rastra Bank could provide training and technical assistance to ADB on money management. Extension should train present and future AMC and ADB employees in the techniques of providing technical assistance. Research should conduct seminars where the latest findings could be presented to ADB, AMC, and Extension. The Center for Economic Development and Administration could provide training in fiscal and manpower management for AMC and ADB officers.

In order to provide their services to farmers, the AMC must have warehouses, offices, agents, and facilities for storing grain either in the surplus producing areas or in the deficit areas. A necessary precondition for a successful food production program, especially in the Hills, is a transportation network that facilitates the north-south movement of farm inputs and food grains. The future design and development pattern for the transportation network should be a function of the planned expansion in the systems which increase food production and reduce the population growth rate. Excess food must move from surplus to deficit areas and food imports (or exports, depending upon the degree of success in increasing food production faster than population growth) must be managed.

Until the Hill people have an assured supply of food, they will continue to have "grain on their minds." And as long as they have grain on their minds, they cannot be expected to seriously consider specializing in farm products for which they may have a long-term comparative advantage, such as vegetables, fruits, and forest products. As they reach the point where they are interested in raising other products, though, the AMC and ADB should be ready to facilitate this aspect of development.

Development Assistance

Agricultural development assistance opportunities are in excess of the amounts likely to be available from all sources. Highest priority should be given to activities which increase food production.

Perhaps the most effective way the United States could assist is through a Title I PL 480 agreement. Given the present situation and outlook, it appears that Nepal should:

1. Continue to export paddy to India, even if doing so leaves them in a deficit position with respect to food grain;
2. Obtain maize or wheat for the Hills from the U. S. under a Title I, PL 480 agreement, on the softest possible terms;
3. Authorize the AMC to move grain purchased in surplus areas either to the Hills or into an export position for sale to India;
4. Sell the PL 480 grain to the AMC, who would be directed to move it on an identity preserved basis into position for sale in deficit Hill areas; and
5. Carefully determine the priority scale for the use of grain sales proceeds.

If these steps were taken, Nepal would be able to continue to generate the Indian rupees that would be needed to purchase goods from India; farmers in surplus producing districts would receive a price that would continue to encourage them to adopt modern farming methods; people in deficit areas would have an assured supply of food grains at a reasonable price; Nepal would generate rupees for development projects at a relatively rapid rate; the future growth of the AMC and the ADB could be financed at minimum cost; and the United States could assist development in Nepal at a lower cost than under dollar assistance, as the U. S. government would save the cost of setting aside excess grain acreage.

HMG must make sure that the AMC and the ADB have first claim (along with family planning) on future development resources. These organizations should have allocated to them all the resources they can efficiently administer and effectively absorb because the rate of growth in the AMC and the ADB will go a long way towards determining the future pace of progress and the level of economic and social development in Nepal. The United States should be prepared to assist Nepal in pursuing the two top priority objectives -- increasing food production and decreasing the population growth rate. It is highly unlikely that the payoff from investment in other programs would be as high.

A general conclusion is that the payoff over the next several years will be higher if effort is concentrated on using what has already been created rather than using funds to create new entities.

ASSISTING AGRICULTURAL DEVELOPMENT IN NEPAL

INTRODUCTION

The United States has supported development projects in Nepal for more than 20 years; an important recipient has been the agriculture sector. The present program of assistance to agricultural development is nearing completion, with phase-out scheduled for fiscal 1974. In turn, USAID is appropriately exploring alternative assistance programs. At the same time arrangements are being made for the USDA to undertake substantial responsibilities for future programs under a Participating Agency Service Agreement. These events give rise to this report.

An early task of the new program managers will be to formulate with the Nepalese a program for the future that both governments can support. The purpose of this report is to provide a framework within which the new program of assistance can be formulated.

This report attempts to identify the major barriers or constraints to further agricultural development in Nepal, and to determine how they can best be removed. A judgemental cost effectiveness approach is used to suggest a priority scale among projects, and as a guide to projects the United States should consider for support.

There are more formal analytic techniques that could be used to identify investment opportunities, but more time and richer data would be required to make the results reliable and useful. The alternative is to rely upon the judgement of experienced individuals and buttress their judgement with available analyses. This has been the approach of this report.

BACKGROUND

Nepal, landlocked and mountainous, is wedged between the Tibetan region of China to the north, Sikkim to the northeast, and India to the west, south, and southeast. As one traverses the 800 kilometers from west to east, the course takes on an east by southeast direction, as do the three mountain ranges. The north to south distance is around 160 kilometers at the narrowest, and about 240 kilometers at the widest point. Nepal has 140,798 square kilometers, a bit larger than Arkansas.

The southeastern border is about 480 kilometers due north of Calcutta, India, the port used by Nepal to trade with countries other than India and China. Kathmandu, the capital, is located at 27.45 degrees north latitude (the same as St. Petersburg, Florida) and 85.25 degrees east longitude.

The terrain is rugged. The Himalayan range covers the northern border. The main range below the Himalayas is the Mahabharat Lekh, and to the south lies the lower Swalik range. Mount Everest, near the northeastern corner of the country, rises 8,840 meters above sea level. Just over 160 kilometers to the south is the southern border which is only a meter or two above sea level. All

along the southern border is a narrow strip of flat plain called the Terai (part of the Indo-Gangetic plain) ranging from 75 to 300 meters above sea level. Paddy is the major Terai crop, but several other crops are also grown. North of the Terai are the "Hills" and above them the "Mountains." There are several fertile valleys between the Swalik and Mahabharat Lekh ranges, at altitudes of 300 to 1,220 meters, known as the inner Terai. Kathmandu lies in one of these valleys. But most land in Nepal is covered by forests or is formed into terraces rising like huge steps, one above the other up the hillside where food and other crops are grown.

Most people live in the Hills but most food is produced on the Terai. During the rainy season, from June to September, rainwater is stored in catch-basins built on the slopes of the hills above the terraces. Irrigation ditches carry water to the terraces during the dry season. Paddy, maize, wheat, and millets are the chief terrace crops. At elevations of 3,000 to 4,600 meters, the high mountain valleys are used as pasture for sheep and yak by nomadic tribes. Animals are moved to lower elevations further south during the winter when wool, sheep, and milk are bartered for consumer goods.

Nepal's climate varies from the heat on the Terai to the extreme cold of the Himalayas. Terai temperature ranges from 4° to 21° C. in December and January, and from 21° to 46° in May and June. During the monsoon, temperature moderates but humidity rises. The monsoon usually comes in June and leaves in September, after depositing about 1,520 mm. of rainfall, that, together with melting snow, fuels the many streams that rise in the Himalaya and then weave through Nepal into India. Annual rainfall varies from about 1,000 mm. in the west to over 2,500 mm. in the east. The Kathmandu Valley normally receives 1,270 to 1,520 mm. of rain a year. Although most of the rain falls during the monsoon, there is shower activity at other times of the year, particularly in the Hills and Mountains.

Nepal's three major rivers -- Karnali, Gandaki-Narayani, and Kosi -- provide a great source of potential power. Nepal has no large-scale manufacturing. Small factories produce jute bags, ceramics, glassware, cotton textile, paper, and metal-ware. Nepal's chief exports are mainly unprocessed products; imports are processed primary and secondary products. India is its chief customer and leading source of imports. Grain is the largest export. The transportation and communication network, now being created, is still deficient.

Most of the 12 million Nepalese are farmers; more than half are Hindus and most of the rest are Buddhists.

Cereals are the main staple of the diet; consumption of fruits, vegetables, sugar, meat, eggs, fish, fats, and oils is relatively low.

Nepal remained isolated from the world until 1947 when diplomatic and trade relations were established with several countries. Then, the Rana family ruled as hereditary prime ministers and virtual dictators as they had for the previous 100 years. That rule ended in 1951. Then, the King tried to form a constitutional monarchy; a cabinet was formed from members of various political groups, but a stable government was not established until later. Nepal became a member of the United Nations in 1955, the first year of its first 5-year development program.

Nepal became a constitutional monarchy in 1959. The King, a hereditary ruler, is head of state. A constitution was approved by the King in 1959 and people voted for the first time, electing members of the lower house of Parliament. But, as rivalries and political favoritism threatened the country's safety, the King dismissed the government and dissolved Parliament. In 1961, all political parties were banned and the King took over all powers of government. In 1962, the King approved a new constitution authorizing the National Panchayat, a one house Parliament whose 125 members are elected for a 5-year term. The King appoints a Council of Ministers from Parliament as advisers. King Tribhubana Bir Bikram Shah Dev ruled from 1951 to 1955; King Mahendra Bir Bikram Shah Dev from 1955 to 1972; and Birendra Bir Bikram Shah Dev became King early in 1972. The governmental administrative structure is centered in Kathmandu and extends through 14 zones to the 75 districts.

There are about 14.2 million hectares of land in the 75 districts. Only 14 percent were estimated to be under cultivation by 1970/71. About a third of the land is perpetually under snow or classed as non-reclaimable waste land. Another third is forest land and the remaining fourth is in other uses (8 percent) or reclaimable waste land (13 percent). On the average, there is about 1.2 hectares of land per person but each hectare of land under cultivation has to support six people.

The 16 Mountain districts account for a third of the land but much of it is unproductive (see Table 1). Fewer than 10 percent of the people live in the Mountains. They have only 5 percent of the cultivated land -- less than one-tenth of a hectare per person. Almost one-half the people live in the Hills. They have, on the average, about 1.1 hectares of land but only one-tenth of a hectare of cultivated land per person. The densely populated Kathmandu Valley districts have, on the average, about the same amount of cultivated land per person as do those in the Mountains -- .08 of a hectare. Almost two-thirds of the cultivated land is on the Terai. Here, each person has about three-fourths of a hectare of land and about three-tenths of a hectare of cultivated land.

Table 1.--Nepal: Distribution of cultivated area and population by geographic region

Region	Number of districts	Percent of total		
		Population	Area	Cultivated area
Mountain	16	9.6	33.0	4.8
Hill	36	47.2	43.5	27.3
Kathmandu Valley ...	3	5.2	0.5	2.4
Terai	20	38.0	23.0	65.5

The new regional classification splits Nepal into four regions -- Western, Central Western, Central Eastern, and Eastern (see Table 2). The regional classification brings the cultivated area per person into better balance than the geographic classification (compare Tables 1 and 3). Each hectare under cultivation supports 6.4 people in the Western Region, 7.0 in the Central Western Region, 5.8 in the Central Eastern Region, and 4.4 in the Eastern Region. Data based upon the geographic classification scheme show each hectare under cultivation supporting 11.4 people in the Mountain districts, 9.9 people in the Hill districts, 12.4 people in the Kathmandu Valley district, and 3.3 people in Terai districts. The data clearly suggest a relatively favorable position for those living on the Terai.

Table 2.--Nepal: Distribution of districts by geographic and political region

Geographic regions	Political region					Total
	Western Region	Central Western Region	Central Eastern Region	Eastern Region		
Mountain	7	3	3	3		16
Hill.....	11	11	6	8		36
Kathmandu ...	--	--	3	--		3
Terai.....	5	3	7	5		20
Total	23	17	19	16		75

Table 3.--Nepal: Distribution of cultivated area and population by political region

Region	Number of districts	Percent of total		
		Population	Area	Cultivated area
Western	23	21.5	36.7	19.2
Central Western ...	17	21.5	24.0	17.5
Central Eastern ...	19	32.9	19.5	32.2
Eastern	16	24.1	19.8	31.1

DEVELOPMENT PLANS AND POLICIES

Priority to the Hills region, the monsoon, regionalization, and reorganization currently dominate development discussions in Nepal.

Government officials repeatedly stated that the Hills must now have priority. The monsoon, late in coming and below normal in output, was a source of great concern. This situation presented the possibility of starvation and also threatened future development. There were frequent assurances that the King has adopted the regional approach to development planning and management. Serious work was underway to recombine and restructure organizations and institutions so they could better serve the development process and fit the regional frame that was to be adopted.

These activities and concerns obviously have deep roots. The talk of priority to the Hills indicates dissatisfaction with the present development strategy. The regionalization effort suggests a flaw in the framework for planning and managing development programs. The interest in reorganization points to problems in operating development programs. The concern over a weak monsoon is understandable in any circumstance but the intensity of the concern implies the results from development programs have not been sufficient to withstand an event that will, in the normal course of events, happen periodically.

The first 5-year development plan began with 1955/56. Over the years prior to the initiation of development programs, epidemics, famine, and war were the events that held population growth to a relatively low level. These events kept the system under control. When an epidemic came, or a drought struck, it took its toll. The people were unable to prevent these things from occurring. Then, talk of planned development created the expectation that things would be better in the future.

Planned development often carries with it unwarranted responsibilities for such uncontrollable events. Along with development plans came hope and promises that epidemics can be controlled, the consequences of drought made less severe, and living conditions made better. Promises accompanying planned development are easy to make, long remembered, but hard to keep. People are led to believe that man no longer has to struggle alone against adverse events. And, of course, managers of development programs are quick to take credit for positive events that occur, even if not the immediate product of development programs. This places them in a position of also having to take credit for the slow rate of progress and for disasters that continue to come in spite of development efforts. For example, a poor crop in the Hills becomes, in the minds of the people, no longer a natural event but increasingly a flaw in the development strategy or in the agricultural development program.

PRIORITIES OF THE PLANS

For the 20 years of planned development, a total of Rs. 5.24 billion has been allocated for the series of four development programs (see Table 4). The fourth plan, initiated in 1970/71, runs through 1974/75.

Table 4.--Nepal: Funds allocated to the four 5-year development plans

Plan	Period	Million rupees	Percent of four plan total	Rupees per person
I	1955/56 - 1959/60	330	6.3	35-40
II	1960/61 - 1964/65	600	11.5	55-65
III	1965/66 - 1969/70	1,740	33.2	150-160
IV	1970/71 - 1974/75	2,570	49.0	190-200
Total		5,240	100.0	---

Development funds provided for the fourth plan were nearly eight times those for the first plan. Yet, on an annual basis, the fourth plan allocates only about Rs. 40 (\$4) per person for all development programs.

Plan I:

The first plan provided funds for transportation, agricultural resettlement and development, village development, industrial development, irrigation and power, education, health, and other miscellaneous programs. The largest share was allocated to transportation (mainly roads). Transportation, irrigation, and power received over half the funds. Education and health obtained Rs. 44 million (13 percent), village development nearly the same (Rs. 42.5 million), agricultural resettlement and development Rs. 32 million (10 percent), and industrial development Rs. 25 million (8 percent); the remaining Rs. 12.5 were allocated to miscellaneous programs.

Plan II:

The priority scale was modified significantly for the second plan, and several new programs were initiated. About one-sixth of the second plan funds were earmarked for new programs. A substantial effort was made to gather factual data, provide training opportunities, and initiate programs to provide safe drinking water, improve forests, and develop cottage industries. A smaller beginning was made on the communication network, land reform, cooperatives, credit, and tourism. But the major changes were made in the development programs initiated during the late 1950's. Funds for village development were sharply reduced, and those for agricultural resettlement and development were cut 12.5 percent. A 15 percent increase was provided for transportation programs. Priority was given to irrigation, power, and industrial development. The allocation for irrigation and power was 2.6 times the amount in the first plan. For industrial development, a 3.6-fold increase was planned. Education funds were more than doubled and health received a 50 percent increase. Even so, transportation remained the major recipient of funds.

Plan III:

A few new programs received funds in the third plan (mining, railways) but most additional funds were earmarked for expansion in ongoing programs. Transportation, irrigation, and power were funded at a much higher level -- together they accounted for 54 percent of the total amount, and captured nearly 60 percent of the increase. Others with large increases were agricultural resettlement and development, education, health, and forestry programs. No increase was provided for industrial development. Roads remained the main user of funds; the gap between roads and power, the second largest program, became far larger.

Agriculture resettlement and development programs were allocated Rs. 130 million -- an increase of Rs. 102 million. Forestry programs were granted a Rs. 48 million increase, to Rs. 61.5 million. Agriculture moved from seventh in level of funding for the second plan to a tie with education for the number three spot. Forestry climbed from twelfth to ninth place.

Funds for the social service programs increased Rs. 177.3 million. Almost all the new funds were allocated to education (Rs. 90 million) and health (Rs. 83 million).

