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INTERNATIONAL DEVELOPMENT ASSOCIATION

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125
Vol. 2

Report No. 125a-NEP

ECONOMIC SITUATION AND PROSPECTS

OF

NEPAL

SECTOR ANNEXES

- I - AGRICULTURE
- II - EDUCATION
- III - INDUSTRY
- IV - POPULATION AND FAMILY PLANNING
- V - POWER
- VI - TRANSPORT

August 15, 1973

Asia Region
South Asia Department

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CURRENCY EQUIVALENTS

Currency Unit - Nepalese Rupee (NR)

Effective February 20, 1973

US\$1	=	Nrs 10.56
NR 1	=	US\$0.095
NRs 1,000	=	US\$94.70
NRs 1,000,000	=	US\$94,697

Prior to February 20, 1973

US\$1	=	NRs 10.125
NR 1	=	US\$0.099
NRs 1,000	=	US\$98.77
NRs 1,000,000	=	US\$98,765

NOTE: All calculations in this Report are made on the basis of the rates of exchange in force prior to February 20, 1973. On that date the Nepalese rupee was devalued in terms of the US\$ by 4.12 percent.

Nepal Fiscal Year - July 16 to July 15

Nepal Calendar Year - April 16 to April 15

This report is based upon the findings of a mission which visited Nepal between May 1 and May 25, 1972. The mission consisted of: Messrs. A. Cleveland (Chief of Mission), N. Reynolds (General Economist), Z. Samad (Agricultural Economist, FAO), W. Wyatt (Irrigation Specialist, FAO), A. Tarnawiecki (Industry Specialist), M. Heitner (Industry Specialist), K. Clare (Transportation Economist), B. Newbry (Education Specialist), E. Erkmen (Electric Power Specialist), H. Jones (Population Specialist), C. Xenos (Population Specialist, consultant), H. Granados (Fiscal Specialist, IMF), and Miss M. Hill (Secretary).

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SUMMARY AND CONCLUSIONS

i. Agriculture (including forestry) directly accounts for about 70 percent of GDP, 80 percent of Nepal's export earnings, and provides employment for about 90 percent of the labor force. Land and forest revenues account for about 20 percent of total domestic Government revenues. According to the most recent available data, based on no more than informed guesses, agricultural GDP grew at a compound rate of about 1.8 percent per year in real terms between 1965-70, which is a little more than half that of the non-agricultural sectors and was less than the average growth of population of about 2 percent. Predominantly agricultural, and with limited possibilities for diversification, Nepal's economic development will, for a long time to come, be largely dependent on its ability to increase agricultural production. Moreover, Nepal's development will depend heavily on its ability to create surpluses in agriculture to pay for its large and growing import requirements.

ii. While tenant cultivation is relatively unimportant in the Hills, the land tenure system and the rent practices in the Eastern Terai, where most of the surpluses are produced, act as a serious disincentive to improved cultural practices. The government has not been inactive in the realm of land reform, but much more needs to be achieved. Nonetheless, the weakest link in the agricultural development effort is the inadequacy of agricultural extension services. The staffing has been generally poor, both in quantity and quality; moreover the staff has rarely at its disposal the minimum quantity and variety of agricultural inputs necessary for demonstration.

iii. Institutional agricultural credit was introduced in the country only 10 years ago. It has made rapid progress but still does not provide more than 20 percent of the credit needs. Large farmers benefitted much more from this source of credit than small farmers. Similarly, institutional credit has favoured the Terai to the detriment of the Hills.

iv. At present, probably no more than 15 percent of the land is irrigated. During the last decade, the government has provided for a command area of 120,000 ha. (about 6.6 percent of cultivated area), but this increased irrigation capacity has been translated only partially into actual utilization, since the construction of field channels has been partly neglected. It is only recently that new irrigation projects have been designed to provide for multiple cropping and for an integrated approach to development.

v. Use of modern inputs is limited by supply shortages and the lack of an integrated production program. Nonetheless, area under improved cultural practices is reported to have increased from about 4 percent in 1968/69 to 7 percent in 1970/71. This small scale green revolution has, however, been mostly concentrated in the Kathmandu Valley. Adoptive agricultural research, still limited in scope, has been successful in introducing new wheat and potato varieties.

vi. In a sense, Nepal has two agriculture sectors - that of the Hills and that of the Terai. While the two share certain common features, they are quite distinct in others requiring therefore different approaches to remedial action.

vii. The Hills have a deteriorating economy. The major reason for this is a growing population pressure which has gradually disturbed the former people/resources near-equilibrium. To sustain a growing population, marginal lands, forests and grazing grounds had to be reclaimed, which accelerated erosion. In turn, this affected the productivity of the land. Moreover, except for the Kathmandu Valley, little public investment was directed to the Hills.

viii. The consequences of such a situation are the extreme poverty of many Hill people, who are both short of food and short of cash to finance minimum purchases of salt, cloth, etc. More than a fourth of the Hill population is reported to migrate to the south during the winter months in search of employment. Due to population pressure a growing flow of seasonal migrants becomes by force that of permanent migrants trying to find an uncertain living as landless laborers or as illegal settlers in the Terai.

ix. Clearly, the objectives of a development policy for the Hills should be to provide a decent income to people, so as to slow down out-migration. Achieving such an objective would mean the shifting of the present production pattern to a new one along the lines of comparative advantages. This would ideally call for use of yield-increasing techniques, restructuring of present land-use patterns by means of substitution of land from low value to high value crops and from field crop production to horticulture.

x. But since Hill farmers cannot be expected to turn to long maturing crops, such as fruit trees, without a transitional period, an intermediate strategy is called first. Most of the Hill farmers experience foodgrain deficit and before they start specializing their production for export to the Terai and to India, they would need first to be as near as possible to a situation of self-sufficiency in food. What is required now is the introduction of intensive foodgrain production techniques in bottom valleys and the immediate slopes above them. Quick yielding horticulture production, such as potato and vegetable, could be extended to moderately sloping land, while steep land and hilltops need afforestation. Coupled with proper crop rotation for cattle feed and land regeneration, the income increment of the Hills could be quite substantial.

xi. Such a policy to be successful requires the building of north-south roads penetrating densely populated areas and serving adjacent valleys, to break the vicious circle of "no economic activity - no road - no economic activity." At the same time, however, it would be erroneous to presume that transport facilities alone will "automatically" induce economic progress. In fact, the developing of the Hills will largely depend upon the external stimulus that government agencies will be able to provide.

Minor irrigation works are to be developed, soil conservation techniques introduced, inputs made available, etc. This requires, therefore, the proper working of supporting agricultural agencies in charge of delivering credit, inputs and technical guidance. Given the paucity of resources, both financial and human, this also means concentration of efforts in selected areas.

xii. The Terai is the agricultural surplus region of Nepal. This is due mostly to the still relatively comfortable land resource base per capita, but these surpluses are gradually declining because of population pressure. Yields are generally low; multiple cropping is very limited, because most of the existing irrigation works are meant to ensure the supply of supplementary water during the rainy season. Irrigation potential of the region appears very substantial.

xiii. The role assigned to the Terai in the Nepalese economy is two-fold: (i) supplying the country with foodgrains and cash crops for exports to the Hills and to India and (ii) promoting economic opportunities to migrants coming from the Hills.

xiv. To exploit fully the substantial production potential of the Terai, the development of irrigation projects providing for multiple cropping is required, as well as the proper working of the input delivery, credit and extension systems. Acreage under cultivation could be very substantially increased by turning part of the Terai into cropland and to avoid the present damaging practices of forest encroachments by migrants the number of resettlement projects should be greatly increased. But forest planning has to be carefully planned so as to leave enough timber resources for developing a forest-based industry, which will help diversify Nepal's economy.

xv. Past public investments in agriculture have been limited and unduly favored long gestation projects. Moreover, their implementation has been impaired by lack of coordination among ministries and grave deficiencies in agricultural services. Wherever possible, investment programs should give priority to short gestation projects to stop or to reverse the present trend of declining surpluses in the Terai and the deterioration of economic conditions in the Hills. Investment allocations between the Terai and the Hills should be balanced, so as to gradually move the production pattern of these two regions along the lines of their respective comparative advantages. Careful review of the future resource position of the country as a whole is urgently needed, so as to draw up realistic development programs. Such an assessment would probably lead to some concentration of efforts.

I. CHARACTERISTICS OF THE SECTOR

The Role of Agriculture in the Economy and Recent Performance

1. Agriculture accounts for about 65 percent of GDP and 80 percent of Nepal's export earnings; foodgrains constitute 70 percent of total exports. Ninety percent of the labor force in the country is employed in the agricultural sector. Land revenues provide 16 percent and forest revenues 4 percent of total domestic government revenues.
2. National income data for Nepal go back only to 1964/65, and in large measure are based on informed guesses. According to these data agricultural output grew at a compound rate of 1.8 percent per year between 1965 and 1970 which was less than the average population growth of about 2 percent. This growth rate was little more than half that of the nonagricultural sector, thus resulting in a marginal fall in the share of agriculture in the GDP. Available information suggests that there has been some increase in nonagricultural employment in recent years, from an estimated 0.46 million in 1964/65 to 0.69 million in 1968/69. As a result agriculture employed an estimated 87 percent of the labor force in 1969/70 compared with 90 percent in 1964/65. In absolute terms, however, there was an increase of about 8 percent in the agricultural labor force, which is estimated to have increased to 4.43 million in 1969/70.
3. Nepal has traditionally been an exporter of foodgrains and raw materials and an importer of consumer goods from India. Food comprises about 66 percent of total exports and 16 percent of imports. In recent years, however, the share of foodstuffs in total imports has declined as imports of consumer goods and machinery have increased rapidly. The need to diversify the direction of trade as well as the traditional product mix has received considerable attention in recent years, but Nepal's landlocked position continues to condition trading patterns, and the great majority of trade continues to be with India.
4. Official data show that in 1968/69 agriculture, livestock, fishery and forestry together produced about 69 percent of GDP, made up as shown in the following table. These data indicate that fishery and forestry contributed less than one percent of the total agricultural output. Nevertheless, because of the unsatisfactory nature of available data, the precise numbers used here should not be taken as indicating anything more than probable orders of magnitude. For example, the 1972 IBRD/FAO Cooperative Program forestry mission estimated the income from forestry at about Rs 400 million--twenty times greater than the official data. However, this figure too is little more than an educated guess. It is clear, therefore, that any assessment of agricultural performance based on available statistical information is necessarily tentative.

COMPOSITION OF AGRICULTURAL OUTPUT 1968/69

	<u>Value in Current Prices</u> (Rs million)	<u>Percent</u>
1. Cereals	3,822	59.6
Rice	2,516	39.8
Maize	854	13.3
Others	452	7.0
2. Other food crops	550	8.6
3. Cash crops	652	10.1
Mustard	105	1.6
Jute	30	1.2
Others	467	7.3
4. Livestock products	1,351	21.0
Meat /a	385	5.0
Milk and products /a	789	12.2
Others /a	177	2.7
5. Fishery products	23	0.4
6. Forestry products	18	0.3
7. Total value of production less fertilizer and pesticides	6,416 <u>-10</u>	100.0
8. Sectoral products	6,406	
9. Gross Domestic Product	9,326	
10. Total of items 1-8 as % of item 9		68.7

/a Net value breakdown not available; based on percentage breakdown of gross value data.

Source: Ministry of Food and Agriculture

5. On the basis of data that are available, rates of growth of area and output over the past decade have been calculated and are summarized in the table below. It can be seen that the output of cereals, which comprise 60 percent of the value of agricultural production, has grown at less than one percent annually, even though the area sown has risen by about two percent. Growth of both area and output of paddy has been even slower, while maize production has stagnated. Wheat has been the only dynamic foodgrain, and both area and output have doubled; this has largely been due to an increase in area as well as double cropping. For cereals as a group there has been a downward trend in yields, suggesting that the use of inputs and improved cultivation practices has been insufficient to compensate for declining fertility.

GROWTH OF CROP PER AREA AND OUTPUT
1961/62-1970/71 AND OUTPUT IN 1970/71

	<u>Average Annual Growth (%)</u>		<u>Production 1970/71</u> (in thousand tons)
	<u>Area</u>	<u>Production</u>	
Cereals	1.9	0.9	3,486
Rice	0.9	0.7	2,305
Wheat	13.9	9.3	193
Maize	-0.1	-0.9	833
Jute	9.7	4.8	53
Oilseeds	0.3	1.6	55
Sugarcane	6.8	11.9	236

Source: Ministry of Food and Agriculture: Economic Analysis and Planning Division.

6. More recent information does not suggest a reversal of the downward trend in yields. Admittedly, climatic conditions have been unfavorable during 1972/73 and to a lesser extent in 1971/72. Nevertheless, according to the Ministry of Food and Agriculture, 1971/72 foodgrains output was roughly similar to that of 1970/71, but declined by about 6 percent to 3.28 million tons in 1972/73. The same source has calculated that, during the past 8 years, 1964/65-1971/72, the rate of increase of foodgrains production amounted to only 0.7 percent (plus 1.2 percent in the Terai and minus 0.3 percent in the Hills) annually while population grew at an average 1.8 percent per year.

7. Although of only minor importance in the sector as a whole, cash crops are the major source of cash income for many farmers. Again production data are weak, but it appears that both the area and, to a lesser extent, the production of jute has risen significantly in recent years. Jute is of major importance to the economy because it provides 70 percent of convertible foreign currency earnings (i.e. from exports to countries other than India). Most jute exports go to Western Europe. However, jute at present is barely competitive with alternative crops, particularly paddy, owing to high production costs and poor quality (the unreliability of shipment combined with poor quality and grading causes Nepalese jute to be discounted on world markets). Yields are poor because of low input use, poor production practices and lack of irrigation. Low quality results from inferior seed, undrained retting ponds, and wasteful stripping practices. Because of this weak competitive position, jute exporters are subsidized under the Exporters Exchange Entitlement Scheme through which they are allotted a proportion of the sale proceeds in foreign exchange. As a result of this incentive, jute production has risen by about five percent annually over the past decade. A \$4 million project (financed recently by the Asian Development Bank) should allow an improvement in the yields as well as in the quality of the fiber.

8. Oilseed production has risen slowly in recent years, and rape seeds are a significant export to India. Sugarcane production has increased rapidly and Nepal is self-sufficient in this commodity. However, yields are low (less than 20 tons of cane per ha) owing to poor varieties, lack of fertilization and pest control, and poor water supply; there is considerable potential for raising yields of this crop. Tobacco production has stagnated, and is insufficient to meet domestic demand. The bulk of leaf utilized in the three cigarette factories has to be imported. Spices are an important cash crop, but it would seem that much greater emphasis could be given to their production. Certain areas of Nepal are well-suited to their cultivation, and their high value/volume ratio is a particular advantage with Nepal's poorly-developed transportation network.

9. Nepal's production of fruits and vegetables other than potatoes is not reported. Potatoes are an important crop and its production has expanded very rapidly from 186,000 tons in 1964/65 to 273,000 tons in 1970/71, largely on account of the introduction of a disease-resisting high yielding variety. Selected subregions have demonstrated comparative advantage in this line of production. However, most of these favorable regions lack road transportation for movement of the produce to possible markets both within Nepal and to India.

10. According to the 1961/62 Census of Agriculture for Livestock, Nepalese farmers maintained an estimated 7.3 million cattle (an average of 4.9 head of cattle per holding against 2.9 in India), 1.3 million sheep, 2 million goats, 200,000 yak, 150,000 swine and 14 million poultry. Buffalo are concentrated in the Western and Far Western Hill districts and in some districts of the Eastern Hills where the production and marketing of ghee is a major source of cash income. Bovines predominate in all other districts where the production of bullocks for draft power is of higher priority than the production of milk and ghee. The management of the cattle herd is generally very poor, its genetic quality and productivity very low and religious beliefs prevent rapid improvement. Poor management of the cattle herd places a heavy burden on the nation's deteriorating pasture resources. On the other hand, sheep and yaks are the mainstay of economic life in the Himalayan region and offer reasonable prospects for development.

The Structure of Production and Production Practices

11. Nepal's agricultural resource base is determined to a large extent by topographic conditions. The terrain varies from the Terai, which is the upper limit of the Gangetic Plain, through the Choria and Mahabharat Hills, two parallel ranges which traverse the country from east to west, to the Himalayas. The climate is dictated by elevation and the rain shadows of the Hills, and ranges from subtropical in the Terai to tundra on the higher mountains. Topographic conditions and the consequent transportation difficulties create distinct regional differences between the lowland Terai, the Hills, and the Mountains. The Terai contains 70 percent of the country's cultivated land and produces about two-thirds of total agricultural output, but only contains one-third of the population. It is a grain surplus

region, and also produces oilseeds, jute, sugarcane and hardwoods. Due to poorly developed communication to the north, and lack of purchasing power in the Hills, trade of Terai products is directed primarily towards India.

REGIONAL DISTRIBUTION OF RESOURCES

	<u>Mountains and Hills</u>	<u>Terai</u>	<u>Kathmandu Valley</u>	<u>Nepal</u>
Land area (%)	74.8	24.8	0.4	100.0
Population, 1961 (%)	58.7	36.4	4.9	100.0
Population density, 1961 (p mi ²)	157.0	244.0	2,110.0	173.0
Cultivated area, 1967-68 (%)	31.8	65.3	2.9	13.0
Industrial capacity (%)	-	62.5	37.5	100.0

Source: Fourth Plan.

12. The Hills contain 60 percent of the population and one-third of the cultivated area. As a result of the heavy population pressure, land use is very intensive, with terraced hillsides under cultivation and a high labor input. The recent "Comprehensive Agricultural Credit Survey of Nepal" concluded that, at existing levels of technology, farmers in Hill districts are operating at close to optimum levels. In this region maize is the dominant crop, with wheat, barley, paddy and millets also widely grown, largely on a subsistence basis. Tea is an important crop in a few eastern areas. The Kathmandu Valley, although located in the Hills, is developed to a much greater degree and is quite distinct from the remainder of the region. The Mountain region lies at elevations of 10,000 to 15,000 feet; its use is limited to summer grazing for sheep and yak herds which are moved southward in the winter. The distribution of land and population by regions is summarized in the above table.

ACTUAL AND POTENTIAL LAND USE

	<u>Area</u> ('000 ha)	<u>Percentage</u>
Cultivated	1,845	13
Forest	4,532	32
Pasture	2,000	14
Other	5,703	41
of which cultivable	<u>(2,775)</u>	<u>(21)</u>
	14,080	100

Source: Ministry of Food and Agriculture: Economic Analysis and Planning Division.

13. Production practices vary with the regions and with the crops. Most paddy is transplanted, but varieties differ among regions. Where irrigation is available, paddy is planted early (in April/May) but rainfed

crops are not transplanted until July. Production practices are generally more intensive in the Hills, where manuring and multiple weeding are common. Maize is grown largely under rainfed conditions, often as a mixed crop with soyabeans or millet. It is sown early, in February-April, and is often followed by a second crop; wheat has grown in importance in recent years as a winter crop in both major regions. Sown in November, it enables land to be double-cropped, and is the major reason for the increase in cultivated area that has occurred in the past few years. Use of improved seed, largely limited to wheat, and fertilizer is improving where supplies are available, but only 50,000 ha, or less than 5 percent of the area, mostly in the Kathmandu Valley, are sown with improved seeds at present. Jute is grown only in the eastern Terai, about one-third of it under irrigation. Input use is quite high, and both weeding and harvesting is labor-intensive. It is often followed by mustard, paddy or wheat.

Land Use

14. Information on land use patterns and potential is poor, and estimates vary greatly. Data given by the Ministry of Food and Agriculture are summarized in the preceding table. From these figures, it would appear that there is considerable potential for an expansion of agricultural area. While this is true, and indeed should be a major plank of agricultural development strategy (as discussed in Chapter III), such expansion is both costly and slow, involving forest clearance, land reclamation, irrigation and infra-structural investment. Moreover, existing data are too fragmentary to allow a program of systematic land development to be drawn up.

AREA OF PRINCIPAL CROPS, 1965/66 AND 1970/71

	<u>1965/66</u>	<u>1970/71</u>
Total cropped area ('000 ha):	2,168.0	2,401.0
Percentage distribution:	<u>100.0</u>	<u>100.0</u>
Cereals	83.3	83.2
Rice	51.2	49.2
Maize	20.8	18.6
Wheat	5.4	9.5
Other	5.9	5.9
Oilseeds	4.4	4.4
Jute	1.5	2.3
Other	10.8	10.1

Source: Ministry of Food and Agriculture: Economic Analysis and Planning Division.

Nepal's diverse climatic and topographic conditions allow the production of a wide range of products, but the high man:land ratio and traditional technology result in a very heavy emphasis on foodgrain production. Cereals account for 60 percent of the value added in agriculture, 66 percent of total exports, and more than 85 percent of the agricultural

land area. Rice is the most important crop, followed by maize and wheat. There appears to have been little shift in land use patterns in recent years, except for increases in the areas of wheat (mostly through double-cropping) and jute. For the country as a whole the cropping intensity is about 125-130 percent, ranging from more than 170 percent in certain Hill districts to little over 100 percent in parts of the Eastern Terai.

INTENSITY OF LAND USE BY REGION

	<u>Cropping Intensity, %</u>	<u>Cropped Area Under Foodgrains, %</u>
Hills - Eastern	120	89
Western	150	98
Kathmandu Valley	157	97
Terai - Inner	143	73
Eastern	110	36
Western	145	76

Source: Based on sample district data from "Farm Management Study in Selected Regions of Nepal, 1968/69", Ministry of Food and Agriculture.

Farm Size and Tenancy

16. Data on farm size and tenancy are weak and conflicting. The 1962 sample agricultural census showed the national average size of holding to be 1.2 ha, ranging from 0.6 ha in the Hills to 2.4 ha in the Terai. The recent Farm Management Study showed the average area cultivated by a family to be in the range of 0.2-0.6 ha in the Hills, 0.9-2.7 ha in the Inner Terai, 1.7-6.8 ha in the Terai, and 0.8 ha in the Kathmandu Valley. The distribution among size groups in the principal regions is summarized in the following table. Even though these data indicate only orders of magnitude, it is clear that the vast majority of Hill farmers must operate at a subsistence level, and that many farm units are neither actually nor potentially economically viable under present levels of technology. By the same token, the majority of Hills farms are clearly too small to provide full employment for a family with an average of four working adults. The inadequacy of the resource base is further compounded by the high degree of fragmentation--the average holding contains 3-5 parcels in the Hills, and up to 8 parcels in the Terai.

DISTRIBUTION OF FARM HOLDINGS BY SIZE

<u>Hills</u>		<u>Terai</u>	
<u>Farm Size</u>	<u>% of Holdings</u>	<u>Farm Size</u>	<u>% of Holdings</u>
Below 0.1 ha	17	Below 0.7 ha	53
0.1 - 0.6 ha	64	0.7 - 1.7 ha	25
0.6 - 1.0 ha	11	1.7 - 13.5 ha	19
Above 1.0 ha	8	Above 13.5 ha	3

Source: Based on sample district data from "Farm Management Study in Selected Regions of Nepal 1968/69"; Ministry of Food and Agriculture.

17. Information is inadequate on tenancy practices in Nepalese agriculture. Because of enormous transportation problems, the mountain ranges and rivers, and the absence of markets for agricultural products, the land in the Hills has never been divided into large estates under the ownership of great families who ruled from them. Even where families did have large holdings, their lands were scattered and they exercised little control over the people who worked the soil. In the Hills of Nepal cultivator ownership was common, but lands have been divided over time in each generation among all the sons, resulting in a continuous process of fragmentation of land holdings.

18. The situation was different in the Eastern Terai. "It is no exaggeration to say that we found there one of the very worst land tenure systems in any part of Asia." ^{1/} Because of increasing pressure of population on a limited amount of arable land, landlords were able to extract increasingly higher rents. Ladejinski found in 1962 that some peasants in southern Nepal paid as much as 80 percent of their crop to the landowner. Survival in such circumstances could only be assured by borrowing. This in turn plunged the peasant into the debt circle. As the interest rate was extremely high, repayment was virtually impossible. Debts, in fact, were often passed from generation to generation. The recent Farm Management Study also suggests that tenant cultivation is relatively unimportant in the Hills and reaches significant proportions only around Kathmandu and in certain areas in the Terai.

^{1/} Report of Wolf Ladejinsky, Consultant Ford Foundation, to H. M. the King of Nepal, 1962.

II. MAJOR POLICY ISSUES

Land Reform

19. The process of the modernization of Nepal has and will continue to depend on three basic changes: the broadening of the power and security structure in the countryside; the evolution of a more representative political and governmental system; and the adaptation of social codes towards a more flexible and responsive society. The last two are part of an evolutionary process embodied in the Panchayat system and in a continuing series of social legislation and the provision of social services. The former, which is to be achieved through land reform, was seen initially as a once and for all national effort to establish sound social and economic conditions around land ownership and use.

20. Nepal has by now pursued land reform as a prime national objective for at least 15 years (taking the 1957 Land Reform Act as the initial legislative action), and the experience gained allows a broad view of the objectives, issues and supporting devices required for a successful land reform program. In effect, land reform shares economic, political and social goals with the movements for governmental and social change, and the three support and depend on each other to an important degree. The aim of the Panchayat system (1961) - a partyless and decentralized democratic society based on the principles of class coordination and free from exploitation - is unlikely to be fulfilled unless the great variety of inequitable practices surrounding land ownership, tenure, credit and taxation are cleared up under the land reform program.

21. Land reform in Nepal was designed to meet two objectives: to create an institutional framework conducive to the modernization and growth of the agricultural sector; and to facilitate a gradual transfer of labor, managerial skills and capital to the nonagricultural sector. A number of measures were enacted from the early 1950's, but the present policy is based on the Land Act of 1964. The strategy throughout was to modify the concentration of ownership through land expropriation and redistribution by the imposition of land ceilings, and to strengthen the security of the tenant by removing intermediary rights to land and by the regulation of rents and land taxes. Surplus capital was to be mobilized through the Compulsory Saving Scheme and utilized for the provision of institutional credit, aimed at elimination of exploitation by moneylenders. The preamble of the 1964 Land Act requires, inter alia: (a) equitable distribution of cultivated land, (b) improvement in the standard of living of the tiller; and (c) maximization of agricultural production.

22. The achievements of the land reform process to date should not be belittled. 1/

1/ Taken from Ram Bahudur K. C., in Report of National Seminar on Land Reform, Kathmandu, Nepal, 1970.

- (a) 1.8 million farmers have been interviewed about their debt particulars, loan obligations and land holdings; all of them have been legally guaranteed by providing provisional certificates. In some places permanent certificates substituting all temporary certificates have been issued.
- (b) A large number of farmers have benefited from debt reduction, debt determination, and reversion of mortgaged lands. Rs 32 million worth of debts have been reduced and approximately 6,329 ha of mortgaged land is being reversed.
- (c) 123,000 ha of land above ceiling has been identified. Of this 75,000 ha has been acquired and 54,000 ha has been actually distributed.
- (d) A sum of Rs 120 million has been collected under the Compulsory Saving Scheme, of which Rs 90 million has been disbursed as loans to farmers.
- (e) Cadastral survey, identifying real owners and tillers and supplying varied information as regards land classification and area, has been already completed in 23 districts, covering approximately one million ha of land.
- (f) Land offices and the permanent set-up in respect of land consolidation and land development measures, have already been set up in 18 districts.

23. There are, however, many cases where the law has not been effective and the maintenance by landlords of their control over tenants continues unimpaired over large areas of the country. The transformation of a complex social order built of a variety of tenure, rent and ownership patterns derived from centuries of Asian history and preserved intact in Nepal because of its isolation, has proven more difficult than was at first imagined. The reform program has turned out, in practice, to be largely one of tenurial reform, but even there the difficulties encountered should not be minimized.

24. In the Terai, for instance, landlords seek to remove tenants so as to employ labor from India which is not protected. The situation is particularly acute in the Eastern Terai, where harassment by landlords is common. The tenant will seldom dare to approach the Department of Land Administration for fear of repercussions. Rather he will send a surrender notice to the office. The Department may then question the tenant as to why he should wish to surrender his tenancy rights and act accordingly to redress any real grievance. The office can fine landlords on the spot up to Rs 500, but just how effective a deterrent to malpractice is the role of the office and the

threat of the fine is not known--presumably not very effective in the Eastern Terai where the benefits to the landlord from the direct control of land are considerable.

25. It is only in the last three years that land administration has been treated as a prerequisite to effective implementation of the reform program and for efficient revenue collection, and then only in areas where the cadastral survey has been completed--previously the records kept pertained to revenue transactions and were of little use for land administration. Land (administration) offices have been established in 23 districts where the cadastral survey has been completed.

26. There is a growing awareness that the maximum legal rent at 50 percent of the main crop is too high and acts as a major disincentive to intensified farming. The relatively weak performance of the Terai under this proportionate rent and the Kathmandu Valley's surging production after the introduction of a fixed rent has raised the demand for fixed rents, and the government has recently extended the fixed rent regulations to 12 districts in the Eastern and Inner Terai. Whether this new regulation will be as well enforced in the Terai as it has been in Kathmandu remains to be seen. Kathmandu is relatively well administered, people are well informed, politically active and landlords have more often than not other sources of income in civil service, in tertiary activities, etc. In the Terai, landlords rely exclusively on rent for their income and they are naturally strongly inclined to resist the law and to by-pass it. The main problem of rent regulation is, indeed, that of enforcement.

Agricultural Extension

27. It is widely agreed by the responsible government officials and others connected with agriculture in Nepal that the weakest link in the agricultural development effort is the inadequacy of the agricultural extension services. At the district level the person in charge of the activities is the Agricultural Development Officer (DADO), who usually holds a B.Sc. (Agriculture). ^{1/} Given the poor transportation facilities and lack of telephone, instructions from Kathmandu are rare and the DADO officers are often absent from their office several months a year. When, as is frequently the case, even the highest officials are reluctant to take decisions, the efficiency of the various government departments, offices, agencies, etc. may well be imagined when there is no one at the top to enforce decisions.