Plan IV:

The current plan has Rs. 830 million more than the third plan (see Table 5). Transportation, irrigation, and power have about 58 percent of the funds. Most of the new money was earmarked for transportation, irrigation, and power. Rs. 313.1 million more are programmed for roads, Rs. 126.9 million more for aviation, and Rs. 124.2 million more for irrigation and power (irrigation increases Rs. 158.9 million, power decreases Rs. 34.7 million).

Roads remain the number one consumer of funds, aviation moves from eighth to fifth position, and transportation takes a relatively stronger position compared to other sectors.

Agricultural resettlement and development programs were granted an increase of Rs. 70 million. Most other programs were granted additional funds, but funds for education were cut back and those for railways, food, sports, and training dropped out.

Summary of the Four Plans:

Roads have claimed the largest share of the resources in each of the four plans. Power (electricity) has been near the top in each -- fourth in the first plan and second, second, and third in subsequent plans. Agriculture started high, dropped sharply in the second plan, but then came back to third and fourth positions. Industry has moved in the opposite direction from agriculture, rising to the number three position during the second plan but then dropping back to seventh and eighth in the third and fourth plans. Irrigation has moved from position seven to four, then back to six, and then into second in the fourth plan.

Education has also moved up and down, from eighth to fifth to fourth to seventh. Health has stayed in position six for three plans and was in position five during the third plan. Aviation has moved higher on the priority scale, into fifth position for the fourth plan. Forestry moved into the agenda during the second plan and then moved up to the ninth position for the third and fourth plans. Mining came on the list for the first time in the third plan and moved from fifteenth to tenth for the fourth plan. Over time, relatively more resources have been made available for cooperatives and credit, but fewer for village development.

Taking the four plans together, transportation, irrigation, and power have been allocated 55 percent of planned public sector investment outlay. The allocation for social services, mainly education, health, and drinking water, has been nearly 15 percent of the total. Industrial development, cottage industry, and mining have been allocated about 9 percent of the funds. The amount earmarked for agricultural resettlement and development programs has been about 7 percent. And when combined with land reform, food, cooperatives, and credit, the total for agricultural programs comes to 10 percent of the development funds. Forestry has been allocated about 3 percent of the total. Several minor programs account for the remaining 8 percent.

Table 5.--Nepal: Ranking of programs in fourth 5-year development plan by allocated funds

Rank	Program	Million rupees	Percent of total
1	Roads	813.1	31.6
2	Irrigation	258.9	10.1
3	Power	225.3	8.8
4	Agricultural resettlement and development	199.7	7.8
5	Aviation	196.9	7.7
6	Health	151.2	5.9
7	Education	120.0	4.7
8	Industry	118.5	4.6
9	Forestry	80.8	3.1
10	Mining	74.5	2.9
11	Cadastral survey	49.2	1.9
12	Cooperatives and credit	46.1	1.8
13	Village development (panchayat)	41.0	1.6
14	Land reform	40.9	1.6
15	Communication	40.0	1.6
16	Drinking water	37.2	1.4
17	Hydrology	24.0	0.9
18	Cottage industry	22.7	0.9
19	Statistics	14.7	0.6
20	Broadcasting & publicity	7.7	0.3
21	Tourism	5.0	0.2
Total		2,567.4	100.0

EXPENDITURES

In 1962/63, HMG expenditures for both the regular budget and the development budget came to Rs. 214.2 million (see Table 6). They were Rs. 769.5 million for 1970/71. The revised estimate for 1971/72 is Rs. 928.8 million and the budget estimate for 1972/73 is Rs. 1267.5 million. However, the revised budget tends to be 4-6 percent and the budget estimate 20-25 percent above actual expenditures. A 5 percent adjustment for 1971/72 would place expenditure estimate at Rs. 882.4 million, while a 22.5 percent adjustment for 1972/73 would bring expenditures for that year down to Rs. 982.3 million.

In any event, the growth in government expenditures is rapid. They doubled from 1962/63 to 1965/66, grew slowly over the next 2 years, and then again proceeded to climb quickly.

Table 6.--Nepal: Government expenditures for selected years

Program	1962/63	1966/67	1970/71
----- Million rupees -----			
Administration	48.5	75.3	115.7
Defense	24.7	39.9	57.0
Social services	38.2	82.2	118.2
Education	17.6	33.4	51.7
Health	11.4	20.9	33.9
Other	9.2	27.9	32.6
Economic services	85.2	212.4	435.0
Agriculture	9.1	21.1	44.9
Forests	8.9	10.2	12.2
Electricity	12.6	25.0	35.2
Industry and Mining	14.0	17.0	41.0
Public works and other			
economic services ...	40.6	139.1	301.7
Miscellaneous	17.6	29.0	43.6
Total	214.2	438.8	769.5

Expenditures in 1970/71 were 3.6 times those in 1962/63. Expenditures for public works and other economic services are by far the largest and have grown the fastest. Major programs included in this category are roads, aviation, and irrigation. Agricultural expenditures have also grown faster than those for any other major program. Expenditures for forestry programs have risen but at a relatively slow rate.

EXPENDITURE PLANS

The budget can also be used as an indicator of program priority. Expenditures are programmed to more than double in 2 years for industry and mining, communication, and agriculture. The second priority group, with a growth of 70 to 90 percent in 2 years, includes education, forests, village development, transportation, and health. A third group consists of irrigation and electricity, where expenditures are expected to grow by a third. At the bottom are defense and police with increases of 25 and 11 percent respectively.

Another way of viewing priorities, however, is to look at the programmed increase and see how the increase has been allocated. When this is done, we find one-third of the additional funds go to transportation, already by far the largest item of expenditure. Education, agriculture, and industry and mines each receive between 9 and 10 percent of the programmed increase. Nearly 5 percent goes to health, about 3 percent to communications, and smaller amounts are set aside for defense, irrigation, village development, electricity, and forests (see Table 7).

Taking both the magnitude of the programmed increase and the programmed rate of growth into account shows a priority ranking for the major functions of government (see Table 8).

Table 8.--Nepal: Priority ranking of major government functions

Function	Rank	Priority group
Transportation	1	I
Industry and mining	2	II
Agriculture	3	II
Education	4	II
Health	5	III
Communications	6	III
Panchayats	7	IV
Forests	8	IV
Irrigation	9	V
Electricity	10	V
Defense	11	V
Police	12	VI

Nearly all additional funds for transportation are for aviation (an 11-fold increase) and bridges (a 3.8-fold increase). The amount programmed for roads in 1972/73 is about the same as actual expenditures for 1970/71; however, the programmed amount is well above the revised estimate for 1971/72.

Table 7.--Nepal: Government expenditures by sector for 1970/71 and planned for 1972/73

Sector	Budgetary expenditure for 1970/71				Proposed budget for 1972/73				Increase - 1972/73 compared with 1970/71	
	Regular		Development		Regular		Development		Share of Increase	
	budget	budget	Expend- iture	Share	budget	budget	Funds	Share	Increase	increase
	----- Million rupees -----				----- Million rupees -----				----- Percent -----	
Transportation ...	8.6	223.0	231.6	30.1	15.6	382.4	398.0	31.4	71.8	33.4
Education	27.1	24.6	51.7	6.7	35.4	62.2	97.6	7.7	88.9	9.2
Agriculture	4.5	40.5	45.0	5.8	6.7	83.2	89.9	7.1	99.8	9.0
Industry & mining :	1.4	39.7	41.1	5.4	1.8	86.3	88.1	6.9	114.4	9.4
Defense	57.0	---	57.0	7.4	71.0	---	71.0	5.6	24.6	2.8
Health	12.0	21.8	33.8	4.4	20.5	37.4	57.9	4.5	71.3	4.8
Irrigation	1.2	37.5	38.7	5.0	2.7	49.7	52.4	4.1	35.4	2.8
Electricity	2.6	32.6	35.2	4.6	5.1	41.4	46.5	3.7	32.1	2.3
Police	30.5	---	30.5	4.0	33.8	---	33.8	2.7	10.8	0.7
Panchayate	12.8	5.1	17.9	2.3	13.2	18.1	31.3	2.5	74.9	2.7
Communication	7.2	7.4	14.6	1.9	11.4	18.8	30.2	2.4	106.8	3.1
Forest	3.3	8.9	12.2	1.6	4.6	17.9	22.5	1.8	84.4	2.1
All other	136.3	23.9	160.2	20.8	188.0	60.4	248.4	19.6	55.1	17.7
Total	304.5	465.0	769.5	100.0	409.8	857.8	1,267.6	100.0	64.7 ^{1/}	100.0

^{1/} This percentage was calculated as follows: Total 1972/73 funds minus total 1970/71 expenditures divided by total 1970/71 expenditures.

Regular budget expenditures are programmed to increase from 1970/71 to 1972/73 by 35 percent; development expenditures are to increase 85 percent. The intention is to accelerate spending for development faster than for non-development purposes.

REVENUE

HMG revenues were Rs. 125.7 million in 1962/63 and Rs. 459.7 million by 1970/71. The revised estimate for 1971/72 is Rs. 518.1 million and the budget estimate for 1972/73, including new tax proposals, is Rs. 601.0 million (see Table 9).

Table 9.--Nepal: Source of government revenue in selected years

Source	1962/63	1966/67	1969/70	1970/71
----- Million rupees -----				
Customs	37.4	121.7	193.5	156.5
Excise	9.2	20.0	38.1	56.6
Land revenue	53.0	56.6	87.7	76.4
Forest revenue	9.8	16.5	17.7	12.5
Income, sales and other tax	3.6	24.9	76.4	90.4
Registration	1.5	2.6	15.6	15.8
Irrigation and water .	0.4	0.5	1.1	1.3
Communications	1.6	3.5	4.6	4.7
Transportation	3.7	0.4	0.7	1.4
Principal, interest and dividends	0.6	4.7	18.9	29.2
Civil administration .	3.2	4.1	4.8	12.0
Miscellaneous	1.7	1.2	4.9	2.9
Total	125.7	256.7	464.0	459.7

In the early years, land revenue was the major source of funds. But the growth of such receipts has been slow. In fact, there was a decline in land receipts from 1969/70 to 1970/71. Customs receipts now are the major source of revenue, with import duties and Indian excise refund the two major contributors. Customs receipts fell sharply from 1969/70 to 1970/71.

Dividends from companies and loan repayments (plus interest), from government employees mainly but also some from companies and corporations, began to make a significant contribution to revenues in the late 1960's. The other

revenue source with very rapid growth is taxes, mainly on personal income and sales. Sales taxes were first collected in 1965/66; in that year, receipts were Rs. 6.3 million. Five years later the amount collected was 10 times the first year figure. Income tax collections at Rs. 21.2 million in 1970/71 were only one-third as high as sales tax receipts and the annual increase in collections is well below those from sales taxes.

Excise taxes are another important source of revenue, particularly those on industrial products classed as luxury goods. Forest receipts were well above the 1970/71 level in the mid-1960's; these have become a relatively minor source of revenue.

House, land, and vehicle registration fees are a significant but still relatively minor fund source. The sectors that have claimed most development funds (roads, aviation, and irrigation) generate very little revenue for the government.

Revenues are expected to increase Rs. 58.4 million from 1970/71 to 1971/72 and by Rs. 131.3 million in the 2 years from 1970/71 to 1972/73 (see Table 10).

Table 10.--Nepal: Increase of government revenue by major source over 1970/71 for 1971/72 and 1972/73

Source	1971/72	1972/73
----- Million rupees -----		
Customs	33.9	65.5
Sales tax	4.7	11.7
Excise taxes	3.5	8.4
Land revenue	3.6	5.6
Forest	3.6	17.4
Principal, interest and dividends	2.7	12.1
All other sources	6.4	10.6
Total	58.4	131.3

Over half the added funds are to come from customs receipts, and most of this from Indian excise refunds. Forests, sales tax collections, and repayment of loans and interest by government employees are the other major sources of added revenue.

THE BUDGET GAP AND FOREIGN ASSISTANCE

IMG expenditures always exceed revenues. The shortage is financed mainly by foreign aid but also by internal borrowing and a reduction in cash reserves when necessary (see Table 11).

Table 11.--Nepal: Financial position of government, 1962/63 through 1970/71
and estimates for 1971/72 and 1972/73

Item	1962/63	1963/64	1964/65	1965/66	1966/67	1967/68	1968/69	1969/70	1970/71	1971/72	1972/73
										<u>1/</u>	<u>2/</u>
	----- Million Rupees -----										
Expenditures	214	259	350	428	439	462	594	684	770	929	1,267
Revenues	126	150	192	217	257	326	400	464	460	518	601
Deficit	88	109	158	211	182	136	194	220	310	411	666
Source of deficit financing											
Foreign											
Assistance	71	106	147	178	146	158	214	244	271	260	291
Borrowing	---	---	---	---	---	---	---	8	32	40	120
Internal											
Borrowing	7	- 5	8	8	1	10	20	20	30	50	171
Changes in cash balances	- 10	- 8	- 3	- 25	- 35	32	40	52	23	- 61	- 84

1/ Revised estimate

2/ Budget estimate

The budget deficit was Rs. 88 million for 1962/63. It became larger in each of the following 3 years, reaching Rs. 211 million for 1965/66. The growth in expenditure was small in the following 2 years and, because revenues continued to rise, the deficit was cut to Rs. 182 million for 1966/67 and to Rs. 136 million for 1967/68. Since then, expenditures have risen faster than receipts. The deficit was Rs. 310 million for 1970/71. Revised expenditure and receipts estimates for 1971/72 show a deficit of Rs. 411 million and the budget estimate for 1972/73 has a deficit of Rs. 666 million.

From 1962/63 through 1966/67, foreign aid was large but not enough to cover the deficit. Internal borrowing for these 5 years came to a net of Rs. 19 million and the cash balance was reduced Rs. 81 million to cover the Rs. 100 million gap that remained after accounting for foreign assistance.

Foreign assistance in each of the next 3 years was sufficient to cover the deficit and add to the cash balance. Internal borrowings of Rs. 50 million simply permitted a faster growth in cash balance. The situation was changing by 1970/71. Expenditures were up significantly but receipts were not. The deficit was not fully covered by foreign aid. There was a Rs. 23 million increase in the cash balance, but only due to an expansion in internal borrowing to Rs. 30 million and in external borrowing to Rs. 32 million.

The revised estimate for 1971/72 and the budget plan for the following year calls for foreign assistance to cover a smaller share of the deficit, and for more of the funds to come from internal and external borrowing and a reduction in the cash balance. And even though expenditures may be overstated for these 2 years, the trends and events of the time suggest that the funds to finance future development will have to come increasingly from borrowing and less from grants.

In recent years India has been the major source of foreign aid (see Table 12).

Table 12.--Nepal: Source and amount of foreign aid for 1970/71 and estimated 1972/73

Country	1970/71 actual	1972/73 estimated
----- Million rupees -----		
India	125.4	110.5
United States	59.7	56.8
China	47.2	50.1
United Kingdom	17.4	17.1
Russia	2.8	2.5
Others	18.3	54.1
Total	270.8	291.1

The revised 1971/72 estimate has a foreign aid total of Rs. 260.1 million with reductions in amounts from India and the United States more than offsetting increased aid from China, the United Kingdom, Russia, and others. The United Nations agencies, the Asian Development Bank, and the World Bank Group are expanding their activities in Nepal.

DEVELOPMENT RESULTS

As noted earlier, Rs. 2.67 billion were set aside for development programs from 1955/56 to 1969/70. HMG expenditures for all purposes were well above this, as the activities of government not directly related to development accounted for a larger share of expenditures than did those directly for development. Regular budget expenditures were still 40 percent of total expenditures by 1970/71.

What development results were obtained from the expenditure of these funds? Available data do not permit calculation of output/input ratios for various development programs because inputs and outputs are reported separately. In fact, it is not possible to match financial and manpower inputs with programs. This makes it difficult to evaluate effectiveness of development programs. But, some accomplishments have been reported; others are obvious. Official HMG sources are used to report results except where otherwise noted. In some cases, reported results vary considerably from one HMG source to another and therefore it is best to focus on trends instead of specific point estimates.

CREATING A SYSTEM

In the first years of planned development most of the financial resources were used to create a system for planning and managing development. Even though the system continues to change in scope and composition with time, there has been a system in operation for several years. The system has several components:

1. An organizational structure to manage the affairs of government. At present, the key points in the structure are the central and the district agencies even though there is another layer in the hierarchy, at the zonal level, and a linkage below the district with the village panchayat. The organizational structure expands horizontally at each level as new programs are added and the task of coordination assigned to the ranking officers at each level becomes more difficult.
2. A process to guide the formulation, discussion, and approval of 5-year development plans. Development policies have been formulated, development strategies outlined, and broad program priorities established. The Planning Commission has responsibility to guide this process; the various ministries prepare and defend proposals. The Finance Ministry is final authority on fund allocation.
3. A structure through which people can have a voice in formulating and approving laws. The panchayat network runs from the grass roots to Parliament and provides an orderly process for selecting representatives.

4. Quasi-governmental organizations to implement and operate development programs. Numerous corporate bodies have been created to manage the flow of development inputs and outputs.
5. Institutes and institutions to serve development needs. Various organizations have been established to conduct research, train manpower and manage the money supply.
6. Manpower to operate the system. A relatively large pool of manpower has been trained in development-related fields, mostly outside Nepal.

NON-AGRICULTURAL SECTOR OUTPUTS

Most development funds have been expended to create the infrastructure needed to provide basic inputs for development. This includes development of a transportation and communicating system, dams and facilities for power generation and water management, factories for producing goods, buildings for providing services, and related activities. A partial list of some of the more obvious results follows:

1. A modest transportation network now exists. Roads, ropeways, bridges, and trails have been built. Air transport services to isolated areas are available at several locations.
2. The power supply capacity has increased several-fold, and a growing proportion of the people have access to electricity.
3. A beginning has been made on a communications network.
4. Industrial enterprises have been expanded and new ones created that generate a gradually growing flow of goods.
5. Exports and imports have increased significantly.
6. The number of education facilities, teachers, and students have risen substantially.
7. Health facilities and services are more readily available in some areas.

AGRICULTURE INPUTS AND OUTPUTS

Development funds allocated to agriculture have been used primarily to develop a research capacity and to provide services and inputs designed to increase agricultural production, mainly by expanding crop area, increasing yields, or using land more intensively.

A major objective of the agriculture resettlement program is to convert forests to cultivated area. Farmers are encouraged to settle on forested land, clear it, and raise crops.

Several programs are designed to increase yields. Channels are being built to bring water to dry land. Field trials are being conducted to find improved seed varieties and cultural practices. The Extension Service provides technical assistance to farmers in the use of modern farming techniques and inputs. The Agriculture Development Bank provides credit at reasonable terms and conditions for inputs needed to increase crop and livestock production or reduce production costs. The Reform Savings Corporation absorbs savings and puts them to work in part on production increasing investments. The Agriculture Supply Corporation provides a system through which farmers can obtain fertilizer, plant protection materials, seed and seedlings, tools, and machinery.

Search is also underway for seed varieties that mature in fewer days so land can be used more intensively. Significant progress has been made. For example:

1. Area under cultivation increased from 1.7 million hectares in 1961/62 to almost 2 million by 1969/70.
2. Minor irrigation projects covering 22,092 hectares had been completed by 1970/71; others under construction cover another 4,863 hectares.
3. The Extension Service, operating through a national office, seven regional offices, and 51 district offices, now has about 600 employees working with farmers. Each Junior Technical Agent or Junior Technical Assistant has 3-5 villages, so about one-half the 3,700 village panchayats are covered.
4. Four of the five research farms are nearly up to standard, and several testing and experimentation sites are conducting field trials. The emphasis has been on food grain crops, but cash crops are gaining attention.
5. The Agricultural Marketing Corporation, after taking over the Agricultural Supply Corporation and the Food Management Corporation, has a national office, four regional offices, and 41 branch offices operating through 300 dealers. Sales of the major farm inputs grew substantially during the last half of the 1960's:
 - A. Fertilizer sales -- from less than a million rupees in 1966/67 to Rs. 16.9 million for 1970/71.
 - B. Plant protection material sales -- from Rs. 21,000 in 1966/67 to over Rs. 200,000 for 1969/70 and 1970/71.
 - C. Seed sales -- from Rs. 470,000 in 1966/67 to Rs. 997,000 for 1968/69 but then back down to Rs. 736,000 for 1970/71; (other reports indicate farmers used more improved seed each year -- from 70 metric tons in 1965/66 to 1,040 metric tons by 1970/71, covering an area of 5,060 hectares in the former year and 72,430 hectares in the last).

- D. Agricultural tools and inputs sales -- from Rs. 23,000 in 1966/67 to Rs. 1,145,000 in 1969/70 and Rs. 979,000 in 1970/71.
6. Between 1965/66 and 1969/70, some 794 tractors and 1,280 pump sets were imported by the Land Reform Savings Corporation, National Trading Corporation, Agricultural Supply Corporation, Birgunj Sugar Factory, and private dealers.
 7. The Agricultural Development Bank loaned Rs. 0.9 million in 1963/64. Total loaned in 1970/71 was Rs. 20.5 million according to one source; Rs. 52.7 million according to another. The Land Reform Savings Corporation loaned about Rs. 9.0 million in 1966/67 and Rs. 22.2 million in 1970/71. Although these gains are impressive, a recent credit survey indicated the amount loaned through both these institutions (now being combined into one) was less than 10 percent of the credit used by farmers, and that most of the credit from these sources flowed to larger, higher income farmers.

Crop Area:

Most of the increase in area under cultivation apparently has been in the Inner and Eastern Terai regions. For example, the reported increase of 135,000 hectares from 1967/68 to 1969/70 was almost entirely in these two regions -- an increase of 70,000 hectares in the Eastern Terai and 66,000 hectares in the Inner Terai. A small decrease was reported for the Western Terai, and nominal increases for two other regions (see Table 13).

Table 13.--Nepal: Area under major crops, 1964/65 and 1971/72

Crop	1964/65	1971/72	Change from 1964/65 to 1971/72	
			1,000 hectares	Percent
Paddy	1101	1202	101	9.2
Maize	437	437	0	---
Wheat	100	240	140	140.0
Millet	100	115	15	15.0
Oilseed	108	111	3	2.8
Jute	32	60	28	87.5
Potato	29	51	22	75.9
Barley	24	28	4	16.7
Sugarcane	9	15	6	66.7
Tobacco	8	9	1	16.8
Total	1948	2268	320	16.4

Wheat and paddy area has increased the most; wheat, jute, potato, and sugarcane have the fastest rates of growth in area. Paddy, maize, and wheat are the three main crops, accounting for about 83 percent of the area listed above in 1971/72.

The area in food crops (paddy, maize, wheat, barley, millet, and potato) has moved up each year but the rate of increase has dropped off since 1969/70 (see Table 14).

Table 14.--Nepal: Food and cash crop area, 1964/65 through 1971/72

Crop	1964/65	1965/66	1966/67	1967/68	1968/69	1969/70	1970/71	1971/72	1971/72 over 1964/65
	1000 hectares	1000 hectares	1000 hectares	1000 hectares	1000 hectares	1000 hectares	1000 hectares	1000 hectares	Percent
Food...	1791	1839	1846	1928	1970	2016	2047	2073	15.7
Cash...	157	149	147	164	168	177	184	195	24.2
Total...	1948	1988	1993	2092	2138	2193	2231	2268	16.4

Oilseed area dropped in 1965, remained at the lower level for 3 years and then started to rise, but exceeded the 1964 level only by 1971. The other three cash crops (sugarcane, jute, and tobacco) have all made impressive gains in area.

Even though the rate of growth in area used for cash crops exceeded that for the food crops, over 91 percent of the total was in the latter in 1971/72, only a small decline from the 92 percent share in earlier years.

Yields:

Yields apparently were lower in the early 1970's than in the mid-1960's for most crops. Food crop yield dropped in 1966/67 and again in 1967/68, partially recovered in 1968/69 and again in 1969/70, but then dropped again in 1970/71 and 1971/72. The 1971/72 yield was about 7 percent below that for 1964/65.

Barley yield is reported at 15 percent below the 1964/65 level for the last 3 years. Millet yield apparently has improved recently. Potato yield, however, dropped sharply in 1967/68 and remains at the lower level. The yield pattern for paddy, maize, and wheat is shown on Charts 1, 2, and 3.

Chart 1.--Nepal: Paddy area, production and yield

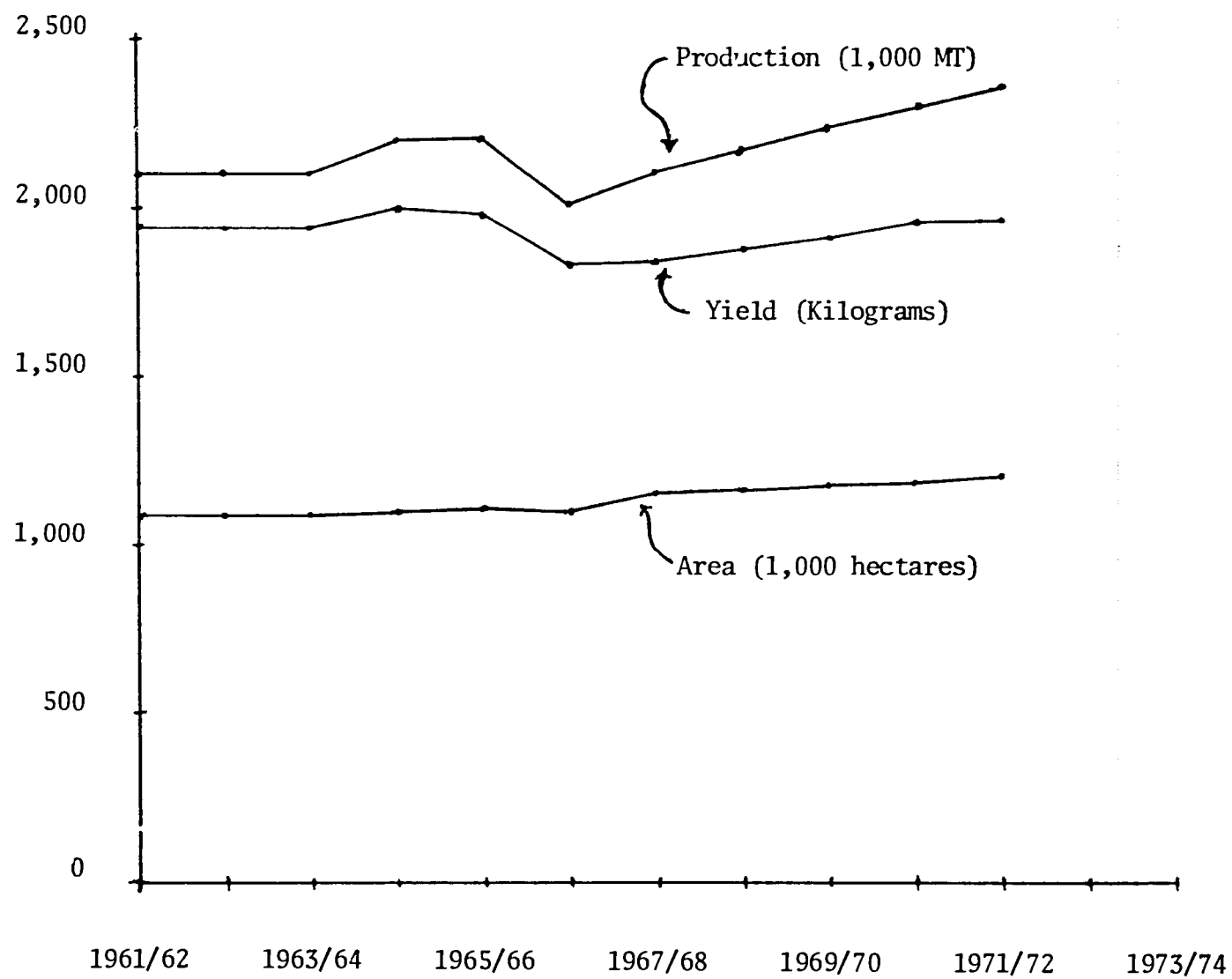


Chart 2.--Nepal: Maize area production and yield

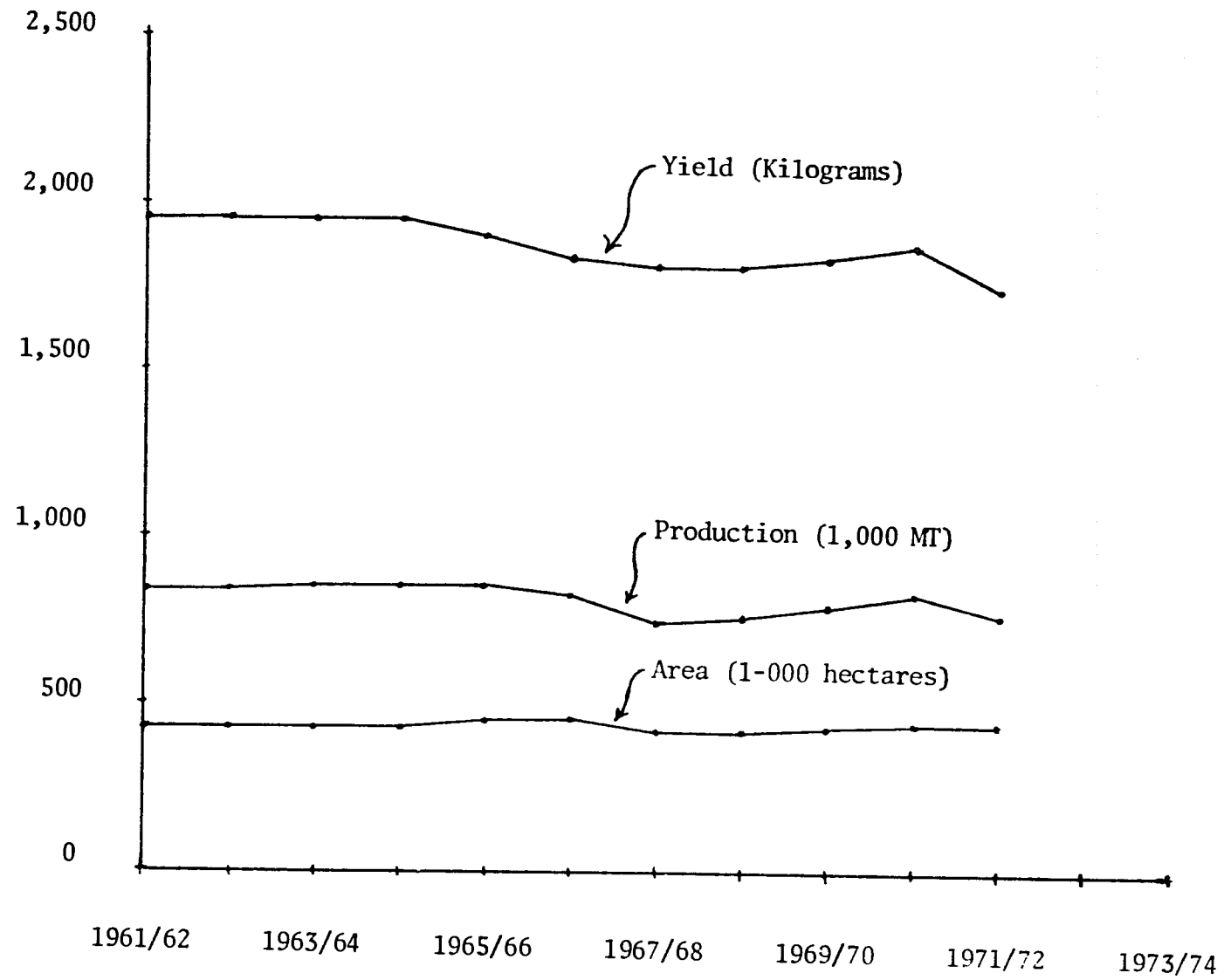
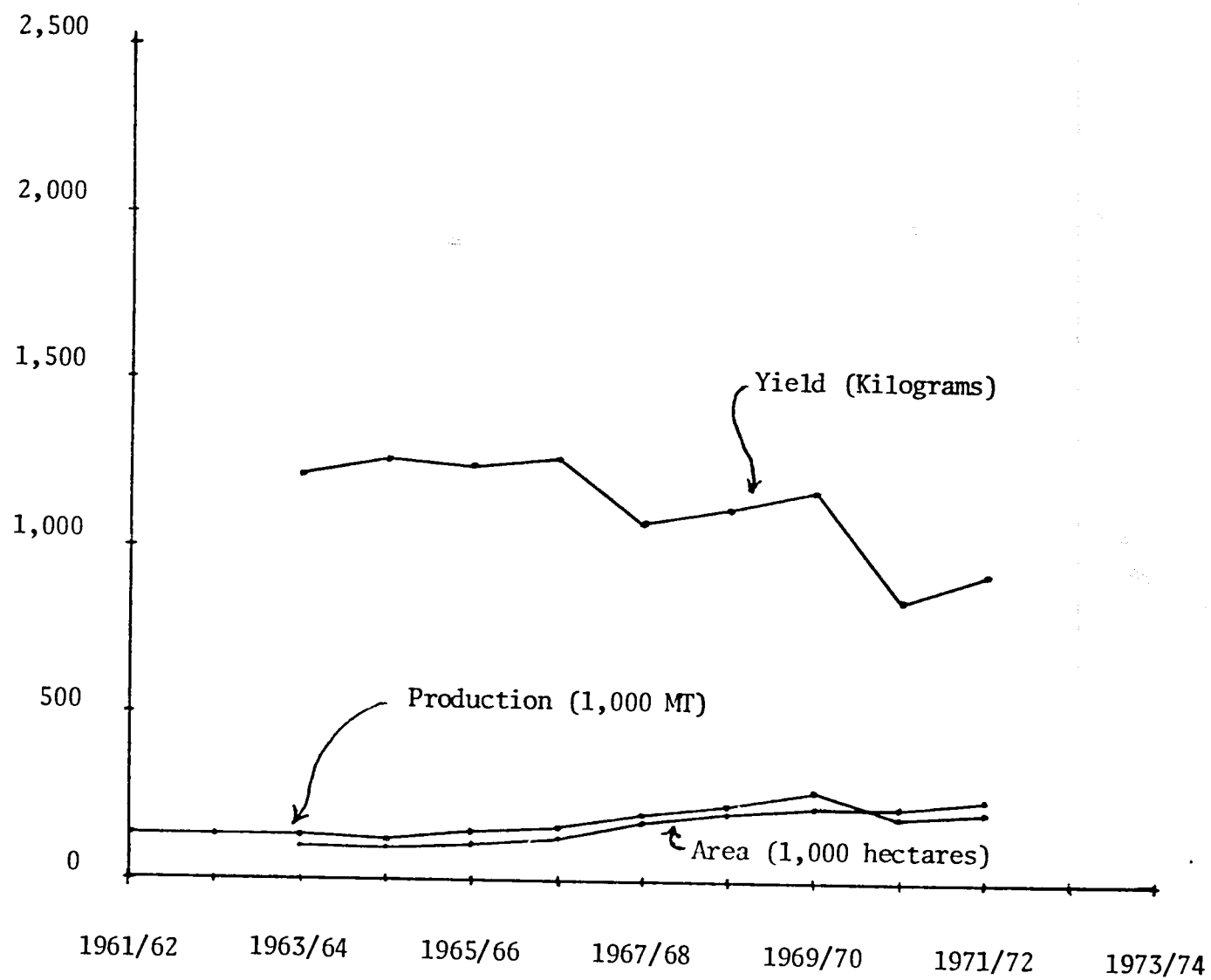