28. The bulk of the extension staff, which does most of the actual work with the farmers, is composed of Junior Technical Assistants (JTA's). These are young men with no prior agricultural experience, and with only one year's training in agriculture after matriculation. Not infrequently, JTA know in fact less about farming practices than the farmers they are supposed to

^{1/} In a district visited by the mission the incumbent had a doctorate from the United States.

guide and educate. Not unexpectedly, JTA's are more inclined to lecture the farmers rather than have demonstrations. Furthermore, they have rarely at their disposal the minimum quantity and variety of agricultural inputs necessary for demonstration. The total number of JTA's is reported to be about 600 (there are an additional 250 vacant posts) and this number has to service about 3,000 Panchayats. This implies that each extension worker is supposed to reach on an average 2,000 farm households. As they are not provided any transport facilities, the task is clearly impossible. Moreover, JTA's are given few incentives and this also certainly acts as a negative factor in lowering their efficiency. For instance, JTA's salaries are less than US\$20.00 a month (US\$15.50 as basic salary plus US\$2.80 to US\$3.20 as field travel allowance). Due to such a low ceiling on field trip allowances, JTA's cannot reasonably be expected to go very often into the field, which should be their main function, and they naturally concentrate their activities on villages near their headquarters. Apart from these low salaries (and practically no welfare facilities), JTA's have for all practical purposes no career prospects. It follows that there is extremely low morale, difficulty in recruitment and a high drop-out rate (about 15 percent a year).

29. JTA's are supposed to become the main activating force in the agricultural development of the country, i.e., to be the principal link between the farmer and government agencies such as the Agricultural Development Bank, the Agricultural Marketing Corporation and the Agricultural Research Department. They fill in the loan application forms, and loans are usually granted on their recommendations. In addition to this, they are supposed to perform other essential duties expected of an extension worker. The overall conclusion seems obvious: the weakness of this service is one of the decisive constraints in the implementation of agricultural programs.

30. The government and top officials connected with agricultural planning are fully aware of the deficiencies of the agricultural extension services as they are also aware of the fundamental importance of these services. In an effort to improve the agricultural extension services, the government decided in 1970 to appoint Regional Agricultural Development Officers (RADO) in each zone. Undoubtedly RADO would be an important element in the task of coordinating extension activities, but the most urgent need is, in order of priority, (a) improve the effectiveness of JTA's through in-service training programs, and (b) to strengthen the base by increasing the number of qualified JTA's.

31. Hopefully, the educational reform, now being gradually carried out in Nepal, should have a beneficial impact but the waiting period may have to be long. Vocational training will receive its due place in the education system and more scholarships would be granted for students following vocational courses, so that the recruitment base for extension workers, up to now predominantly made up of students belonging to urban middle class families, may be broadened to include farmers' children. Under the new system, also, a JTA ^{1/} with a good performance report is encouraged to pursue

^{1/} JTA has one year training after the School Leaving Certificate.

advanced training generally leading to a certificate, a diploma or even a degree. He will have, however, to pass the requisite entrance tests. If properly implemented, this scheme by opening career prospects could do much to improve the morale and the efficiency of extension workers. The pay scale should also be reviewed, especially for those JTA's active in remote areas: at least, present ceiling of field trip allowance needs to be raised to a considerable extent.

32. The past history of development of extension services in Nepal confirms that institutions without service are of little or no value. The best conceived institution will not solve problems; institutions are only as useful as the people who work in them. This means that technically extension workers should be properly trained and have therefore something useful to tell the farmers; if extension workers know less than the farmers they are supposed to help, the whole system is likely to fall into discredit. This also means that extension workers should acquire a more definite sense of civil service: they are providing a service to the farmers and not doing the farmers a favor. Since most farmers are unable to cope with the required bureaucracy (for obtaining a loan, for instance), it is the responsibility of the extension service to serve its clientele, the farmers; if not, the farmers have no other choice but to rely on the traditional money lenders. This is a social and psychological problem and it may be more difficult to solve than the problems pertaining to the organizational structure of the institution.

Agricultural Credit

33. The provision of institutional credit to the agricultural sector in Nepal has a history of only nine years. It includes the adoption of a bold compulsory savings scheme as well as programs with cooperatives and conventional banking. While institutional credit still provides only a small part of total credit needs of the sector, estimated to be one-fifth, it has made considerable progress in recent years. At the same time the sources, management and use of funds are undergoing major changes, and these changes raise questions on the role of development banking within the overall strategy of agricultural development.

34. The two main public sector credit institutions in agriculture were until recently the Agricultural Development Bank and the Land Reform Savings Corporation. The Agricultural Development Bank (ADB) was established in 1968, taking over the assets and liabilities of the Cooperative Bank which was then five years old. The Cooperative Bank had labored under limited financial administrative arrangements and had not begun to develop into an effective agency, to a large extent because of its inability to deal outside the poorly developed cooperative field. Rehabilitation of cooperative societies is an important objective of the Fourth Plan. A "supervised" credit program was launched in 1971, and 130 cooperative societies have been brought under the technical supervision of the ADB. The Agricultural Development Bank Act of 1967 gave broad goals and adequate powers to the ADB, and in the five years since 1968 its loan disbursement has increased

nearly eight times to Rs 23.5 million. Forty-one percent of loans have been advanced for agricultural production, 22 percent for farm improvement and irrigation, and 15 percent to agro-industries.

35. The Land Reform Savings Corporation (LRSC) was specially created in 1967 to handle and distribute funds collected under the Compulsory Savings Scheme, a component of the land reform program. Initiated in 1963, this scheme was intended to mobilize resources in the agricultural sector for the provision of institutional credit and the financing of storage, marketing and agro-industries. The scheme raised Rs 120 million before collections were conditionally suspended in 1969, and it is proposed to reactivate this scheme in 1973/74.

36. The idea for such a scheme arose during the experimental implementation of the Land Reorganization Act (1962). The traditional moneylenders, a group which included many landlords, refused credit to the farmers in an effort to frustrate the program. It was concluded therefore that land reform could not proceed without the creation of an alternative source of credit, and the Lands Act of 1964 required all landowners, ownertillers and tenants to deposit every year a fixed portion of their farm produce as a loan to government. The deposit, in cash or kind, was made with the Ward Committee, ^{1/} and was assessed at roughly 7 percent of cereal crops and at about 9 percent in cash of cash crops (except for jute and sugarcane which were collected in kind). Repayment was to be made in cash or kind or in bonds. In addition to collecting the savings, the Ward Committee was responsible for the storage of the savings collected in kind, for the supply and recovery of short-term credit charged at 10 percent, for the maintenance of books and accounts, and for the inception of loans.

37. The first two years saw a fast start to the scheme and collections in the first two years 1964/65 and 1965/66 were Rs 12 million and Rs 60 million, respectively. However, collection slipped back to Rs 20 million in 1966/67 and declined further in subsequent years; in 1969/70 the collection of savings was postponed. There were a number of reasons for this, some of which undoubtedly grew out of the success of the scheme itself. It proved impossible to direct and audit the 33,200 Ward Committees, particularly when grain collected as savings had often to be stored in committee members' houses until godowns had been built--about 16,000 godowns were built by collective effort. Not only had losses and wastage occurred due to inadequate storage, but in the absence of any grain standards problems surrounding conversion into cash and the great variety of local measures and weights made the exercise with deposits in kind too complicated on such an ambitious scale. Few members of the Ward Committees had any prior knowledge of book-keeping and many were probably effectively illiterate. The field staff assigned to the program were few in number in relation to the assistance

^{1/} Each of the 3,800 village Panchayats is divided into 9 Wards. Each of the 33,300 Ward Committees has 3 members. A Ward has a population of roughly 300.

and control required, and were poorly trained. Moreover a countrywide drought in 1967/68 accompanied by a raise in the land tax rates led to a substantial fall in the savings rate.

38. By 1969 it was felt that the volume of savings accumulated was sufficient to meet the demand for commercial credit within the constraints of existing irrigation, transport, and marketing infrastructure. Therefore about Rs 40 million, or one-third of total deposits, was made over to the specially created Land Reform Savings Corporation. Although this movement of funds to a central organization disturbed one objective of the scheme, which was to utilize funds locally, it did allow idle funds to be utilized. The original promise, that an effective cooperative movement would develop to generate investment opportunities through the supply of inputs and the distribution of produce, did not materialize and neither the demand for funds nor the availability of supporting services evolved fast enough to utilize the available funds.

39. The best information on farm credit needs is the Agricultural Credit Survey carried out by the Rashtra Bank in 1971. Some of its findings are summarized in the following table. It can be seen that institutional credit agencies play only a minor role in meeting the credit needs of farmers, supplying only about 21 percent of credit and accounting for about 17 percent of the outstanding debt. The survey also showed that large farmers benefited more from institutional credit: 49 percent of their borrowing was from the credit institutions, compared to 16 percent and 9 percent for medium and small farmers, respectively. Whatever institutional credit the small farmers have obtained is largely confined to ward/village committees. Other institutional credit agencies have mostly limited their operation to bigger farmers.

40. The average borrowing ranged from Rs 245 for small households to Rs 1,123 for large households. On a regional basis, average borrowing per farm household was Rs 383 in the Hills while it was Rs 504 in the Terai. On the other hand, the outstanding debt was higher in the Hills (Rs 938) than in the Terai (Rs 604). In the Hills more than 90 percent of the total loan was obtained from the village moneylenders, friends and relatives, while in the Terai 51 percent of the loans were institutional. Interest rates ranged between annual equivalents of 25-50 percent for private credit, compared to 9-10 percent from institutional sources.

AVERAGE FARM BORROWINGS AND OUTSTANDING DEBT

<u>Source of Credit</u>	<u>Percent of Borrowings</u>	<u>Percent of Outstanding Debt</u>
Institutional	<u>20.9</u>	<u>17.0</u>
Cooperatives	1.5	0.9
Ward/Village Committees	7.8	9.2
Agricultural Development Bank	2.3	1.5
Land Reform Savings Corporation	6.1	3.0
Commercial Banks	3.2	2.4
Private	<u>79.1</u>	<u>83.0</u>
Moneylenders	<u>37.4</u>	<u>42.6</u>
Landlords	5.2	4.5
Traders	2.9	2.1
Friends and Relatives	<u>33.6</u>	<u>33.8</u>
	100.0	100.0
Total per farm family	Rs 345	Rs 665

Source: Agricultural Credit Survey: Rashtra Bank, Kathmandu, 1972.

41. Agricultural credit is the most dispersed of all types of finance and is faced in Nepal with formidable problems: method of cultivation still predominantly traditional, illiteracy, poverty, predominance of small and fragmented holdings, almost total dependence on the vagaries of rainfall, perishable nature of products, lack of proper marketing and transport facilities, etc. Moreover, the findings of the Survey (see paragraphs 39 and 40) point to difficult socio-economic problems. The bigger farmers have far more influence in the village power structure than the smaller ones and have naturally been the main beneficiaries of institutional credit. The small farmers, on the other hand, because of their handicapped position, were largely left at the mercy of moneylenders, who charge exorbitant rates of interest.

42. It is obvious that the small farmers will remain potential clients of the moneylenders unless institutional credit agencies extend their effective service to them. If larger production and higher productivity of the large number of small farmers are the basic aims of agricultural development, the best policy and program should be to organize a sound and suitable organizational set-up both at the village and national levels. To this end, the Agricultural Credit Survey has made proposals, accepted by the government, which reform drastically the organizational set-up and lending policies.

43. At the village level, the ward committees are presently operating in every part of the country, whereas the cooperative societies, which had mushroomed in numbers, have been shrunk under the revitalization program. The ward committees which number nine altogether in one village Panchayat

are too numerous and too small for economic operations. Therefore, the process of merger of ward committees with village committees will be completed within a time-bound program. At a later stage, village committees will be transformed into full-fledged cooperatives. Simultaneously, the Agricultural Development Bank which has launched a program of organizing "guided" cooperative societies in the country, will enlarge and spread its activities and provide technical assistance, supply of inputs and credit and marketing of produce. The government will also assign at least one JTA in each cooperative society under the control of the paid manager of that society for preparing farm plans and for supervising the farm activities of the borrowing farmers.

44. At the district level, the main financing unit for agriculture will be the branch of ADB which will disburse loans and supervise and control the cooperative societies and village committees directly. Since commercial banks hardly come to rural areas, ADB will also act as a commercial bank, collecting deposits and making direct loans to the farmers. At the national level the former two central rural credit institutions (ADB and LRSC) were competing with each other in respect of most medium- and long-term loans and consequently LRSC has been amalgamated with ADB.

45. As revealed by the Survey, institutional loans are confined mostly to big farmers. To remove this anomaly, 70 percent of available credit would be made available for small and medium farmers, and only 30 percent for large farmers. Small farmers would be provided, if necessary, up to 100 percent of their total requirements for production credit; in the cases of medium and large farmers, they would be provided with only 75 and 50 percent, respectively. Credit granted to large farmers on this basis should not, however, exceed 30 percent of total available resources. Short-term loans would not be based on security offered, but on the farm plan worked out by the JTA; this should normally ensure the repayment capacity of the borrower. Consumption credit would also be granted to small and medium farmers, but should not exceed 25 percent of production loans obtained.

46. There are two main basic problems related to the change in the whole rural credit structure: that of availability of adequate resources and the financial viability of ADB and that of proper staffing. Estimates of credit requirements for the decade 1971/72 to 1981/82 have been worked out by the Nepal Rastra Bank survey. The total cumulative gross disbursement of medium- and long-term loans in the next 10 years stands in the neighborhood of Rs 770 million. Of this, not more than 25 percent is expected to be recovered within that period and outstanding loans would amount to about Rs 580 million by the end of 1981/82. With regard to short-term credit, by the fiscal year 1981/82, the lending institutions will have to disburse annually Rs 350 million. Such a total credit need of about Rs 1,000 million is probably unrealistic. It assumes that all farmers to whom institutional credit is made available will apply for the optimum amount of credit required to maximize production. It assumes further that improved technology will be employed on 33 percent of the total cropped area by 1981/82.

47. However, whatever the precise figure would be for institutional credit needs in 10 years time, it will undoubtedly be a multiple of what is presently available. Additional resources would therefore have to come from the following sources:

- (a) Sizeable increase in the share capital.
 - (i) By government; and the overall resource position of the public sector would be crucial in that respect;
 - (ii) By Rastra Bank, commercial banks and borrowers;
- (b) Mobilization of rural savings by way of deposits, ADB acting as a commercial bank.
- (c) Collection of compulsory savings; this scheme is going to be reactivated in 1973/74 and is expected to yield Rs 20 million a year.
- (d) Subscription of long-term debentures by the Provident Fund Corporation, Insurance Companies, Commercial Banks, etc.
- (e) Accumulated reserves and foreign loans and grants.

48. Given the importance of the funds likely to be handled by ADE, it is imperative that ADB operates on a self-financing basis. Otherwise losses which occur because of pricing of services which do not take into account the real cost of borrowing money and do not make provision for likely defaults in repayment, could result in a heavy drain on public resources. To attract deposits in the rural sector, ADB should offer an attractive rate of interest, even for short-term deposits, and probably higher than those prevailing in the urban money market. Funds collected under the Compulsory Savings Scheme are expensive: purchased at 5 percent the administrative collection cost may have been in the past as high as 10 percent; even with an improved collection machinery, cost of these funds would be higher than 10 percent. There is, therefore, a need for proper pricing; an interest rate well above 10 percent would not defeat the purpose of institutional credit. Rates charged by moneylenders are so high that even if the rate of interest charged by the credit institutions were to be raised to - say - 12 to 14 percent, the gap between the two rates would still be significant. Furthermore, farmers are to a certain extent less concerned about the rate of interest charged rather than the adequacy, timeliness and easy availability of the loan, especially for short-term borrowing.

49. The success of this basically sound reorganization of the institutional credit structure will essentially depend upon the quality and skill of personnel employed by it and also by supporting institutions such as the Agricultural Marketing Corporation. The key person in the whole structure

would remain the JTA, who is in charge of drawing farm plans of individual farmers and making recommendations for loans to credit agencies. To a large extent, therefore, the effectiveness of institutional credit agencies will depend on the performance of the extension services (see paras 27-32).

Irrigation

50. Seasonally concentrated precipitation, torrential river flows with a sharp variation of altitudes and unstable soil conditions have caused serious damage to Nepalese farming areas. In the degree of the caprice of the rivers and also in the difficulties of checking and controlling them, Nepalese rivers are the toughest challenges to irrigation engineers. In the long run, control of floods and erosion is one of Nepal's major challenges.

51. By 1972, the government had provided irrigation for a command area of about 120,000 ha, for the nearly exclusive benefit of the Terai and Kathmandu Valley. Eighty percent of the cost of these projects has been provided by international assistance. India has been the main contributor: 15 medium-scale surface irrigation schemes. USAID also carried on with a groundwater irrigation project in the Western Terai and the UNDP/FAO project NEP-7 continued the preparation of a feasibility study on irrigation in the Central Terai area.

52. This irrigation development was characterized by infrastructural nature, either in the form of preinvestment survey or in main canal construction, and secondary and tertiary distribution work was somewhat neglected. As a result, increased irrigation capacity has been translated only partially into actual utilization since where secondary and tertiary channels did not exist, end channels bringing water to the farm did not exist either. The causes for this ineffective use of irrigation capacity are diverse. With some exceptions, the major concern has been with the engineering aspect of irrigation which is only part of the system of irrigation. There has been no mechanism bridging agriculture and water-engineering groups. This lack of coordination among agencies which should have been closely associated, made difficult the design and construction of detailed network of tertiary and the end channels of water. Project selection was not always optimal. Most major projects were located in the vicinity of the Indian border and the closer the location of the canal to the border the smaller the command area tended to become.

53. Until recently, the underlying philosophy behind public irrigation development has not been double-cropping, but provision of supplementary water to ensure the staple wet-season rice crops. All of the completed projects and almost all of the on-going ones were based on this "protective irrigation" concept. This approach was understandable considering the shortage of readily available water in the dry season, but did not provide for optimal water management.

54. The third characteristic of public irrigation development has been the inadequate pricing of water. At present, farmers are charged only

about Rs 10 per crop per ha, with the result that revenue from water charges amounts to a small and declining fraction of maintenance expenditures on irrigation.

REVENUE FROM WATER CHARGES
(Rs '000)

<u>Fiscal Year</u> (1)	<u>Regular Expenditure</u> (2)	<u>Development Expenditure</u> (3)	<u>Revenue from Water Charges</u> (4)	<u>(4) as percent of (2)</u> (5)
1970/71 (actual)	11.99	374.85	1.71	14%
1971/72 (Rev. Est.)	24.20	376.55	1.70	7%
1972/73 (Est.)	26.69	496.74	2.00	7%

Source: Public Sector Enterprises and Pricing of Products and Services,
B. B. Pradhan, January 1973.

55. The fourth characteristic of public irrigation policy has been the neglect of the Hill areas with the exception of Kathmandu Valley. Little is known about the extent of private irrigation in the Hills. Some rough estimates would tend to show that local irrigation works, such as tanks, wells and small drains and channels constructed by the farmers themselves (both in the Terai and in the Hills), supply water to about 400,000 ha but in many places such works are not dependable and frequently fail to ensure an adequate and regular supply of water.

56. The main features of past irrigation policy are: (1) Poor utilization of existing capacity, because of lack of integrated approach, (2) emphasis on the "protective irrigation" concept, (3) inadequate pricing of water and (4) neglect of the Hills. A fresh start has been made which offers an answer to the first three problems. Recently, the government has signed loan agreements with the Asian Development Bank for two projects, one in the Kankai Area (5,000 ha) and the other in the Chitwan Valley (11,000 ha). A third one, the Birganj Irrigation Project (about 30,000 ha) is being financed by the World Bank Group.

57. In common, these three projects are designed to ensure that the previous functional isolation between agriculture agencies and water-engineering groups is brought to an end and that irrigation proper is only one, albeit fundamental, aspect of the agricultural development policy. These three projects are also designed for optimum water management, which include multiple-cropping. Similarly, these projects have provided for adequate pricing policies, which should ensure that total maintenance costs and part of capital costs would be covered by revenues from water charges. This new development should therefore be welcomed.

58. Policy for irrigation development should try to respond to immediate priority problems; and namely, the need to stop a further deterioration of the overall foodgrain supply situation, while allocating scarce resources (both in terms of capital and of skilled manpower) in an optimal

manner. "One minor irrigation surface water project had an investment cost of less than NRs 1,000 per ha and increased the value of output by an estimated NRs 500 per ha per year with a project life span of thirty years. Preliminary results with tubewell irrigation projects show an investment cost of NRs 2,200 per ha irrigated to achieve NRs 600 increase in value of output per year for ten years. One major irrigation project proposal under review has an estimated capital cost exceeding NRs 8,000 per ha and an estimated annual increase in value of output of NRs 1,000 per ha per year for 100 years." 1/ While the absolute figures need to be revised, their respective relationships are probably still valid today.

59. It is difficult to generalize, but given the pressing needs to increase foodgrain output, the scarce operating managerial capacity and the opportunity costs of capital, it seems that wherever possible some preference should be given to minor and medium surface water projects, which appear to have a higher value of output per unit of capital required and shorter gestation. While some compromise should be reached between short and long gestation projects, the emphasis should be on minimizing the construction time factor before delivery of water to farmers' fields.

60. As regards irrigation in the Hills, the problem is of a different nature and will be reviewed in the next Chapter. Suffice to say that development efforts in these areas must be concentrated on the more promising accessible areas at first, and these can be widened only to the extent that road construction proceeds.

Supply of Agricultural Inputs

61. Seemingly, the inadequate supply of agricultural inputs has been one of the chief obstacles in the way of achievement of the agricultural targets of the Third Plan. However, in the implementation of an agricultural input program, the supply of such inputs is only partially responsible for its overall success. The program has to be supported by concerted policies in research, extension, marketing prices and credit. All through the Third Plan, this coordination hardly existed except in the Kathmandu Valley.

62. The Agricultural Marketing Corporation, which resulted from the recent merger of the Agricultural Supply Corporation and of the Food Management Corporation, 2/ is the main agency responsible for the procurement and supply of improved seeds, fertilizers, plant protection material and implements to the farmers. The main constraints the Corporation has to face in extending its activities are shortage of supply due to slow handling

1/ Current Economic Position and Prospects of Nepal - Volume II
Agricultural Development. IBRD, June 26, 1969, SA-7a, pages 26 and 27.

2/ The main purpose of the Food Management Corporation has been the purchase of foodgrains at cheap prices in order to supply foodgrains to the army and police departments and the Kathmandu Valley at low prices to help keep prices down.

of imports in Calcutta, difficulties of internal transport, the lack of storage facilities and the lack of an integrated production program. At present the Corporation has a storage capacity of 5,500 tons located in Kathmandu, Birganj and Bahirawa. During the Fourth Plan period the Corporation plans to construct four more godowns of a capacity of 8,000 tons. Distribution is conducted through 100 cooperative societies and 200 private dealers. Margins of 7 percent and 5 percent are allowed to the cooperatives and the private dealers respectively. The small margins have not encouraged participation of the private sector.

63. Although it is largely true that the use of fertilizer has been very low in the Hills due to transport difficulties, nevertheless it is true that for some areas this is not the decisive obstacle. The mission was told that fertilizer could be economically transported to many more areas than at present supplied even with the existing transport network. Taking a few illustrations: from Nepalganj to Surkhet; Palpa to Gulmi, through mule track; Kathmandu to Trisuli, through unmetalled road; Kathmandu to Barbise, Chinese road; Janakpur to Sindhuli, metalled road and fair-weather jeep track; Lahan to Udaipur, fair-weather road and jeep track; Dharan to Dhankuta, mule track. Many more places could be reached at a reasonable cost, but so far have not been touched by the Agricultural Marketing Corporation activities.

64. The main obstacle appears, therefore, to be the lack of an integrated production program. This can be shown by the comparative performance of three districts in the Terai (Sunsary, Morang, Siraha) and the three districts of the Kathmandu Valley, all six districts having reasonably good transportation facilities. In the Kathmandu Valley where extension services and the service agencies are working reasonably well, consumption of fertilizers has increased rapidly while consumption of fertilizers in the Terai district grew very slowly and remained at a very low level. The results in terms of yields have been the following in 1968/69. ^{1/}

USE OF FERTILIZERS IN SELECTED DISTRICTS AND YIELDS

	Paddy		Wheat	
	Consumption of fertilizers (in tons)	Yield tons per ha	Consumption of fertilizers (in tons)	Yield tons per ha
<u>Terai districts</u>				
Sunsary and				
Morang	24	1.85	113	0.95
Siraha	-	2.10	-	1.05
<u>Kathmandu districts</u>				
Kathmandu	1,504	3.52	1,162	1.60
Khaktapur	1,523	3.90	770	1.65
Lalitpur	499	3.62	562	1.60

^{1/} Source: Evaluation of Third Plan agricultural performance, HMG 1972.

65. A fourth factor which inhibited consumption of fertilizers has been the high prices in many areas of the Hills. In early 1972, for instance, prices were on average 25 to 30 percent higher in the Hills than in the Terai. Another factor which also disturbed the marketing has been the fact that fertilizer price in India was much higher than in the Terai area of Nepal, which has resulted in re-export of fertilizer to India. To overcome these problems at least partly, the Agricultural Marketing Corporation has formulated a new price policy which became effective in July, 1972: prices have been unified for the whole country, which involve substantial subsidies, more or less equal to internal transportation costs, while price differential with Indian prices has been reduced in the hope that the small difference remaining (about 10 percent) would not be enough of an incentive for smuggling. The extent to which these pricing policies have produced the desired effect is not as yet apparent.

66. As a result, even though consumption of fertilizer has increased from about 3,000 tons in 1965/66 to over 30,000 tons in 1970/71, this still represents a very low rate utilization per ha (12.5 kg in gross terms). Fertilizer application has been largely restricted to the Kathmandu area. Negligible five years ago, the total area under improved seeds is reported to have increased from about 4 percent in 1968/69 to 7 percent in 1970/71; wheat area under improved seeds has expanded substantially and now covers about one-third of the planted area. This "mini green revolution" is again mostly concentrated in the Kathmandu Valley and explains the level of fertilizer consumption following the successful introduction of more fertilizer responsive varieties.

Markets and Prices

67. Adequate storage and marketing organization is important for improving the farmers' response to government development policies. As of December 1972, storage capacity for food under government control, was only about 20,000 tons (10,000 tons in both the Terai and Kathmandu), ^{1/} which is very little if one considers that in a normal year about half a million tons of foodgrains are marketed from the Terai to India and to the Hills. The result of this limited storage capacity is two-fold: farmers have to sell immediately after harvesting, at a time therefore when prices are depleted or they have to accept important storage losses. Due to lack of storage also, some products are exported to India to be re-exported to Nepal during the season of shortage.

68. Private storage capacities are not known, but grain handling, storage and processing facilities at the farm level and primary and secondary assembly points, are extremely primitive and result in excessive losses. Handling and storage losses of 25 to 40 percent were reported for wheat stored more than six months under these conditions. For rice, in addition

1/ Source: Planning Division, Ministry of Food, Agriculture and Irrigation - March 29, 1972.

to losses due to excessive moisture, rodents and insects, there is a problem of processing. Hand-pounding or the huller type rice mill, typical of village rice milling, recover 52 to 55 kilograms of rice from 100 kilograms of paddy. The sheller-type rice mill, typical of commercial operations in the Terai, recovers 56 to 60 kilograms of rice when raw rice is processed, and 60 to 63 kilograms when parboiled rice is processed. Reasonable standards would be 65 to 67 percent while the most modern techniques should yield 68 to 70 percent rice recovery rates.

69. Similar problems of storage and processing were observed for maize and millets under typical village conditions. Potato produced in the Terai must be marketed soon after harvest as cold storage facilities are not available. For the cash crop and animal products, market facilities for handling, storage, processing and transportation may also be characterized as primitive.

70. Solutions to all these problems are not easy to formulate. Since paddy is the main foodcrop, better rice recovery rates are an urgent priority and proper attention should, therefore, be given to the modernization of the rice milling sector. There exist at present about 1,000 rice mills, the great majority of which have a capacity of less than 1/2 ton per hour. Storage is needed in the Terai to maximize export earnings and to ensure the supply of foodgrains to the Hills and Kathmandu Valley, where storage is also needed.

71. Nepal's ability to use price policies as a vehicle to increase production or to change production patterns is limited in view of Nepal's economic dependence on India. Foodgrain prices in India are the leading prices, but proper storage facilities would allow Nepal to export to India when prices are not at their lowest level, i.e., just after harvest. Proper storage facilities both in the Hills and the Terai would help in reducing price differences of foodgrains between these two areas. At the beginning of the 1972 winter for instance, price of foodgrains was four times higher in Jumla - located in the Hills - than in the Terai, and at Rs 8 a kilogram, local traders found it profitable to transport grains by airfreight. Admittedly, Jumla is far from the Terai and 1972 was a drought year; nonetheless, price disparities are substantial and are the rule even in a normal year. Storage and effective working of the Agricultural Marketing Corporation would do much to reduce these disparities, which aggravate greatly the ills of the Hills. But a lasting solution of these would imply a greatly improved transportation system.

Agricultural Research

72. Crop Production. Agricultural research, mainly directed towards the adaptation of already discovered technology, will be of prime importance in the process of transformation of the traditional agriculture in Nepal. Research in cereals and cash crops is at present conducted by the Department of Agricultural Education and Research. The Department has an elaborate research complex at Khumli Tar near Kathmandu consisting of five sections doing research on agronomy, agricultural botany, soil science, plant

pathology and entomology. These sections are staffed by highly qualified agricultural scientists. The Department has 12 other research stations and agricultural farms in various regions of the country, and the total technically qualified staff at advanced professional levels in the Department is reported to be about 100 persons.

73. So far, the Department has achieved success in adapting improved varieties of wheat, which have been successfully introduced mostly in the Kathmandu area. Research is also being carried out on improved varieties of rice and maize, but results so far are not transferable to typical farm conditions. One high-yielding variety of maize, "Khumul Tar Yellow", has been identified, but attempts to introduce this variety to farmers have failed because of its long maturing time. This year a new Mexican seed (high lysine-Opaque 2) crossed with local varieties is being tried. Trials are also likely to be started this year on better varieties of mustard. ^{1/}

74. The adaptive research work of the Department is severely handicapped because so far, in the major research centers in India, Pakistan and elsewhere, a rice variety suitable for monsoon sowing has not been successfully identified. In addition to the varietal research on new varieties and the research on new technology, equal attention should be given to research on the response of local varieties to chemical fertilizers and to the more efficient utilization of compost manuring. Research on the technical and economic feasibility of a more purposeful crop rotation also needs active consideration.