Chart 3.--Nepal: Wheat area, production and yield

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Sugarcane yield shows a definite upward trend even though the preliminary estimate for 1971 is below the year earlier level. The tobacco and jute yields show no consistent trend over the last 5 years, but the recent year yields are reported to be significantly below those of 7 or 8 years ago. Oilseed yield has varied from a low of 517 kg. for 1971/72 to a high of 571 kg. per ha. in 1966/67.

The reasons for the reported yield pattern are unclear. The districts with resettlement programs recorded the fastest rate of gain in yield from 1961/62 to 1968/69 but, even in the latter year, yields in these districts remained below those termed intensive agricultural districts or even the remaining "non-intensive" agricultural development districts. Bringing new land into production that initially yields far less than older land partially explains the lower average yields in recent years. Weather is another factor. The monsoon apparently was weak in 1966 and 1967 and this could explain the drop in yields. But it is surprising they could not move up to the earlier level by the late 1960's. The reported large drop in yield for most crops in the mid-1960's raises a question about accuracy of reports. It appears the development programs have not significantly increased grain yields so far. Actually, only a relatively small area has benefited from these programs.

Production:

The target for the Third Plan (1965/66-1969/70) was a 15 percent increase in food grain production. According to HMG estimates, food crop production (paddy, maize, wheat, barley, millet, and potato) was 3.354 million metric tons in 1964/65. Five years later, in 1969/70, food crop production was estimated to be 3.493 million tons -- an increase of 4.14 percent. This works out to a simple annual average increase of 0.83 percent. Furthermore, the 5-year average food crop production was 3.335 million tons, slightly less than was available in 1964/65. The preliminary estimate for 1971/72 is a food crop production of 3.539 million tons, an increase over 1969/70 of 1.3 percent, for an annual rate of about 0.6 percent.

Production of the three major grains in 1964/65 was reported to be 3.181 million metric tons. In 1969/70, it was 3.301 million tons, an increase of 3.8 percent and equivalent to an annual average increase of only 0.7 percent. Since 1969/70, the increase is even less -- less than 0.6 percent a year.

The area, yield, and production record for paddy, maize, and wheat is shown on Charts 1, 2, and 3.

Paddy

Paddy production in 1971/72 was higher than for any of the preceeding 7 years. Yields have steadily increased since 1966/67 but still remain below the 1964/65 or 1965/66 levels. Even though the yield is below that obtained in earlier years, area has increased sufficiently to more than offset the yield decline.

Maize

Maize production was low in 1971/72 apparently due to excessive rainfall which prevented farmers from planting intended area and also reduced yield from the area they were able to plant. Maize area has been quite stable -- the 437,000 ha. for 1971/72 is the same as reported for 1964/65, an area lower than for 1965/66, 1966/67, and 1970/71 but above that reported for the 3 other years of the series. The maize yield is lower in 1971/72 than for any preceeding year and even the yield for 1970/71 at 1869 kg. per ha. was below the yield obtained in 1964/65 and 1965/66.

Wheat

Wheat production rose sharply from 1964/65 to 1969/70, then dropped off sharply in 1970/71 and partially recovered in 1971/72. Area has increased every year but the yield shows a distinct downward trend. Since 1967/68, the increase in area has been slower than for earlier years.

Sugarcane, Jute, and Tobacco

Production of sugarcane nearly doubled from 1964/65 to 1971/72. Jute production also increased sharply but oilseed production remained relatively stable. Tobacco production apparently declined nearly 25 percent.

Other Production Information

Nearly 80 percent of the paddy, 30 percent of the maize, and 45 percent of the wheat is produced in the 20 Terai districts. Yields are higher in the Hills and Mountain districts than on the Terai, especially for paddy and wheat but also in most cases for maize.

The pattern of production for the three major grains varies sharply within Nepal. Maize is the major grain produced in the Hills and the Mountains, except for the Western Mountains where wheat ranks above the other grains. Rice is by far the major Terai crop (see Table 15).

The change in food grain production from 1967/68 to 1971/72 varied significantly among the sub-divisions of the four major regions (see Table 16).

Although the Table 16 comparison may be distorted due to differences in the adequacy of the monsoon in the 2 years of concern, the major gains in food grain production have clearly come from the Terai.

GROSS DOMESTIC PRODUCT

In the final analysis, it is the aggregate output instead of the immediate output that measures the net result of development efforts. Gross domestic product (GDP) is estimated to have risen from Rs. 5.89 billion in 1964/65 to a provisional Rs. 9.45 billion for 1969/70, an increase of Rs. 3.56 billion in 5

Table 15.--Nepal: Percentage distribution of edible food grain production for sub-regions of Nepal

Sub-region	Paddy	Maize	Wheat
	Percent		
Eastern Mountains	10	83	7
Eastern Hills	30	67	3
Eastern Terai	93	3	4
Central Eastern Mountains ...	22	69	9
Central Eastern Hills	38	47	15
Central Eastern Terai	75	18	7
Central Western Mountains ...	12	67	21
Central Western Hills	33	61	6
Central Western Terai	72	16	12
Western Mountains	31	27	42
Western Hills	26	53	21
Western Terai	66	27	7
Nepal	59	32	9

Table 16.--Nepal: Percentage change in edible grain production, 1967/68 to 1971/72

Sub-region	Percent change
Eastern Mountains	0.8
Eastern Hills	2.1
Eastern Terai	8.9
Central Eastern Mountains	9.7
Central Eastern Hills	6.0
Central Eastern Terai	25.6
Central Western Mountains	6.0
Central Western Hills	5.0
Central Western Terai	52.6
Western Mountains	4.7
Western Hills	2.1
Western Terai	16.8
Nepal	7.8

years. This represents a 60 percent increase or an average annual increase of 9.9 percent per year. But most of the rise in GDP was due to price rises. In constant terms, GDP rose from Rs. 5.893 billion in 1964/65 to Rs. 6.539 billion for 1969/70. And this is a 5-year increase of Rs. 646 million, an average annual increase of 2.1 percent per year.

The agricultural sector is by far the most important contributor to GDP. About two-thirds of GDP originates in the agricultural sector. Agriculture's contribution is slightly smaller in constant prices than current prices because non-agricultural product prices are rising slower. In the future, the share contributed by agriculture can be expected to decline relative to faster growing sectors.

Ownership of dwellings is the distant second most important contributor to GDP, followed closely by cottage industry. Manufacturing, wholesale and retail trade, and services follow.

The fastest growing sector in relative terms, but extremely small, is public utilities (275 percent increase in money terms from 1964/65 to 1969/70), followed by manufacturing (235 percent increase), public administration and defense (143 percent increase), financial institutions (86 percent increase), transport, communications and service (85 percent increase), agriculture (68 percent increase), cottage industry (67 percent increase), and services (50 percent increase).

Within the agricultural sector, the contribution to GDP arises mainly from grain production. The distribution of the 1968/69 contribution was:

Agricultural crops	-	75 percent
Livestock products	-	18 percent
Commercial crops	-	6 percent
Forestry income	-	less than half of one percent

POPULATION

The population was essentially stable over the first three decades of the 1900's, but increased sharply since the 1930's, although the precise growth rate is in doubt (see Table 17). The Food and Agriculture Organization (FAO) of the United Nations placed the 1955 population at 8.42 million. FAO estimated the annual growth rate at 1.9 percent per year from 1955 to 1960 and 1.8 percent per year from 1960 to 1965 and 1965 to 1970. IMG uses a population growth rate of 1.81 percent for 1966-71 and projects a 1.95 percent rate for 1971-76.

The preliminary population estimate for 1971 has recently been revised, from 11.3 million to 12.0 million. The preliminary estimate indicated a 20 percent increase in population from 1961 to 1971. The revised estimate indicates a 27.5 percent increase in population. This implies an annual growth rate of 2.47 percent per year. Population must have grown faster during the last half of the 1960's than the gross domestic product, and therefore the GDP on a per capita basis declined slightly. Population growth has been much faster than food production.

Table 17.--Nepal: Estimated population for selected years

Year	Million people	Year	Million people
1920	5.57	1952	8.47
1930	5.53	1961	9.41
1941	6.28	1971	12.00

FOOD BALANCE

The Economic and Planning Division (EAPD) of the Ministry of Food and Agriculture has made estimates for 1970/71 of the food supply and demand position for each district. After making deductions for seed and animal feed use, and for loss due to insects, pests, and milling, EAPD concludes edible cereal grain production was 2.21 million metric tons for 1970/71. They assumed annual cereal grain requirements to be 190, 160, and 140 kilograms per person for those living, respectively, on the Terai, in the Hills, and the remote Hill areas. These assumptions gave a national average requirement of 170 kilograms per person. At these rates, a population of 11.29 million would require 1.92 million metric tons, leaving a net surplus of 294,000 metric tons. However, a population of 12.0 million would require 2.04 million metric tons, leaving an excess over domestic requirements of only 172,000 metric tons.

Given the food consumption pattern of the Nepalese, to reach the FAO/WHO Expert Committee's minimum level of 2,223 calories for Asia and the Far East, annual cereal grain consumption would have to be 190-200 kilograms per person. To insure the minimum for each person, the national average would have to be well above the 190-200 kilograms per year.

If the edible cereal grain supply was 2.21 million metric tons for 1970/71 and if population was 12.0 million, the per person supply was only 184 kilograms per year, well below the minimum level. Either the supply estimate is too low, the population estimate too high, or many were consuming a diet below the minimum standard, especially since some grain was exported.

EAPD assumptions, when applied to the 1965/66 cereal crop, lead to an estimated edible cereal grain supply of 2.14 million metric tons in 1965/66 (only 71,000 metric tons below the 1970/71 amount). If the population then was around 10.5 million, the per person supply of cereal grain was 204 kilograms. This implies a reduction in the cereal grain supply of 20 kilograms per person over a 5-year period, and a shift during this time from an excess to a deficit position according to minimum nutritional requirement. Per capita food supply has clearly declined over the past several years. Tight supplies should exert upward pressure on retail food prices, and cereal exports should be declining or food imports rising.

FOOD PRICES

Retail prices appear to have changed direction around 1968. Food crop production for 1966 was 6.5 percent below 1965, but the 1967 and 1968 crops were 2.1 and 3.5 percent above the preceding year. The 1969 crop was nearly 4 percent above 1968 but since 1969 the annual increase has been small (see Table 18).

Table 18.--Nepal: Changes in the retail prices for 1965 to 1968 and 1968 to 1971

Commodity	Years	
	1965-1968	1968-1971
	Percent -----	
Eggs	- 1.8	10.5
Mutton	- 7.1	15.6
Buffalo meat	-13.6	3.1
Pork	-10.8	21.9
Chicken	-11.8	32.1
Milk	- 2.1	17.6
Ghee	9.9	6.2
Jute	-20.4	30.8
Tobacco	- 4.1	24.3
Mustard oil	- 1.5	7.0
Paddy (course)	7.7	4.8
Rice (course)	12.9	3.2
Paddy (fine)	3.6	2.7
Wheat	24.3	-13.5
Maize	2.4	- 0.5
Potato	-10.0	18.5
Sugar	14.7	- 3.7

Meat, poultry, and livestock product prices were reported to be declining from 1965 to 1968, but since then they have risen quite rapidly. The price of ghee is the exception, having risen over both time periods.

Cash crop -- jute and tobacco -- prices declined from 1965 to 1968, and then rose rapidly.

Paddy and rice prices have risen over both time periods, but wheat prices dropped considerably, after rising sharply from 1965 to 1968. The maize price has been relatively stable, rising slightly from 1965 to 1968, and then declining by a very small amount from 1968 to 1971.

Potato and oil prices have followed the pattern observed for most non-grain foods, declining from 1965 to 1968, and then increasing from 1968 to 1971.

The price of every item in Table 18, except buffalo meat, was higher in 1971 than in 1965. The net price rise, however, has been moderate, mainly in the 10-15 percent range over the 6 years. The price pattern varies by commodity, reflecting changes in the supply of the various commodities at times, but the net change in price from 1965 to 1971 has been remarkably similar for all the items. However, food prices were reported to be moving up rapidly this summer.

Food grain prices vary significantly within Nepal. The price is higher in the Hills than on the Terai. In some places, the price in the Hills is twice as high. But generally in the Hills, paddy is 30-50 percent higher, rice 20-25 percent higher, wheat 10-20 percent higher, and maize 25-40 percent higher than on the Terai. The rice price has a 5-10 percent variation within the Terai, and 35-40 percent within the Hills. Maize price shows a 90-100 percent variation on the Terai and 35-50 percent among the Hills. The paddy price is lowest in the Western Terai. There, and in the Central Terai, the price is very close to the price in India. But the Indian price for paddy is well above the Eastern Terai price. Exports of paddy through customs in 1969 was mainly from the Western Terai (8,500 metric tons from the Western Terai and 1,500 metric tons from the Eastern Terai).

FOREIGN TRADE

The total reported value of exports for 1968/69 was Rs. 567.8 million; imports were Rs. 744.3 million. More recent data were not available. Ten years earlier, exports were Rs. 117.9 million and imports Rs. 223.4 million.

The major export items are food, inedible raw materials, and manufactured goods. Over the 10 years, the largest increase was in food exports, but the rate of growth was higher for manufactured goods and inedible crude materials.

The main import category is manufactured goods. The balance of trade on manufactured goods is greatly in favor of the importers. Food ranks second among imports but here the balance continues to favor Nepal. Other important imports are machinery and transportation equipment; minerals, fuels, lubricants, and related materials; chemicals and drugs; and inedible raw materials. The balance of trade for these categories is favorable to Nepal only for inedible raw materials. The increase in imports over the 10 years was the largest for manufactured goods. The rate of growth has been high for machinery, transportation equipment, chemicals, drugs, fuels, and lubricants.

India is by far the largest trading partner. For 1966/67, 96 percent of the exports were to India. About 1.3 percent of both imports and exports were with Tibet (China), leaving only 1 percent of exports and a bit over 2 percent of imports to or from all other countries.

Paddy or rice is by far the largest food export item; maize is a distant second. The import and export data used for these comparisons end with 1968/69. In view of the low rate of growth in food production and the high rate of population growth, it seems reasonable to assume food exports have declined. And

since they were a major component of total exports, the gap between exports and imports that had already been growing must have widened appreciably since 1968. In this year, with food supplies so short that imports of PL 480 grain are required, the gap grows rapidly because food exports drop at the same time food imports rise.

The long term outlook is for a faster rate of growth in imports than in exports because the exports are mainly raw materials (primary products) and imports are mainly processed products. The demand for the latter will grow faster than the former.

DEVELOPMENT PROBLEMS

Current discontent over Nepal's rate of development stems from these basic trends:

1. The population is growing rapidly, and at a rate considerably above that assumed when structuring development plans, deciding upon program priorities, and allocating funds to programs.
2. Gross domestic product is growing, but, in real terms, at a slower rate than population and, therefore, the real income per person gradually declines.
3. Food production is growing but very slowly and at a rate far below the rate of growth in population.
4. Food requirements are growing far faster than food supply, leading to a moderate increase in food prices and a rapid decline in the exportable surplus.
5. The unfavorable balance of trade is becoming more so, as the gap between exports and imports continues to widen.
6. Government expenditures are rising faster than revenues, and foreign aid no longer makes up the gap between them.

There are also other problems the trends fail to highlight. These problems are associated with foreign assistance, program priorities, the development strategy, and the system for planning and managing the development process.

FOREIGN ASSISTANCE

A relatively large share of the development effort has been financed by foreign assistance. The problem is that foreign aid to Nepal is subject to greater leakage than in nearly any other country. Technical assistance, equipment, and material usually are imported and even labor has been imported to a high degree. The funds for imported equipment and material flow to the importing country, mainly India in this case, and the multiplier starts to work there. Funds for manpower imported from outside Nepal are expended in part in Nepal

but the excess over day-to-day living expenses tends to flow to their home country. Since most of the funds flow out of the country, the payoff from foreign assistance has to come mainly from the use of the infrastructure and the performance of the organizations and institutions created through foreign assistance.

The fact is that much of the infrastructure has not been used, at least not effectively. So many institutions and organizations have been created, some for essentially the same task, that inefficiency, duplication, and lack of staff strongly reduces effectiveness. In other cases, the institutions forced on the Nepalese simply did not fit the system.

PROGRAM PRIORITIES

Priority has been given to the development of infrastructure in Nepal. A large proportion of the funds for "bricks and mortar" have come from outside Nepal. The decision to allocate such a large proportion of available resources for the development of infrastructure and such a small proportion for the use of infrastructure is a problem the Nepalese recognize but have a difficult time correcting. In part, this is due to an inadequate capacity to conduct the analyses needed to back-stop development plans and, therefore, aid donors have been able to push through projects and programs that "fit" their partial analyses and political objectives.

In addition, program priorities are heavily influenced by the magnitude of and constraints on foreign assistance. Foreign governments frequently find financing visible things more appealing than the invisible. In many cases, aid donors can cover the foreign exchange component of a project but not the local currency costs. Thus, the Nepalese have to rely mainly on their own manpower and financial resources to repair the roads, develop water distribution systems, and operate the plants, factories, institutions, and organizations created through foreign assistance. It seems highly unlikely that the present program priority scale could be justified by cost effectiveness analyses or would be maintained if financial assistance were programmed more by Nepal.

DEVELOPMENT STRATEGY

The development strategy adopted in Nepal is to concentrate upon selected geographic areas, sub-sectors of selected sectors, and sub-groups of selected groups. The short term payoff was promised to be higher under this strategy. But the expected short term payoff did not generate enough soon enough to permit mounting other efforts that would distribute benefits more widely. Rather, the net effect of the efforts have added up to a growing disparity from one geographic area to another. Even within areas, the gap has widened. There are large areas where development programs have yet to come. Almost all of the development funds and assistance have been allocated to selected urban areas and to the Terai. Some sectors of the economy have received very little assistance, and usually it has been those with the highest income that are helped first with credit from the Agricultural Development Bank or advice from the Extension Service.

The relatively poor crops in the Hills in recent years have fueled the gradually growing discontent with development. Political unrest has become more evident. Unless the program strategy is changed, one can expect those in areas where assistance is not being provided to continue to become more discontent and to express their dissatisfaction through the political system or whatever other avenue they can use to bring pressure to bear.

PLANNING AND MANAGING THE DEVELOPMENT PROCESS

There has been too little planning from the bottom up; too much from the top down; and too little planning to guide program operations. Seldom can one find a functional planning unit with responsibility for planning program operations. The task of scheduling inputs and output flows according to a rigorously defined time path and regularly reporting on program performance does not appear to be standard operating procedure.

Those with responsibility for managing development programs tend to have relatively little training in program management and very few staff resources that know how to provide them with the kind of information needed for day-to-day management. A related problem is the separation of authority and responsibility. The responsibility for program performance is assigned to one official and the authority for the release of manpower, money, and materials rests with other officials.

Most of the planning has been associated with the formulation of development plans. This has been mainly a Kathmandu activity. The major barriers to development must vary considerably from one part of Nepal to another. And the set of development programs that "fit" one geographic area must, therefore, be quite different from the best package of programs for another area. But unless there is a regional framework within which planning takes place, the chances are good that no geographic area will have a set of programs in operation that is "optimum."

At the present time, the Planning Commission does not appear to have the analytic resources to formulate detailed development plans that adequately take into account regional differences.

DEVELOPMENT PROBLEM PRESCRIPTIONS

The King has taken several actions to begin resolving these development problems. Major ones are:

1. Revised development plans are being forged for the major sectors.
2. Development expenditures are to be accelerated faster than regular expenditures, even if it means spending cash balances.
3. Future development plans are to give priority to the Hills.

4. The regional framework for development planning and management has been adopted and is to be implemented.
5. The number of organizations are to be reduced and their charters revised to make them explicit.
6. Organizations are to be reorganized so that they can better assist the development process.

These all appear to be steps in the right direction, but it will take time to implement them. The revised development plans will have to be translated into programs and resources will have to be allocated.

HMG expenditures are programmed to increase, but the increase is for roads and irrigation. If the revised development plans are in fact revisions, they apparently will not be funded until 1973/74 or later. The 1972/73 budget suggests resources are still being programmed largely in line with the availability of foreign assistance. Irrigation provides an illustration. Funds for water development continue to flow into Nepal while funds for water use and management have been in short supply. Clearly, the short term payoff from investing in distribution systems to bring water to the fields and to teaching farmers how to use and manage surface and sub-surface water would be higher than further investments in water development. At present, there are very few who know how to design an effective water distribution system, level land, and manage the flow of water on cropland.

The near total absence of development programs in the Hills means there will be a time lag before the new emphasis takes hold. Organizations have to open branches, reassign staff, and obtain buildings, facilities, equipment, and materials before they can operate. But, perhaps of even greater importance, the relative lack of experience in working on Hill problems means HMG is not well prepared to move in with effective programs. Moving too quickly means poor plans and mainly a trial and error approach; waiting for experimentation may mean waiting too long for results.

It is one thing to decide to adopt a regional frame for planning and managing the development process, and quite another thing to implement that decision. It will take years for the regional offices to get into a position where HMG can fully plan and manage programs at the regional level. Several key decisions remained to be made this summer. For example, it was not clear if the chief coordinator at the center and at each region would be the most capable public servants or if seniority and politics would have to dictate the choice. Nor was it clear if responsibility and authority would rest with the same person or even be at the same level (i.e. authority could remain in Kathmandu and responsibility at the regional headquarters). Authority should be delegated to the chief regional coordinators. They, in turn, would redelegate these authorities to those with responsibility for development programs in order to prevent a continuation of the problems that arise because responsibility and authority rest with two different organizational units. Apparently, plans had not been made and no action taken to provide for sufficient office space, officer quarters, schools, hospitals, clinics, and the other infrastructure necessary to implement the regional strategy.

Combining the Land Reform Savings scheme with the Agriculture Development Bank also makes sense. But, in early September, the savings scheme resources were still not available to the ADB, apparently due to a controversy over the need for broader legislative authority. Someone of sufficiently high stature needs to be able to resolve these issues quickly. If new legislation is needed, it should be obtained without delay.

The merger of the Agricultural Supply Corporation and the Food Management Corporation also seems to be a very good decision. But the Agriculture Marketing Corporation will need firm support from HMG to be able to live up to its potential, particularly in the politically sensitive area of supporting prices at the farm level and in managing food supplies.

The pace at which the Agriculture Marketing Corporation and the Agriculture Development Bank will be permitted to expand by the Nepal Government will essentially determine the rate of growth in agricultural development. There simply is no higher priority for the Government than to see to it that these two organizations have every opportunity to expand quickly and to have bureaucratic road blocks removed in a timely manner.

Reorganization plans for research and extension were still on the drawing board. Several alternatives were under consideration:

1. An organizational structure tailored to the regional approach to development planning and management.
2. A crop-dominant organizational structure geared to the international crops research structure that has its focus on individual crops.
3. A discipline-dominant organizational structure similar to the present one but with minor modifications.

The present research and extension organizational structure is essentially a product of foreign aid. Examples are:

1. The Extension Department has the responsibility for food grains which parallels the program of assistance from USAID.
2. The Horticulture Department, a by-product of Indian assistance, has responsibility for horticulture research and extension.

Thus, at the present time, there is an Extension Department but its scope does not extend to all crops and livestock. Similar confusion exists with respect to research, making it unnecessarily difficult to operate an efficient program of research and extension.

The alternative reorganization plans were mainly of two basic forms. One would reorganize the Ministry so that there would be a research division, an

extension division, an economic planning and analyses division, and perhaps a marketing division. The small scale irrigation unit now in the irrigation department could come back to the agriculture department under this plan. The horticulture, engineering, and livestock sections would be abolished and the functions picked up under research or extension. This reorganization could be made no matter what happens with respect to the discipline-dominant or crop-dominant organizational form at subsequent levels.

The other plan would have research organized along crop and livestock lines, with each crop or livestock backed by an interdisciplinary team of specialists. A national research center would be designated for each major crop or livestock type and each center would have satellite field testing stations. The satellite field testing stations very likely would be used by more than one center. And each center would become a satellite center for other major centers. The central laboratory facilities would remain at Kathmandu.

The latter organizational structure could lead to a very short chain of command that should improve effectiveness. For example, the line of authority could go from the director of research straight to the head of the national maize research center, and from him to team members. A crop-dominant organizational structure for research is generally felt to be more effective than a specialist-dominant structure, but the former requires more manpower. And since trained manpower may well be the most limiting constraint in Nepal, caution will have to be taken in redesigning the system to make most effective use of the available skilled manpower.

While these prescriptions should, given time, lead to better development plans, a more realistic set of program priorities, more efficient organizations, better program management, and a better distribution of the benefits from development, they are not likely to attack the major program problems soon enough and with sufficient vigor.

The major development problems arise from the rapid rate of growth in population and the slow rate of growth in food production. Top priority will have to be given to these problems.

But even under the best of circumstances, the rate of population growth cannot be curbed quickly. The rate appears to be increasing, the capacity to provide family planning services is limited, and the task of motivating the people to adopt the small family norm has not even started in much of the country. Nevertheless, the rate of return on funds invested to prevent births will be higher than for any other program and several times higher than additional investment in irrigation and power.

The prospects for a significant rise in food production within the next 2 to 5 years appears more promising than does a significant reduction in the population growth rate. This opinion arises in part out of a belief that the weather has been on the unfavorable side in recent years, but also because the system for providing farm inputs, including technical advice, is in operation and should be able, given proper encouragement, to expand its service capacity quite rapidly. But to turn this opportunity into actual results requires a series of decisions and follow-through action.

The Food Production System:

Yield is a function of weather and the quantity and combination of inputs. IMG cannot control the weather but it can control the flow and use of inputs to a degree. The task of determining the proper quantity of each input at different locations is the responsibility of adaptive research. The responsibility for advising farmers on the optimum package of imports rests mainly with the Extension Service. The responsibility for getting inputs to the farmers has been assigned to the Agricultural Development Bank (credit), to the Agricultural Marketing Corporation (fertilizer, seed, chemicals to control diseases, insects, pests and weeds, tools, machinery, pump sets, and tractors) and apparently to the Irrigation Department. The responsibility for control of funds and manpower rests with other IMG Departments.

It is evident that the system established to pursue food production targets has been structured in a manner that makes effective coordination nearly impossible and that makes it unnecessarily difficult to operate efficiently and effectively. Even so, the present system is less complex than when the Land Reform Savings Corporation, the Agricultural Supply Corporation, and the Food Management Corporation were separate entities.

At the heart of the present system is the Agricultural Marketing Corporation. AMC responsibilities are far greater than for any other organizational unit in the system. It manages the flow of most inputs and the flow of food from surplus to deficit areas. If inputs fail to get to the farmers in the proper quantities and at the right time, the AMC is responsible. If surplus food production in an area drives the price down to the point where farmers fail to produce sufficient food or if the price of food rises too high in deficit areas, the AMC is responsible.

Serious consideration should be given to assigning the responsibility for coordinating the entire food production system to the AMC, and giving its general manager the broadest possible authority for and flexibility in allocating manpower and financial resources.

The ADB and the AMC should operate as one organizational entity. At the proper time they should become one. In the meantime the necessary degree of coordination may be obtained by joint planning, and making sure both serve the same geographic areas, preferably from the same building. These two organizations will be expanding into the Hills; their expansion plan should be carefully coordinated.

AMC should establish soil testing and seed testing facilities for farmers who could be charged for the service.

The Agriculture Development Bank has started making arrangements for providing technical assistance to farmers. At the same time, the Extension Service is having difficulty in keeping good technical assistants on their payroll. It may be advisable to assign the technical assistants to the ADB and make them a part of that organizational structure instead of the Extension Service. Then the Junior Technical Assistants would have a career path; the ADB would have a sales force and a deeper technical assistance capacity; and the Extension Ser-

vice would be free to concentrate on the other important tasks such as massive and needed technical assistance training. However, if this were done, it would be even more important to have the AMC and ADB operating as one organization.

The ADB will have to change its program strategy and probably simplify procedures to fulfill its role. A higher proportion of credit will have to flow to farmers with lower income. Other recommendations from the agriculture credit survey should be given careful consideration, particularly those with respect to granting authority for ADB to take deposits and pay interest on them; to serve as the commercial bank in areas where no such bank exists; and to use commercial banks as ADB's agents where banks exist and ADB does not have facilities.

The output of research is an input into AMC and Extension. The research program should be linked more closely with AMC and ADB in the future. The scope of the present research program should be broadened. Most of the current effort is designed to find the maximum yield seed varieties. And most of the varieties being tested are imported, although local variety trials are found more frequently. The trend toward local variety trials should be accelerated.

Research designed to measure the net gain in yield and income from the proper use of chemicals to control diseases, insects, and pests should be given relatively high priority. They, as well as experiments designed to measure the impact of varying levels of fertilizer, should be quite cost effective.

Research should shift its focus from the highest yield to varieties that are most economic from the farmers' point of view. Trials simulating practices now used by farmers should be conducted.