75. Industrial crops have so far been completely neglected except for jute, where a modest start has been made. Significant payoffs can be expected from research on sugarcane, tobacco and oilseeds. Another field which appears promising is the development of spices, where the country appears to have some comparative advantage. Spices are high in value and small in bulk, and therefore suited to the present transport conditions of the country. Another commodity which, despite the priority position accorded to it by the government, is not supported by any research effort is tea. Some efforts by the Tea Development Corporation have been concentrated on marketing and blending, but very little with growing.

76. The present foreign assistance to the Department includes the technical and financial support provided by the Rockefeller Foundation, USAID, India and UNDP/FAO. Assistance is also being given by Japan and West Germany within the regional projects which have been set up and managed by the respective governments in collaboration with Nepalese staff.

^{1/} On a visit to the agronomy section of the Khumul Tar farm, research on these varieties was noted. Rice: for the Hills - Taichnung 176, Chianan 2, Chianang 242, Tainan 1, Khumul (P i 25936); for the Plains - IR 20, IR22, IR8, Malaysian varieties like Malinja, Masuli. Wheat: for the Hills (Kathmandu conditions) - Pitic 62, S331, Lerma Rojo 64, yerm 52; for the Plains-Kalyan sona, S331, Sonalika. In addition, fertilizer trials were being carried out on local mustard and wheat.

The Asian Development Bank is assisting an integrated program for improving jute production. The program aims at strengthening the Biratnagar Agricultural Station, expansion of jute demonstration farms in selected areas, and improving cultural practices, marketing and grading. The program also includes improved quality control in, and modernization of two existing jute mills.

77. The government is aware of the importance of research and hopes to improve its effectiveness and to coordinate the activities of the Research and Education Department with those of the Horticulture and Livestock Department. "Chief Officers" are being appointed in important districts. So far such officers have been appointed in the districts of Jiri, Jumla, Parwanipur and Tarahra.

78. Horticultural Research. As part of their strategy for the Hills development, the Government wants to diversify the Hills production towards horticulture and livestock products. This strategy originates from a fairly rich potential which certain Hill areas have for horticulture. At present, many different types of fruits ^{1/} are produced in almost all parts of the country, but because of the lack of transport, marketing and storage facilities their consumption is limited to the local markets and to a very short season. Furthermore, because of the lack of orientation towards commercial horticulture, little attention has been paid to quality.

79. The Horticulture Department is responsible for research on fruits, vegetables and potatoes. There are 23 horticulture stations in the country, two more are to be established in Jumla and Mustang during the current Plan period. So far the impact of these activities has been very limited. The centers are mainly concerned with the supply of fruit trees at subsidized prices to the farmers. In research, the only notable achievement has been the identification of disease-resisting high-yielding varieties of potatoes, which have been successfully introduced (see para 9). India has been providing assistance in horticulture since 1960.

80. Livestock Research. All activities in the livestock sector face the serious constraint posed by inability to eliminate surplus and uneconomic cattle. Working within this constraint, the Government has a fairly elaborate list of objectives. The broad policy directives aim at development of yak and chauri and sheep farming in the high mountain areas, development of buffalo farming in the Hills and the Terai and the development of goats, poultry and pigs in the area near urban centers in the Terai and the Hills.

81. At present there are four multi-purpose livestock development farms at Lalitpur, Chitwan, Sunsari and Kaski for conducting research on livestock farming (mainly cattle, buffaloes, pigs and poultry). In addition,

^{1/} Banana, mango, papaya, orange, almond, guava, pear, peach, cherry, apricot, plum, leechee, jackfruit, lime, grape, pineapple and walnut.

there are three sheep breeding farms at Chilong, Panchsayakhola and Jumla. ^{1/} During the Fourth Plan two more livestock development farms will be established at Nepalgunj and Tapeljung.

82. Yak and chauri ^{2/} appear to have a reasonably good chance of development in the mountainous areas. Expansion and improvement in raising them can provide a source of income, work and nutrition for the mountain population. Furthermore, such development will not be constrained by the taboos on animal slaughter. The government is rightly giving priority to this sector for the mountains. In pursuance of this policy, it plans to set up a yak and chauri research farm at Solo Khumbhu. During the Fourth Plan the government also plans to set up three more cheese factories in the mountain areas.

83. Research in Fodder Crops and Pasture Grasses. Feeding the enormous number of unproductive cattle is a heavy burden on the pasture resources of the country, but the present socio-ethical conditions leave hardly any choice open to the planner. The increase in human and cattle population will progressively aggravate the present situation. Another factor which has contributed to the worsening of conditions in the mountain areas is the loss of Tibetan grazing grounds. To cope with at least one side of the problem, the Government is actively interested in increasing the pasture resources of the country.

^{1/} One of these sheep breeding farms is in the mountain area near Jumla, established only about 2 years ago, and is in the initial stages of work. Attempts were made without much success to crossbreed local sheep with a foreign breed. Most of the imported rams died; the remaining two have also failed to acclimatize themselves.

^{2/} Yaks and naks (female yaks) are high altitude animals which live in the Himalayas at altitudes of about 3,000 meters. Yaks are used to breed the local cows to produce Urang chauries for milk production. The male off-spring is sterile and is used for ploughing. The naks are also bred with the local bulls and the female off-spring, dinzo chauri, is used for milk production, while the male off-spring is sterile and is used for ploughing and as a pack animal. The milk production of naks is 1.5 liters per day, while that of chauries is 2.5 liters per day. The lactation period is nine months. These animals are the main source of meat, milk and fat for the mountain population. Milk is also utilized by the three cheese factories of the Dairy Development Corporation at Lantang, Pike and Thodung for cheese making. In areas where there are no cheese factories, milk is converted into ghee (butter oil). Herds are shorn and rope is made from the fibers. The tails of yaks and naks also have commercial value.

84. The estimates of areas under alpine meadows and pastures vary from 7 to 14 percent of total land area. Because 21 percent of total area is said to be cultivable waste land, government sources hope that at least a part of this cultivable waste can be used for pastures and fodder cultivation. To take advantage of these possibilities, the government hopes to establish pasture development centers at Lalitpur, Rasuwa, Ramechhap, Rapti, Sunsari and Jumla to undertake research in pasture grasses. The seeds for the experiments will be imported, and those eventually found suitable will be distributed to the farmers.

85. India has provided bulls and buffaloes to the livestock farm for breeding purposes. Assistance in the past was also given by USAID, the New Zealand Government and the Swiss Association for Technical Assistance (SATA).

86. Fisheries. At present, the government has twelve fish breeding centers in the country. Their impact on production, however, has been insignificant. In some areas, it has been actually falling. The reasons for the decrease in some areas include the illegal use of dynamite for "fishing" and non-observance of the size limits on the catch - in one instance (Pokhara) it was stated to be the faulty design of the irrigation barrage gates. The government intends to establish four new breeding centers during the Fourth Plan. So far the only successful project has been the FAO fish-cum-duck raising farm in Hetaura. Other fishery development projects have shown disappointing results, because government fish farms have not been cost-conscious enough nor sufficiently market-oriented, so that they could not gain wider range of support from the private farms and merchants nor from the consumers in general.

III. THE HILLS AND THE TERAI

87. A general review of the major problems of Nepal's agriculture sector, such as was made in the preceding chapter, presents only a part, albeit an important part, of the total picture. But to complete the analysis, it is important to recognize that Nepal in a sense has two agriculture sectors--that of the Hills and that of the Terai. While the two share certain common features, they are quite distinct in others requiring therefore different approaches to remedial action.

88. Climatically, the Terai is a hot and sub-tropical zone while the Hills enjoy a pleasant and temperate climate. Both zones therefore could produce entirely different crops and to some extent actually do. There are also important ethnic differences and the attendant differences in the socio-cultural milieu. The people of the southern plains are predominantly made up of Aryan stock while those of the Midlands have a blend of Mongoloid and Aryan stocks; these differences in ethnic composition are reflected in corresponding differences in the socio-cultural structure and, by extension, in areas such as the attitude to women working in the fields or the willingness of upper and middle class males to be employed in public works programs.

89. Nepal's transport sector is relatively undeveloped but the Terai which is flat can at least boast of well developed bullock trails; in contrast, the Hills have practically nothing beyond porter trails; as a result, economic development in the Hills is handicapped by generally prohibitive transport costs. The Terai is substantially integrated into the economy of the Indo-Gangetic plains while valleys on the Hills are isolated from each other. The Terai population is sedentary while more than a fourth of the Hills population reportedly migrates to the south in the winter months in search of employment or fodder for their cattle, or to sell their surplus products (mostly ghee). Also, for over 150 years, sheer necessity forced Nepalese from the Hills to seek alternative and more durable economic opportunities outside Nepal, and many enlisted in the Gurkha regiments of the British and Indian armies or found employment in security post guards in Indian cities. The economic impact of this migratory movement should not be minimized. There is no doubt that army pay and pensions ^{1/} help keep many rural areas, namely in the Gandaki sector, solvent

90. The most important difference however is economic. The land/man ratio in the Terai is relatively comfortable; as a consequence perhaps, yields per unit of land and cropping intensity are low. Nevertheless, the Terai is a surplus region. On the other hand, the land/man ratio in the Hills is very low, but yields are nearly optimum at the present level of technology and cropping intensity high. With such a narrow resource base, most of the Hills districts are, however, deficit in foodgrains. The

^{1/} Remittances equivalent to \$3.0 million in 1966/67 and \$5.7 million in 1971/72.

difficult economic situation facing the Hills is best revealed by the classification of the farmers in the Hills by the Agricultural Credit Survey: "big" farmers are those cultivating above 1.02 ha of land, "medium" farmers are those cultivating between 0.51 to 1.02 ha and "small" farmers are those cultivating between 0.05 to 0.51 ha.

The Hills: A Deteriorating Economy

91. Official statistics show that foodgrain production in the Hills decreased by 0.3 percent a year between 1964/65 and 1971/72. Given the considerable uncertainty surrounding the reliability of agricultural statistics, such a percentage should not be taken at its face value, but as an indication of a trend. This trend is, moreover, confirmed by many surveys conducted in the Hills. Thus, impressionistic information sustained what official estimates would suggest.

92. The major reason for the Hills' deteriorating economic situation is fairly obvious: fast growing population pressure. The Hills have been the most ideal for human settlement; altitude and climate provided extremely favorable conditions for almost any kind of agricultural production. The land was moreover fertile. Furthermore, through their location, the Hills were almost inaccessible to outside invasion and provided ideal ground for people to take refuge from invaders and conquerors who over previous centuries raided the northern part of the Indian sub-continent. As a result, the Hills were densely populated, but a near-stable population provided for some kind of equilibrium between people and resources.

93. This people/resources near-equilibrium no longer exists as demographic growth has resulted in a doubling of population during the past two generations. Previously confined to the flat and fertile land of the river valleys where there is scope for irrigation and on the slopes of the ridges and spurs immediately above them, agricultural activity had to be pushed onto the steeply terraced hill slopes, to sustain an increasing population. But these lands, thus devoid of vegetal cover, could not be irrigated. Further population pressure required more land to be brought under cultivation by means of deforestation, thus accelerating erosion and minimizing net results. There are inherent indications of a general decline in soil fertility, as more and more top soil is washed away by heavy monsoon rains and more nutrients are drawn from the soil, while few are returned to it. With the passing of time and increased erosion, not only did productivity decline, but also production.

94. As a result, the main problem of animal husbandry in the Hills is the acute shortage of fodder and grazing grounds accentuated by the reclamation of nearby forests, and large fluctuations in their availability from year to year caused by uncertain and uneven rains. After the crops are harvested, the stalks of the harvested grains provide one source of fodder but, because of the number of animals, this supply is soon exhausted. Foraging by women and young girls is being done at considerable distance from the villages to obtain leaves and greens out of the reach of animals or grass on terrain too rugged for animals. Pasturage is becoming so difficult to find that many households take their animals to the lower foothills or to the Terai jungles for winter grazing.

95. Thus, the average quality of most of the animals is very poor. The bullock are small in size and milk yields are quite low, averaging 135 kg of milk per cow per year. Milk products from cows are most of the time used for domestic consumption. The only source of cash income from many Hill households comes primarily from the she-buffaloes. They give more milk than cows and given the same amount of buffalo and cow milk, more ghee can be extracted from the former. A milch buffalo produces approximately 18 kg of ghee annually. This poor yield of the cattle herd is not only due to insufficient feed, but also to the absence of cattle management. Among many farmers, taking care of a large population of useless cows is a religious obligation.

96. The picture that emerges from the above description is a distressing and alarming one: distressing, because of the dire poverty of many households in the Hills; alarming, because according to most observers, including official observers, the situation is deteriorating. If population pressure is mostly responsible for this situation, the lack of public investments in the Hills, with the exception of the Kathmandu and, to a lesser extent, of the Pokhara valleys added to this grim development.

97. Developing the Hills necessarily means opening them to the road network, without which few modern inputs can be put at the disposal of the farmers nor consequent agricultural surplus be marketed. And little has been done - nor in fact could have been done - in this regard. Building east-west connections first was not only a political, but also a logical necessity. Building of feeder roads requires that main arteries be built first even if, in some cases, it may be argued that development along existing arteries could have taken place much earlier. This lack of transportation facilities meant also the poor staffing - both in terms of quality and quantity - of supporting development institutions such as the extension services, institutional credit institutions, etc. Even if more public funds ^{1/} had been made available for development of the Hills, these funds could not have been used efficiently for lack of effective public institutions and for lack of coordination among them.

98. The consequences of the combination of these factors - population pressure, low land resources base and lack of public investments - are extreme poverty. Some survey findings in the Hill area of Kosi and Gandaki sectors reveal that per capita income there has been estimated to be more or less \$40, i.e. about half the national average. Moreover, this income has little or no element of cash. This need for cash and in certain cases for food, forces the Hill people to migrate.

99. There are general causes for migration. Being predominantly of subsistence nature, agricultural activity does not create cash income, and some cash income generation is absolutely vital for minimum purchase of

^{1/} Most of the limited funds provided for Hill development have, with few exceptions outside Kathmandu, failed to show any tangible results.

salt, cloth and some household items. For lack of proper communication, these items in the Hills are extremely expensive because of costly portorage charges. Airfreight is also evidently quite prohibitive since most of the Hills with air connection are not served by scheduled but chartered flights; and chartered airfreight is 15 times more expensive than scheduled airfreight. For instance, compared with the Nepaljung (Terai), prices in Jumla (Hills) ^{1/} in December 1972, were 2.5 times higher for matches, 4 times higher for rice and 8 times higher for kerosene. Therefore, households with outside cash income resources (pensions, remittances from relatives in Gurkha regiments) send out at least one member of the family to purchase the necessary items in Terai bazaars. There he can purchase them at a reasonable price, since there is stiff competition among bazaar shopkeepers.

100. The only significant Hill product tradable for cash is ghee which is not bulky and is of high value. Typically, farmers will go to the Terai to sell ghee and with the generated cash purchase salt, cloth and household items. If sale of ghee does not generate enough cash for the required minimum purchase, a farmer will look for employment in the Terai to raise the needed additional cash. Due to shortage of fodder during winter, many cattle herds have to be moved for grazing to the Terai forest; cash will also be generated by the sale of ghee produced during the winter months.

101. In a normal year many Hill farmers produce just enough food to feed their family but when the harvest is poor, as in 1972, many of them have no other choice but to move to the Terai or to India, very often with their family, in search of a gainful employment as a laborer. This is a condition of survival. If they borrow money from local moneylenders, their situation is bound to become pretty desperate. Seasonal migration is also a condition of survival for farmers with tiny holdings and also for landless workers: for seven months a year, there is no demand for labor, and non-agricultural occupations are nearly nonexistent. Seasonal migration appears, therefore, to be a permanent and vital feature of the economic life in the Hills.

102. Seasonal migrants from the small farmer and landless laborer groups are potential permanent migrants. What they want is to own some land in the Terai or to be provided with permanent jobs. They have however, no resources to buy land and few all-year jobs are available. Nevertheless, they are often forced to migrate. When a tiny holding is to be divided among brothers, one or more of them have no other choice but to leave, a direct result of population pressure. Another cause of forced permanent migration is the result of erosion. Overgrazing, at the expense of the forest cover, has accelerated the natural erosion, which is constant, severe and widespread. Occasionally, a side of a mountain will slide into the valley carrying the terraced fields with it, when heavy cloud bursts cause landslides and avalanches of boulders in the mountains. Here again, the unfortunate farmers have to leave their valleys and look for an uncertain living on the southern plains.

^{1/} Causes and impact of migration - A preliminary survey in Surket Region - CEDA and SFIT, Mimeo, March 1973.

103. Extreme misery brought by indebtedness also forces people to leave their villages. When farmers have to borrow from local moneylenders and shopkeepers to meet their food needs or their social and ceremonial obligations (marriage), they very seldom can escape from the debt circle, given the prohibitive interest rate. In some ways their land is being annexed; in some extreme cases also, debtors are reduced to a status of pseudo-slavery and forced to provide portage services at dictated and unfair terms.

104. One does not know the number of people who are compelled to migrate permanently, but the large number of people observed waiting around the few established or on-going resettlement projects in the Terai bears testimony to the growing magnitude of permanent migration. "Forced" migration is the right word, because Hill people migrate only reluctantly: it is psychologically destructive to leave one's ancestral home, friends and village community, just because of unbearable misery, to adjust oneself to new geographical surroundings, where summer months are cruel for people accustomed to a temperate climate. Moreover, most of the migrants especially from the Western Hills are poor people with a limited horizon and ill-prepared to avail themselves of the full benefits of potential economic opportunities. On the other hand, in some other parts of the Hill region, some ethnic groups, for which betterment of their economic and social status has long been ingrained in their cultural institutions, send down to the Terai and to the Inner Terai individuals with strong motivation and initiative. In a better situation of course, are the well-off Hill farmers who have enough resources to buy land in the Terai while keeping their ancestral land in the Hills.

105. The situation in the Hills calls for remedial actions which are in a sense easy to spell out, but difficult and costly to implement. The problem is to try to slow down the rate of migration by developing the Hills - in a selective manner - so that a large part of the population can be provided with a decent income. In the absence of development, the economic and social situation would continue to deteriorate because of the vicious population pressure - erosion - poverty circle; under such circumstances, migration is likely to grow in magnitude which will inevitably result in more illegal and uneconomic encroachment in the Terai forests and the creation in the Terai of an important uprooted landless class. As a matter of fact, it is very unlikely that resettlement programs would be able to keep pace with a growing migratory flow; even today, resettlement programs are far behind the needs.

106. Development of the Hills, however, would not altogether prevent migratory movement because population is expected to continue to grow and the holdings are too tiny to be split further. It would nonetheless reduce the magnitude of this flow. This reduced flow of migrants would, therefore, have to be offered alternative economic opportunities and organized resettlement in the Terai is also called for.

107. In the following paragraphs, we will try to review the development potential of the Hills and the means required to develop it. So far, no systematic and scientific review has been carried out regarding the exact potential of the Hills. Many surveys, however, have been conducted which

make possible an attempt to outline in a rough manner what kind of potentialities do exist.

108. The existing production pattern is not running along the lines of comparative advantage. By force, the Hills could hardly specialize in lines of production well suited to their climatic conditions, such as horticulture, because of lack of rapid means of transportation which prevents the marketing of bulky and perishable products. The only specialization the Hills have been able to achieve is in livestock: ghee is the major source of cash income. But as it stands now, this specialization is in jeopardy. As we have seen, population pressure has gradually led to the diversion of land hitherto devoted to fodder, to foodgrain growing. Similarly, in order to increase food supply, accessible grazing grounds have been turned into cropland. Today, the economics of livestock in the Hills is largely dependent on the continuing availability of grazing grounds in the jungles of the Terai.

109. The ultimate purpose of development of the Hills clearly points to shifting the present cropping pattern towards an optimal one along the lines of the Hills' comparative advantages. In terms of development strategy, this would ideally call for use of yield-increasing techniques, restructuring of present land-use patterns by means of substitution of land from low value to high value crops and from field crop production to horticulture. But such a development policy can only take place gradually and some intermediary steps must be implemented first.

110. Most of the Hill farmers experience foodgrain deficit and before they start specializing their production, they would need to be as near as possible to a situation of self-sufficiency in food. After reaching this stage, they might be willing to gradually change their cropping patterns, grow more cash-crop and, with the cash generated, purchase part of their food requirements in the Terai. In the Hills, each small region has its own balance of payments and, if there are to be imports, there must be exports to pay for them but it necessarily takes time before substantial export surpluses can be created. During the first phase of their development, Hill production activities should therefore be predominantly import-substitution oriented, but not exclusively, since some quick-yielding production requiring few inputs (vegetables, potatoes) can be exported; during the second phase, the Hills should become export-oriented and reorganize their land utilization along the lines of comparative advantages.

111. With proper use of modern inputs and improved cultural techniques, intensive cultivation of foodgrain should be concentrated in the valley bottoms and the immediate slopes above them, which can be irrigated through minor works. Area under maize and pulses should be stabilized. Area under rice should be increased by reducing the acreage under millets. Wheat and barley cultivation should be increased during winter months through higher cropping intensity. Proper rotation of cropping should be adopted along with soil conservation techniques. The enrichment of the soil would be a natural process and a good proportion of the land presently fallowed could be brought under cultivation. Berseem and luzerne crops, which provide excellent feed for cattle, should be introduced in the new cropping pattern.

Potential for vegetable growing should also be explored. Trees, preferably fruit trees, could be planted on the hilltops and steep lands with more than 40 percent slope for soil conservation purpose, with a prospect of future cash income generation. Moderately sloping lands could be cultivated by bench terracing /which consists of a series of platforms having suitable vertical slopes/ on which chilli pepper could be grown. Chilli pepper has a potential for good yields and could bring substantial cash return. There is also good scope for extension of potato cultivation which requires few inputs. As three to four crops of potatoes can be harvested in a single year, this line of production could offer a very interesting cash return potential, and if potatoes could be partly substituted as a staple diet, it could lessen the problem of food sufficiency in the Hills.

112. At the first stage of Hill development, there is little scope for planting fruit trees, except as soil conservation measures. As a matter of fact, it is likely that farmer's acceptance of fruit culture at the cost of foodgrain cultivation would not be easy to come by. The main reason is that farmers would have to wait five to ten years for a return. On the steep slopes, however, where the topsoil is being gradually washed away by rains and consequently yields are diminishing rapidly, farmers could be persuaded, given proper support, to plant fruit trees, while growing inter-crops in the orchard for the initial period of four to five years. It is worth mentioning that most landslides occur when cultivation has been given up on the hill tops and steep lands, because the soil has become sterile; afforestation by fruit trees, while protecting lands situated downwards, would not therefore necessarily compete with foodgrain cultivation.

113. Developing the economic potential of the Hills would not be easy nor cheap. The key prerequisite is undoubtedly the building of roads, without which no inputs can reach the Hills, no surplus can be exported to pay for the inputs, and no institutions supporting agricultural development can be expected to work efficiently. In Nepal's present condition, roads cannot reach every valley. What can be done at this stage is the building of south-north axis penetrating densely populated areas and serving adjacent valleys. The command area of a road, in terms of influence, is estimated to be half a day's walk from the road, so that a farmer can go to a collection and distribution center situated along the road and be back to his village the same day. Some observers would estimate the command area of a road to be equivalent to a one-day walk.

114. While the building of roads is an imperative and basic requirement for developing the Hills, it should be realized that it also has its drawbacks. It may adversely affect employment opportunities of professional porters and the livelihood of traders. For instance, as a result of the Kathmandu - Trisuli road, the Trisuli market has lost its market function almost entirely to Kathmandu. It is also difficult to develop a given local economy to such an extent that it would effectively benefit from a road before it is opened, thus facilitating possibly the out-migration of the Hill population. It is therefore absolutely necessary that proper steps be taken to minimize the danger of migration.

115. One important step would be to recruit local people for building ^{1/} the portion of the roads near their villages and valleys and to pay them in cash. This cash injection in the local economy would facilitate the initial purchase of inputs and, for a time, deter people from migrating. The second important step would be the proper phasing and timing of action of supporting institutions, such as the Agricultural Marketing Corporation for supply of inputs, the Agricultural Development Bank for credit provision and the extension services for proper counsel. Ideally, these supporting institutions should prepare the ground for their development action before the road is opened in a given area.

116. After the opening of a road, one of the main development priorities in the command area should be the development of minor irrigation schemes. For topographical reasons, rainfall in the Hills usually drains from the field as soon as it falls. Much of this could be checked, if bunding was taken up on a large scale. Increasing the moisture content of the soil, would, in many cases, help to substitute less remunerative crops (e.g. millet) with more remunerative ones (e.g. oilseed). Return on this type of investment, allowing minimal opportunity cost for labor, would be quite high.

117. The most common form of irrigation used in the Hills is irrigation ditches, but they are mostly dug-out channels without any concrete foundation and proper regard for drainage. Consequently, maintenance and repair costs are very high. Digging of wells is also a possibility as well as lift irrigation by means of diesel pumping sets from local streams, provided they have perennial waters, for irrigation of lower terraces. Irrigation potential is probably not negligible, but its development would require engineering guidance and credit availability.

118. Aside from irrigation facilities, other inputs critically needed for intensifying agriculture are manure, fertilizers, improved varieties of seeds, and control of disease and pests. Animal manures now used are not sufficient to increase yields from the depleting soil. The soil in the Hills appears deficient in calcium and phosphorus probably due to soil erosion and also in organic matter and nitrogen. Soil fertility could be greatly enhanced through adequate application of fertilizers and proper crop rotation. However, added fertility cannot be maintained without first stopping the soil erosion.

119. Soil conservation requires a proper land use program combined with water management and cultural practices. Cultivation in the Hills is usually done without employing necessary protective measures. Terraces are irregular and slope outwards; marginal bunds are very weak and no proper arrangement is made for run-off and exhaustive crops (e.g. maize and wheat) that are grown year after year. All those factors, in addition to the destruction of the natural forest cover, burning and overgrazing, are aggravating the erosion problem. Afforestation of hill tops and steep

^{1/} Building a road through the rugged terrain of the Hills is by force labor-intensive. Only surfacing works could be done by capital-intensive techniques.

lands with more than 40 percent slope is badly needed. Proper marginal bunding and backward slopping of moderately slopping lands should be carried out, as well as the growing of close cover crops such as grass and legumes.

120. Proper management of the cattle stock could also serve as an important source of supplementary cash income. Adequate crop rotation could provide enough fodder for animals and reduce the risk of over-grazing which adds to erosion. The strategy of livestock development should be based upon the suitability of various animals and breeds. Thus, more use of buffaloes for milk purposes could drastically reduce the number of cattle which compete with other animals in sharing the available scanty fodder resources. In addition to increased feed supply, special attention should therefore be given to the improvement of the existing breeds.

121. The success of such a development program for the Hills will by and large depend upon the availability of adequate credit on easy terms. There will be a need credit for seeds, fertilizers, implements, irrigation and so forth. Irrigation works, erosion control and change in cropping patterns will also require a proper working of extension services and related agencies. In fact, the developing of the Hills will largely depend upon the external stimulus that government agencies will be able to provide.

The Terai: Declining Agricultural Surpluses

122. The Terai, especially the eastern part of the region, produces most of Nepal's exportable surpluses: rice and wood products to India; jute and jute goods to third countries. This region is able to produce such surpluses, because the per capita land resources is about 3.5 times that of the Hills; another factor responsible, albeit to an unknown extent, for the creation of this surplus is the land structure in the Eastern Terai, where two-thirds of the Terai population is concentrated. In this part of the Terai, the ownership structure is said to be concentrated and share-cropping and oral tenancy reported widespread. As a result, rents paid by the tillers of the soil are very high which, by restricting the consumption of the majority of the poor, allows the accumulation of important foodgrain surpluses by large owners.

123. Due to lack of security of tenure and high rents, the tillers of the soil have little incentive to improve their cultural practices and land productivity has remained, at best, stagnant. With mounting population pressure, foodgrains surpluses in the Eastern Terai are, therefore, gradually declining. For the whole Terai, foodgrain surpluses declined from 500,000 to 300,000 tons during the 60's. Some attempts have been made to remedy this land ownership structure by imposing a ceiling of landownership on large holdings and redistributing surplus land to small farmers. Some results have been obtained, the extent of which is nevertheless really not known. Similarly, laws have been recently enacted which introduced fixed rents for tenants in the Eastern Terai districts. The extent to which these new regulations would be enforced remains largely unknown.

124. Efforts to ensure security of tenure to the tillers and to regulate rents should be pursued vigorously, if cultural practices are to be improved. At present, cropping intensity in the Eastern Terai districts is only 110 percent, the lowest of the whole Nepal. The production potential of this region appears therefore to be important. Its development however, would require that tillers be given, among other things, proper incentives. Such a successful development would probably increase the consumption of the poor -a basic goal -and be able to generate substantial and probably increased agricultural surpluses.

125. With the eradication of malaria during the 60's, a substantial part of the forests and lands of the valleys of the Inner Terai have been turned into cropland. In the western and far western parts of the Terai, the potential for additional land which could be put under cultivation appears very substantial.

126. The role assigned to the Terai in the Nepalese economy is two-fold: (i) supplying the country with foodgrains and cash crops for exports to the Hills and to India and (ii) providing economic opportunities to migrants coming down from the Hills. These two goals are to a certain extent intertwined.

127. Increasing the productivity of lands already under cultivation requires the extension of irrigation facilities allowing for multiple-cropping. The irrigation potential in the Eastern and Central Terai plain is important but it consists mostly of major and medium surface irrigation works ^{1/} based on main rivers with perennial flows. Groundwater resources (tubewells, artesian wells) have not been systematically reviewed, but they are a priori not necessarily negligible; tests are being currently carried out in different parts of the Terai. On the other hand, minor surface irrigation potential appears limited since it would have to rely to a large extent on small rivers without perennial flows, which would not therefore allow for multiple-cropping. Aside from irrigation facilities, other familiar inputs, such as seeds and fertilizers, are critically needed and their supply will largely depend upon the availability of credit on easy terms and on the efficiency of the input delivery system. As in the Hills, efficient working of other supporting development institutions is also required.