But perhaps of greatest importance, the research program needs to have a better framework for making decisions on how to allocate research resources. They need to be more closely in touch with the problems the farmers face and they need to give attention to the Hills. Rough cost effectiveness estimates would be useful guides to a research program. And a closer working relationship with ADB and AMC would be mutually beneficial. ADB and AMC should be in closer contact with farmers. They should be responsible for seeing that these problems come to the attention of those concerned with research while the researchers should see as their primary task the resolution of these problems.

In order to move in these directions, people trained in cost effectiveness analyses should be brought into the research system to help both with the design of experiments and in the analyses of results.

HMC institutions should be encouraged to provide training and assistance to ADB and AMC. The Nepal Rastra Bank could provide training and technical assistance to ADB on money management. Extension and research should provide training and seminars on latest findings to employees of ADB and AMC who provide technical assistance to farmers or who have responsibility for purchasing and selling inputs. The Centre for Economic Development and Administration could provide training in fiscal and manpower management for ADB and AMC officers.

Managing Food Supplies:

No matter how effective the IMG system for increasing food production becomes, there will continue to be the need to move the excess food supply from surplus to deficit areas within Nepal and to either manage food imports or food exports, depending upon the degree of success in increasing food production faster than population growth.

Farmers on the Terai must receive a price that keeps grain production profitable. The people in the Hills must be assured of an adequate supply of food grains, at reasonable prices. It may be possible to accomplish these objectives and in the process create the infrastructure for further development progress. At the present time, the gap in grain prices on the Terai and in the Hills appears to be greater than the cost of transportation would justify. If so, AMC and ADB may be able to protect farm prices on the Terai through a purchase and loan program, and then transport and sell the required amount in the deficit areas at a lower price than is now paid but still at a profit. Profits could be used to pay for required storage facilities and to make improvements in the transportation network. AMC has a vested interest in the development of a lower cost transportation system.

As long as the Hills people are preoccupied with grain to assure their food supply, they cannot be expected to seriously consider specializing in farm products for which they may have a long term comparative advantage such as vegetables, fruits, and forest products. But, as they reach the point where they are interested in raising other products, the AMC and ADB should be ready to help.

Additional Development Prescriptions:

There are further actions that should be taken by IMG to encourage agricultural development when the time is right. They include:

1. Investing in means of producing farm inputs instead of importing them as soon as demand projections show it will be feasible to produce them in Nepal. At times, it may be justified to make these investments even before the growth in demand makes them feasible. At the present time, top priority should be given to producing seed in Nepal. It makes little sense to import seed from India. The Nepalese farmers have the capacity to provide this input. Perhaps, second on the list is lime which could be produced in Nepal for use by farmers. Chemicals to reduce losses due to diseases, insects, and rodents probably could be combined in Nepal. Arrangements should be made to work out a cooperative arrangement with India so that scarce foreign exchange need not be used for fertilizer. Or, a fertilizer factory might be constructed in Nepal when (if) demand justifies.

2. Investing in milling, storing, and processing facilities instead of continuing to have serious losses due to lack of adequate storage and the loss of foreign exchange involved in exporting raw agricultural products and importing finished agricultural products. A considerable quantity of flour now is imported.
3. Establishing standards and grades so products can be traded and marketed on an equitable basis.
4. Encouraging the opening of markets where products can be sold at reasonable and fair prices. AMC and ADB should provide financial and technical assistance for this purpose. A relatively small investment can create the infrastructure needed to encourage markets and marketing opportunities.
5. Investing in a distribution system and providing technical assistance so that the available water can be put to use, and a start can be made on developing the capacity to control erosion.

Agricultural development in Nepal can be accelerated in the most cost effective way by spending money to increase the effectiveness of institutions and infrastructure that have already been created.

Development Assistance:

Nepal will likely need to import some grain over the next few years. The feasibility of importing under a Title I PL 480 agreement should be carefully appraised. Public Law 480 prohibits a country from exporting the same commodity that it imports through a PL 480 agreement, but this may not be a serious constraint for Nepal. They could continue to export rice to India and import maize or wheat. A PL 480 agreement would be mutually beneficial.

The price of grain in Nepal is a function of the grain price in India and in the Hills of Nepal. Grain prices in India are supported by the government at a level generally above world prices. The long, open border between Nepal and India makes it impractical, if not impossible, to keep grain from flowing into India from the surplus producing Terai. This year, after 2 years of short crops in the Hills, it was found there could be hunger in the Hills and still grain would be sold to India. In fact, enough grain moved into India to leave Nepal in a net deficit position, a situation which brought about a Title II PL 480 food grant.

Because the Indian support level for grain is above the world market price, Nepal is better off selling grain to India than trying to sell to third countries. Further, Nepal relies heavily upon India for imports of processed and manufactured goods and needs Indian rupees to pay for these imports. Nepal needs to develop a processing and manufacturing capacity and should be encouraged to do so, but for years they will have to export unprocessed farm products and other raw materials to India in order to generate the rupees needed for trade.

Indian rupees are no longer available to finance U. S. aid-supported agricultural projects in Nepal. Future projects will have to be dollar-funded unless Nepalese rupees can be generated or India changes its present position. The probability associated with the latter alternative is quite low.

The Agricultural Marketing Corporation is responsible for supporting the price of food grains at a level that will encourage Nepalese farmers to adopt modern farming practices. This directive will have to be implemented by AMC purchasing grain from farmers in surplus producing areas of the Terai. The purchase price will have to be carefully geared to the price offered Indian farmers across the border by the Government of India.

Given this situation, it appears that Nepal should:

1. Continue to export paddy to India, even if doing so leaves them in a deficit position with respect to food grains.
2. Obtain maize or wheat for the Hills from the United States under Title I of PL 480 on the softest possible terms.
3. Authorize AMC to move grain purchased in surplus areas either to the Hills or into export position for sale to India.
4. Sell the PL 480 grain to AMC which would be directed to move it on an identity-preserved basis into position for sale in deficit Hill areas.
5. Carefully determine the priority scale for the use of grain sales proceeds.

If these steps were taken, Nepal would be able to continue to generate Indian rupees that would be needed to purchase goods from India. Farmers in surplus producing districts would receive a price that would continue to encourage them to adopt modern farming methods. People in deficit areas would have an assured supply of food grains at a reasonable price, one that is lower than at the present. Nepal would generate rupees for development projects at a rapid rate. The future growth of AMC and ADB could be financed at minimum cost. And the cost of development assistance in Nepal from the United States Government would be lower than under dollar assistance, as the United States Government would save the cost of setting aside some of its excess grain acreage.

Agricultural development assistance opportunities will likely cost more than Nepal can afford. A Title I PL 480 agreement could generate the rupees needed to fund several high priority projects. Each ton of maize should bring Rs. 1,000 or more in sales proceeds -- 20,000 tons in a year would generate Rs. 20 million. But it is of major importance both to Nepal and the United States that the proceeds from PL 480 grain be assigned to development projects before shipments occur. The priority scale for these funds should be in line with the priorities indicated for agricultural development in Nepal on the previous pages.

HMG must make sure that AMC and ADB have first claim (along with family planning) on development resources. These organizations should have all the resources they can efficiently administer and effectively absorb.

The ADB has the need for a revolving fund. The fund may be available from the Rastra Bank or the Asian Development Bank. This is an opportunity to explore. If U. S. assistance is required, it may be advisable to restrict these funds to agricultural production and marketing purposes and to prohibit their use to finance large tractors.

For several years, the chief of the Food and Agriculture Division/USAID served as an adviser to the Board of Directors of the Agricultural Development Bank. It is essential to keep at least this level of involvement with the ADB. This is a top priority technical assistance task.

The AMC needs financial assistance for food storage facilities. AID may want to fully explore this opportunity for assistance, as it would be a natural for PL 480 grain proceeds.

The AMC needs technical assistance in food management operations; input supply operations; and operational planning (information system, pricing policy analyses, market surveys, and marketing strategy). A person from the Commodity Operations Division of the Agricultural Stabilization and Conservation Service, U. S. Department of Agriculture, or from the U. S. grain trade should have the experience needed for grain management. The person to provide technical assistance on input supply operations could be found in a private corporation or a farm cooperative. The person to work on operational planning should have formal training in economics and business management together with experience in corporate planning or program planning for a relatively large organization.

Due to their extreme importance for the future of Nepal, priority should be given to the financial and technical assistance needs of the AMC and ADB. Remaining available assistance could very profitably be used to help accelerate the research effort in the Hills and make it more relevant to Nepal's problems.

Work on water use and management on the research farms has hardly started. This should have the highest priority under the present program of assistance. Water use and management specialists should continue to be provided. At present, there are practically no trained engineers in water use and management. The engineering section in the Department of Agriculture has recently employed about 35 junior engineers and this provides the opportunity to begin developing a capacity in this important area. This is a particularly important area and would help the department gear up for important erosion control efforts over the longer term.

A statistician/economist is needed to provide technical assistance to those with responsibility for designing and appraising research experiments. In addition, a well trained, but junior, agricultural economist could be fully employed in Nepal. There are many issues that need an input from an economist along with the input from other specialists as they move forward for decision. At the present time, there is a great shortage of economic analysts. An example this summer was the \$2.5 million loan from the Asian Development Bank for

tractors and pumpsets. A tender had been issued and a group assigned the task of recommending the make of tractor. They could not find a person trained in economics to help them in the analyses necessary to guide and support their recommendation.

The need for additional manpower in research and extension is unclear and will remain so until after the reorganization proposals are sorted out and implemented. The Rockefeller Foundation may fund a team of specialists provided from an International Crops Research Center.

Manpower training will continue to be an area of major need and plans probably should include a person to work with the Extension Service in this area. However, the need for this position is not yet clear.

Grain storage, milling, processing, and marketing of farm products is another high priority area that should be carefully watched but may end up being adequately serviced by UNDP/FAO and other foreign assistance agencies.

FAO is providing technical assistance on tobacco and cotton and has plans to add sugar and oilseed experts. There are others also interested in helping Nepal with cash crops but this also is an area where there may be an opportunity and need for assistance from USAID.

APPENDIX

A Digest
of Selected
Reference Materials
on
Nepal

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DEVELOPMENT PLANNING

1. Rice, E. B., Farstad, E. H., Harris, W. T., and Thorne, M. D., An Appraisal of USAID's Present Program and Future Options for Agricultural Development in Nepal. November 30, 1971.

Concludes that the current USAID program "should be supported without reservation," but recommends development of agricultural research and extension services to food grain farmers on the Terai to improve the program. The program alternatives discussed were: shifting out of field work and establishing a team of subject matter specialists in Kathmandu; concentrating on surface and subsurface water use and development in the Terai; shifting the focus to regional development of the Western Terai; building a program for the Hills (several variations are briefly outlined); or developing an integrated Western regional development program. The team leaned toward the latter alternative but made no firm recommendation.

2. Sakiyama, Teruji, Evaluation of Third Plan Agricultural Performance (1965/66 - 1969/70), Nepal. (Third Revised Draft, Confidential, Internal Use Only). FAO. January 1972, 102 pages.

Documents the expansion in government services, magnitude of external assistance, training abroad of IMG officers, production trends for major agricultural products, and the relatively small share of total IMG expenditures allocated to agriculture. Production of the major cereal crops grew 8.5 percent over the 5 years; the target was a 15 percent increase. Reasons for the low growth rate are detailed. A food balance projection for the 1970's is presented and medium and longer term recommendations made. The former mainly stress the need for economic analyses, planning, and evaluation; the latter stress flood and erosion control, mass agricultural education, and rural transportation development, together with suggestions for resource generation and allocation and the efficiency of man and his organizations.

3. Methodology for the Construction of the Fourth Plan. (It is assumed the Planning Commission prepared the report in 1968 or early 1969, but this is not specified.)

Presents national objectives, policies, and strategies regarding regional development; the private sector; local government; price stability; foreign exchange; subsidies; balanced growth; individual economic freedom; and development corporations and institutions. Discusses bottlenecks to progress in the major sectors and suggests corrective measures.

4. Current Economic Position and Prospects of Nepal, Volumes I and II. Report No. SA-7a (Restricted). South Asia Department, IDA, IBRD, June 26, 1969.

Volume I contains summary and conclusions, a review of the state of the economy, an appraisal of the resource potential, and an identification of development problems and opportunities for the future. A faster rate of

growth in development expenditure is suggested. Problems created for Nepal by relatively unplanned foreign aid are outlined.

Volume II provides basic data on Nepalese agriculture, including soil characteristics, temperatures, rainfall, land utilization, production of farm products, size of farm, livestock and forestry resources, and capital used in agriculture. There are quantitative data on inputs used for agricultural production, marketing patterns, transportation flows, and prices. Contains a description of the agricultural development process, discusses future demand for agricultural output, and outlines some major development problems. Identifies alternative means for reaching production goals and then groups projects into first, second, and third priority. Appendices contain factual data on Nepal.

5. Fort, Raymond E., Agriculture Sectoral Analysis - Nepal. USAID/Nepal. November 11, 1971.

Presents factual data on Nepalese agriculture (land use, agro-climatic patterns, size of farm holdings, yields, area, and production of selected crops), foreign aid to Nepal, the total budget, and the budget and manpower for agricultural development (including specification of projects assisted by external sources). Identifies and briefly discusses agricultural problems (small land units, land tenure under traditional pattern, high land rent, little credit at reasonable rates, too much credit from private money lenders at extremely high rates, cooperatives dominated by traditional leadership, lack of a price support mechanism, inadequate use of available water resources, imported instead of locally-produced inputs, overpopulation in the Hills, primitive transportation facilities, high percentage of illiteracy, lack of valid data, lack of technology for the Hills). Recommends reducing production costs by lowering land rents; removing import duties on farm inputs; and subsidizing the cost of transporting farm inputs. Improvements suggested in the marketing system are collective bargaining by farmers; farm or village storage facilities; and construction of roads and trails. Presents a case for investing in processing facilities and stresses the need for supervised credit. Presents alternatives to the current emphasis on cereal (food) grains -- shift to cash crops; emphasize animal production; stress horticulture crops, vegetable production, or high value items such as flowers and exotic items. The factual data in this paper are largely the same as in Volume II of reference 4.

6. Okada, Ferdinand E., Preliminary Report on Regional Development Areas in Nepal. National Planning Commission, IMG. Singha Durbar, Kathmandu. July 1970, 141 pages.

Identifies four major growth axes -- Biratnagar-Hedangma in the East, Birgunj-Kathmandu in the Eastern Central, Bhairahawa-Jomson in the Western Central, and Nepalganj-Jumla in the West. Identifies potential growth centers within each region. Discusses climate, land use pattern, population, food production, migration patterns, the growth axis, and growth centers. Presents many practical regional development priorities for each region.

7. Cool, John C., The Far Western Hills -- Some Longer Term Considerations. USAID/Nepal. February 1967, 30 pages.

Speaks to the man vs. nature struggle in Western Nepal. The basic problem -- the pressure of population growth on resources -- brings others such as erosion, burning of forests, overgrazing of land, declining soil nutrition and fertility, a perpetuation of traditional agriculture, continued regionalism, communalism and factions, and inadequate preparation for modernism. Contains agro-climatic data, a description of farming patterns, identification of demographic factors, and food deficit estimates. Presents some possibilities for study (migratory labor patterns, resettlement, ghee production, and salt trade) and action (trails, airfields, roads, family planning, reforestation, soil conservation and erosion control, agricultural technical assistance, management training, Hill market centers, and rural public works program).

8. Donner, Wolf, Agricultural Development Problems in the Far Western Terai. FAO. April 1967, 15 pages.

Discusses and makes recommendations on transportation, the agricultural situation, irrigation, resettlement activities, and agricultural training.

9. Schroeder, Mark C. W. and Sisler, Daniel G., The Impact of the Sonauli-Pokhara Highway on the Regional Income and Agricultural Production of Pokhara Valley, Nepal. Cornell University. June 1970, 113 pages.

Reports findings of a joint Tribhuvan University/Cornell University Department of Agricultural Economics research project. Analyzes the economy of the Pokhara Valley before the road changed the traditional pattern of farming and appraises the effect of improved transportation on the regional economy. Survey data are subjected to formal tests of significance and projection models are developed and used in this precise and detailed study. Regional income is estimated for 1968 and projected for 1973 and 1978.

10. Development Assistance Program - Nepal, FY 1974. USAID/Nepal. July 5, 1972.

Identifies priority areas, outlines development strategy of IMG, presents priority problems and plans for the future, describes efforts of IMG to come to grips with current problems and presents timetable for Mission work through FY 1974.

11. Field Budget Submission, Nepal, FY 1974. USAID/Nepal. July 1972.

Companion to No.13 above. Narratively summarizes the development process as it has unfolded over time in Nepal. Discusses budgetary problems that are becoming serious (revenue lagging behind expenditure) and the potential problems they may create. Discusses shift from U.S.-owned Indian rupees to appropriated dollar requirements to offset the loss of rupees. Briefly presents specific proposals for FY 1973, including program level and manpower projections.

12. Rana, Pashupati Shumshera J. B., Role of Foreign Aid and Trade in Economic Reconstruction During King Mahendra's Reign. CEDRA. August 1972.

A straightforward and relatively hard hitting critique of aid during the late King's reign. Rana suggests aid may have reduced the internal capacity of the nation to create capital out of its own resources, that there was virtually no growth in per capita output (infrastructure was created but not used effectively) during the 1960's, and that because so much of the aid "leaked" out of Nepal there was only a very small multiplier. Reviews technical aid, concluding that manpower development funds have been useful but the "brain drain" threat requires care in insuring that highly trained manpower is used effectively. Also concludes that many foreign advisers have been of too little help, and some may have had a negative impact by trying to apply solutions from a different system to Nepal. For the future, Rana suggests technologies that make maximum use of labor -- "invest native savings, both of money and time, gainfully."

The trade section points out that Nepal tends largely to export primary goods and import manufactured goods. This leads Rana to conclude that since the demand for processed and manufactured good always grows faster than the demand for unprocessed and raw materials when development takes place due largely to the higher income elasticity of demand for the former, both the volume and price of Nepal's exports will drop in the future.

Many of India's goods are priced higher than world prices, but Nepal will have to trade with India. Rana wonders if comparative advantage vis-a-vis India lies in Hill agriculture -- large urban centers in India may be good markets for orchard, livestock, and herbal produce from the Hills. Forest-based industries for producing goods for export are suggested as an area to explore for the longer term. Other areas for exploration are: electric power; sealed wagons through Bangladesh to the world; trade with China on a barter basis (like India's really is); and exporting goods by air.

13. Summary Brief: On-going and Planned FAO Projects in Nepal as per 1/12/1971. FAO/Nepal.

Describes projects, giving personnel, duration, and UNDP costs. Includes the feasibility study of irrigation development in the Terai; the project on increased use of high-yielding crop varieties and fertilizers in the central Terai; the forest development project in Banke and Bardia districts; inland fisheries development projects to establish commercial fish farms, hatcheries, etc.; agricultural development planning with the Economic Analysis and Planning Division of MFA; animal production and health activities; the animal by-products and feed mixing plant at Hetauda; land administration; wildlife management; cash crops experts; and the rural youth program. Planned projects mentioned are wildlife management and national park development; erosion control; fisheries development; nutrition; and livestock development.

14. FAO Country Brief, Nepal, February 1972 (Second Draft).

Contains recommendations on agricultural development strategies and programs to get an immediate increase in production (intensive inputs for grain crops, modernize milling industry, convert forest land to agriculture, complete existing irrigation schemes, encourage production of cash crops, lower land rents); to lay the foundation for long term development (erosion control, wildlife preservation, national parks, training in water use and management, Hill programs, marketing and storage, etc.); and to promote long term development (irrigation, Hill agriculture, food processing, forest management).

Specifies areas where external financial assistance for irrigation development, agro-based industrial development, forest industries, transport/communication systems development, and erosion control. Identifies specific projects for which FAO technical assistance should be continued or undertaken during the 1972-76 cycle (irrigation advisor for water development; two forest management officers and one forest products marketing expert; fisheries development; wildlife management and national parks; erosion control; cash crop experts in tobacco, cotton, sugar and oilseeds; two economists for EAPD; nutrition development; sheep, goat and wool development; rabies control; other livestock projects; seed production and processing facilities).

15. Resume of the Work Done in the Indian Cooperative Mission during the Year 1971-72. ICM, Kathmandu.

A summary of the assistance program to Nepal.

16. 20 Years of Nepalese - American Cooperation. A summary of American Aid to Nepal. 1951, USAID/Nepal.

A narrative and financial summary of aid over these years.

17. Sakiyama, Teruji, International Assistance to Nepalese Agriculture - Subsectoral and Project Analysis (1951-70). EAPD Staff Paper No. 4. Economic Analysis and Planning Division, MFA, IMG, Singha Durbar, Kathmandu. August 1971.

International assistance to agriculture from all sources from 1951 to 1970 is estimated at \$57 million, with about four-fifths of this provided during the 1960's. In 1970, agricultural assistance was about \$5 million, or around 14 percent of all foreign assistance. About 61 percent of the agricultural assistance was for irrigation works; the second largest component went to crop production improvement and its related infrastructural and institutional activities. Livestock, horticulture, fisheries and forestry have received only \$4.5 million in the 20 years, accounting only for 8 percent of the total. There have been a large number of small scale assistance projects that have created problems of duplication and lack of integration and coordination, thus resulting in waste of scarce resources and the fragmentation of capital and manpower resources. More than 90 percent of the foreign resources have been concentrated in the Terai and Kathmandu Valley.

18. Activities of the UNDP in Nepal. UNDP Resident Representative, Kathmandu.
A four page summary of UNDP assistance program in Nepal, by sector and UN agency. Includes list of manpower on board and vacant positions.
19. Fourth Quarterly Project Review of Food Grain Technology (Economic Analysis and Planning) Project. USAID/Nepal. August 1972.
A summary of accomplishments, problem areas, and recommended actions.
20. Program and Budget for the Year 1972-73, Agricultural Development Bank. Planning Research and Project Division, Agricultural Development Bank. June 1972.
States functions and priorities, reviews progress as of the end of fiscal year 1971-72, and presents the program for fiscal year 1972-73. Budgets and the manpower staffing pattern for the central and each field office are included.
21. Newton, Roger, Termination Report. Peace Corps, Nepal. July 1972.
Records experiences of a Peace Corps volunteer who was assigned to Ilam district as a JTA. It's a detailed report with many interesting suggestions for improving the agricultural development program in Nepal and also the Peace Corps program. The recommended maize variety "Kumaltar Yellow" fared quite badly, due in part to weather and in part to lateness in arrival of seed.
22. Fourth Quarterly Project Review of Agricultural Development Bank Project. August 1972.
Compares 1971-72 accomplishments with targets, explains reasons for shortfalls in 1971-72, and summarizes plans for 1972-73.

MARKETING, STORAGE, TRANSPORTATION

23. Wilson, Tom, HMG Food Grain Storage and Procurement Program. USAID/Nepal. Summer 1972.
A program proposal designed to initiate a price supporting mechanism that would permit HMG to build up a buffer stock of grain while keeping it stored on the farm. The farmer would benefit by cutting his storage losses and by being able to hold his grain for higher post-harvest prices.
24. Fourth Quarterly Review of On-Farm-Storage Project.
25. Fourth Quarterly Review of Food Grain Testing Project.
26. Fourth Quarterly Review of Agriculture Marketing Corporation Project. USAID/Nepal. August 1972.

Items 24, 25, and 26 are summaries of projects, and cover accomplishments, problem areas, recommended actions, and fiscal status.

27. "Agricultural Marketing Information." EAPD Bulletin. Economic Analysis and Planning Division, MFA, IMG. May 1972.

Reports retail prices for farm products; wholesale prices for some.

28. Abbott, J. C., Marketing, An Accelerator of Economic Growth. Marketing, Credit, and Cooperative Services, FAO/UN. February 1972.

A 23-page paper presented at the Agricultural Marketing Conference in February 1972, at Kathmandu, Nepal. Stresses the components of a successful marketing system and its relationship to economic growth. Entrepreneurship in both the private and public sectors is stressed as is the supporting role of government.

29. Shaffer, James P., Designing Agricultural Marketing Systems in Developing Countries. Department of Agricultural Economics, Michigan State University. February 1972.

A 32-page paper presented at the Agricultural Marketing Conference at Kathmandu in February 1972. Speaks to the task of designing the various components of an agricultural marketing system. The systems approach is highlighted. Marketing farm products is stressed but attention is also given to the marketing of consumer goods and market related factors such as population, nutrition, and labor.

30. Steele, Howard J., Improving Marketing Systems in Developing Countries - An Approach to Identifying Problems and Strengthening Technical Assistance. International Development Center, Economic Research Service, U. S. Department of Agriculture. February 1972.

A 30-page paper presented at the Agricultural Marketing Conference at Kathmandu in February 1972. Presents a systematic approach to identifying marketing problems (the appendices contain an example from Brazil), identifies factors affecting the evaluation of marketing systems; speaks to the nature of food marketing problems, and the tasks of delineating and defining marketing problems; and develops evaluation criteria for evaluating performance. The growth of marketing systems is presented in diagram form.

31. Lee, C. Y., Agricultural Marketing System in Nepal -- The Present Situation and Improvement Programs. FAO Report to EAPA, MFA, IMG. February 1972.

A 36-page paper presented at the February 1972 Agricultural Marketing Conference in Kathmandu. Describes the agricultural marketing setup in Nepal and presents a rather detailed set of recommended actions that could be taken to move toward a solution of present problems and create a more effective marketing system.

32. Giri, P., Marketing and Export of Food Grains. Federation of Nepalese Chamber of Commerce and Industry. February 1972.

A 19-page paper presented at the February 1972 Agricultural Marketing Conference at Kathmandu. Discusses where changes are needed to develop a more effective agricultural marketing system. The importance of better transportation and communication networks, the potential impact of India's green revolution on Nepal's food grain exports, the problems in reaching targets when prices rise too fast, and the need for better cooperation and coordination within governmental agencies and between government and the private sector are among the areas covered.

33. Shrestha, J. B., Marketing and Export of Cash Crops. Biratnagar Jute Mills. February 1972.

A 20-page paper presented at the Agricultural Marketing Conference at Kathmandu in February 1972. Describes the Jute production/marketing/exporting system as it presently exists; identifies the problems inherent in the present system; and points the way toward solving the problems.

34. Pradhan, S. B., Marketing of Agricultural Inputs. Agricultural Supply Corporation. February 1972.

35. Koirala, D. R., Development of Adequate Market Structure to Support Farm Credit Framework and Credit for Agricultural Marketing. Agricultural Development Bank. February 1972.

A 16-page paper presented at the February 1972 Agricultural Marketing Conference at Kathmandu. Stresses the importance of credit in developing Nepal's agricultural marketing system. Surplus food grain producing districts are identified and estimates of the share of production that is sold by farmers (food and cash crops) are presented. Where farmers sell, their knowledge of prices, and their selling times and willingness to store farm products are reported in quantitative terms based upon survey results. Marketing credit is seen as a means of getting farmers higher prices by checking the fall in prices at harvest and by reducing the margin in prices paid by the consumer and the producer. The need for marketing credit is estimated to be at least as great as the need for production credit.

36. Pyakuryal, K. N., Problems of Cooperatives Marketing. SRO, CEDA. February 1972.

An 11-page paper presented at the Agricultural Marketing Conference in Kathmandu in February 1972. Describes the development of cooperatives, the present attempt to make them more useful, and, in view of the need for managerial talent, suggests caution in future expectations.

37. Pfalser, Donald R., Storage, Drying and Transportation of Agricultural Commodities. USAID/Nepal. February 1972.

A 35-page paper presented at the February 1972 Agricultural Marketing Conference at Kathmandu. Describes the present means of storing farm

- products, estimates storage capacity, gives freight rate data, discusses storage losses, presents data on storage costs for construction and operation, and presents ideas on how losses can be reduced (grain drying, on-farm storage, transportation).
38. Upadhyaya, R. M., Marketing of Livestocks and Livestock Products in Nepal. Dairy Development Corporation. February 1972.

A 37-page paper presented at the February 1972 Agricultural Marketing Conference at Kathmandu. Describes the present marketing system for livestock, meat, milk, ghee, other milk products, and wool (and its products); evaluates the present system for each product; and recommends improvements for each.
 39. Rana, K. S., Oil Seeds Marketing. February 1972.

A 5-page paper presented at the February 1972 Agricultural Marketing Conference at Kathmandu. Describes the mustard business in the Nepalgunj area.
 40. Gurung, C. B., Marketing of Fruits, Vegetables and Their Products. February 1972.

A 25-page paper presented at the February 1972 Agricultural Conference at Kathmandu. Presents estimates of marketings and exports of selected fruits (mainly oranges, mango, banana, and pineapple) and vegetables (mainly potato). Discusses marketing-related problems and presents recommendations for overcoming them. The second part of the paper speaks to the need to process fruits and vegetables for domestic and export markets. Present problems and recommended solutions are discussed.
 41. Preliminary Report on Agricultural Marketing Conference. EAPA, MFA, IMG. February 1972.

Contains the recommendations of the Conference held at Kathmandu on February 21-24, 1972.
 42. Lee, C. Y., Marketing of Livestock and Livestock Products in Nepal -- A Supporting Paper for FAO/SATA Joint Livestock Development Survey Mission to Nepal. FAO/Nepal for EAPD, MFA, IMG. June 1971.

A 32-page paper describing the existing marketing system in Nepal (processing, marketing channels, pricing, and trading practices) for livestock, meat, milk, ghee, other milk products, and wool and woolen products. Evaluates the present situation and presents recommendations for improvement. (This paper is very similar to Marketing of Livestocks and Livestock Products in Nepal, which was presented at the Marketing Conference by R. M. Upadhyaya.)
 43. Lee, C. Y., Marketing Problems of the Piple Fish Farm. FAO for EAPD, MFA, IMG. July 1971.

An economic analysis of the Piplely fish farm and the retail operation -- production costs, sales volume, break even points -- and a description of marketing practices and problems. Suggests a more profitable marketing program and discusses how to implement the new program. A brief history of the farm is presented in the first section of the report.

44. Agriculture Marketing Corporation. August 23, 1972.

Excerpts from the AMC plan that is pending approval. Covers the location of present offices and the proposal to add 19 additional offices. Sales targets are reviewed and established (revised from 5-year plan in some cases) for fertilizer, seeds, agricultural implements, pumps, tractors, and plant protection materials. Means of obtaining crop seeds and expanding into vegetable seeds, veterinary medicines, and livestock feeds are presented. The future need for a fertilizer factory is discussed and preliminary work toward establishment is encourage. (Plan was being translated but not available before I left Nepal.)

45. Agricultural Marketing in Kathmandu Area. EAPD, MFA, and Tribhuvan University. December 1971.

A collection of four papers prepared by students at the Department of Economics, Tribhuvan University, including poultry marketing in Kathmandu; a case study of Shaku Multipurpose Cooperative Society; meat marketing in Kathmandu; and a case study of Kavrepalanchok District Cooperative Union.

RESEARCH, EXTENSION

46. Fourth Quarterly Project Review of Agricultural Extension Project. USAID/Nepal. August 1972.

Progress compared with targets, with reasons for shortfalls. Summary of accomplishments and problems (JTA drop-out; unfilled positions; need for subject matter specialists).

47. Fourth Quarterly Project Review, Education and Research Project. USAID/Nepal.

48. Fourth Quarterly Project Review, Research Construction Activities. USAID/Nepal. August 1972.

Training and staffing situation, problems, and suggested solutions. Status of construction program for buildings, machinery, irrigation, and equipment at the research farms.

49. Splitter, M. V., CIMMYT Maize Population Improvement Plan. August 1972.

This plan, suggested by Dr. E. W. Sprague, is being implemented this year. It is designed to generate 10 superior full sib maize families for on-farm testing in the summer of 1974.

50. Weiss, M. G., Evaluation of Maize Research in Nepal. USAID/Nepal. March 1972.
51. Weiss, M. G., Implementation of Evaluation of Research. USAID/Nepal. March 1972.
52. Weiss, M. G., Criteria and Guidelines for Evaluation of Research. USAID/Nepal. March 1972.