128. The resettlement policy, mostly in the forests of the western and far western Terai, should have two primary objectives: to provide economic opportunities for Hill people who have to migrate and to contribute to the overall surplus position of the Terai which in the long-term is the only way to permit the specialization of the Hills.

129. In the past, official resettlement projects have been limited and illegal encroachment is the most serious forestry problem, though its precise extent is not well known. Hill migrants in quest of tillable land continually encroach on already exploited or virgin forest areas.

^{1/} See feasibility study in Irrigation Development in the Terai Plain (Phase II). Nippon KOEI Co. Ltd., Tokyo 1972.

This encroachment occurs near the fringe of the forest belts or within the interior of virgin forests when transportation facilities into the area exist. This was partially borne out during a recent field study ^{1/}: squatting nearby the Dhanagadi - Dandeldhura Road alignment has already caused some destruction of forest. Typically, new settlers in forest land have become very destructive to the existing forests. Forest department officials may be inclined to disregard offenses for they may not have the means to evict or punish these squatters in the face of threats or other forms of persuasion.

130. Apart from encroachment, there are other problems which result in the destruction of forests. Villagers have the privilege of cutting wood on payment of a nominal license fee issued by the local Panchayat for the construction and maintenance of houses and for making agricultural implements. It is difficult to exercise adequate control over these privileges and it is doubtful if all the trees cut in this manner are used for the specified purposes. Additionally, villagers also have the privilege of recovering dead wood as fuel which is very often subject to abuse.

131. Short of strictly policing forest use which may prove impractical in many respects, there is no other solution but to increase greatly the number of official resettlement projects. As a matter of fact, if too limited opportunities are offered, migrants would have no other choice but to reclaim forests illegally in an uneconomic and chaotic manner, which may write-off in a couple of years the last precious assets that Nepal still has at its disposal. How far this agricultural resettlement program should be pushed is nevertheless not known with precision.

132. The Terai districts still contain some of the finest forest resources in the country. Different varieties of forest occur of which Sal is considered the most valuable; sissou is also regarded as premium wood for furniture. Clearly, forest clearings by the government agencies should be selective and allow for conservation of large tracts of forests. First there are ecological reasons including preservation of wild life which may in the future provide hard currency revenues from tourism. Secondly, forestry-based activities offer a great opportunity for diversifying the economy. Proper use of forest resources could bring many benefits to the country as a whole. Commercial exploitation of forests could offer important opportunities for job creation; saw milling and plywood plants could increase the added-value in forestry-based activities while offering additional employment. There is a ready market in India for wood products, if proper marketing arrangements are made, which could earn the country badly needed Indian rupees; in the future also, labor-intensive furniture making could offer interesting export possibilities to third countries. Thirdly, what happens to the Terai forests would have a profound impact on ghee production in the Hills. Earlier we have seen that the livestock economy of the Hills depends probably upon the availability of grazing grounds in the Terai during winter months. Extensive clearing of forest lands would therefore dangerously affect ghee production; thus, the degree of population pressure in the Hills relieved by the resettlement would be partially cancelled by a loss in the ghee industry.

133. Early planning of future land use of the Terai regions appears, therefore, warranted. While further development of resettlement projects should be vigorously carried out, there is also a need for an integrated ecologic and economic approach in planning for an overall development effort of the region so that conflicts in land use can be resolved rationally and new opportunities for development brought to light.

134. In existing on-going resettlement projects, exploitation of timber generally lags behind the settlement work. One reason for this is that contractors are interested only in exploiting the most favorable timber stands. As a result, settlers cannot get the land allocated to them and in many cases, food aid from World Food Programs has terminated before settlers have become self-sufficient, thus forcing settlers to seek employment away from the settlement areas to support their families. This calls for changes in organizational and management priorities. In each resettlement project, the complete integration of forestry operations with settlement activities should be ensured. The financing arrangement should provide only one budget for both forestry and settlement operations. Organizationally this implies one line of authority or a unified command. This authority should ensure that forest exploitation operations cover all marketable and commercial forest species which currently are unutilized because of the existing selective buying practiced by contractors. The authority should have freedom to negotiate contracts; namely, for processing and marketing of forest products, to hire its personnel, enjoy a large degree of autonomy, e.g., in respect of terms and conditions of employment.

135. More importantly, since the main objective is settlement, this authority should be in a position to enlist directly or indirectly the help of the input delivery system and of rural credit institutions. The authority should be entitled to borrow from the Agricultural Development Bank both long-term and short-term loans under refinance arrangements with the Nepal Rastra Bank. The Agricultural Development Bank should be in a position to advance to families settled in the area long-term loans to cover purchases of food, cattle and tools and short-term credit requirements. As the settlers will have no land to offer as security since rights on land would be passed to the settlers only after payment of a certain amount of money payable over a certain number of years, the authority or the government would have guaranteed loans. The Agriculture Marketing Corporation would have to assist the authority in the supply of inputs to settlers and in marketing saleable surpluses. The success of a resettlement project would also largely depend upon the efficiency of the staff provided by the Extension Services.

Investment Priorities

136. Planned public sector investment in agricultural sector during the past three Plans and the Fourth Plan is shown in the following table:

PLANNED PUBLIC SECTOR OUTLAYS IN THE FOUR PLANS

	Outlays (Rs million)				Percent of Total			
	Plan I	Plan II	Plan III	Plan IV	Plan I	Plan II	Plan III	Plan IV
1. <u>Transport and Communications</u>	124	144	615	1,050	37.6	23.9	35.4	40.8
2. <u>Agriculture</u>	95	117	378	663	28.7	19.6	21.6	25.7
3. <u>Industry and Power</u>	55	193	385	470	16.6	32.2	22.1	18.3
4. <u>Social Services</u>	44	115	293	324	13.3	19.1	16.8	12.7
5. <u>Miscellaneous</u>	13	32	70	63	3.8	5.2	4.1	2.5
<u>TOTAL</u>	330	600	1,740	2,570	100.0	100.0	100.0	100.0

Source: B. P. Dhital - Role of Agriculture in Economic Development, 1970 - p. 66-67.

In the mission's view, the percentage of agricultural development expenditure, although on the increase for the on-going Plan, appears too low to meet the needs of the sector. The transport sector seems to have received a very high priority and it was the sector which received the bulk of foreign aid. During the Second and Third Plan, allocations to industry and power exceed those of agriculture. As most of the projects in industry and power benefited mostly urban people, notably those in Kathmandu, it has been roughly calculated that during the Third Plan, urban population received a per capita outlay of Rs 670, whereas rural population received only Rs 40 1/.

137. During the Fourth Plan, outlays for agriculture were expected to give preference to long gestation over short gestation projects.

PLANNED INVESTMENT IN AGRICULTURE IN THE FOURTH PLAN
(In million rupees or percent)

	Public Sector		Panchayat Sector	Private Sector	Total (Rs)	Total (%)
	(Rs)	(%)	(Rs)	(Rs)		
Total Agricultural Investment	662.8	100	39.0	470.0	1,171.8	100
<u>Short Gestation</u>	313.8	47.3	39.0	470.0	822.8	70.2
Agriculture and Services	186.9	28.2				
Credit	46.1	6.9				
Forestry	80.8	12.2				
<u>Long Gestation</u>	349.0	52.7			349.0	29.8
Survey & Land Reform	90.1	13.6				
Irrigation	258.9	39.1				

Source: Fourth Plan.

In the above table, it can be seen that only 47 percent of the public investment is likely to be productive within the plan period. One hundred percent of the expected Panchayat and private investment is considered to be short maturing. The Fourth Plan, however, advocates concentration of development resources in 28 districts (16 in the Terai and 12 in the Hills) and of efforts on on-going projects, and better utilization of existing capacity. A recent addition to the development policy is the regional development strategy. This aims at concentrating an effort in four north-south development corridors linking the Terai, the Hills and the Mountains. The object is to reduce inter-regional disparities and integrate the national economy. Special attention is to be paid to the elimination of the imbalance among various projects, with particular reference to under-utilization of existing capital investment. Four growth centers have been selected for their potential for rapid economic growth. Some regions are linked by an existing road; in other regions roads are planned or are under construction. ^{1/}

138. Problems in Implementation. Coordination between the Planning Commission and the ministries concerned, and coordination between the ministries and the various departments of the ministries, has been a long standing issue in the country. The ministries, although constitutionally bound to follow the Plan, in effect act more or less independently because

^{1/} The four growth axes are: Kosi Growth Axis (Biratnagar, Dharan, Dhankuta, Hedangma); Gandaki Growth Axis (Bhairawa, Butwal, Tansen, Syangja, Pokhara, Tuche); Karnali or Western Growth Axis (Nepalganj, Surkhet, Dailekh, Jumla); Metropolitan Growth Axis (Birganj, Hetaura, Kathmandu Valley, Barbise, Dhunche).

they are little involved in the process of Plan formulation. The location of the Economic Analysis and Planning Division in the Ministry of Food and Agriculture, in March 1969, partially improved the rapport between the Plan and the Ministry of Food and Agriculture. Nonetheless, the overall Plan reflects a departmental approach. Due to existing administrative arrangements, the Plan is not an integrated program with respect to either the projects involved or the time span covered.

139. These observations are not intended to minimize government efforts to evolve a workable and functional planning effort. Nepal is a newcomer to this type of developmental initiative, and the government has tried hard to build up an administrative structure to bring it about. The eagerness of the country to have a workable organization is reflected by the fact that during the fifteen years from 1955 to 1969 the planning organization was reconstituted eight times; similarly, the Ministry of Food and Agriculture passed through nine reorganizations.

140. Another set of constraints relates to the implementation capacity of the present administrative structure in the country. Until very recently government staff concerns were limited to law and order functions. In recent years there has been a sizeable increase in research, agricultural extension, and agricultural servicing staff, even in remote areas. Even though the administrative heads would like to press development efforts, their personnel do not have the experience to carry through big programs. Therefore at present, when possible, small and quick yielding projects should be given priority. This point is elaborated further in the section below on the investment allocation strategy.

141. The third set of constraints relates to the well known deficiencies in the agricultural institutions and the agricultural services, limitations of agricultural research, agricultural extension, agricultural credit, marketing and storage of agricultural produce, supply of agricultural inputs, and the regressive effects of the tenurial structure.

142. Investment Allocation. The country has a formidable task of building up a large body of physical, economic and social overheads. To squeeze this into a reasonably short span of time, the country will need large capital investment, as well as to make efficient use of the available funds. In view of the present availability of capital and the level of development, the most workable criterion for the country appears to be that priority should be given to shorter gestation and smaller size projects. This does not imply that no long gestation projects should be undertaken, for some additional long gestation investment will be necessary in order to support short gestation investments in the longer-term future. But long gestation investment should be undertaken only when, after considering short gestation alternatives, its economic feasibility is fully justified. Moreover, certain short gestation activities will, through interaction, shorten the maturity period of durable investment, and these linkages should be thoroughly investigated and made an integral part of the durable investment decisions. In other words, the durable investment decisions should incorporate decisions on collateral activities which could shorten the maturity of such investment.

143. In the light of the above, bulky public sector irrigation projects will need careful scrutiny, and a weighing of benefits against the alternatives of small private lift pumps and tubewells, or minor works undertaken as a part of community development programs. Similarly, bulky transport projects will need to be considered along with the other alternatives, e.g., mule track, jeep track and the like. Full consideration will need to be given to the building up of supporting activities around proposed roads. Learning from past experience, when some road and irrigation capacity even now remains unutilized, greater care is being exercised in the selection of projects. The proposed regional axis strategy can also help in visualizing and implementing investment programs as integrated projects with all the supporting activities. In other words, the regional strategy can be extremely useful in fully utilizing the forward and backward linkages of the programs.

144. Apart from maximizing production by favoring short gestation projects, the second consideration which should govern investment allocation is to make Nepal into a single country, by developing and integrating the economies of the Hills and the Terai.

145. The Hills require the following developmental activities:

- (a) The opening of their economy to exchange by building a transportation network, which would allow the use of modern inputs and the marketing of surpluses to the Terai or India.
- (b) Development efforts towards reaching near self-sufficiency in foodgrains by means of intensive cultivation. From this position, the Hills could gradually move towards an export-oriented economy: ghee, potato, vegetable, chilli pepper and at a later stage fruit trees, tea, fisheries and small tourist facilities, wherever areas are properly located for these kinds of activities.
- (c) To be successful, such development effort should be accompanied by vigorous anti-erosion measures, including afforestation, change in cropping pattern, and development of minor irrigation facilities.

146. The Terai requires the following developmental activities:

- (a) Full utilization of existing irrigation projects and irrigation development.
- (b) Improvement in rice milling processing facilities.
- (c) Large numbers of resettlement projects with major emphasis on development of marginal lands and clearance of marginal forest lands.
- (d) Creation of a large forestry resource based economic activity.

147. Both Regions will also require:

- (a) The drastic improvement in agricultural services, extension, banking and marketing to exploit known opportunities.
- (b) The completion of the Land Reform and Land Administration Programs.

148. Integration of the economies of the Hills and Terai - a basic long-term goal - requires developing to the fullest extent their potential and complementary activities along the lines of their respective comparative advantages, as discussed in this report.

149. When considering these development priorities, the problem of resource should not be overlooked. With the increase in social expenditures, the fast rising cost of maintaining the growing capital base of the country and the increase in the tempo of on-going investments, the future resource position of the country in the face of slow growing revenues, should be assessed properly so that future investment plans can be prepared in a realistic way. Proper assessment of the future resource position may lead to a more careful selection of projects and, despite the immense needs of the country, probably to some concentration of efforts in both the Hills and the Terai.

STATISTICAL APPENDIX

<u>Table No.</u>	<u>Title</u>
1	GDP at Current Market Price, Nepal
2	GDP Agriculture at Current Price, 1968/69
3	Export of Goods to Overseas Countries
4	Imports of Goods from Overseas Countries
5	Area and Production Under Foodgrains and Cash Crops, 1961/62-1970/71
6	Livestock Population of Nepal
7	Livestock Products
8	Summary of Resources Available per Sample Household by Selected Districts
9	Intensity of Cropping in the Selected Districts
10	Third Plan, Targets and Achievements Agricultural Production
11	Third Plan, Agricultural Inputs, Targets and Achievements
12	Fourth Plan: Use of Chemical Fertilizers to Achieve Grain Crop Targets
13	Conversion Table -- Weight Measurements Used in Nepal
14	Conversion of Volume Measures into Weights of Agricultural Products
15	Conversion Table -- Land Measurements

Table 1: GDP AT CURRENT MARKET PRICE, NEPAL

<u>Sectors</u>	<u>Rs. Million</u>					<u>1969/70</u> (Preliminary)
	<u>1964/65</u>	<u>1965/66</u>	<u>1966/67</u>	<u>1967/68</u>	<u>1968/69</u>	
Agriculture	3,915	4,694	4,218	5,217	6,406	6,563
Mining	1	2	1	1	1	
Manufacturing	83	98	104	137	212	
Construction	123	144	116	134	186	
Transport, Communi- cation, Storage	91	93	102	120	141	
Cottage Industry	392	469	422	522	641	
Financial Institution	69	80	82	87	106	
Ownership of Dwelling	676	689	677	698	714	
Public Administration and Defense	82	101	143	154	357	
Public Utilities	4	5	8	10	11	
Wholesale and Retail Trade	309	299	248	247	316	
Services	170	177	204	219	235	
<u>Grand Total</u>	<u>5,915</u>	<u>6,851</u>	<u>6,275</u>	<u>7,546</u>	<u>9,326</u>	

Source: Central Bureau of Statistics, HMG, Nepal.

Table 2: GDP AGRICULTURE AT CURRENT PRICE, 1968/69

<u>Commodity</u>	<u>Production</u> (M/T 000)	<u>Price Per</u> M/T (Rs.)	<u>Gross Value</u> <u>of Production</u> (Rs. million)	<u>Net Value</u> <u>of Production</u> (Rs. million)
<u>Foodgrains and Straw</u>				3,821.7
Paddy: Total Area Surveyed	2,321.6	1,278.5	2,968.2	2,365.0
Regions Not Covered			44.5	
			<u>3,012.7</u>	
Wheat: Total Area Surveyed	227.0	1,532.7	348.0	278.0
Regions Not Covered			1.7	
			<u>349.7</u>	
Maize: Total Area Surveyed	899.6	1,182.2	1,063.4	853.9
Regions Not Covered			10.6	
			<u>1,074.2</u>	
Millet: Regions Accounted	110.7	1,072.9	118.8	95.7
Barley: Regions Accounted	28.7	1,140.0	32.7	26.4
Straw: Paddy				150.6
Wheat				52.5
<u>Other Food Crops</u>				549.1
Miscellaneous Food Crops			180.9	180.9
Pulses	17.0	2,341.3	39.8	32.8
Potato	289.9	1,178.7	341.7	264.8
Other Vegetables				71.2
<u>Commercial Crops</u>				651.7
Mustard	56.8	2,103.2	119.5	105.1
Other Oilseeds				26.3
Jute	44.0	2,065.2	90.9	80.0
Tobacco	6.3	7,611.4	47.9	24.0
Sugarcane	187.7	150.0	28.2	27.3
Ginger				51.3
Turmeric				10.8
Chilly				17.5
Other Spices				86.4
Fruits				192.0
Miscellaneous				31.0
Commercial Crops				

Table 2 (cont'd.)

- 2 -

<u>Commodity</u>	<u>Production</u> (M/T 000)	<u>Price Per</u> M/T (Rs.)	<u>Gross Value</u> <u>of Production</u> (Rs. million)	<u>Net Value</u> <u>of Production</u> (Rs. million)
<u>Livestock</u>				1,350.0
<u>Meat for Consumption:</u>	44.9	5,154.9	232.7	
Buffalo	18.7	2,773.5	51.9	
Sheep	2.6	5,894.6	15.3	
Goat	2.7	5,894.6	15.9	
Pig	4.0	3,914.5	15.7	
Poultry	16.9	7,297.5	134.0	
Milk	563.5	1,531.8 (per 000 litres)	863.2	
Milk Products			91.5	
Eggs (million eggs)	280.9	0.39 (per egg)	109.6	
Hides and Skins			3.2	
Dungs			69.3	
Honey and Wax			2.0	
Wool			23.6	
Pig Bristle			5.2	
Value of Livestock Products			1,399.0	
<u>Net Value of Agricultural and Livestock Products</u>				6,374.0
<u>Fishery Products</u>				23.0
<u>Forestry Products</u>				18.0
<u>Deducting Value of Fertilizer and Plant Protection Material</u>				-10.0
<u>Total Agricultural GDP</u>				6,405.0

Source: CBS, Nepal, quoted by Teraji Sakiyama, Evaluation of the Third Plan Agricultural Performance, EAPD, MFA, Kathmandu, Nepal.

Table 3: EXPORT OF GOODS TO OVERSEAS COUNTRIES^{/1}

	Rs. 000				
	1966/67	1967/68	1968/69	1969/70*	1970/71*
1. Raw Jute	25,715	49,751	68,399	42,615 ^{/1}	33,319
2. Jute Cuttings	-	-	10,516	-	2,703
3. Jute Goods	31,438	32,509	26,344	22,941	23,022
4. Musk	226	201	4,142	2,853	2,905
5. Bristle	2,284	6,885	14,258	16,713	7,967
6. Feathers	149	92	328	943	78
7. Curio Goods	192	1,473	1,907	4,004	1,864
8. Mica	37	1,415	9,317	9,319	879
9. Carpet	488	813	608	1,160	757
10. Miscellaneous	<u>412</u>	<u>1,709</u>	<u>10,188</u>	<u>14,182</u>	<u>11,515</u>
(Oil seeds, Candies, Monkeys, Goat's skin, Cow Bezards, etc.)					
Total	60,941	94,848	146,006	114,730	85,009

* Revised

^{/1} All the countries excluding India and Tibet, jute cuttings included.

According to Central Bureau of Statistics, the shares of Nepal's exports in 1966/67 by distinction are as follows:

India	-	97.8 percent
Tibet	-	1.3 percent
Overseas		
Countries-		0.9 percent

Source: Nepal Rastra Bank, HMG, Nepal.

Table 4: IMPORTS OF GOODS FROM OVERSEAS COUNTRIES ¹

Rs.000

Description of Goods	1967/68	1968/69	1969/70	1970/71
1. Machineries and Spare Parts	8517	5459	12215	5906
2. Raw Materials	14967	20333	29058	4744
3. Buildings, Constructional electric and household materials	5899	5078	5818	6224
4. Vehicles - Cars, Trucks, Scooters and Motorcycle etc.	757	1772	3543	7005
5. Readymade Garments, Socks and Carpets	10179	4789	11664	25308
6. Radios, Transistors, Record-Players, etc.	2188	791	2256	1387
7. Beverages and Tobacco	929	3283	1321	1396
8. Medicine and medicinal goods	442	629	3107	1467
9. Agricultural tools, implements & fertilizers and other materials	3024	3561	4571	1650
10. Stationery Goods	1262	101	576	2443
11. Cosmetics	-	-	-	-
12. Food and food articles	6622	8522	2483	922
13. Watch and watch materials	388	317	169	106
14. Photographic goods	744	233	918	493
15. Miscellaneous (Laboratory equipments included)	2635	34912 ²	43850	26369
TOTAL ³	58553	89780	122049	22844

¹ All the countries excluding India and Tibet.

² Including developmental goods.

³ According to Central Bureau of Statistics, the shares of Nepal's imports by destination is as follows:

India	-	96.4 percent
Tibet	-	1.3 percent
Overseas Countries	-	2.3 percent

Source: The Nepal Rastra Bank, HMG, Nepal.

**Table 5: AREA AND PRODUCTION UNDER FOODGRAINS
AND CASH CROPS, 1961/62 - 1970/71**

<u>Crops</u>		<u>1961/62</u>	<u>62/63</u>	<u>63/64</u>	<u>64/65</u>	<u>65/66</u>	<u>66/67</u>	<u>67/68</u>	<u>68/69</u>	<u>69/70</u>	<u>70/71</u>
Paddy	A ^{1/}	1,108	1,090	1,090	1,101	1,111	1,100	1,154	1,162	1,173	1,182
	P ^{2/}	2,108	2,108	2,109	2,201	2,207	2,007	2,119	2,178	2,241	2,305
Maize	A	432	431	434	437	451	450	412	422	433	446
	P	843	843	849	854	856	824	746	765	795	833
Wheat	A	N.A.	N.A.	113	100	118	126	192	208	226	228
	P	138	138	139	126	147	159	205	233	265	193
Barley	A	N.A.	N.A.	N.A.	24	27	27	25	26	26	27
	P	-	-	-	26	28	28	23	22	24	25
Millet	A	N.A.	65	69	96	100	100	102	109	112	115
	P	63	-	64	63	120	120	113	121	125	130
Sugar- cane	A	N.A.	N.A.	N.A.	9	13	10	11	12	13	14
	P	-	-	-	126	192	147	169	189	216	236
Jute	A	30	32	32	32	32	32	47	46	52	55
	P	37	36	36	39	39	38	46	43	49	53
Oilseed	A	N.A.	N.A.	N.A.	108	96	98	97	101	103	106
	P	-	-	-	51	51	56	52	54	57	55
Tobacco	A	N.A.	N.A.	N.A.	8	8	8	9	9	9	9
	P	-	-	-	-	-	-	-	-	-	-
Potato	A	N.A.	N.A.	N.A.	29	42	43	43	43	46	49
	P	-	-	-	186	277	300	245	250	263	273

1/ A = Area = 000 ha.

2/ P = Production = 000 M/T.

Source: Economic Analysis and Planning Division, MFA, HMG, Nepal.

Table 6: LIVESTOCK POPULATION OF NEPAL

Kind of animal and sex	1966-67	1967-68	1968-69	1969-70
<u>Cattle</u>				
Female	3 010 000	3 074 000	3 136 000	3 198 000
Male	2 850 000	2 911 000	2 969 000	3 028 000
Total	5 860 000	5 985 000	6 105 000	6 226 000
<u>Buffalo</u>				
Female	2 802 000	2 862 000	2 919 000	2 977 000
Male	475 000	485 000	495 000	505 000
Total	3 277 000	3 347 000	3 414 000	3 482 000
<u>Sheep</u>				
Ewes	1 500 000	1 533 000	1 567 000	1 601 000
Rams	475 000	485 000	496 000	507 000
Total	1 975 000	2 018 000	2 063 000	2 108 000
<u>Goats</u>				
Does	1 650 000	1 686 000	1 723 000	1 761 000
Bucks	450 000	460 000	470 000	480 000
Total	2 100 000	2 146 000	2 193 000	2 241 000

Source: Nepal Livestock Development Mission, UNDP/FAO/SATA, Rome, December 1971.

Table 7: LIVESTOCK PRODUCTS

Product	1967-68	1968-69	1969-70
<u>Meat</u>			
Buffalo	18 300	18 700	19 000
Mutton	2 558	2 600	2 700
Goat	2 550	2 700	2 300
Pig	3 880	4 000	4 200
<u>Milk</u>			
Buffalo	375 000	386 000	400 000
Cow	170 000	173 000	178 000
Others	4 500	4 500	4 600
<u>Milk Products</u>			
Chee	42	50	55
Butter and Cheese	85	87	90

Source: As in Table 11.

Table 8: SUMMARY OF RESOURCES AVAILABLE PER SAMPLE HOUSEHOLD

BY SELECTED DISTRICTS

District	Average Area Cultivated by Sample Household	Owned & Self Cultivated Area in Hectares	Area Owned Cultivated as % of Total Cultivated Area	Average Family Size	No. of Workers Per Family	No. of Literates	No. of Fragments of Cultivated Land	Size of Fragment in Hectares	No. of Draught Animals
Eastern Hills									
Ilam	0.56	0.45	80	5.87	3.78	1.38	3.00	0.19	1.33
Kabhrepalancho	0.38	0.36	95	5.62	3.69	0.91	3.77	0.10	0.49
Western Hills									
Dhading	0.38	0.37	97	5.71	3.81	0.75	4.75	0.08	1.22
Syangja	0.24	0.25	96	5.99	3.84	1.52	5.58	0.04	0.81
Sallyan	0.33	0.33	100	5.82	4.10	0.51	4.99	0.07	1.08
Kathmandu Valley									
Kathmandu	0.82	0.55	67	5.06	3.30	1.02	3.66	0.22	0.08
Inner Terai									
Chitwan A.	2.69	2.67	99	7.88	4.90	2.24	1.10	2.44	3.70
Chitwan B.	0.91	0.91	100	6.14	3.80	0.64	1.56	0.56	1.87
Eastern Terai									
Morang	-	-	-	6.18	4.07	1.22	3.24	-	3.33
Saptari	1.92	1.57	82	5.85	3.90	1.30	4.70	0.41	1.75
Dhanusha	1.67	1.45	87	5.66	3.64	11.03	4.58	0.36	1.47
Parsa	1.88	1.30	89	5.67	3.72	0.97	3.57	0.53	1.27
Western Terai									
Rupandehi	2.85	2.77	97	6.40	4.31	1.02	7.86	0.36	2.53
Bardia	4.80	2.81	59	7.05	4.64	0.50	3.23	1.48	3.03
Kailali	6.77	6.48	96	11.82	8.20	0.90	4.85	1.40	7.44

Source: Farm Management Study in the Selected Regions of Nepal, 1968/69: H.M.G., Economic Analysis and Planning Division, Kathmandu, Nepal.

Table 9: INTENSITY OF CROPPING IN THE SELECTED DISTRICTS

<u>District</u>	<u>Total Cultivated Land in Hectares</u>	<u>Total Cropped Area in Hectares</u>	<u>Cropping Intensity</u>	<u>Percentage Cropped Area Under Foodgrains</u>	<u>Percentage Area Under Other Crops</u>
<u>Eastern Hills</u>					
Ilam	349	401	115	91	9
Kabhrepalancho	307	389	127	86	14
<u>Western Hills</u>					
Dhading	276	477	173	97	3
Syangja	226	272	120	100	-
Sallyan	205	309	151	98	2
<u>Kathmandu Valley</u>					
Kathmandu	741	1,179	159	97	3
<u>Inner Terai</u>					
Chitwan A.	1,205	1,719	143	72	28
Chitwan B.	159	228	143	84	16
<u>Eastern Terai</u>					
Morang	1,754	1,889	108	73	27
Saptari	1,816	2,066	114	95	5
Dhanusha	1,540	1,707	111	86	14
Parsa	1,765	1,906	108	91	9
<u>Western Terai</u>					
Rupandehi	2,335	3,028	130	84	16
Bardia	2,229	3,438	155	66	34
Kailali	3,875	5,746	148	77	23

Source: As in Table 13.

Table 10: THIRD PLAN, TARGETS AND ACHIEVEMENTS AGRICULTURAL PRODUCTION

	1965/65	Target 1969/70	1965/66	Achievement		Percentage increase in 5 years.			
				1966/67	1967/68	1968/69	1969/70	Target	Achievement
Food grains	3270	3776	3358	3138	3206	3319	3450	15.0	6.0
Paddy	2201	2368	2207	2007	2119	2178	2241	7.6	2.0
Maize	854	918	856	824	746	765	795	7.0	- 6.0
Wheat & Barley	152	425	175	187	228	255	289	1.80	90
Millet & others	63	65	120	120	113	121	125	3	100
Cash crops									
Sugar cane	125	252	192	147	169	189	216	100	71
Oil-seeds	51	60	51	56	52	54	57	18	12
Tobacco	8	24	8	8	9	9	9	200	13
Jute	39	54	39	38	46	43	49	38	26

Source: Fourth Five-Year Plan, Data from other sources for 1969/70.

Table 11: THIRD PLAN, AGRICULTURAL INPUTS, TARGETS AND ACHIEVEMENTS

<u>Programmes</u>	<u>Units</u>	<u>Target of the Third Plan</u>	<u>1965-66</u>	<u>1966-67</u>	<u>1967-68</u>	<u>1968-69</u>	<u>1969-70</u>	<u>% of target</u>
1. <u>Area under improved seeds</u>	<u>Hec.</u>	<u>800,000</u>	<u>10754</u>	<u>25993</u>	<u>57303</u>	<u>102630</u>	<u>136500</u>	<u>18.0</u>
Paddy	"		6331	13493	26068	42552	49800	
Wheat	"		4326	11371	28027	53775	75500	
Maize	"		97	1209	3208	6303	11200	
2. Use of chemical fertilizer (gross)	<u>M.T.</u>	<u>221,000</u>	<u>3169</u>	<u>6670</u>	<u>15000</u>	<u>24000</u>	<u>29091</u>	<u>13.0</u>
3. Irrigation	<u>Hec.</u>	<u>148,000</u>	<u>6000</u>	<u>25000</u>	<u>12850</u>	<u>15240</u>		<u>39.9</u>
4. Reclaimed land	"	<u>13,900</u>	<u>804</u>	<u>2801</u>	<u>3873</u>	<u>4931</u>		<u>35.5</u>
5. Resettled families	<u>No.</u>	<u>6,000</u>	<u>800</u>	<u>1378</u>	<u>1913</u>	<u>1936</u>		<u>32.3</u>

Source: Fourth Five-Year Plan, Data from other sources for 1969/70.

Table 12: FOURTH PLAN: USE OF CHEMICAL FERTILIZERS TO ACHIEVE GRAIN CROP TARGETS

<u>Crop</u>		<u>1970-71</u>	<u>1971-72</u>	<u>1972-73</u>	<u>1973-74</u>	<u>1974-75</u>
Paddy	Intensive Dists.	3,892	5,989	7,531	9,258	11,365
	Other Dists.	57	104	166	239	317
	Total	3,949	6,093	7,697	9,497	11,682
Wheat	Intensive Dists.	3,982	4,692	5,562	6,634	7,728
	Other Dists.	420	536	684	880	1,091
	Total	4,402	5,228	6,246	7,514	8,819
Maize	Intensive Dists.	832	1,395	2,294	3,309	4,507
	Other Dists.	397	500	628	782	950
	Total	1,229	1,895	2,922	4,091	5,457

Source: As in table 7.28.

Table 13: CONVERSION TABLE WEIGHT MEASUREMENTS USED IN NEPAL

	<u>Pau</u>	<u>Seer (Hills)</u>	<u>Dharni</u>	<u>Seer (Terai)</u>	<u>Maund</u>	<u>Pound</u>	<u>Long Ton</u>	<u>Kilogram</u>	<u>Quintal</u>	<u>Metric Ton</u>
1. Pau	1.00	0.25	0.08333	0.213762	0.00534405	0.439712	0.0001963	0.1994508	0.0019945	0.00019945
2. Seer (Hills)	4.00	1.00	0.33333	0.855049	0.0213762	1.758848	0.0007852	0.7978032	0.007978	0.0007978
3. Dharni	12.00	3.00	1.00	2.265148	0.0641287	5.276544	0.0023555	2.3934096	0.023934	0.0023934
4. Seer (Terai)	4.6785	1.169625	0.389875	1.00	0.025	2.057717	0.000918375	0.9331	0.009331	0.0009331
5. Maund	187.14	45.785	15.535	40.00	1.00	82.2868	0.036735	37.3242	0.373242	0.0373242
6. Pound	2.3741992	0.5685498	0.1895165	0.4861	0.012153	1.00	0.00044643	0.4563	0.004536	0.0004536
7. Long Ton	5094.2062	1273.551552	424.517184	1088.88	27.222	2240.00	1.00	1015.05	10.1605	1.01605
8. Kilogram	5.013768	1.253442	0.417814	1.07169	0.026792	2.20463	0.00098421	1.00	0.01	0.001
9. Quintal	501.3768	125.3442	41.7814	107.169	2.6792	220.463	0.098421	100.00	1.00	0.1
10. Metric Ton	5013.768	1253.442	417.814	1071.69	26.792	2204.63	0.98421	1000.00	10.0	1.00

Source: Annual Report, Land Reform, Agriculture and Food Ministry, 1967-68 (Translated)

Table 14: CONVERSION OF VOLUME MEASURES INTO WEIGHTS
OF AGRICULTURAL PRODUCTS (NEPAL)

<u>Commodities</u>	<u>Muri</u>	<u>lbs</u>	<u>kg.</u>
Rice (Marshi) (2nd Grade)	1	160	72.58
Rice (Fine)	1	150	68.04
Paddy (3rd grade)	1	110	49.90
Paddy (fine)	1	105	47.63
Wheat	1	150	68.04
Maize	1	150	68.04
Millet	1	145	65.77
Papar (kind of Millet)	1	120	54.43
Barley	1	100	45.36
Pulses (small)	1	160	72.58
Gram	1	140	63.50
Beans	1	129	58.51
Long Beans and Big Peas	1	150	68.07
Mustard	1	125	56.70
Sesame (til oilseed)	1	115	52.16
Sarshu (kind of oilseed)	1	122	55.34
Maize Flour	1	107	48.54
Wheat Flour	1	94	44.45

Source: Annual Report - Land Reform, Agriculture and Food Ministry,
1967-68, p. 110 (translated).

Table 15: CONVERSION TABLE - LAND MEASUREMENTS /1

	<u>Khet</u>	<u>Hectare</u>	<u>Bigha</u>	<u>Acre</u>	<u>Matomuri</u>	<u>Ropani</u>	<u>Muri</u>	<u>Pathi</u>	<u>Mana</u>	<u>Sq. Meter</u>	<u>Sq. Yard</u>
Khet	1.000	1.3045	1.9568	3.2192	10.1755	25.000	100.000	2000.00	16000.00	13045.0	15581.2
Hectare	0.7665	1.000	1.50	2.4678	7.8003	19.1644	76.6377	1533.036	12269.938	10000.0	11944.2
Bigha	0.5110	0.6667	1.000	1.6463	5.2003	12.7769	51.1077	1022.075	8180.368	6666.7	7963.2
Acre	0.3106	0.4052	0.6078	1.000	3.1607	7.7654	31.9331	621.186	4971.779	4052.0	4840.0
Matomuri	0.0983	0.1282	0.1923	0.3164	1.000	2.4569	9.8275	196.689	1573.006	1282.0	1530.0
Ropani	0.0400	0.05218	0.07827	0.1288	0.4070	1.000	4.000	80.00	640.245	521.8	623.2
Muri	0.0100	0.013045	0.01957	0.03219	0.1018	.2500	1.000	20.00	160.000	130.5	155.8
Pathi	0.0005	0.0006523	0.009785	0.001610	0.00509	.1250	0.050	1.000	8.000	6.52	7.79
Mana	0.0000624	0.0000815	0.0001223	0.0002011	0.000636	.00156	0.00625	0.125	1.000	0.82	0.97
Square Meter	13045.0	10000.0	6667.0	4052.0	1282.0	521.8	130.45	6.52	0.82	1.000	1.1944
Square Yard	15581.2	11944.2	7963.2	4840.0	1530.0	623.2	155.8	7.79	0.97	0.837	1.000

/1 Values for Khet, Ropani, Muri, Pathi and Mana are not standardized in all Nepal districts. The values given here are standard for about 75 percent of the district. Some of them, like Pathi, Muri, and Mana, are also used as volume measures for cereals.

Source: As given in Nepal's Third Plan, Page 172 and calculated for hectares and acres.

SECTION II

EDUCATION

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SUMMARY AND CONCLUSIONS

- i. Basic to an understanding of the shortcomings of the present educational system in Nepal is an appreciation of the fact that during the 104 years of their rule, which ended in 1951, the Ranas remained opposed to any form of universal public schooling. In 1951, less than one percent of the children of school age was enrolled in primary schools. Primary education grew rather rapidly, but has been characterized by a very high dropout rate and the shortage of qualified teachers has been a severe problem. As a result the primary cycle has produced only a limited number of literate children. Secondary education was primarily oriented towards academic subjects. While retention rates have been relatively good, the wastage through failure at the School Leaving Certificate has been very high. Higher education has grown very rapidly and its curricula have been largely unrelated to development needs, creating problems of educated unemployed.
- ii. Dissatisfaction with education and government's determination to gain control of the system led to the appointment of a Palace Task Force in 1970 which was charged with drafting a new plan for education in harmony with national aspirations and consistent with future manpower requirements. Its report - a very remarkable one - adopted in mid-1971, marks a significant turning point in Nepal education. The Plan is primarily aimed at counter-acting the elitist bias of the inherited system of education by linking it more effectively to productive enterprises and egalitarian principles. It calls for unifying education into one productive system that serves the country's needs and aspirations. The Plan seeks to replace the concept of education as a means to white collar jobs by a new concept that regards education as an investment in human resources for the development of the country.
- iii. Under the New Education Plan, the educational structure will broadly be divided into two levels - School Level and Higher Education Level. The School Level will further be divided into three levels - Primary, Lower Secondary and Secondary - each having a specific aim of its own. The aim of the Primary Level of education will be to impart literacy, that of Lower Secondary will be character-building and vocational orientation, and the third level - Secondary education, will aim at creating useful citizens by laying special stress on vocational education. Likewise, there will be four levels of higher education - Certificate, Diploma, Degree and Research. As the main object of higher education will be to produce trained man-power, the Certificate level will help produce middle-level man-power, the Diploma and Degree levels high-level man-power, and the Research level specialized man-power.
- iv. To ensure quality, the New Education Plan System (NESP) will rely heavily upon systematic and frequent examination tests and upon a comprehensive supervision system. Similarly, in order to attract talented individuals to the teaching profession, better service conditions will be offered. Government financial assistance and awards of scholarships will be granted in such a way so as to increase enrollment in primary cycle and encourage vocational training. Chances will also be given to low-level

technicians to join higher-level technical institutes, provided they pass requisite entrance tests. A National Development Service Corps will be instituted in order that higher education may not be equated with theoretical and bookish knowledge alone and also to provide students scope for service in national development while engaged in studies.

v. The reform Plan, which deserves warm endorsement, is a policy document rather than an operational plan. The main problem therefore is to translate its recommended policies into a realistic action program. As it stands now, the two main operational weaknesses are the absence of a realistic evaluation of the number of teachers who could reasonably be trained within a time-bound schedule and the absence of any evaluation of the resources needed to be raised by local governments to meet the Plan's targets pertaining to capital costs, nor for that matter, how these local governments are going to raise these resources.

vi. This implies that the government should:

- (a) reconsider the Plan phasing;
- (b) concentrate first on the development of sound teacher training;
- (c) ensure that the costs of the Plan should be more carefully projected and both the sources and availability of funds be determined;
- (d) strengthen the administrative and planning capacity in the Ministry of Education;
- (e) refine manpower projections before defining educational programs in terms of projections; and
- (f) restudy the objectives of secondary education.

The introduction of agricultural subjects into the curricula of rural secondary schools is sound, but pressure to expand such a program beyond the Ministry's capacity to plan and provide for teachers should be resisted. A delay in Plan implementation will result, but chances of success will be increased.

I. THE EDUCATION SYSTEM IN TRANSITION

Introduction

1. Gunnar Myrdal in his book "Asian Drama, An Inquiry Into the Poverty of Nations" points out that one of the principal reasons for the poverty of the Asian countries is the poor quality of preparation of their people to face the complex problems of the modern world based on technology and science. He ascribes this to the poor quality of their educational systems, which are largely unrelated to the life, needs and aspirations of the people. He concludes that the economy of the developing countries of Asia will not improve unless and until their educational systems are radically transformed, substantially improved in quality and expanded to provide a fair level of equality of educational opportunity to all concerned. Asian countries must concentrate on the reconstruction of their educational systems in all earnestness and with all the resources at their command.

2. Nepal has taken up the challenge. Dissatisfaction with education and government determination to gain control of the system led to the appointment of a Palace Task Force in 1970. This resulted in publication of: "An Educational Policy for National Development" in February 1971. The new plan incorporates in a logical structure most of the educational reforms and prerequisites which have been proposed by the educational experts, both Nepali and foreign, during the past 15 years.

3. Thus, there are firm proposals for: (1) investment in education as the basis for national development; (2) curriculum revision and reform; (3) reform of the examination system; (4) improvement of the professional status of teachers; (5) provision of educational materials; (6) effective supervision and inspection; (7) improved administrative organization; (8) promotion up to the higher levels of the educational pyramid to depend on ability and achievement rather than on social and financial status; (9) tackling the problem of illiteracy; (10) a graded system of initiation into a sense of vocation and special technical training at the higher secondary level; and (11) the organization of higher education in order to insure that manpower requirements according to national needs will be met.

Shortcomings of the System

4. During the 104 years of its rule, which ended in 1951, the feudalistic Rana regime opposed any form of universal public schooling. Only they and other members of the ruling elite provided formal instruction for their own children to prepare them to take their place in the governmental structure. In 1951, less than one percent of children of school age was enrolled in primary schools. Since that date, three events are of particular importance: (1) the establishment of the Ministry of Education in 1951; (2) appointment in 1953 of the National Education Planning Commission and its resulting plan for education; and (3) appointment of the Palace Task Force in late 1970 to redesign the education system and the issuance of its plan in 1971.

5. In terms of numbers, progress of education has been spectacular:

PROGRESS OF EDUCATION, 1951-1970

	Schools			Students			Teachers		
	1951	1961	1970	1951	1961	1970	1951	1961	1970
Primary:	321	4,001	7,256	8,505	182,553	449,141	n.a.	n.a.	18,250
Secndary	11	156	1,065	1,680	21,115	102,704	n.a.	n.a.	5,407
Higher	2	33	49	250	5,143	17,200	n.a.	n.a.	1,070

Source: National Education System Plan for 1971-76. Ministry of Education, 1971.

6. During this development period, serious deficiencies in education became evident: (1) lack of clear policies and goals for education led to fragmentation and duplication of effort; (2) there was a proliferation of schools at all levels, with no real consideration of the role of education in Nepal's social and economic development; (3) education was highly academic, the sole aim was higher education with little opportunity for skill training; (4) quantitative expansion led to quality reduction, particularly in the teaching staff; (5) excessive dropout, repeater and failure rates made it clear that there was much wastage in the system. Concern over these educational problems led to the appointment in 1970 of a three member Palace Task Force charged with drafting a new educational plan.

7. Elementary Education. In 1970, an estimated 32 percent of the age group 6-10 years was enrolled in about 7,250 schools, one-sixth of them being private. Three quarters of the pupils were in grades 1-3. The dropout rate in primary schools is high. In 1965/66 enrollment in grade 2 was only 39 percent of that in grade 1; by 1969/70 this has increased to 58 percent. Of 100 children registered in the first grade in 1965, only 14 entered grade 6 in 1970. The dropout rate is high because many children still enter the labor force at an early age in the countryside.

PRIMARY (GRADES 1 to 5) ENROLLMENT AS % OF CHILDREN, AGE 6-10

1951	1961	1970
0.9	15.8	32.0

Source: NES Plan for 1971-72. Ministry of Education, 1971.

8. Shortage of qualified teachers has been a severe problem. Out of 18,250 teachers, 20 to 25 percent is reported as trained, i.e., have

6 to 10 years of schooling plus some professional training and a large part of this pool of trained teachers is concentrated in the Kathmandu Valley. Typically, in the countryside the village teacher is appointed by the Panchayat; not infrequently, he is a relative of one of the Panchayat members. Poorly and irregularly paid, the appointed teacher considers his job as a part-time one and attends to his farming activities when sowing or harvesting is on. Officials estimate that school attendance usually does not exceed 100 days in the countryside - average schooling generally does not exceed 4 hours a day.

9. The marked disparity of educational opportunity and quality between Kathmandu and the rest of the country is not limited to the respective qualification of teachers. Textbooks are generally available to students in Kathmandu, but rarely in the countryside. As a result there is no uniform curriculum in elementary schools throughout the country. Since three quarters of the enrolled children leave after three years of what can be called "partial" schooling, it is doubtful that many of them can be considered as literate. The system is clearly wasteful.

10. Secondary Education. Enrollments in secondary schools increased from 1,680 in 1951 to over 100,000 in 1970, while the number of schools increased from 11 to 1,065. Retention rates have been relatively good; of 100 students in grade 6 in 1965, 70 were in grade 10 in 1969. However, the wastage through failure at the School Leaving Certificate (SLC) level is very high, the pass rate being only 30 percent. This is largely due to the development of a large number of private secondary schools, many of them primarily profit motivated. In many cases, student's admission is not dependent upon his qualification, but upon his parents' ability to pay high fees. No wonder under these circumstances that only a minority of students were up to SLC's standards. Through the whole period secondary education remained almost entirely academic.

11. In an attempt to increase the relevance of education in Nepal, vocational education as recommended by a National Commission was implemented beginning in 1957. Known as the Multipurpose High School Program, comprehensive community high schools were to provide "academic, vocational and practical education to allow students from all societal levels to interact socially and educationally". Vocationally, they were to provide instruction for "those who will terminate their formal education after secondary school ... in order to become the skilled workers in business, agriculture and industry". Additionally, the Multipurpose Program would provide a practical background for those students who would pursue professional level careers. Training and instruction were offered in general education and in one of four vocational options: Trades and Industries, Home Science, Agriculture and Secretarial Science. From its beginning in Pokhara in 1957, the system was expanded to include 25 schools, which by 1969, had graduated some 275 students with vocational backgrounds.

12. By 1969, the growing Multipurpose Program was experiencing a number of difficulties. A lack of trained teachers produced a heavy teaching load, with its consequent inhibitory effect on lesson planning and

preparation, and forced the teachers to resort to the lecture/note memory approach. The absence of proper and sufficient textbooks, appropriate reference materials and classroom furniture, made even that approach difficult. A shortage of technical inputs such as seeds, fertilizers, improved varieties of chickens and livestock, water and tools, limited demonstrations and practical field-work experiences. But above all, the Multipurpose Program was failing to achieve its primary objective: to provide a relevant and useful vocational education to the terminal student, i.e., the student not intending to study beyond high school. The great majority of these students face either unemployment or a return to the traditional family farm. The attrition rate from vocational subjects was quite high, indicating a lack of relevance that is directly visible to the terminal student. Further, of the 275 vocational graduates mentioned above, 95 percent of those traceable were continuing their studies, again suggesting that the program was not reaching students for whom vocational training was expected to be the terminal point in their formal education.

13. Specifically, the vocational agriculture curriculum was very broad, embracing many areas of animal science including poultry, dairy and pig husbandry, farm machinery and repair, plus many and varied aspects of plant science. In a country where agriculture is almost totally non-mechanized and the average farm so small as to preclude a rapid growth of animal husbandry, one quickly realizes the impracticality of this curriculum.

14. Higher Education. The unstructured growth of higher education in Nepal is also a major point of dissatisfaction. From 250 students in 1951, higher education grew to 21,500 in 1972, mostly in 49 colleges. Almost half of the students were majors with very poor prospects of finding suitable employment. Less than one-fifth enrolled in science and technology. The Nepal Education Planning Commission recommended in 1954 that higher education should be limited to 5 percent of secondary enrollment. Today, higher education enrollment has reached over 20 percent of secondary enrollment. As a result, over 25 percent of total education expenditures has been spent on higher education. At the same time, government grants-in-aid provided 70 percent of higher education costs, against about 50 percent in primary schools, and 25 percent in secondary schools. While fees are comparatively high for primary and secondary education, there are virtually none for higher education.

15. The growth of higher vocational and technical education has been haphazard. Twelve specialized centers, responsible to a variety of ministries, offer skill training, each having its own entrance requirements and curriculum. Very small enrollments ranging from 16 to 160, and unnecessary duplication make them expensive. Total enrollment in 1971/72 was about 850 and output in 1971 was 458. Vocational education has been notably expensive and ineffective in Nepal. The technical/vocational institutes developed as small units with no central controlling authority to establish programs and requirements. Agricultural training is given in the College of Agriculture in Kathmandu. It offers a one-year and a two-year course and had an enrollment in 1972 of only 108 students in a country predominantly agricultural, where agricultural specialists are in short supply.

Problem Areas

16. Attitude Towards Education. The above paragraphs have shown the wastage implicit in the present education system. Primary education probably does not produce more than a limited number of literate children. Secondary education is primarily academic and unrelated to development problems. Higher education has mushroomed in an uncoordinated manner and has also been unrelated to the country's development problems giving rise moreover to the problem of educated unemployment. Furthermore, higher education has been almost entirely financed by the public exchequer, thus favoring mostly the children of the privileged section of the national community.

17. The educational system has followed such a course because of public pressure since education is regarded by many as the main hope for escape from the country's main economic activity: agriculture. Agriculture is regarded as a "last resort" choice of careers. Farming is looked upon by many as a way of life left to those who are unable to find better occupations. There are, indeed, valid, deep and understandable reasons for this attitude. The land is often unproductive, and the holdings are too small to assure acceptable family living conditions. In the Hills of Nepal approximately 90 percent of the farms are less than 1 ha, with perhaps 75 percent of them less than half a hectare. Even in the Terai about 50 percent of the farms are reported to be less than 0.7 ha.

18. In the villages there is a marked absence of communication, leisure and social services, and a physical and cultural isolation. Through the schools and from information received by the villagers from their relatives who have already migrated to the urban centers, urban life appears so attractive that even potential unemployment is seen as worth a risk. In fact, the rural exodus is in direct proportion to the level of education. Thus, the people most qualified to help in the development of their community are the first to leave it. Directly related to the low prestige of agriculture, is the attitude of parents. Education is expensive and career expectations of the parents for their children are, in general, a steady, secure job, preferably in the government bureaucracy even at a minor level. A steady, reliable income is viewed not only as security for the child, but also security for the parents in their old age, particularly since there is no old age security system.

19. The Teaching Profession. "The teaching profession has been unable to attract talented people. The educated people themselves look down upon the teaching profession. Since other professions fetch higher salaries, teachers switch over to them at the first opportunity." ^{1/} In addition to poor pay, training facilities for teachers are inadequate. Only about 20 to 25 percent of currently employed teachers are adequately qualified by government standards. Teacher training is currently offered in six centers,

^{1/} NES Plan for 1971-76, page 5.

three of them in good permanent structures and three in inadequate rented facilities. The capacity of the permanent centers is about 1,200. One of these, the National Vocational Training Center was converted to technical teacher training. Rented premises hold about 900. Total output is only about 850 teachers annually.

20. The resulting problem of teacher shortage is aggravated by the resistance of trained teachers to assignments outside the towns and cities. It should be, indeed, recognized that an educated person is bound to feel lonely in a village and that moving his family to a more remote area is also naturally a difficult personal decision to make. The more competent educators, therefore, concentrate in a few areas, producing more educated Nepali who wish to remain in the same areas. Training of educators is also made difficult by Nepal's topography. Recruitment of students for teacher preparation is handicapped by the lack of easy travel between villages and the normal schools.

21. Sociological factors interfere with Nepal's educational system. Most teachers come from castes which have traditionally looked down on manual labor. Moreover, the socio-economic class structure of Nepal, combined with the school fee system, keeps most members of lower classes from acquiring enough education to become teachers. Therefore, the curricula and methods used by teachers reflect a bias towards the upper-class/ caste values, which frustrates the objective of emphasis on vocational subjects. As a result, Nepal is presently drawing on the potentialities of only a tiny portion of its population. Most of the peasants are barred from reaching positions of educational leadership, although the population is preponderantly peasant. A vicious circle has developed: rural areas are likely to attract second-rate teachers, which in turn limits the possibility for peasant children to advance to teaching positions.

22. Educational Finance. The proportion of the central budget spent for education varied between 6 and 8.2 percent between 1965 and 1972.

GOVERNMENT EXPENDITURE ON EDUCATION, 1965-1972
(in millions of rupees)

	<u>Total</u> <u>Government Expenditure</u>	<u>Education</u> <u>Expenditure</u>	<u>Education Expenditure</u> <u>as % of Total</u>
1965/66	428.1	35.0	8.2
1966/67	438.8	33.4	7.6
1967/68	461.9	32.8	7.1
1968/69	537.2	37.5	7.0
1969/70	683.8	42.2	6.2
1970/71	819.3	51.7	6.3
1971/72	928.2	69.0	7.4

With public spending of less than \$0.60 per capita, Nepal is probably one of the world's lowest investors in education. To this, however, should be

added private spending which is probably of about the same magnitude as public spending. Government grants in aid have provided about 50 percent of primary school costs, 25 percent of secondary and almost 70 percent of higher education costs.

23. Capital expenditures from the Ministry of Education (MOE) budget have traditionally appeared to be higher than recurrent expenditures largely because of relatively rapid school expansion at all levels, low teachers' salaries and substantial salary support at the local level, which is derived from tuition charges. The Government of Nepal also has a record of under-spending, with actual expenditures falling substantially below allocations in recent years:

ALLOCATIONS AND ACTUAL EXPENDITURE
(in millions of rupees)

	<u>Total</u> <u>Budget</u>	<u>Actual</u> <u>Expenditure</u>	<u>%</u> <u>Expended</u>	<u>MOE</u> <u>Budget</u>	<u>Actual</u> <u>Expenditure</u>	<u>%</u> <u>Expended</u>
1965/66	458.8	428.1	91	36.1	35.0	97
1966/67	546.2	438.8	80	37.3	33.4	89
1967/68	667.3	461.9	70	42.7	32.8	77
1968/69	840.9	537.2	64	50.9	37.5	74

24. Output of the Educational System and Manpower Requirements. As we have seen, the major weakness of the educational system is its systematic orientation towards academic subjects. The second weakness is the over-emphasis on higher education. As a result high level academic persons are in oversupply while there are shortages of skilled workers. Although the problem of educated unemployed in Kathmandu is becoming acute, there are more than 250 junior technical assistants' posts unfilled in the Ministry of Agriculture and the need for about 250 operators and maintenance personnel for the airport expansion scheme cannot be met. Unemployed people, with high educational background, could apply for such jobs and get the necessary training. They do not do so, probably because they are reluctant to take up assignments outside Kathmandu, in the hope that sooner or later some job opening would materialize in the Kathmandu area. Moreover, low salaries and no career prospects, especially for Junior Technical Assistants, do little to overcome this reluctance.

25. An assessment of manpower requirements carried out by the Human Resources Division (National Planning Commission Secretariat, December 1971) shows that the various types of manpower available at present are entirely different from the types required. For example, the available higher-middle- and lower-level manpower as of 1970, are about 7,600, 5,800 and 4,300 respectively. This means that there is more high-level manpower than mid-level; and more mid-level than lower-level. The National Education System Plan has estimated that mid-level manpower requirement is 50 percent more than that of the higher-level, whereas the low-level manpower requirement is twice that of the middle-level manpower requirement. In other words,

the actual number of lower- and middle-level manpower is not adequate in relation to high-level manpower and the relationship appears an "inverted pyramid".

26. The sharp discrepancy which exists between the specific need for manpower and the kind of manpower the existing educational system is able to train is made more apparent when one studies the document prepared by the Planning Commission pertaining to the "Specialized Manpower Requirement for the Fourth Plan (1970-75)". Clearly, this document is limited in scope and calls for some reservations. The scope of the study is confined to programs of economic and social development included in the Fourth Plan. There is, therefore, no indication of the manpower requirement in the private sector. Moreover, the assessment of manpower requirement is based on the implicit assumption that all economic and social projects included in the development plan will be implemented in full. While it would be dangerous to reorganize the education system on the basis of such fragile estimates without further refining such projections, they nevertheless give interesting clues as to what kind of skills have to be developed.

27. The need for professional, technical and related workers is estimated to be about 30,000 during the Plan period. Over 500 additional engineers are required to carry out the planned projects in agriculture, irrigation, drinking water, transport and communication, industry and power. The demand for technicians at diploma level, who fill the gap between the professional engineer and the skilled worker, is estimated at 1,250 personnel. Moreover, there is an increasing demand for draftsmen, estimated to be about 300 personnel.

28. During 1970, about 1,900 graduates were engaged in agriculture including 240 specialists and 1,120 extension workers. In the remaining years of the Fourth Plan the requirement of this group has been estimated at 1,730 persons. Of this, there is a need for 170 agricultural graduates and 100 related specialists together with 1,460 extension workers at diploma level.

29. Despite a substantial increase in the facilities for medical services, the shortage of medical personnel continued to be acute during the last decade. During this period, the number of scholarships awarded in the field of medicine at degree and specialization level increased from 20 in 1956 to 50 in 1967. In spite of this increase, however, the doctor-population ratio as of 1970, has remained more or less constant at 1:37,000. It is estimated that about 160 medical doctors including physicians, surgeons and other specialists will be required to man the proposed medical and health services in the current plan. For optimum utilization of graduate doctors and for expanding the medical and health services commensurate with the country's needs, middle-level manpower like nurses and other para-medical personnel will also have to be made available in adequate numbers. Approximately 2,800 persons will be needed to serve as auxiliary health workers, nurses, auxiliary nurses, midwives and other health personnel.

30. Additional manpower is required in the field of education. Requirement during the Plan-period is expected to be about 50 higher education teachers, 7,900 secondary education teachers and 10,150 primary education teachers. During 1970, the number of such higher, secondary and primary education teachers were 1,070, 5,780 and 19,160 respectively.

31. Additional requirements for government administrators together with production managers, sales managers and horticultural managers, are estimated to be about 400 persons compared to only 90 in these fields in 1970. Of this total, industry will require 150 and power development 120. The demand for production managers, sales managers and horticultural managers, altogether 100 persons, is a result of widening the industrial base under the plan. There is an urgent need for such qualified managers since the successful and efficient running of industries in the public and private sectors depend upon the availability of management personnel in adequate numbers.

32. The largest manpower requirement, however, concerns the skilled labor force which includes trained and qualified mechanics, sheet metal workers, tool makers, operators of construction and heavy earth-moving equipment, masons, moulders, foremen, carpenters, blacksmiths, spinners, electric fitters and workers. The additional requirement of this personnel during the plan period is about 310,000 persons, while there were only 50,600 in 1970. The major share of skilled labor is required in the infrastructure development like irrigation, drinking water projects, transport and communication, housing and physical planning projects and others. The shortage of skilled labor has handicapped the implementation of such development projects in the past.