A set of three documents designed to present and test an approach to evaluating research. The results of a test of the evaluation instrument on the maize research program are in the first listed volume. This leads to a set of recommendations for improving the maize research program such as focus on improvement of protein quality for the long-term, develop hybrids, do more agronomic research, establish inter-discipline cooperation in planning and execution, initiate training in research techniques for JTA's and field assistants, improve utilities for laboratories (especially the water pressure system), stock standard research supplies centrally, get more land at Parwanipur, improve irrigation facilities and water sources at stations, provide replacement parts for repair of equipment, and introduce research equipment and aids designed to improve accuracy and precision of experiments.

53. Sharma, K. P., Report on the Evaluation of Research Activities and Improved Methods of Cultivation on Food Grain and Production. Department of Economics, Tribhuvan University. March 1972.

An attempt to compare the costs and benefits of research. There seem to be serious methodological or arithmetical problems which lead to a large overstatement of the benefits.

54. Coordinated Wheat Program 1972-73.
55. Results of Coordinated Wheat Research Program 1971-72.
56. Experimental Results -- Maize Coordinated Program 1970.
57. Experimental Results -- Maize Coordinated Program 1971.
58. List of Experiments Under Maize Coordinated Program 1972.
59. Coordinated Rice Program 1970.
60. Nepal Coordinated Rice Program 1971.
61. Results of Experiments on Co-ordinated Rice Program 1971. Department of Education and Research, MFA, IMG.

These are examples of the kind of documents prepared every year for each major crop. They describe the experiments to be undertaken, provide general instructions on how to conduct the experiment, show the layout (design) of each plot, and specify the treatment for each crop. The companion

volume presents the results obtained from the experiments. Statistical tests of significance are applied to the research results, but there frequently are problems, apparently due to the human error associated with conducting the trial accurately and with precision. This leads either to throwing out the results from the statistical tests or leaving them in and frequently concluding no statistically significant difference.

IRRIGATION

62. Proposed Surface Water Feasibility Study of Nepal Terai Areas.
Available from Office of Development Planning, USAID/Nepal. March 20, 1969.

A proposal to study the economics of the use and management of surface water but includes a description of the present situation with respect to tubewell irrigation and compares the situation in Nepal with Pakistan.

63. Peterson, Dean E. R., NESA Irrigation Seminar -- Summary of Recommendation Topics. July 1972.

A 2-page outline of recommendations for developing a capacity to use and manage water in Nepal.

64. Moorti, T. V., "A Comparative Study of Well Irrigation in Aligarh District, India." Cornell International Agricultural Development Bulletin. May 19, 1971.

Results of a joint project of the Agricultural Experiment Station of the Uttar Pradesh Agricultural University and the Department of Agricultural Economics of Cornell University. Compares the costs and returns from well irrigation under private and State operation. Private wells return higher net than State operated wells.

65. Mohammad, Ghulam, "Private Tubewell Development and Cropping Patterns in West Pakistan." Quarterly Journal of Pakistan Institute of Development Economics, Karachi. Spring 1965.

Presents information on the costs and returns from tubewells. Comparisons without tubewells show a significant increase in net returns from tubewells and also that returns to electric-powered tubewells are considerably higher than from diesel-powered wells.

66. Propst, John W., Irrigation Cost Analysis. USAID/Nepal. August 1969.

Presents detailed information on the total irrigation costs of different surface and subsurface systems, drawing upon various sources and converting to Nepalese currency. Compares artesian wells and electric- or diesel-powered tubewells using earth or brick canal or concrete pipe. Also compares surface systems using diesel- or electric-operated pumps with the same three distribution materials.

POLICY, PRICE, CREDIT 1/

67. Bista, Kirti Nidhi, The Honourable Finance Minister, HMG. Budget Speech of the Fiscal Year 1972-73. July 6, 1972.

Some quotes: "Our efforts and achievements in the past 12 years have mainly been concentrated in the development of the infrastructure...However, with due consideration to the ecological conditions of the country His Majesty's Government has decided to implement the integrated regional development program through the establishment of four growth centers... in the coming fiscal year the largest share of development expenditure has been allocated to the construction of roads...However, significant progress has not been possible in agricultural production mainly due to the lack of irrigation facilities. Hence, emphasis is given to the development of irrigation. Besides, due attention will be given to the coordination of agricultural development programs...necessary steps will be taken to construct warehouses for storing food grains in the different parts of the country."

The speech lists sources of revenue and breaks expenditures into regular budget and development budget.

68. Fort, Raymond E., "Policy Papers" (Restricted Use) prepared for USAID/Nepal.

A collection of papers left with the Mission Director on the agricultural development strategy for the future. Includes suggestions on reorganizing the Ministry of Agriculture and on policies regarding adaptive and basic research, extension, and manpower training.

69. Lee, C. Y., Behavior of Selected Food Grain Prices in Nepal. FAO. December 1971.

Contains data on the general trend in prices from 1964-65 through 1970-71 for paddy, rice, wheat, maize, potato, arhar, gram, mustard oil, mustard seed, jute, tobacco, sugar, eggs, mutton, buffalo meat, pork, chicken meat, milk, and ghee. Also gives regional price variations for paddy, rice, maize, and wheat; the seasonal price fluctuation for paddy and rice; the market arrival patterns for paddy and rice; the milling margins (theoretical) for rice; and a comparison of paddy prices at selected points in Nepal and India. Presents the case for a price stabilization program for food grains, including data on surplus and deficit areas and quantity flows.

Key points are that prices for most farm products have been rising steadily since 1968, a reversal from previous trends. The only products with falling prices from 1968 to 1971 were wheat, maize, and sugarcane. Second, food grain prices are higher in the Hills than the Terai -- about 30-50 percent

1/ See item 35 on credit.

higher for paddy, 20-25 percent higher for maize. Third, from 1967-68 through 1970-71 the variation in rice prices within the Terai was only 5 to 10 percent, but was 34 to 54 percent within the Hills. The rice price in the highest price district of the nation was 58 to 76 percent higher than in the lowest price district. Maize prices in the highest price district were twice as high as in the lowest price district (Rs. 750 to Rs. 1,500 per ton). Fourth, the seasonal variation in price is greater than can be assigned to the difference in transportation and carrying charges.

70. Revision of Fertilizer Price. Agricultural Supply Corporation, Central Office, Kathmandu. Undated.

An ASC staff paper preparing the case for the decision to raise fertilizer prices in the Terai and reduce them in the Hills. The purpose was to keep fertilizer in the Hills (fertilizer price in Nepal had been lower than across the border and some was being sold into India).

71. Dhital, B. P., Agricultural Price Policies in Nepal. EAPD, MFA, HMG. February 1972.

A 20-page paper presented at the February 1972 Agricultural Marketing Conference at Kathmandu. Describes the basic factors that must be taken into account in establishing agricultural product price policies in Nepal. Presents price trends for the major commodities at the national level plus the variation in food grain prices at a point in time within the country and seasonal variations in rice prices at various locations. (These price data also appear in Agricultural Statistics of Nepal and Behaviour of Selected Food Grain Prices in Nepal).

72. Agricultural Credit Survey, Nepal, Recommendations. Nepal Rastra Bank. July 1972.

Concise summarizes recommendations from a credit sample survey representative of the 32 accessible districts which cover 78 percent of the total cultivated area and 56 percent of the population. Twenty-two districts were in the sample area.

During 1969-70, 38 percent of the families borrowed money; 65 percent were indebted. The average amount borrowed by a family was Rs. 132; the average debt was Rs. 419. More was borrowed for consumption than for production, except for large farmers in the Terai. The amount borrowed for production was estimated to be less than 3 percent of the total production credit needed for modern farming. In the 32 districts, total credit needs are estimated at Rs. 1 billion. Average annual net income, including receipts from the sale of assets, was estimated at Rs. 1,020 for large hill farmers; Rs. 734 for small Terai farmers; Rs. 775 for medium Terai farmers; and Rs. 2,928 for large Terai farmers.

Most credit was supplied from private sources (79 percent); the institutional credit agencies provided only 21 percent. The rate of interest from private sources was as high as 50 percent, with the highest rates charged

the small farmers. In addition, a discount was frequently charged which varied from 5 to 25 percent, again with the larger discount charged the small farmer. The smaller the size of farm, the larger the borrowings from private credit agencies.

Ward village committees contributed about 8 percent of the credit and the co-operative societies, ADB, and Land Reform Savings Corporation together provided about 10 percent of all agricultural credit. Only 10 percent of the farmers in the small size group had been able to get credit from institutional sources, as compared to 16 percent of the medium size group and 49 percent of the large size group.

The volume contains 90 generally well-reasoned recommendations on how to improve the agricultural credit system in Nepal, including measures designed to strengthen ties with the Nepal Rastra Bank.

73. Fort, Raymond E., "Occasional Papers." Prepared from January 1968 to June 1972. USAID/Nepal.

Some 45 papers describe Nepal's agricultural development at various points in time. Several papers prepared for Peace Corps training stress the importance of agricultural development to the development of Nepal; the importance of fertilizer to the agricultural development process; the fact that agricultural production is governed by the most limiting factor; the importance of the principle of comparative advantage; that returns to farming need to be favorable for adoption of modern technology; and that modern farming requires greater managerial skill. Others speak to the need for price policy (support machinery) and marketing mechanism for agriculture. Others are status reports on agriculture in Nepal. Credit and credit institutions are described and recommendations for action presented.

Policy discussions prepared for use when the Fourth 5-Year Plan was being formulated: covers food grain price policy (importance of India's to Nepal); a national marketing board for food grains (food grain management); subsidization of food for urban consumption (should be stopped); greater use of the private sector (favors); Hill vs. Terai agricultural development (debates the Terai first strategy -- no conclusion here but in other places comes down in support); coordinated agricultural programs (identifies some problems in getting coordination); pros and cons of establishing an agricultural college (suggests caution); organization of the Ministry of Agriculture to provide a coordinated agricultural program (reorganization thoughts); diversification of agriculture (dangers over long-term in concentrating on food grains for export -- sees opportunities in the valley for vegetables, berries, and eggs; uncertain about the Hills); fertilizer policy considerations (fertilizer now from India, cheaper from third countries, but still expensive; produce locally -- pros and cons); and irrigation policy considerations (the problems with surface or sub-surface systems, including legal ones).

The August 1970, May 1971, and February 22, 1972, papers review problems in developing the Hills and presents a strategy for overcoming these

problems. Several papers describe agricultural institutions -- their past, present, and future. The September 1971 paper contains several suggestions for improving the credit system of ADB. The January 1972 paper lists problems facing extension and suggests improvements. The March 3, 1972 paper defends the Terai's first research strategy, but suggests some shift to the Hills.

74. Farm Management Study in the Selected Regions of Nepal, 1968-69. Economic Analysis and Planning Division, MFA, HMG. December 1971, 177 pages.

Reports findings of a survey of 10,667 farm households in 14 of the 75 districts of the Kingdom to determine land holding patterns; cropping system and land use; farm business investment; and farm receipts, expenses, and returns. Presents information on both a per hectare and per farm basis. Includes gross receipts, expenses, and three levels of return (farm business income, return after allowance for labor, and return after allowance for capital) for all farm activities as well as for paddy, maize, wheat, and several other crops. There are also sections on livestock enterprises and labor inputs (family and bullock). Also discusses the agricultural resources of Nepal and the agricultural economy of the country. The appendix tables contain a wealth of information, broken down by size of farm and by crop. From this report one can obtain information on production costs in 1968-69 for the various crops, and compare the differences in costs, returns, and other factors from district to district and within a district by size of farm.

Cultivated area per farm is several times higher in the Terai than in the Hills. The largest farms are in western Terai, with the average size decreasing as one moves eastward. In the Hills, farms tend to become larger as one moves in the opposite direction -- from west to east. Family size increases with cultivated area. Cropping intensity is the greatest in the Central Eastern Region, followed by the West, Central West, and then East.

Income, on a per farm basis, is far higher in the Terai than in the Hills. Wage rates for human labor and bullocks are higher in the Terai. For humans, the range was from Rs. 2.50 to Rs. 5.00 per day. The day wage rate for a pair of bullocks had an even wider range -- from Rs. 3.62 to Rs.12.00. Within the Western Region the bullock rate in a Terai District was three times the rate in a Hill District.

75. Agricultural Statistics of Nepal. Economic Analysis and Planning Division, MFA, HMG. July 1972. (Still restricted from distribution)

Contains about all the basic statistical data now available on agriculture in Nepal: Gross Domestic Product, Agricultural Gross Domestic Product, grain and cash crop production, imports and exports of farm products, size and number of holdings, tenure, livestock population, forest area and sawlog volume, irrigation area, agricultural inputs purchased and sold, food balance estimates for 1970-71, government revenue and expenditure, farm management survey findings, prices of agricultural commodities, international assistance, manpower, fourth plan targets, and other information.

76. Lee, C. Y., A Preliminary Study on the Feasibility of a Commercial Fruits Farm for Kathmandu Market. FAO for EAPD, MFA, HMG. January 1972.

Costs and returns are estimated for a hypothetical pineapple, banana, mango, limes, lichi, and guava farm. The internal rate of return is estimated to be 23 percent for the farm, under assumed conditions.

77. A Case Study on Impact of Tractor and Pumpset Loan. Research and Planning Division, Agricultural Development Bank, Kathmandu. September 1971.

Part I, a case study in Bara and Parsa Districts, shows the impact of a tractor loan on resource allocation, farm production, and profitability. The comparison is between traditional farming and modern farming, and all the benefits of modern farming are assigned to the tractor! Therefore, the tractor is very profitable!!

Part II, a case study in Rautahat District shows the impact of pumps and artesian wells on resource allocation, farm production, and profitability. Basically, the same methodology is used as for the tractor case.

Part III is essentially the same study as under Part II, but in Dhanukha and Mahottari Districts.

Part IV looks at artesian wells in Dhanusha District.

78. Thappa, Y. S. and Baushota, Mahesh, "Population Reference Materials" (a collection of papers prepared for publication by the authors). CEDA. August 1972.

These papers were prepared when the preliminary 1971 population Census estimate was 11.3 million and before the detailed 1971 Census tabulations were released. They draw upon the preliminary Census figures and earlier projections by Abram David, the Central Bureau of Statistics, and others. Changes in District boundaries between 1961 and 1971 make comparisons below the national level difficult.

The 1971 preliminary estimate implied a 20 percent increase for the decade. In August the preliminary estimate was revised upward to 12 million. David earlier projected a population of 11.4 million for 1970 and, assuming constant fertility, a population of 22.7 million for 1995.

Relying upon the preliminary estimate, and Census results for 1951 and 1961, the authors point out:

1. Population density in the Hills has remained more or less the same over the last 20 years.
2. Population is growing far faster in the Terai than in the Hills. The growth rates from 1961 to 1971 ranged from 0.7 percent for the Eastern Mountains and Hills to 5.3 percent for the Western Terai. The rate for the other regions were: Western Hills and Mountains, 1.2 percent; Central Hills and Mountains, 1.8 percent; and Eastern Terai, 3.4 percent.

3. The heaviest migration is from the Eastern Hills to the Terai; next largest is the flow from the Western Hills to the Terai.
4. The Hills, with 77 percent of the total land area but only 32 percent of all land under cultivation, have 62-63 percent of the people. Excluding the Kathmandu Valley, the Mountains and Hills have 6.5 million or 57.4 percent of the people.
5. There were 1,075 people per square kilometer of cultivated land in the Hills. This compared to 299 in the Terai.

Population projections by the Central Bureau of Statistics compare with David's as follows:

Age	Central Bureau of Statistics			Dr. Abraham David	
	1971	1976	1981	1980 <u>1/</u>	1980 <u>2/</u>
----- 1,000 people -----					
0-14 years	4,426	4,803	5,332	6,355	5,821
15-54 years ...	5,889	6,427	7,206	7,250	7,251
55 years +	933	1,163	1,239	1,115	1,115
All ages	11,248	12,393	13,777	14,720	14,187

1/ Assumed no reduction in fertility.

2/ Assumed 50 percent reduction in fertility in 25 years.

Both sets of projections apparently are low, but David's are closest to the revised estimate. He projected a population of 11.4 million for 1970, which would become nearly 11.7 million for 1971.

Revising the 1971 population to 12 million implies a growth in population from 1961 of 27.5 percent, or a compound growth rate of 2.47 percent per year.