33. The estimated manpower requirements are summarized in the following table:

ESTIMATED MANPOWER REQUIREMENTS OF THE FOURTH FIVE YEAR
PLAN (1970-1975) BY BROAD OCCUPATIONAL CATEGORY /a

<u>Categories</u>	<u>Manpower in 1970/71</u>	<u>Additional Requirements 1971-76</u>
1. Professional, Technical and Related /b	28,976	25,588
2. Administration and Management	90	403
3. Clerical and Related	2,703	2,320
4. Service	636	903
5. Agriculture and Related /c	351	203
6. Production, Transport, Equip- ment and Construction /d	<u>50,615</u>	<u>311,332</u>
Total	103,371	340,749

/a Human Resources Division, National Planning Commission.

/b Includes teachers.

/c Agriculturalists are also listed under Category 1. Total shortages amount to 2,000 specialists.

/d Building trade workers constitute the largest part of this total, 281,000.

II. REFORM: THE NATIONAL EDUCATION SYSTEM PLAN (NESP)

Educational Structure

34. Under the old structure, the primary level extends over a period of five years. As we have seen, three quarters of enrolled children only attend grades 1 to 3 and the lack of competent teachers generally results in a very poor schooling performance. Under the new plan, primary education would be reduced to three years. All schools will follow the same curriculum which aims at literacy, numeracy and citizenship: Nepali language 40 percent; arithmetic 30 percent; social studies 20 percent; handicraft and art 10 percent; and hygiene and physical education, which are taught informally. First textbooks of a good standard will be made available to children in remote areas and at fair prices to others. The government will make financial grants to fully cover the salaries of primary school teachers who will be appointed by the District Education Service Commission. Individuals with a School Leaving Certificate or its equivalent, and trained, will be enrolled as primary school teachers.

35. Under the new structure, secondary education will be in two cycles, the first of four years (grades 4-7) and the second of three years (grade 8-10). First cycle secondary will offer a diversified curriculum including pre-vocational subjects such as agriculture, home economics, commerce and industrial arts. It will provide places for about 40 percent of the primary school students and it will have a two-fold goal: further development of literacy, citizenship and character and development of pre-vocational interests and skills. Enrollment in grades 4-7 will increase from about 14 to 20 percent of the relevant age group. A national curriculum will be established: national language 30 percent; foreign language (usually English) 10 percent; social studies 13 percent; mathematics 20 percent, science 10 percent; pre-vocational (adapted to local needs) 10 percent; physical education and hygiene 7 percent.

36. The large number of school dropouts are ill-prepared to become productive members of a developing society. The multipurpose schools were not successful. Opportunities for skill training are very few. The Ministry hopes to improve this situation at the first cycle secondary level by the inclusion of compulsory practical subjects, usually agriculture. It thus hopes to shape attitudes and enable students to enter the labor force prepared for further training. In the words of the Plan, pre-vocational training is meant "to arouse respect for and habits of labor". Individuals with diplomas in Education or the Arts or their equivalent will be enrolled as teachers.

37. Total second cycle secondary enrollment is projected to rise from 6 to 15 percent of the 13-15 age group during the Plan period. The focal point of the Plan's objective is to provide every student with some measure of skill training, mostly in agriculture, which will be offered in two-thirds of the schools. Second cycle secondary schools will be of three kinds:

- (a) General: Nepali 12 percent; English 12 percent; mathematics 12 percent; social studies 12 percent; science 12 percent; Panchayat 5 percent; Health 5 percent; optional academics 10 percent; vocational 20 percent.
- (b) Sanskrit: Nepali 10 percent; Sanskrit 30 percent; mathematics 10 percent; social studies 10 percent; science, health and physical education 10 percent; vocational education 20 percent; optional academics 10 percent.
- (c) Vocational: Nepali 12 percent; English 12 percent; mathematics 12 percent; science, hygiene 12 percent; social studies 12 percent; vocational 30 percent; optional 10 percent.

38. A difference of 3-4 periods per week or 10 percent of the timetable, is insignificant in discriminating between general and vocational schools. Unless the curriculum content in the latter is designed to include adequate practical training, consideration ought to be given to the development of a comprehensive secondary school, with vocational options provided in accordance with local needs. Fifty percent of the lower secondary school

students and 20 percent of the primary school students will be given higher secondary school facilities. Trained individuals with B. Ed. or B. A. or their equivalent, will be enrolled as teachers.

39. Higher education, which is now fragmented into 49 largely autonomous colleges, will be the responsibility of the Tribhuvan University which will function as an autonomous institution within the policies enunciated by the National Education Committee. The University will have its own budget as well as responsibility for curriculum, personnel and facilities. Existing colleges are to be consolidated into 13 institutes.

40. The main object of higher education will be to produce trained manpower. Each level of higher education will, therefore, be related to the different levels of trained manpower:

- (a) the Certificate level will provide low-level manpower.
- (b) the Diploma level will provide middle-level manpower.
- (c) the Degree level will provide high-level manpower.
- (d) the Research level will provide specialized manpower.

41. As the country goes on developing, there will be a need for various kinds of manpower and the formation of new institutes will become necessary. Accordingly, some institutes will be organized for education up to certificate level only, while others will be equipped to continue studies up to the degree and research levels. For instance, given the urgent need for para-medical personnel, the Institute of Medicine will not go beyond the certificate level; physicians will have therefore, to get their degrees outside Nepal, mostly in India. Economy of scale will also determine the organization of the respective institutes. While there is a need to train a large number of forestry experts at the certificate level, there is little need for forestry experts at higher a level. There would, therefore, be no justification for a degree course in forestry in Nepal.

42. The University will organize a separate admission test to determine eligibility for higher education. Arrangement will be made to reduce the number of those taking up arts and humanities and increase the number who elect technical subjects. Thus, the approximate 80:20 ratio of students in general/technical areas will be gradually changed over the Plan period to about 55:45 unless manpower requirements change.

Administrative Structure

43. A high-level national education committee has been formed to implement the National Education Plan. The committee is composed of members nominated by His Majesty the King. Its main functions are:

- (a) formulate policies and issue directives;

- (b) coordinate the functions of Tribhuvan University, the Education Ministry and other Ministries concerned in enforcing the National Education Plan;
- (c) evaluate the progress of the entire educational program; and
- (d) clarify the plan as and when required.

Under the guidance of the National Education Committee, the Tribhuvan University would be in charge of higher education and the Ministry of Education of primary and secondary education. The Secretary, the principal executive of the Ministry of Education, is responsible for carrying out:

- (a) the formulation of plan and program;
- (b) the general administration for implementation;
- (c) the technical administration for implementation; and
- (d) evaluation and control.

44. In such an administrative organization, the Secretary is expected not only to carry out administrative functions, but also to provide leadership to the whole operation. The main burden of implementation rests, however, on the four regional directors. Working directly under these directors, District Education Officers will be charged with two types of responsibilities:

- (a) administration which includes organization of education services, appointments and transfers of teachers; and
- (b) supervision.

Main Objectives of the National Education Plan

45. To ensure quality at all levels of education, the new system will rely heavily on examinations. Quarterly examinations will be held to assess the progress made by the students. At the end of primary education, students will be promoted on the basis of examinations conducted by a team of district school inspectorate officials. At the end of the term of the lower secondary school, examinations will be held on a zonal basis. The School Leaving Certificate test will be given at the district level. Twenty-five percent of the marks obtained in the internal assessments will be added to the marks obtained in the SLC examinations.

46. At the higher education level, the present practice of biennial examinations will be replaced by semester examinations. Students will be evaluated partly by internal assessment and partly by external examinations at the end of every semester. In the early stages, internal assessments

will be assigned a weight of 20 percent which gradually will be increased to a maximum of 50 percent. Furthermore, at every level of higher education, i.e., certificate, diploma and degree, there will be an entrance examination. The whole examination system is, therefore, geared to ensure good standards, to decrease wastage of public and private money and to give preeminence to merit.

47. The supervision system is also geared to ensure sound, uniform standards. School supervision will be of two kinds: (a) to examine the physical facilities of the schools and find out whether the teachers are sufficient in number and are up to the standard in performance; and (b) to evaluate the course of study at each level. The inspectors will visit the schools at least twice a year to carry out the supervision.

48. It is also essential that talented people be attracted to, and be induced to stay in the teaching profession to reform and improve the quality of education. The present practice is to appoint teachers in government schools by the Public Service Commission; since there are in Nepal a large number of private schools, many teachers have no security of service, few promotional prospects and probably inequitable pay scales. With the reform, the District Education Service Commission will be solely in charge of appointing, promoting, transferring and dismissing teachers, whether they work in a government school or in an approved and certified private school. ^{1/} The pay scale of teachers will be fixed at the same level as is applicable to personnel of other professions having similar qualifications.

49. The second thrust of the reform is to increase enrollment in the primary cycle and to encourage vocational education tied to investment patterns. To ensure this, the government will cover teachers' salaries in primary schools. In those areas designated as remote, the government will also bear other expenses. At the low secondary level, government will provide for 75 percent of teachers' salaries and 100 percent in areas designated as remote. The government will bear the expenses of teachers' salaries at both the general and vocational high secondary institutions in areas which are designated as remote. In other places, government's contributions will amount to 75 percent of teachers' salaries in respect of vocational institutions and 50 percent in respect of general institutions. The government will bear the entire expense of higher technical institutes, such as in medicine and agriculture.

50. Scholarships will also be provided to economically handicapped but talented students and to those from backward areas and communities. Preference will be given in scholarship awards to students following

^{1/} There will, from now on, be no schools except those that operate according to the NESP. If found capable of running in the form of a viable institution, a private school may be allowed to continue, but under the full direction and control of the Government.

technical education. The same criteria will apply to the awards of foreign scholarships in subjects for which Nepal lacks study facilities. Scholarships will not be awarded in subjects unrelated to the plan requirements or so highly sophisticated that they cannot be put to any conceivable use in the country; instead, emphasis will be placed on such subjects as are fundamental in nature and are likely to prove helpful to the development of Nepal.

51. The National Education Plan provides also for a more open school system. Chances will be given to low-level technicians who pass requisite entrance tests to join higher-level technical institutes. Under the previous system, a primary teacher or a JTA had practically no career development prospects which led to a high drop-out rate, low morale and poor efficiency. No doubt these career opportunities will encourage the most motivated individuals and hopefully improve the overall working of the institutions to which they belong.

52. Another interesting feature of the National Education System Plan is the setting up of National Development Service Corps. This Corps will be instituted so that higher education may not be equated with theoretical and bookish knowledge alone and also to provide students scope for service in national development while engaged in studies. Under the national service scheme, a student passing the first year of the diploma course (equivalent to the present bachelor's degree) or the first year of the degree course (equivalent to the present master's degree) will be required to serve for a year in a place where he is assigned. At the outset, such service will be compulsory for those who complete the first year of the degree course only. Later, it will be made compulsory for those passing the first year of the diploma course as well. The development service corps shall be an integral part of university education and diplomas or degrees will only be awarded if the candidate has served in this program. Holders of foreign diplomas or degrees will be barred from pursuing further studies or taking up employment in Nepal until they fulfill this service requirement.

53. The members of the National Development Service will be divided into the following four corps:

- (a) Education Service Corps
- (b) Health Service Corps
- (c) Agriculture Service Corps
- (d) Construction Corps

The students of the various corps will be assigned to different rural areas for one year and their salaries and allowances will be provided by the ministries concerned. Students drafted under the National Development Service will wear uniforms and badges.

III. PROBLEMS IN IMPLEMENTATION

54. The conceptual approach of the National Education System Plan (NESP) deserves warm endorsement. There are, however, some aspects which require further clarification. The financial and administrative implications of the NESP should also be worked out in a more comprehensive manner.

The Educational Structure

55. It is impossible to judge whether the primary cycle is long enough to provide a reasonable degree of literacy; it would largely depend upon the competence of the teachers and upon the intensity of schooling. At any rate more attention should be given to the supply of reading materials for post-school use. The merit of a short primary cycle of three years is that for years to come many children in rural areas will not be able to attend school beyond the age of 8 (see paragraph 4). Such a primary cycle, to be a success, needs competent teachers.

56. Translation of the policy for introducing vocational courses in secondary schools into a productive program will require careful planning. Objectives are not very clear; curricula have not been developed; manpower projections have not been related to vocational enrollments; a rationale does not exist for distinguishing between vocational secondary and general secondary schools on the basis of 10 percent difference in vocational content. It is doubtful whether Nepal can afford the expenditure necessary to provide reasonably good facilities and equipment and support the recurrent expenditure necessary for sound vocational or pre-vocational teaching in all secondary schools. No other area of the NESP requires such careful planning as the vocational, particularly agriculture courses, if a sound program is to emerge. The question of cost must be studied thoroughly in terms of probable value to development. Considering the high cost of genuine vocational education (5-10 times general education) training for unemployment should not be accepted.

57. The approach towards higher education is basically sound and the NESP gives enough power to the authorities to translate into reality the goals it wants to achieve. The difficulties, however, should not be minimized. It will not be easy to merge the 49 existing institutions into 15, which would mean the closing or downgrading of colleges. Political difficulties will also have to be faced if such a drastic reform of higher education is to be implemented. Since it would strictly control access to higher education, it is unlikely that the main beneficiaries of the present system, i.e., the urban middle classes, would heartily endorse this new approach, however necessary it may be for the country as a whole. Moreover, nothing prevents a student, who fails to qualify for a Nepalese University, to enroll with an Indian University.

Financial Implications

58. Success in Plan implementation will depend on the willingness and ability of the central government to commit the necessary funds. The Ministry of Education has projected a Plan budget of Rs 576 million, which

is estimated to be about 10 percent of the total budget. Expenditures are expected to grow from Rs 71.5 million in 1972 to Rs 158.4 million in 1976 an increase of 22 percent per year. It is impossible to assess the adequacy of this projection, given the lack of precision in teacher and enrollment projections, but lack of provision for capital requirements for teacher training and secondary education will have serious effects. The projection provides capital costs for higher technical education and vocational secondary education only. Capital costs for primary and general secondary education would have to be covered by local governments and no indication is given whether these local resources would be available to meet NESP's objectives.

Teacher Training

59. The NESP is expected to be implemented gradually within 5 years. In terms of teacher requirements, there is a need for over 10,000 additional primary teachers, and about 8,000 secondary teachers. With a present yearly output of 850 teachers trained in existing normal schools, it is difficult to see how the whole education system could be staffed with competent teachers within a 5 year schedule.

60. More acute is the expected shortage of vocational teachers. This could be decisive in the struggle to make vocational education realistic. There is no pool of vocational teachers on which to draw except the small number of poorly trained teachers in the multipurpose schools and there is a projected need for 1,700. Adequately trained supervisory personnel, whose number is expected to increase very rapidly, are also critical to Plan success particularly in view of large numbers of poorly trained teachers.

Conclusions

61. The NESP is a policy document rather than an operational Plan; nevertheless, it constitutes the basic framework for the implementation of an important and vital reform. The main problem, therefore, is to translate its recommended policies into a realistic action program. As it stands now, the two main operational weaknesses are:

- (a) the absence of a realistic evaluation of the number of good quality teachers who could be reasonably trained within a time-bound schedule; and
- (b) the absence of any evaluation of the resources needed to be raised by local governments to meet the Plan targets, nor for that matter, how these local governments are going to raise these resources. The undefined proposals to raise an education tax does not offer a satisfactory answer to this basic question.

It therefore appears that the most urgent decision should be to reconsider Plan phasing in a more realistic and less ambitious way, and chiefly ensure that effective planning precedes implementation.

62. This implies that the government should:
- (a) concentrate first on the development of sound teacher training;
 - (b) ensure that the costs of the Plan are more carefully projected and both the sources and availability of funds are determined;
 - (c) organize the curriculum development process and develop a tightly controlled organization to coordinate curriculum and textbook development;
 - (d) strengthen the administrative and planning capacity in the Ministry of Education;
 - (e) refine manpower projections before defining educational programs in terms of projects; and
 - (f) restudy the objectives of secondary education. It is doubtful whether it will be possible to provide vocational education in all secondary schools for many years. The introduction of agricultural subjects in the curricula of rural schools is sound, but pressure to expand this and other vocational programs beyond the Ministry's capacity to plan and provide for teachers should be resisted. A delay in Plan implementation will result, but the chances of success will be increased.

STATISTICAL APPENDIX

<u>Table No.</u>	<u>Title</u>
1	Education Development: 1951-1970
2	Education Enrollment: 1969/70
3	Alternative Enrollment Projections and Teacher Needs
4	Teacher Training Requirements
5	Teacher Training
6	Technical and Vocational Education, 1972
7	Government Expenditure on Education, Actual and Projected

Table 1: NEPAL - EDUCATION DEVELOPMENT 1951-1970

Level	Number Schools			Number Students			Number Teachers			P/T Ratio			% of Age Group		
	1951	1961	1970	1951	1961	1970	1951	1961	1970	1951	1961	1970	1951	1961	1970
Primary	321	4,001	7,256	8,505	182,533	449,141	N.A.	N.A.	18,250	N.A.	N.A.	25/1	.9	15.8	32
Secondary	11	156	1,065	1,680	21,115	96,614	N.A.	N.A.	5,407	N.A.	N.A.	19/1		.02	5.2
Higher	2	33	49	250	5,143	17,200	N.A.	417	1,070	N.A.		12/1	16/1		.9

Enrollments by Grade Level, 1965-1970¹

	Primary					Total	Secondary					Total	Higher					Total	
	1	2	3	4	5		6	7	8	9	10		11	12	13	14	15		16
1965/66	187,159	73,339	55,657	39,643	30,307	386,104	17,037	13,890	11,159	8,585	6,769	57,440	3,496	2,534	817	807	446	8,100	
1968/69	175,964	92,517	78,168	57,499	44,606	448,754	26,989	21,844	18,085	14,618	12,595	94,731	5,842	4,524	2,388	1,603	351	292	15,000
1969/70	164,219	94,921	82,628	60,602	46,762	449,141	27,419	23,545	18,988	14,567	12,095	96,614	6,616	5,808	1,981	1,962	506	327	17,200

Projected Enrollments by Level 1972-1976²

School Age Group, 6-8	Primary - Grades 1-3			1st Cycle Secondary, Grades 4-7			2nd Cycle Secondary, Grades 8-10		
	School Population	% of Age Group	School Age Group, 9-12	School Population	% of Age Group	School Age Group, 13-15	School Population	% of Age Group	
1972	876,000	478,700	54	1,176,000	191,000	16	748,000	96,000	13
1973	890,000	507,500	57	1,203,000	203,000	17	765,000	102,000	13
1974	903,000	543,000	60	1,230,000	217,000	18	783,000	109,000	13
1975	917,000	587,000	64	1,259,000	237,000	19	801,000	118,000	15
1976	930,000	595,000	64	1,290,000	260,000	20	821,000	126,000	15

¹ Statistics prior to 1965/66 and later than 1969/70 not available.

² Projected on basis of Plan structure although dual system will be operating.

³ Mission Projections.

Source: Ministry of Education
Planning Division
& Mission Projections

Table 2: EDUCATION ENROLLMENT, 1969/70

ENROLLMENT BY SEX IN PRIMARY EDUCATION

	Grade										Sub-Total		Grand Total
	1		2		3		4		5		Boys	Girls	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls			
Government	114,663	23,775	68,418	11,602	60,520	9,136	44,402	6,687	34,592	4,829	322,602	56,029	378,631
Private	21,854	4,427	12,741	2,160	11,271	1,701	8,270	1,245	6,442	599	60,078	10,423	70,501
TOTAL	136,517	28,202	81,159	13,762	71,791	10,837	52,672	7,932	41,034	5,428	382,680	66,452	449,132

ENROLLMENT BY SEX IN SECONDARY EDUCATION

	Grade										Sub-Total		Grand Total
	6		7		8		9		10		Boys	Girls	
	Boys	Girls											
Government	19,225	2,847	16,586	2,368	13,400	1,865	10,224	1,575	8,265	1,472	67,700	10,147	77,847
Private	4,601	690	4,017	574	3,246	457	2,477	383	2,002	356	16,399	2,458	18,857
TOTAL	23,826	3,537	20,603	2,942	16,646	2,322	12,701	1,958	10,267	1,828	84,099	12,605	96,704

Source: Ministry of Education

Table 3: ALTERNATIVE ENROLLMENT PROJECTIONS AND TEACHER NEEDS ^{1/1}

	Teachers Needed Grades 1-3 P/T ratio 30:1				Teachers Needed Grades 4-7 P/T ratio 25:1				Teachers Needed Grades 8-10 P/T ratio 25:1			
	Enrollment assumes 6% annual increases	Total teachers needed	Enrollment assumes 10% annual increases	Total teachers needed	Enrollment assumes 6% annual increases	Total teachers needed	Enrollment assumes 10% annual increases	Total teachers needed	Enrollment assumes 6% annual increases	Total teachers needed	Enrollment assumes 10% annual increases	Total teachers needed
1970	341,768	11,392	341,768	11,392	158,328	6,330	158,328	6,330	45,650	1,826	45,650	1,826
1971	362,400	12,080	376,990	12,500	171,800	6,840	174,150	7,000	48,400	1,920	50,200	2,040
1972	384,000	12,800	413,600	13,800	182,100	7,280	191,500	7,660	51,300	2,050	55,200	2,200
1973	407,000	13,600	454,900	15,100	192,000	7,680	210,700	8,400	54,400	2,180	60,700	2,400
1974	435,500	14,500	500,000	16,700	203,500	8,140	232,000	9,280	57,700	2,300	66,800	2,700
1975	457,500	15,250	550,500	18,350	215,700	8,600	255,000	10,200	61,200	2,440	73,500	2,950
1976	485,000	16,160	605,427	20,180	229,000	9,160	282,500	11,220	65,000	2,600	80,850	3,250

^{1/1} Mission Projections

Table 4: TEACHER TRAINING REQUIREMENTS ¹¹

Primary	1972	1973	1974	1975	1976	Total
Total Required	900	3,000	4,500	5,000	4,500	18,000
Target New Trainees	813	1,600	2,000	2,150	2,150	8,713
TTC Programs	532	910	1,300	1,750	1,750	6,242
Mobile Units		250	200	350	350	1,150
Total New Trainees	532	1,160	1,500	2,100	2,100	7,392
Stock of existing Trained	<u>250</u>	<u>750</u>	<u>1,125</u>	<u>1,250</u>	<u>1,125</u>	<u>4,500</u>
Total Trained	782	1,910	2,625	3,350	3,225	11,892
Lower Secondary						
Total Required	432	1,600	2,100	2,400	2,000	8,532
Target New Trainees	200	450	750	1,000	1,200	3,500
TTC Programs	180	450	750	950	950	3,280
Stock of existing Trained	<u>100</u>	<u>400</u>	<u>500</u>	<u>600</u>	<u>500</u>	<u>2,100</u>
Total Trained	280	850	1,250	1,550	1,450	5,380
Secondary ¹²						
Total Required	216	800	1,040	1,200	1,064	4,320
Target New Trainees	122	450	600	675	700	2,447
TTC Programs	120	520	530	530	700	2,300
Stock of existing Trained	<u>50</u>	<u>150</u>	<u>200</u>	<u>250</u>	<u>200</u>	<u>850</u>
Total Trained	170	670	730	780	900	3,150
Others needing upgrading ¹³						
Teacher Educators	20	50	70	40	20	200
Supervisors	50	110	110	130	110	510
Headmasters	20	50	70	40	20	200

¹¹ The target now is about 65% "trained" teachers in Plan districts. This does not imply SLC plus training, as established as the goal of the Plan.

¹² Projections are high resulting from inflated secondary enrollment projections.

¹³ Training will be done at the Institute of Education, Kirtapur. UNESCO has been requested to provide technical assistance to this program. USAID has agreed to provide 5 teacher educators to work with teacher training and materials development in science, and mathematics. The British Council will provide technical assistance in English language teacher training.

Source: Institute of Education

Table 5: NEPAL - TEACHER TRAINING

Institution	Status	Proposed Specialization	Present Capacity	Planned Capacity	Capacity additional Classrooms	Present Hostel Capacity	Additional Hostel Capacity	Proposed Staff Quarters	Other facilities
Kirtapur	Permanent	a. Teacher Educator b. Administrator c. Secondary Teachers	450	600	150		400		Curriculum laboratory and Language laboratory
NVTC	Permanent	a. Vocational Teachers	450	600	150	70	150		Curriculum laboratory and Language laboratory
Pakhara	Permanent	a. Primary b. Lower Secondary c. Upper Secondary	300	600	300	120	280	10 units	Curriculum laboratory and Language laboratory
Birgunj	Rented	a. Primary b. Lower Secondary (300)	(300)	600	600		400	10 units	Curriculum laboratory and Language laboratory
Dharan	Rented	a. Primary b. Lower Secondary	(300)	400	400		300	10 units	
Palpa	Rented	a. Primary b. Lower Secondary	(300)	400	400		300	10 units	
Kathmandu (city)	Proposed	a. Primary b. Lower Secondary		600	600				Curriculum laboratory and Language laboratory
Ilam	Proposed	a. Primary		200	200		200	10 units	
Nepalgunj or Surket	Proposed	a. Primary		200	200		200	10 units	
Doti or Dadeldhura	Proposed	a. Primary		200	200		200	10 units	
Totals			1,200 Permanent 900 Rented	4,400	3,200		1,930	70	

Table 6: NEPAL - TECHNICAL AND VOCATIONAL EDUCATION, 1972 ¹¹

Institution and Location	Supervising Authority	Fields Offered	Years of Prior Schooling	Course Duration (years)	Enrollment	Output 1971	Total Output to 1971	Year Started
Technical Institute Butwal	Ministry of Industry and Commerce	Mechanical Woodworking	6	4	16	10	36	1966
Institute of Agriculture	Ministry of Land Reform	Agriculture	10	2 cert. 1 JTA	43 cert. 65 JTA	25 0	3,304 1,116 JTA	1957
Nepal Forest Institute Hetaura	Ministry of Forestry	Ranger Forester	10 8	2 1	25 30	12 30	190 489	1949
Nurses Training Center	Ministry of Health	Nursing	10 S.L.C. since 1971	3½	Capacity 50 16	15	162	1958
Assistant Nurse Midwifery Training Center: Beratnagar, Nepalganj, Bharatapur	Ministry of Health	Nursing & Midwifery	8	2	80	48	241	1963
Auxiliary Health Center	Ministry of Health	Medical	10	2	100	56	412	1961
Laboratory Assistant Training, Kathmandu			S.L.C.	2	12	12	22	1968
Nepal Engineering School Kathmandu (ILO assisted)	Ministry of Public Works, Communication and Transport	Civil Engineering	10 Sub SLC	2 Short courses	160 80 Building Trades	20 Irrigation roads 20 buildings 20 engineers	500	1941
Technical Training Institute, Kathmandu (German assisted)	Ministry of Industry and Commerce	Electrical, Auto-Mechanics, Mechanical	1. SLC 2. Non SLC	3 2	25 25	40	179	1963
Cottage Industry Training Center, Kathmandu	Ministry of Industry and commerce	Electrical, Mechanical, Wood, Textiles, leather,	Sub SLC	2 plus short courses	52 (100 capacity)	40	1,057	1956
Repair Training Center, Hetaura	Ministry of Industry and Commerce	Mechanical	8	3	45	15	50 (Est)	1966
Industrial Training Center Belaju (Swiss assisted)	Ministry of Industry and Commerce	Mechanical	9	3	12	10	60 (Est)	1962
Vocational Training Center, Baranagar	Ministry of Industry and Commerce	Mechanical Woodworking	6	1	20 (Est)	25	225 (Est)	1960

¹¹ Tentatively most of these will be integrated into the Institute structure under Tribhuvan University. This decision is pending.

Source: Ministry of Education
Technical Division

Table 7: NEPAL - GOVERNMENT EXPENDITURE ON EDUCATION,

	ACTUAL AND PROJECTED										
	(Millions of Rupees) ^{/1}										
	1965/66	1966/67	1967/68	1968/69	1969/70	1970/71	1971/72	1972/73	1973/74	1974/75	1975/76
Total Government Expenditure	428.1	438.8	462.0	537.2	683.8	819.3	928.2	1,050.6	1,149.2		
Total Education Expenditure	35.0	33.4	32.8	37.5	42.2	52.8	77.6	97.6	115.4	139.7	158.4
Capital ^{/2}	18.9	20.6	21.3	23.3	26.7	23.4	39.9				
Recurrent	9.8	12.3	13.9	12.9	14.2	29.4	37.6				
Education as % of Total Expenditure	8.2	7.6	7.1	7.0	6.2	6.2	8.0	9.0	10.0	10.0	10.0
GDP	6,795	6,333	7,544	8,567	9,449	9,714	10,025				
Education Expenditure as % of GDP	0.51	0.50	0.44	0.44	0.45	0.54	0.77				

^{/1} From Bank Mission revenue and expenditure tables.

^{/2} Ministry of Education. Ministry of Education figures differ from those of the Ministry of Finance for reasons that are not clear, and are included to show the historical relationship between capital and recurrent expenditures even though totals do not equal actual expenditures in some cases.

SECTION III

INDUSTRY

INDUSTRY

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ANNEXES

1. The Main Industries
2. Financing of the Industrial Sector
3. The Indo-Nepal Treaty of Trade and Transit
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STATISTICAL APPENDIX

9. In addition to its dependence upon trade with India, practically all of Nepal's trade with third countries transits through Calcutta. It takes up to three weeks for commodities to reach Calcutta from border towns and up to one month for custom formalities. Imports through India are also subject to delays and pilferage. These conditions have long been a source of dissatisfaction. On the other hand, the foreign exchange entitlements given to certain Nepalese exporters (para 26) have led to substantial investments in activities of dubious value. These consisted of third-country imports, such as stainless steel and synthetic fibers, which were normally processed and re-exported to India where such imports were strictly controlled. These activities were so profitable and had grown to such a magnitude that India was forced to put an end to them. As a result, the new India-Nepal Trade and Transit Treaty signed in August 1971 was more restrictive in accepting Nepalese imports. It still permits duty-free entrance of Nepalese products provided they incorporate 90% or more Nepalese and Indian raw materials and components. Total or partial duty exemptions can be negotiated in each case for manufactured goods incorporating between 50 percent and 90 percent of Nepalese materials and labor. In the meantime, some actual or potential Nepalese exports such as jute, cloth (hessian) and plywood are exempt from customs duty.

10. The much larger Indian market allows for economies of scale not available to Nepalese industries serving only the domestic market. They face a competitive disadvantage since it is generally conceded that any high tariff protection on Indian goods would be ineffective. Those Nepalese industries which could sell part of their output on the Indian market would not be affected by the limitations imposed by economies of scale.

II. STRUCTURE OF THE SECTOR

A. Contribution to the Economy

Contribution to GDP

11. In 1964/65 value added by manufacturing accounted for only 1.4 percent of GDP. From that year until 1969/70, it increased four times as fast as total GDP. In the latter year, however, it still contributed only 2.9 percent to the GDP (Statistical Appendix Table 1). Furthermore, industrial output started from a very small base and much of the growth was due to stainless steel utensils and synthetic textile industries which collapsed after 1970 (para 20). Value added by cottage industries has been estimated at about 7 percent of GDP and this share has been estimated to be fairly constant between 1964/65 and 1969/70 because their output is assumed to have increased approximately at the same rate as the agricultural sector. However, no surveys are available confirming this. Total lack of information on wages and salaries paid, profits, inputs, and value added by the industrial sub-sectors, do not allow a true analysis of their relative importance or of labor productivity and capital/output ratios. Employment in industry is

estimated at 200,000 but no more than 5 percent are in enterprises with more than 100 employees.

Contribution to Exports

12. The main export products are based on agricultural crops: milled rice to India and jute and jute products to third countries. The latter accounted for 70 percent of hard currency exports in 1970/71. Hessian and sacks are the only manufactured goods, other than curios (2 percent of exports) sold by Nepal in third countries.

B. Present Structure of Industry

Location of Industries

13. Industries are generally located in urban areas either along the Indian border between Biratnagar and Birganj or on the Birganj-Kathmandu corridor. However, small industries related to agriculture and requiring simple processing, such as rice mills, are scattered throughout the country. Jute is cultivated in the area surrounding Biratnagar, where two jute mills are located. Some other industrial activities (a sugar mill and a relatively important food canning plant) are also located there. Birganj has the biggest sugar mill in Nepal and also a cigarette factory, a match factory and an agricultural tools factory. The biggest cigarette factory is located in Janakpur, located between Biratnagar and Birganj.

14. Two industrial estates (Patan and Balaju) are located in the Kathmandu Valley. They serve mainly small and medium-scale industries, such as furniture, wood resawing and carpentry shops, steel structures, manufacture of biscuits, shoes, textiles and curios. They serve the local market mostly. There is another industrial estate at Hetaura, between Kathmandu and Birganj, which is still in the process of expansion. A brewery, a parquet factory, and an oil extraction plant have recently been installed there. Nepal's only large sawmill is located near Hetaura. The establishment of several other large industries is anticipated because of the favorable location of the Hetaura Industrial District, on the road from Kathmandu to the Indian railhead at Raxaul, near Simra, where the road east to Biratnagar begins and where there is an airport. The availability of many facilities - power and transportation by cableway to Kathmandu - are also positive factors in this location.

Size and Ownership of Industrial Enterprises

15. There are no statistics analysing industrial enterprises by size or ownership. However, HMG owns or has a majority of the shares in the biggest plants in the following industrial branches: sugar, tea processing, leather, footwear, sawmilling, jute textiles, and agricultural tools. Total authorized capital of these enterprises is over NR 210 million, or more than 35 percent of total authorized capital of the main industries.

16. Enterprises included in the 1965 census had, on the average, only 12 employees. Many of the industrial "plants" obviously must have been little more than family-size enterprises. For instance, the census listed 6 chemical plants having a total of 56 employees ^{1/}. Only the textile sub-sector with 24 plants averaging 142 employees each, could be said to comprise a number of factory-sized establishments. Conditions have changed since then. There are now 18 enterprises having 100 or more employees ^{2/}. But the largest number of industrial enterprises (estimated at over 2,000) are smaller establishments.

Main Industries

17. The main industries (food products, tobacco products, textiles, sawnwood and some small-scale industries) are described in Annex 1. Food processing is the most important industrial sub-sector. Gross value of production of the nearly one thousand small-scale rice mills in operation has been estimated at more than Nr 200 million. Other important food industries are sugar, vegetable oils and tea. A 600,000 litre brewery began operations last year.

18. The textile sub-sector, after a brief period (1967/69) in which gross value of production, mainly of synthetic fabrics, topped Nr 105 million annually, dropped considerably in importance when the Indian market was closed to Nepalese synthetic fabrics in 1970. However, the two jute mills in Biratnagar remain the most important industrial establishments in Nepal, employing more than 4,500 workers and exporting (in 1968/69) about 14,000 MT of manufactured goods with a gross value estimated at Nr 52 million.

19. Other large industrial establishments ^{3/} are: one of the three cigarette factories (employing nearly 600 people), an alcohol distillery, two out of four shoe factories, a saw mill, one out of five match factories, one out of five printing presses, a structural steel and metal working shop, a plant making agricultural tools and a furniture shop. Industrial estates in Patan and Balaju offer common facilities to some large plants and to several small establishments.

20. The physical output of selected commodities for the period 1961/62-1971/72 is shown in the Statistical Annex, Table 8.1, and the corresponding figures are summarized in Table 2 together with the value of production or sales for 1968/1969. These figures are derived from various sources which often give conflicting information, and they should be used with caution. Nevertheless, they provide a rough view of the performance of the various industries. It can be seen that the stainless steel utensil and the synthetic fiber industries grew rapidly after 1960 and collapsed

^{1/} Source: The Economic Affairs Report, Vol. V., No. 2, Nepal (May 1967).

^{2/} Source: NIDC.

^{3/} By Nepalese standards, all establishments with more than 100 employees are considered large.

in 1970, reaching a peak between 1967 and 1969. In 1967/1968 and 1968/69, the gross value of production of either one was higher than that of any other industrial commodity. The table also shows rapid growth in the production of some consumer goods (cigarettes, matches and shoes) thus demonstrating the existence of a small but growing market and the possibility of substituting some imports.

C. Financing of Industry

21. There are no total figures on industrial investment and figures on their sources are largely speculative. However, it is apparent that the main sources of financing industrial enterprises (Annex 2) are direct investment by the public sector (NR 168 million from 1965/66 to 1971/72), foreign aid (NR 146 million received from 1951 to 1971), NIDC loans and equity investments (NR 73 million loans outstanding as of January 1972), and direct investment by private investors (amount not identified).

III. SECTORAL PROBLEMS

A. Structural Factors

22. With a per capita annual income in the range of US\$70 to US\$80, purchasing power of the majority of the population for manufactured goods is very small. According to the 1961 census, only 3.7 percent of the population lived in urban areas (defined as towns having more than 5,000 inhabitants). (Although the results of the 1971 census are not fully known, it is estimated that at present only 16 towns have a population of 5,000 or more and that urban population is still less than 5 percent of the total.) The urban middle class layer, which in other developing countries has offered potential industrialists a concentrated market for consumer goods, is extremely thin in Nepal. About 85 percent of the population are tenant farmers living outside the monetary economy in generally inaccessible rural areas; they make most of the products they need domestically. A substantial proportion of the urban population lives in towns near the Indian border (Nepalgunj, Bhairawa, Birganj, Janakpur, Rajbiraj and Biratnagar). Beyond the border there is an extensive transportation network connecting several Indian producing centers among themselves and with Nepalese towns. Nepal, on the other hand, lacked any commercial roads until 1956 and even at present has less than 800 km of paved roads. Indian manufactured goods transported to the Nepalese urban centers along the border are often less costly than goods made in Nepal.

23. A statement such as "industrial development has been hampered by lack of entrepreneurship" can be misleading if all the elements in the existing complex situation are not taken into account. The feudal or quasi-feudal social system based on agriculture, which existed until a

few years ago, did not favor entrepreneurship or the development of managerial capacity, other than in small-scale trading (and this type of activity is still widespread). Knowledge of finance, of marketing (whether for the country-wide distribution of goods or for exports) and even of simple management procedures and accounting practices, is woefully inadequate. This is a serious handicap for industrial development. In the industrial sector, most entrepreneurs have been Indians or Marwaris ^{1/}. Though they can be criticized for having invested in some industries of doubtful economic value (such as in synthetic fabrics and stainless steel utensils) they also have invested in sounder enterprises such as rice, jute and sugar mills, a brewery and many transportation companies.

B. Institutional Factors

24. Nepal lacks a clear industrial policy. The instrument which should spell out the industrial policy - the 1961 Industrial Enterprise Act - is not clear either in its objectives nor in the means to achieve them. The Act, as amended, classifies industries in four categories. Category A comprises: industries substituting imports (but the Act does not set maximum content of imported materials, minimum value added, or other economic criteria); export-oriented industries based on domestic materials (again without defining minimum content); and basic industries assisting in the development of agriculture or other sectors of the economy (but the acceptable ways of assistance to development are not defined). Industries related to tourism and cottage industries are included in Category B. Category C is for industries processing indigenous raw materials, but it is not clear what the difference is between Category C and industries in Category A. Category D comprises export-oriented industries requiring imported raw materials; clear distinctions between Category D and other export-oriented industries already included in Category A are not made.

C. Incentives and Disincentives

Licensing

25. HMG has a monopoly on industries related to defense. All other industries are grouped according to size. A license is required for any industry involving a capital investment of more than NR 50,000 and applications are processed by the Department of Industry of the Ministry of Commerce and Industry. The Department of Industry approves licenses for any industry with capital investment of less than NR 50,000. However, for any industry with capital investment of NR 500,000 or more, the licensing authority rests with a Licensing Board which consists of eight members,

^{1/} Socio-ethnic group originating in India, active in trade and industry, who often have Nepalese citizenship.

all government officials. 1/ Any industry whose capital investment is below NR 5,000,000 can only be granted to Nepalese citizens or to firms established by Nepalese citizens. There is a great deal of dissatisfaction among private investors with the considerable delays under the present licensing system. These delays have entailed great losses in time and money for the entrepreneurs, and have undoubtedly slowed down the realization of industrial projects.

Tariff Protection, Tax Holidays and Other Incentives

26. The main incentives granted to industries by the 1961 Act are: tariff protection, total or partial tax holidays, duty exemptions on imported equipment and materials, availability of foreign exchange for imports, debt servicing, profit and depreciation remittances, and payment of foreign technicians or royalties. The extent of the incentives granted to specific entrepreneurs, however, is largely discretionary. Another incentive - the foreign currency entitlement scheme - is intended to promote exports in convertible currencies. The exporter receives a percentage of the value of his exports as a bonus 2/. Data on the utilization of this foreign exchange is not available, but is generally believed to have fostered imports of non-essential consumer goods many of which were later smuggled into India. It has not promoted the establishment of new industries nor fostered increased exports of manufactured goods.

27. The incentives described above have failed to mobilize resources in sufficient amounts in the desired direction. The main reasons for the lack of response to them apparently are: the discretionary character of the incentives, which leads to delays and corrupt practices, and the existence of other profitable fields for investment: real estate, trade, and the 8-1/2 percent p.a. tax-free "development" bonds. (By April 1972, out of NR 87.5 million worth of bonds outstanding, NR 18.7 million were held by individuals and NR 28.5 million were held by banks and other financial institutions.)

Industrial Planning

28. The greatest problem faced by Nepal when industrial planning was introduced in the fifties was the gigantic task of creating the required infrastructure. Although this problem is by no means solved - most villages in the Hills and in the Terai can be reached only after travelling on foot for several days - HMG is increasingly concerned with plans to industrialize

1/ Including the Minister, the State Minister, Assistant Minister and the Secretary of the Ministry of Commerce and Industry, the Chief Secretary, the Secretary of Finance, the Secretary of the Planning Commission and the Director of Industry.

2/ For example, in January 1973, the export entitlements were 20 percent for raw jute, 55 percent for hessian and 65 percent for sacking, coddies, jute thread waste and jute cuttings.

the country. However, lacking a broad strategy for industry, the several five-year Development Plans for Nepal have been largely ineffectual in achieving industrial targets. No attempt has been made to ensure consistency in the input and output of the proposed industries, inter-departmental coordination at Cabinet or high administrative levels has not been attained, and foreign aid negotiations have been allowed to proceed independently of the plans. Industrial plans have been little more than a list of industries to be established and the setting down of the aggregate investments required for them. Clear-cut industrial policies were not formulated and no attention was given to priorities or to the way enterprises were to be financed, especially if the private sector had no interest in the projects.

29. The Third Plan (1965-1970) included the following plants, among others, but none of them was finished and only one is under construction:

- (a) A new jute mill to double output from its present level of less than 15,000 MT;
- (b) A large cement factory;
- (c) A 15,000 MT/year paper mill in the Thapa district;
- (d) 3 plywood factories; and
- (e) 2 cotton textile factories with a capacity of 18 million meters.

30. Among the reasons for the underachievements of the first three plans, the most important ones are:

- (a) The planners did not take into account the country's limited financial resources and management skills;
- (b) the private sector went into more profitable, although short-term ventures; and
- (c) licenses were not granted in accordance with the plans (non-planned industries were awarded licenses).

31. The Fourth Plan (1970-1975) emphasizes the role of the private sector in industrial development and states that "only one or two industries would be set up in the public sector if found necessary". Like the previous plans, the Fourth Plan includes a long list of industries that ought to be established. If during the Third Plan, the private sector did not meet expectations, it is hard to understand why the Fourth Plan again expects the private sector to play a leading role, especially since no clear effort is being made to engage its participation in new industries.

32. In 1971, the Ministry of Industry and Commerce announced an "Industrial Development Program" for the first two years (1971/72 and 1972/73) of the Five-year Development Plan. This plan has not yet been implemented. Incentives are promised to industrial entrepreneurs in terms

of custom duties, income tax and foreign exchange allocations, which in most cases are a repetition of those contained in the Industrial Enterprise Act. Labor intensive industries based on local resources, and those whose investment is less than NR 100,000, no longer have to apply for a license but they must register. A long list of industries to be established in 1971/72 and 1972/73 is appended to the draft program. As of May 1972, out of 95 plants included in this list, only 6 were being undertaken.

Lack of Information for Industrial Development

33. No information is available at present in Nepal on most of the economic data needed to analyze the industrial sector and to take the most effective steps to promote industrialization. Physical output data for several industries and for several years is available as well as some data on sales and investment, but there is no information on inputs, imported materials, wages and salaries paid, value added or capital-output ratios. Data on industrial production is supplied by the Central Bureau of Statistics (CBS), the Department of Industries, NIDC and the Nepal Rastra Bank. The information, however, is incomplete and apparently each institution makes its own survey as the information is often conflicting. It is apparent that the CBS is mainly interested in demographic studies and is not equipped to supply up-to-date industrial statistics.

34. Information on the size of the markets for various industrial commodities is essential for planning purposes. However, no institution collects data on the volume and the value of the various imported commodities. A recently completed brewery was found to be unable to meet the market demand two months after production started due to defective market information received. The plant is now to be expanded, but at a higher capital cost. NIDC has an Investment Promotion Division whose objectives are to promote industry by inviting local and foreign investors to participate in ventures in Nepal; to help prospective private entrepreneurs in filing loan applications; to furnish them with technical data, and to disseminate information about investment opportunities. Unfortunately, the Division has not been yet effective in carrying out its objectives.

IV. INDUSTRIAL POTENTIAL

A. Natural and Human Resources

35. Because of its topography and varying altitudes, Nepal enjoys a great variety of climates and soils and the possibility of growing diversified crops in a relatively small area. The advantage of a varied climate must be weighed against the concomitant disadvantage of having to cope with great difficulties in transportation and communication. However, Nepal has a comparative advantage in growing temperate climate crops in areas which are nearer to some large Indian urban centers than the Indian mountain regions are. Most products based on these crops could be

exported duty-free to India according to the terms of the 1971 Trade and Transit Treaty.

36. The great orogenic processes that built the Nepalese mountain ranges could have been expected to generate important ore deposits. Mineral deposits - such as iron ore, magnesite, and complex copper-lead-zinc ores - have been found, and limestone deposits will be used to make cement. But modern prospecting has just begun in Nepal, and there is no evidence that large-scale, economically exploitable deposits have yet been found (Annex 5).

37. Terai forests have been extensively encroached upon and continue to be destroyed by shifting cultivation or irregular settlement as a result of the inability of the land in the Hills to provide the growing population in that area with means of livelihood. Concern about the misuse of these resources has been voiced since 1951. However, they are still potentially very important. Total volume of standing timber was estimated by FAO, in 1969, at 2,230 million cu. ft. or 63 million m³(r) 1/. A comparative advantage is that part of the resource is located nearer to Calcutta than comparable exploitable Indian forests. At present, plywood mills in Calcutta bring their log supplies from as far as the Andaman Islands.

38. Underemployment in the rural areas is widespread and is one of the reasons for the massive and growing migration to the Terai. Therefore there is an ample supply of unskilled labor. The same cannot be said of skilled labor. However, according to information received from the Swiss Association for Technical Assistance (SATA) and other international institutions, training of Nepalese labor in the mechanical skills presents no great difficulties. However, managerial capacity and industrial entrepreneurship are scarce, mainly because the country was until recently under a semi-feudal social system.

B. Potential and Instruments for Industrialization

Definition of the Potential

39. Considering the present level of development of Nepal, its resources, its infrastructure, potential markets, and the presence of Indian markets, the scope for industrialization is restricted. However, some degree of industrialization will take place, and there is potential for development in specific instances. Benefits in terms of employment, earnings or savings of convertible currency, and linkage effects are desirable, but given the limited resources and markets available they must be carefully selected on the basis of economic criteria. At this stage, it is

1/ Cubic meters round (three) volume.

necessary to identify the opportunities that best fit into the country's circumstances. The following groups should be examined separately and their promotion should be tailored to their needs.

- (a) Large-scale industries substituting imports namely from India;
- (b) small-scale industries;
- (c) export-oriented industries, directed to the Indian market;
- (d) export-oriented industries, directed to other markets, and based mainly on local raw materials; and
- (e) export-oriented industries, directed to other markets, and based mainly on imported raw materials and components.

40. Large-scale industries for the local market generally must be able to reach potential consumers throughout Nepal. Their markets should be large enough to obtain substantial economies of scale compared to cottage industries. At the same time, economies of scale for larger plants than those required by the Nepalese market need not be substantial in order to minimize the advantage held by competing foreign manufacturers. Thus it is doubtful, at one end of the scale, that factory-sized operations would be successful in making ghee and, at the other end, that synthetic fertilizers could be made economically at present. That there is room for some import substitution can be gleaned from broadly classified import statistics shown in Table 4. There are probably many products presently imported that could be manufactured locally with a reasonable profit. However, they need to be identified and to have technical assistance extended to local entrepreneurs. The basic import data needed undoubtedly exist, but a more detailed study of imports is needed, broken down to between 50 and 100 individual products. There are potentially important import substitution opportunities in cotton textiles, soft drinks, some food products, filter cigarettes, glass, plastic articles, furniture and steel structures.

41. Small-scale industries, on the other hand, may succeed in those cases where economies of scale become significant only at very large volumes or where they are practically non-existent. They have the economic advantage of being labor intensive, and the practical advantage of requiring less skills in management, less capital per unit of output, and lower input of advanced technologies.

42. In the case of potential exports to India, industrial products which incorporate 90 percent or more of Nepalese and Indian materials (para 10) should be first considered. These products are mainly milled rice, vegetable fats and oils, ghee, sawnwood, plywood and canned or preserved temperate fruits and vegetables. Tariff exemptions or reduction for products whose manufacture in Nepal looks promising, and which have a content of Nepalese materials and labor of not less than 50 percent, should be negotiated with India in accordance with the 1971 Treaty.

43. In the case of exports to other countries, the emphasis should be placed on manufactures based on raw materials for which Nepal has a comparative advantage (decorative plywood and veneer) or which are labor-intensive and whose products are highly priced per unit volume (carpets, electronics, jewelry). Assembly operations based on components which are normally shipped by air could help overcome the transportation handicap. The difficulty facing Nepal is that neighboring countries having low wage levels and a larger number of competent managerial, marketing and financial personnel available for executive positions in private enterprises (as well as in the public sector).

Formulating an Industrial Policy

44. Very clear decisions must be made on what the future shape and extent of industry must be. Furthermore, these decisions must be realistic and not simply based on a general idea that the "country must be industrialized". They should be based on an evaluation of the markets to be reached, the natural and human resources to be utilized, and the financial costs.

45. Any attempt to formulate an industrial policy must include as a major factor the treaty with India, which will regulate not only the direct trade with her but also, by means of the terms of transit through India, most of Nepal's trade to all other countries. Other possibilities to be considered are the emergence of Bangladesh, future access to the Tibetan market, and development of industries whose products can be exported by air. Nepalese policies must accept that, except for short periods of time, viable import-substitution projects cannot have products priced considerably above the prices for similar products in India. They must recognize that given the difficulties and high costs in transportation of Nepalese products, manufactured goods can be economically exported to third countries only if they have a high unit value or if they are based on resources in which Nepal has considerable comparative advantages. Special treatment may be required for jute, which is now the main export to third countries, and for decorative plywood and veneer, which may allow a more rational exploitation of Nepal's forest resources than at present.

Industrial Planning

46. A realistic industrial plan should be prepared based on the cold appraisal of the availability of financial and natural resources during the period covered by the plan, and of the entrepreneurship and managerial capacity that can be mobilized, in the public as well as in the private sectors, to implement it. Coordination between officials in charge of planning and execution of industrial policies and targets, and of both with the country's financial authorities should be ensured.

47. Unfortunately, data on industries and markets are, at present, inadequate and often contradictory. Information on industrial statistics, imports of manufactured products, availability of natural resources, power and other utilities, should be timely and easily available to prospective investors. The gathering of data may be carried out by various departments

but the responsibility for assembling and presenting them should be given to a single agency. However, since industrial development cannot be stopped until this is accomplished, an industrial plan must be prepared based on data available. Whenever possible, these data should be critically appraised or complemented by consulting persons who are well acquainted with specific markets, although they may lack statistical data.

Industrial Promotion

48. Industries should be classified in groups according to their priorities and their particular problems. Then, incentives could be tailored to suit each group. Special incentives should be devised to promote labor-intensive direction of industrial development, and to avoid opportunities for corruption incentives should be clearly defined, classification of industries well delimited, and the conditions required to obtain the incentives unequivocally spelled out.

49. The foreign exchange entitlement scheme has not been an effective tool for industrial promotion (para 26). It should be replaced by a new system providing incentives for new exports or for the expansion of traditional exports. The proceeds from such a system should be mainly used to increase or maintain productive capacity. The jute industry possibly may require special treatment because of its importance in creating employment but the economic and financial cost of supporting it should be known.

50. Licensing and registering procedures should be streamlined. An "auditing" procedure could be instituted to watch the over-all performance of the licensing system and the granting of incentives.

51. Licensing should be required only for large investments whose volume may have a wide influence in the country's economy, for industries requiring an important (but stated) amount of convertible foreign exchange (for equipment, imported materials and parts, capital repatriation or debt servicing) or for those requiring significant amounts of foreign exchange to pay royalties, foreign personnel or other forms of technical assistance. Whatever the chosen organizational arrangement, ideological differences between government departments on industrial policy (for instance on public sector vs private sector ownership of industries) must be resolved at the highest level. Otherwise, all industrial development efforts run the risk of being sterilized.

Definition of the Role of the Private Sector

52. The Third and Fourth Plans stated that most of the industries listed in them would be installed by the private sector. As shown by results, this proposition was apparently not backed by prior preparatory work with possible investors. The limited availability of entrepreneurship and managerial capacity makes it imperative that they be sufficiently utilized. Under a market-based economic system, the role of the private sector in industrial development must be reinforced. Investment by foreign

capital and by local minorities, who at present seem to have a large share of the available entrepreneurship and liquid capital, should be encouraged under clearly defined conditions or limitations. Considering the limitations of the government in terms of managerial skills and capital, it should only undertake projects which although essential and economically justifiable, have nevertheless failed to attract private entrepreneurs within stated periods of time.

53. The participation, although in a minority position, of the private sector in planning, supervision of licensing, registration, and concession of incentives, and in arbitration of disputes should be secured through a high-level commission in which representatives of the Federation of Chambers of Commerce and Industry (and/or other industrial trade associations) would sit together with representatives of the Secretaries of Industry, Trade and Finance, NIDC, the Planning Commission, and Rastra Bank. Other arrangements are possible. The effective coordination between the public and the private sectors, as well as the preparation of statistical and market information, depends more on the strength and dynamism of the persons entrusted with the task than on the purely static organizational set-up. A strong desire for close cooperation between the public and the private sectors must be there before the successful implementation of an industrial plan can be achieved.

54. Lack of an entrepreneurial and managerial group has been a factor in the failure to attain a higher rate of economic growth. Both public and private sector managers need to be exposed. Training should be undertaken on a broad front. Some personnel should be trained abroad and foreign assistance for training in Nepal should also be sought. This effort also needs to be extended to intermediate level technical and administrative personnel. Simple accounting, marketing and unsophisticated management procedures should be disseminated among small businessmen, medium level public officials and potential new industrialists. In Nepal, Nepalese and Indian currencies are fully convertible and "Nepal can use the entrepreneurship and the managerial and marketing know-how available in India". ^{1/} Excessive control of the Nepalese economy by Indian nationals can be avoided through substantial Nepalese participation in joint ventures and arrangements for the eventual transfer of control to Nepalese nationals.

C. Industrial Opportunities

The 2-Year Industrial Program

55. The two-year tentative industrial program for 1971/72 and 1972/73 listed 95 industrial projects requiring a total investment of US\$48 million and giving employment to about 9,200 people (not counting about 5,700 employed by the jute and rice mills to be modernized). Comments on the proposed

^{1/} Unpublished report of the Centre for Economic Development Administration (CEDA), Nepal.

industries follow. Many projects have a small probability of being installed because of uncertainty about the market for their products, doubtful feasibility or lack of sponsors. However, promising opportunities are found in food processing, cotton textiles, carpets, soft drinks, filter cigarettes, plastic articles, furniture and steel structures. Prospects for the mining sector are shown in Annex 5.

Rice and Wheat Milling

56. A very substantial increase in the value added by industry can be obtained by the modernization of rice mills. Huller mills of the type now in use do not allow separation of bran and have a yield of no more than 61 percent of polished rice and somewhat higher in parboiled rice. Modern mills have a yield of about 68 percent and allow separation of bran. With a total paddy output of about 2.4 million MT annually, the additional recovery of 168,000 MT of rice and 120,000 MT of bran, could result in an increase in value added of nearly NR 300 million. One proposal includes the creation of a Rice Industry Development Board and a demonstration program involving the installation of new mills and the rehabilitation of existing mills (total capacity: 39 MT/hr.). The paddy buying system (now largely in the hands of Indian importers) and the rice distribution network would also be improved. The Two-Year 1971-73 industrial plan considers the installation of 13 mills with a total annual capacity of more than 45,000 MT of rice and 5,000 MT of bran. Total investment required is estimated at NR 26.4 million. These mills would be able to process only about 3 percent of the total paddy crop, but the main advantage expected is that other rice millers would be induced to improve their facilities and processes.

57. Production of wheat has fluctuated between 190,000 and 250,000 MT/yr. in the last 5 years. Most of it is consumed without milling, but about 2,000 MT of wheat flour and NR 3.4 million of biscuits are being imported from India. UNIDO has proposed the installation of a 3,000 MT/yr. (single unit) flour mill and two half-a-ton-a-day biscuit plants in the Terai. The tentative two-year plan includes two flour mills with an annual capacity of 24,000 MT, four bakeries and one biscuit factory with an investment of NR 17.4 million. It is possible that increased production of bakery products may increase demand at a fast rate in the next few years, but a thorough market study is needed before this trend can be confirmed.

Meat and Animal By-Products

58. The 1970-71 UNIDO Mission proposed the installation of a slaughter house and meat processing plant together with a tannery at Hetaura, with an estimated investment of NR 8 million. The tentative two-year plan calls for an investment of NR 13 million. Small bone crushing installations have also been proposed, on the basis of exporting bone-meal, preparing cattle and poultry feeds, or using the bones for glue. None of these projects include market studies. But apparently the slaughter-house and meat processing plant have the backing of private investors as well as of the Government of Denmark which has offered to make a US\$3 million loan for that purpose.

Vegetable Oils and Fats

59. At least 4,000 MT of rapeseed ("mustard" seeds) and a growing volume of other oil-bearing seeds (estimated at more than 1,000 MT in 1966/67) are exported annually to India. Since annual per-capita consumption of edible fats and oils in Nepal (1.5 Kg) is much lower than that in India (4 Kg) and other developing countries, and oil is being imported into Nepal, an effort should undoubtedly be made to process local raw materials. The 1970/71 UNIDO Industrial Advisory Mission suggested the installation of two mills with a total capacity of 2,400 MT of oil annually. It is also recommended that production of other oil-bearing crops be increased. Other experts, however, have come up with different proposals. One would favor the installation of one single 60 MT/24-hr. day oil extraction and refining plant integrated with a 25 MT/24-hr. day oil extraction and refining plant integrated with a 25 MT/24-hr. day vegetable ghee (shortening) plant, requiring a total investment estimated at US\$12.5 million. The tentative two-year plan includes six oil plants with a total annual capacity of 3,600 MT of oil and 700 MT of cake, and one 6,000 MT/yr. vegetable shortening plant, requiring a total investment of about NR 19 million. This figure seems to be considerably underestimated. Additionally there are two 430 MT/yr. oil solvent extraction plants in which private investors are interested. No decisions have yet been taken on these various possibilities. It is clear that an effort should be made to establish an optimal solution and realize the opportunity for industrialization in this sub-sector.

Other Food Products and Beverages

60. Other proposed projects include cold storage for potatoes and oranges, fruit preservation in syrup, jams, milk pasteurizing, ^{1/} tea processing, ghee refining, ginger processing, and manufacture of animal feed. There is not enough information on the prospects for these industries. The two-year plan also includes the expansion of the Biratnagar and Birganj sugar mills, but at present they are operating under capacity. The installation of a soft drink bottling plant with capacity for 2.5 million bottles annually, probably at Kathmandu, and expansion of the recently completed brewery at Hetaura have a good chance of being carried out.

Textiles

61. Installation of two 200-loom cotton textile mills with a total capacity of about 19 million yards has been recommended. The two-year program considers one textile mill with capacity for 13 million meters, requiring an investment of NR 61.2 million, and giving employment to 1,200. The mill would utilize imported yarn. Several possibilities of manufacturing yarn have been mentioned; by rebuilding the Golchha Woolen mills to spin cotton; by installing a 12,000-spindle spinning mill; or, as recommended

1/ The expansion of an existing pasteurizing plant in Kathmandu is already being carried out by a private firm.

by the UNIDO mission, by totally replacing the spinning equipment at Golchha plant by 67,000 new spindles, at a cost of NR 12.7 million. Cotton is not commercially grown in Nepal, so that the projects consider using ginned cotton imported from India. Experimental crops have been tried in the Western Terai with the help of Israeli technical assistance. The prospects for cotton textiles are being further studied by a UNIDO expert. It is now clear that the proposed cotton textile mill will be built by HMG with foreign assistance.

62. The two-year plan, as well as UNIDO proposals, included the rehabilitation and modernization of the jute mills and of jute production generally. The estimated investment is NR 59.3 million. The Asian Development Bank has extended a US\$4 million loan for a total investment estimated at US\$5.1 million. The project includes production of improved seeds, demonstration farms, and other related services (Annex 1, para 10). However, the project has already been delayed by at least two years.

Leather and Shoe Industries

63. UNIDO has also proposed the installation of a shoe factory to make 40,000/50,000 pairs of leather footwear and another plant with capacity to make 60,000 pairs of rubber-soled sandals and shoes (with canvass uppers). The tentative two-year plan calls for one new plant in the Terai and the expansion of the existing Bansabari plant. The prospects of developing leather and shoe industries are reasonably good. The existing shoe manufacturers hardly meet 50% of the national demand, the remaining 50% is met with imports from India. UNIDO estimates that Nepal imports 360,000 pairs of footwear annually, whereas rawhides are being smuggled to India and a substantial quantity of tanned leather is exported both to India and China annually.

Wood Products

64. Some forest resources studied by FAO/IBRD Cooperative Program and Bank missions have been shown to have comparative advantages over those in neighboring countries, some stands being located near recently built roads with little underbrush and trees being generally free of defects. Recent difficulties between would-be settlers and authorities emphasize the need to control resettlement from the Hills to the Terai and make use of the resources removed in the course of resettlement. HMG has proposed to set-up three roving teams equipped with movable sawmills to clear land. Another scheme - the settlement project at Bardia - the future of which is uncertain - included 20 portable sawmills manufactured in India, to utilize the trees removed. The tentative two-year industrial plan considers two forestry industrial projects. One is a settlement project, including five sawmills. The other is a plywood plant, with an estimated investment of NR 36 million to make 30 million sq feet of plywood annually. This project, coupled with improvements in logging equipment and in the present TCN sawmill, was estimated to cost NR 40 million. Asna, the main wood species in the forests in Nepal, has been tested in West Germany and found suitable for manufacture of commercial plywood. Marketing arrangements

in India would be needed, since the volume of production would exceed Nepal's consumption. The possibility of manufacturing decorative veneer and plywood for export to Europe has also been suggested, but marketing studies would have to be undertaken first.

Pulp and Paper

65. UNIDO's Industrial Advisory Mission recommended the installation of a 50 ton-per-day plant to pulp straw and bamboo, and a paper machine of equivalent capacity. Investment required for this project is estimated at NR 111 million. UNIDO estimates that present local demand for the output of this plant would be only 2,500 MT annually but believes that demand may increase faster than in recent years and that border trade in paper would develop. The feasibility of this project, however, is not clear.

66. NIDC officials have also mentioned the possibility of exploiting pine stands in the Western Terai, where they believe that almost 400,000 m³ (r) annually could be cut for a 60 ton-per-day plant. On the other hand, a study carried out by a consultant in 1964 dismisses the possible use of pine and would have a 50 ton-per-day plant installed at Jhapa on the basis of rice and wheat straw, and bamboo, at a capital cost of NR 95 million (based on prices at the time the study was made). Another project developed with the help of SATA is part of the Jiri multi-purpose project to develop a hill area located about 100 km from Kathmandu. All of the proposed plants are smaller than what is now considered to be minimum economic size. Demand for their output is not proven. Therefore, as in the case of the plant described in the previous paragraph, their feasibility is doubtful.

67. The possibility of improving the quality of hand-made paper for exports to countries other than India has also been indicated. The volume and value of these exports cannot be very high, but it could increase the income of some small villages in the hilly areas.

Chemical Industries

68. The tentative two-year plan considers only investments in two paint plants (NR 0.4 million), three soap factories (NR 18 million), a distillery for industrial alcohol (NR 16 million), a plant for pine resin and turpentine (NR 4.8 million), and the Royal Botanical Research Laboratory for medical extracts (NR 12 million). The markets for the proposed distillery and the soap plants have not yet been demonstrated.

Non-Metallic Mineral Products

69. The most advanced project in this group is a glass plant with an annual capacity of 3.4 million bottles, to be installed at Hetaura by private entrepreneurs with the help of Indian consultants. Investment is estimated in the two-year plan at NR 2.5 million. Some very small plants for stone blocks and chips and agricultural lime are also included in the plan, as well as six brick-and-tile kilns with capacity to make 22 million pieces annually and the expansion of the existing plant near Kathmandu (total investment, NR 17 million).

Metals

70. The establishment of an iron-reducing electric furnace has been proposed (Annex 5). Smaller and more imminent projects include a steel electric furnace in Birganj to make 15,000 MT of construction bars, a cast iron pipe factory and a can making plant (not included in the tentative two-year plan). Although private investors are apparently interested in these plants, it would be well to restudy the economic cost that these plants may have for the country as a whole. Unfortunately, the experience in other countries in small-scale steel mills, or in the manufacture of structural shapes and plates, is not very encouraging.

Small-Scale Industries

71. Small-scale industries have so far been reasonably successful and it seems that there is some room for improving the present industries as well as creating new ones. In order to foster small-scale industries, it is necessary to provide industrial training as few Nepalese have had experience in industry. NIDC will have to expand its operations beyond Kathmandu Valley. At present, NIDC has only one very small field office, in Biratnagar, whose functions are mainly to receive loan applications and to follow up NIDC loans in the area. Small industries should be located near urban centers which have a reasonably good transportation infrastructure, for instance along the following roads: Bhairawa-Pokhara, Pokhara-Kathmandu, Kodari-Kathmandu, Kathmandu-Birganj and Biratnagar-Hetaura. Industrial estates can be a tool to encourage the establishment of small-scale industries. By bringing many establishments to one location, it is possible to install common facilities and thus achieve some economies of scale. The promotion of small-scale industries is probably at this stage one of the best avenues to proceed efficiently with the industrial development of Nepal.

V. CONCLUSIONS

72. Industry in Nepal is still at an incipient stage. Ambitious plans for industrial development have been drawn but not fulfilled and, in fact, have remained largely unimplemented. However, actual achievements taking into account the difficulties encountered are encouraging, having given to the sector a higher growth rate than for the economy as a whole.

73. Present plans apparently assign the same importance to many proposed industries. Priorities should be assigned to different industries on the basis of expected economic returns, imported inputs, foreign exchange earnings, employment opportunities and other social benefits. The stage of development of the corresponding projects evidently should also be taken into account. Once the priorities are established, a clear position should be announced on which industries are reserved for the public sector and which ones for the private sector. Some of the latter could be undertaken by the government, if private investors show no interest in them. In some

cases, the possibility of joint ventures should be considered. The government's position on the acceptance of private investments by Nepalese minorities, as well as by Indian or other foreign investors, should be clearly stated for all types of industry.

74. Present licensing procedures are cumbersome and time-consuming, incentives for investment in industry have not been effective, and coordination between the private and the public sectors has been inadequate. For the effective realization of an industrial plan licensing procedures should be considerably streamlined, incentives modified and made more automatic, the foreign currency entitlement system dismantled and other export incentives substituted for it; participation of the private sector at all stages of planning, promoting and installation of industries should be secured.

75. Since Nepal has few comparative natural advantages and limited managerial and entrepreneurial capacity, dispersion and misuse of resources should be avoided and economic and social benefits from industrial projects maximized. To accomplish this objective, HMG should concentrate its promotion efforts on a few sound industrial projects. A new entity or a reorganized unit within the existing public administration structure should be responsible for the market and feasibility studies needed to identify sound industrial opportunities. In the light of the findings of the mission, especially in the agricultural sector, establishment seems promising of modern rice mills, wood-based industries, vegetable oil extraction and processing facilities, cotton mills and glass manufacture.

THE MAIN INDUSTRIES

Food Industries, Beverages and Tobacco Products

1. Food processing, including rice milling, is the most important of the industrial sub-sectors in Nepal. Other established industries in this sub-sector are ghee making, vegetable oil extraction, sugar mills, tea processing bakeries, rum distilling, and a brewery.
2. Rice Milling. Paddy crops average 3.4 million MT annually and most of the crop is milled in nearly 1,000 huller-type mills, the great majority of which have a capacity of less than 1/2 ton per hour. Rice yields average 60 percent in the standard rice mills and 64 percent in mills making par-boiled rice. Three quarters of the mills are located in the Terai and generally between 5 percent and 10 percent of the production, mainly parboiled rice, is exported to India. Gross value of production has been estimated at NR 2,100 million, but value added in milling is less than 10 percent of the gross value of production.
3. Ghee (Milk Fat). It is generally prepared by first souring the milk, then churning, separating the fat, and heating over an open fire. The top layer of the settled mix is then removed. It is a family or cottage-type activity. The main ghee collecting centers are in the Terai (Butwal, Bhirawa, Nepalgunj and Rajapur). Of the total annual production, estimated at 7,200 MT, about one half is exported to India. Value of exports is estimated at NR 50 million.
4. Vegetable Oils. Most of the vegetable oil extraction facilities are small presses operating in combination with rice mills. Many are manually operated; others are steam driven. One modern plant in Hetaura has 5 expellers and 2 filter presses, and its capacity is about 8 tons per 10-hour shift. There are also two other small expeller installations with Chinese equipment. Most of the vegetable oil production is crude rice and rapeseed ("mustard") oil. The most important rapeseed producing areas are the provinces of Naranyari, Bhari, Rapti, Janakpur and Seti. Rapeseed oil output has increased rapidly in the last three years reaching at present a volume of more than 5,000 m³ per year.
5. Sugar. The first sugar mill was established in 1947, and now there are three mills with a total capacity to crush 240,000 MT of sugar cane per season. The largest one, in Birganj, accounts for one half of this capacity. Sugar content of Nepalese sugar cane is less than 10%. The mills operated at better than 75% capacity (16,240 MT) in 1969/70, but their output dropped by 20% in the next year, and more abruptly to about one third capacity (7,500 MT) in 1971/72. Several explanations were given by Nepalese officials for this drop. The most likely one is that some of the shortfall was due to crop failures and some to mismanagement of the Birganj mill.

6. Other Food Industries. Baking, in general, is a domestic-type industry, but 21 enterprises have investments averaging over Rs one million each. The largest one, the Nepal Biscuit and Confectionary Company, employs 132 people and its production was more than 1,000 MT in 1970/71. The five tea processing plants in Nepal have an annual output of 26,000 MT. The main producer is the Nepal Tea Corp., controlled by HMG. There are six fruit and vegetable processing plants, the largest of which is the Rijal Canning Co. Pvt. Ltd., with an authorized capital of NR 500,000. The company processes pineapples, oranges, lemons and guavas and produces canned fruits, juices, jams and jellies. Annual output is 20-25,000 cans and 20-25,000 bottles of squash. Most of the output goes to the domestic market. The company has to import cans and bottles from India, but it seems that it has been successful so far. The main constraint has been the availability of fruit.

7. Beverages. Although no figures were available, soft drinks consumed in Kathmandu are for the most part, still imported. No important bottling plant exists in Nepal. There are 3 distilleries attached to sugar mills, the largest with a capacity of 1.8 million liters of rum annually, belonging to the Mahendra Sugar and General Industries. A 600,000 liter brewery began operation last year in Hetaura.

8. Tobacco. There are three cigarette factories one of which accounts for 90 percent of total capacity. The Janakpur Cigarette Factory Pvt. Ltd., built with Russian assistance, was commissioned in 1965 and is one of the most successful industrial concerns in Nepal. The capacity is 2 billion cigarettes a year and the plant gives employment to nearly 600 workers. In 1970/71, it produced about 1.8 billion cigarettes. The company is located in Janakpur, halfway between Biratnagar and Birganj, in the Terai region where tobacco is grown. Practically all its production goes to the domestic market. Very profitable in the past, the Company is presently self-financing its expansion to manufacture filter cigarettes.

Textile Industries

9. Importance of Jute in Nepal. Though Nepal is a comparatively small jute producer (less than 1.3 percent of world production), jute accounts for more than 70 percent of the convertible currency exports. About 30 percent of the production is transformed into jute goods (hessian and sacking), and the rest is exported as raw jute. Data on jute production are often conflicting, as several institutions (Nepal Jute Board, Ministry of Finance, Department of Industries) apparently carry out their surveys independently. Jute is cultivated in the Eastern Terai. The total area under jute is estimated to be between 35,000 and 45,000 ha. Production of jute has grown from 39,000 MT in 1964/65 to 51,000 MT in 1970/71. However, growth has been regular as it is subject to the influence of climatic conditions and to the prices obtained in the previous season. Most of the jute is sold by growers in the villages and, before it reaches the exporter or the mill, it passes through a chain of intermediaries. This accounts for the wide

margin between the price received by the grower and those paid by the mills and the exporters. The quality of the fiber is unreliable as there are no fixed standards. Usually the lower quality fiber is sold to the mills.

10. Jute Manufactured Goods. There are two mills located in Biratnagar, near the border with India. Most of the machinery in both mills is obsolete. Safety standards are poor. Spare parts are imported from India and there are difficulties and delays in obtaining them. Down time periods are frequent and repairs are also hampered by a critical shortage of competent maintenance personnel. With a total output of 13,284 MT in 1970/71, jute-based manufacturing is practically stagnant. Forty percent of the output is hessian and the balance is sacking. At the request of HMG, ADB has granted a US\$4 million loan for an integrated program of reorganization of the jute industry. The total cost of the program is estimated at US\$5.1 million. The program has not yet begun in June 1972. The most important aspects of the project are:

- (a) Improvement of raw jute production (introduction of better seeds and establishment of an experimental station);
- (b) Improvement of quality control in the mills and of marketing to obtain higher prices;
- (c) Modernization of the two existing jute mills; and
- (d) Provision of three exports (in jute agronomy, jute marketing, and jute mill engineering and management).

11. The Future of Jute. Most experts from FAO as well as from IBRD agree, however, that the future of jute is at least uncertain. Synthetic substitutes are getting a bigger share of the market for carpet backing as well as sacking. In the U.S., jute is retaining some market because polypropylene capacity is unable to satisfy demand. The same phenomenon is present in Europe, where Japanese polypropylene goods are being imported.

12. The Jute Mills. The Biratnagar Jute Mill Ltd. was established in 1936 and it has at present 358 installed looms, 139 of which are for hessian production, the rest for sacking. The number of workers is close to 2,800. The performance of this privately-owned mill has been fairly satisfactory although it had losses in 1965/66 and 1966/67, and its reported average profit between 1964/65 and 1970/71 was 3 percent of sales. The Raghupati Jute Mill Ltd., established in 1946, has 294 looms, of which 24 are for hessian, and employs 1,600 workers. Restructuring of its debt to NIDC is needed, since it has incurred losses every year between 1964/65 and 1968/69. The situation has improved since then, with the appointment of a new manager.

13. Marketing Jute. There are several hundred exporters of jute most of them with limited international connections. The number of exporters has been growing substantially as the export entitlement schemes gave them a

relatively free use of 20 percent of the foreign exchange earned for raw jute, 50 percent for hessian and 60 percent for sacking. These earnings are largely used to import consumer goods, many of which are later smuggled to India. In 1969/70, total jute exports amounted to US\$8.1 million, of which one half were manufactured goods. In 1970/71 approximately 50 percent of all jute exports (mainly as raw jute) went to Europe, 47 percent to India (mostly as sacks), and 3 percent to the U.S. (mostly as hessian).

14. Other Textiles. One 62-loom cotton mill, in Balaju, works with cotton yarn imported from India, but has operated at a fraction of capacity. Its 1969/70 production was only about 600,000 m and its sales NR 3.8 million. Another mill in Biratnagar has not worked for several years. There are also 11 synthetic textile mills with a total investment of NR 33 million, and the largest one, Ashok Textile Company, employed about 200 people in 1969, but it operates only sporadically now. Most of the output was exported to India. The Indian market is now inaccessible because of regulations in the new 1971 Indo-Nepal Treaty of Trade and Transit. As a consequence, total production of synthetic fabrics dropped from 3.5 million m in 1965/69 to less than 0.5 million m in 1971/72. Carpet weaving is carried out by about 2,400 Tibetan refugees, in cooperatives which SATA has helped to organize. Approximately 6,000 m² of carpets were exported last year to Europe. A small hosiery operates in the Patan small industry estate. The Golcha Woollen Textile Company mill, with an investment of NR 10 million produced up to 16,000 kg of woollens in 1964/65, but was closed down in 1969/71, mainly because of inadequacy of supply and marketing problems.

15. Leather and Leather Goods. Leather production on the other hand, has been increasing steadily in the last seven years in spite of difficulties in obtaining good cattle hides due to religious customs. There are four shoe factories. The Bansbari Leather and Shoe Factory, the largest of these with an investment of Rs 10 million and employing 300 people - was built with aid from the People's Republic of China and is owned and operated by EMC. Output was 150 MT of sole and 56,000 pairs of shoes in 1971/72, but sales are lower. An inventory of about 30,000 pairs has accumulated over several years. Disposal of this stock, even at a loss, is very difficult because of styling and deterioration. The General Manager feels that he has no authority to sell the plant's property at a loss and the possibility of obtaining even a small value of this inventory is dwindling. Competition from the India Bata shoe factories is intense. Indian shoes can often reach consumers outside Kathmandu faster than the locally made shoes and at competitive prices. The second shoe factory in Nepal is much smaller, but apparently more effective, selling about 15,000 pairs annually and giving more attention to styling, distribution and sales.

Forest-Based Industries

16. Sawmilling. The most important sawmill in Nepal is owned and operated by the Timber Corporation of Nepal (TCN). It has a capacity of 20,000 m³ (s)/annually and employs 450 people in one-shift operation.

1/ Cubic meters of output (sawwood).

There are some other sawmills, but they all are small, portable ones. Total sawnwood production is 28,000 m³ (s). An undefined amount of sawnwood crosses the border of India in both directions, sawnwood production in Nepal (about 3 m³ per thousand inhabitants) is considerably smaller than in other developing countries (for instance, Latin American countries average 55 m³ per thousand inhabitants).

17. Wood Products. There are several furniture shops, only one of which, in Balaju, employs more than 100 people and has sales over NR one million. Five match manufacturing plants, working at about 60 percent of capacity, produce more than half a million gross. Nearly 40 percent of the total production originates in one NR 2.4 million plant located in Biratnagar. One parquet plant installed in the Hetaura Industrial District has a capacity of 1 million sq. ft. of 8 mm parquet boards. Some are exported to India.

18. Other Forest-based products. Although not related to the wood products industry, but based on forest resources, there are also 2 tanning extract plants, the biggest of which has a capacity of 220 MT/yr and an investment of NR 2 million. Production fluctuates widely. About 90,000 liters of turpentine are also obtained annually from pine stands.

19. Metal Manufactures. There are three shops making steel structures and metal furniture, three making wire and nails, and one small (NR 1 million investment) metal container plant. The largest and best prepared technically is the Balaju shop, set up with the help of SATA. Sales of this shops are NR 3 million annually and the main constraint is lack of working capital. Executives of this plant also feel that they could increase sales considerably by building bridges provided that hot-dipped galvanizing was not required in bridge specifications. The same shop makes some small grain milling equipment, fans and water meters, filing cabinets and metal furniture, and an affiliated enterprise makes simple electric equipment such as distribution panels and switches.

20. The Agricultural Tools and Implements Factory, in Birganj, has a paid-in capital of NR 16 million, and 165 employees, but in three years of operation has not sold more than NR 0.8 million annually. It was designed for unrealistic capacity and has had management problems.

21. The fate of the plants established near the Indian border to make stainless steel utensils has been discussed elsewhere. Although the value added by this industry is less than 15 percent, the gross value of production at one time was larger than that of other subsectors (NR 80 million in 1968/69 against NR 52 million for the jute industries, NR 50 million in 1968/69 against NR 52 million for the jute industries, NR 50 million for cigarettes, NR 62 million for synthetic fabrics, and NR 34 million for sugar). The production of the 7 plants that were licensed, however, dropped to practically nothing in one year.

22. Other Industries. The chemical industry in Nepal consists of nine soap factories (with over 7 MT/day capacity) and 3 alcohol distilleries.

There are two small plants making plastic buttons and one other has been installed to mold household articles, such as cups and saucers. At present other than lumber and small quantities of marble, only one enterprise makes products for the construction industry: the Nepal Brick and Tile Company, near Kathmandu, which produced about 25 million units in 1970/71. This enterprise, however, defaulted this year on a loan received from NIDC. The problem was the distribution system, but apparently there is demand for construction materials and the plant will continue operating.

23. Industries Estates. The Patan and Balaju industrial estates have been highly successful in promoting small industries, which have been able to compete with Indian manufacturers in many products. These small industries (some of which could better be defined as medium-sized in Nepal) cover a wide range of products: textiles (wool, cotton, and silk), furniture, footwear, carpets, blankets, animal feed, biscuit and confectionery, razor blades, curios, etc. Two new estates will be established in Dharan and Nepalgunj) in the next 18 months with Indian assistance (as was the Patan Industrial estate). NIDC has created two industrial "districts" at Hetaura and Balaju. The Hetaura Industrial district is very well located on the road between Kathmandu and the Indian border and some industries, large by Nepalese standards, (oil extraction and parquetry plants), have already been established there.

FINANCING OF THE INDUSTRIAL SECTOR

Foreign Official Aid

1. Foreign aid in official loans and grants has been directed mainly to build up infrastructure. However, several important industrial undertakings have been assisted through bilateral grants and loans of about US\$36 million or 13 percent of the total foreign aid. India has shown interest in the development of industrial estates providing facilities and technical assistance to the Patan industrial estate and has offered to finance two new estates located near the Indian border (Dharan and Nepalgunj). USAID helped to build a modern saw mill (1960) and a dairy was created in 1959 with Swiss aid. The USSR has supplied technical assistance and equipment to the Janakpur Cigarette Factory (1964) and to an Agricultural Tools Factory (1953). The People's Republic of China financed a brick and tile factory (1963) and a tannery and shoe manufacturing plant (1965).
2. International institutions are just starting to show some interest in industry. ADB has granted a loan of US\$4 million for the renovation of the jute industry and a five-man UNDP/UNIDO/ILO mission spent one year in Nepal from July 1970 to July 1971, to advise on improvement of the operation and performance of existing industrial enterprises. The mission also assisted the government in formulating the five year industrial development program and proposed the creation of an Industrial Service Center to undertake feasibility studies, provide consulting services, training and industrial research facilities. This seems to be an ambitious program both from the financial and the managerial standpoints, in spite of the proposed contribution by UNDP of US\$900,000.

NIDC

3. The Industrial Development Center created in 1957 was converted in 1959 into the Nepal Industrial Development Corporation (NIDC). The main purpose of NIDC is to extend loans against adequate security to new and established industrial enterprises. NIDC is also allowed to take equity participations. The lending rate of NIDC is at present 7-1/2 percent which is substantially less than the lending rates of commercial banks for industrial ventures. The authorized share of NIDC financing has been recently lifted from 65 percent of fixed assets to 75 percent. In the case of industries located at the two industrial estates established by NIDC, the authorized participation is higher (85 percent at Hetaura and 80 percent at Belaju). In 1971, the Small Industries Development Corporation was established and a year later it was merged with NIDC. As a consequence, NIDC lends to a wide variety of industries.
4. NIDC has played a lending role in the industrialization of Nepal and there are very few enterprises which have not benefited from NIDC's

assistance in one way or another. NIDC has been very active in transportation (buses and trucks); tourism (hotels and travel agencies) and manufacturing. The latter has received 44 percent of the total outstanding NIDC loans and investments, including those in industrial estates. Among manufacturing activities, the most important recipients of assistance from NIDC (other than the industrial estates) are the first cement plant being built in Nepal, various food processing plants, including sugar and rice mills, textile mills, and wood working mills.

5. Since its creation, up to January 15, 1971, NIDC approved loans amounting to NRs. 218 million, but had disbursed only NRs 68 million. The present staff cannot adequately handle the applications received (the number of which increased from 71 in 1968/69 to 168 in 1970/71, and dropped to 61 for the first nine months of FY 1971/72). NIDC staff often must deal with poorly prepared applications. But loan processing is also slow because each application, even for small loans, has to be reviewed by the Board which meets only once a month. The long time often required between the application for a loan and the decision of the Board may cause the applicant to lose interest in his project. This is one of the reasons for the high cancellation rate and the big gap between the total amount of loans approved and disbursed.

6. As of January 1972, NIDC had resources totalling NRs 42 million in equity and over US\$10 million in loans:

<u>Equity</u>		<u>US\$000</u> <u>Equivalent</u>
<u>Fully paid share capital</u>	NRs. 42,429,000	4,201
<u>Loans, in local currency</u>		
Nepal Rastra Bank	NRs. 10,000,000	991
<u>Loans, in foreign currency</u>		
US Aid	US\$ 1,400,000	1,400
US Aid (Indian Currency)	US\$ 4,000,000	4,000
Kreditanstalt fur Wiederaufbau	DM 4,000,000	1,240
HMG (British Loan)	£ 150,000	391
Government of India	IRs. 7,000,000	962
Ex-Im Bank, Japan	¥ 360,000,000	1,150
<u>Total Resources</u>		<u>14,354</u>

7. Although NIDC had difficulties in the past in collecting loans in arrears it seems that, with a new management, the situation has improved. That was the case of the Soaltee Hotel which had paid only NRs. 78,000 out of NRs. 9,135,000 loan received in March 1963. Its debt has been rescheduled and all interest accrued has been paid. NIDC is not permitted to charge higher interest charges for loans in arrears.

Domestic Investment

8. Traditionally personal savings have been invested in land, real estate, trade and more recently, in banking institutions. Marwaris are particularly active in the manufacture and trade of jute and rice milling and were also involved in synthetic textiles and stainless steel industries. The ability of Marwaris to raise funds and successfully manage industrial concerns is generally recognized, but there appears to be some opposition from some public officials and private industrialists to let the Marwaris dominate the industrial sector and some of them claim to have had difficulties in obtaining licenses. The Tibetans are another minority group who have also been able to establish enterprises with their own funds.

Foreign Investment

9. Private investment by firms established in countries other than India is very small. Investment by Indian firms and individuals is assumed to be substantial, mainly in establishments located in the Terai, but there is no information on their amounts.

Direct Investment by the Public Sector

10. H.M.G. has understandably paid special attention to the development of the country's infrastructure in its development plans. No more than 10 percent of Nepal's development expenditures has ever been spent for industry and for several years considerably less was spent on this sector.

Development Expenditures
(NRs. Million)

	<u>Total</u>	<u>Industry</u>	<u>Industry as a Percent of Total</u>
1965/66 Actual	281	21	7.5
1966/67 Actual	268	16	6.0
1967/68 Actual	281	15	5.3
1968/69 Actual	377	12	3.2
1969/70 Actual	465	18	3.9
1970/71 Actual	465	40	8.6
1971/72 Revised Estimate	571	46	8.0
1972/73 Budget	858	86	10.9

Other Sources of Investment Funds

11. The two commercial banks operating in Nepal extend short-term loans to industrial enterprises. Until April 1971 the interest rates charged were set according to the type of collateral, but at present they depend on the purpose of the loan. ^{1/} It is not known to what extent industrialists have applied for commercial bank loans, but the total amount outstanding on export credits, mainly for jute and hessian, amounted to NRs. 86 million at the end of 1971. The Land Reform Savings Corporation has utilized part (about NR 5 million) of its resources to support agro-based industries started by ex-landlords, accepting as security the government bonds issued to them as compensation. This policy has been attacked since the funds available include small savings. The Corporation has argued that the large landowners who had land expropriated under the land reform program are the best source of entrepreneurship. It has also provided technical assistance.

^{1/} Effective April 14, 1972, commercial bank loan rates were 9 percent for jute manufactures, 9-1/2 percent for raw jute and 12 percent for synthetic textiles and stainless steel industries, and 10 percent for other industries.

THE INDO-NEPAL TREATY OF TRADE AND TRANSIT

1. The most important international frame within which Nepalese industry must develop is the August 1971 Treaty of Trade and Transit between Nepal and India. The terms of this Treaty are not so liberal to exports of Nepalese manufactures as were those of the 1960 Treaty which expired in 1970. On the other hand, the Treaty does open the vast market of Northern India (and of Bangladesh) to many Nepalese exports. It specifies that goods manufactured in Nepal and containing not less than 90 percent of Nepalese or Nepalese and Indian materials will not be subject to payment of basic customs duties or quantitative restrictions when exported to India. For Nepalese products containing between 50 percent and 90 percent of Nepalese materials and labor, the Indian Government will decide on the nature and extent of access to the Indian market and the tariff preferences to be extended to them. Procedures to determine the eligibility of Nepalese products will be agreed upon later. In the meantime, the Indian Government will exempt the following articles from customs duties and quantitative restrictions: matches, strawboard, jute goods, wood articles, vegetable oils, sugar, confectionery (other than chocolate products), handicrafts, prepared fruits, vegetables, oil seed cakes (including de-oiled cakes), refined butter (ghee), tanned leather and leather goods, plywood, cattle feeds, catechu, pine resin, and turpentine.

2. The Treaty includes provisions on the movement of Nepalese rice in India, the transit of Nepalese baggage and goods from one point in Nepal to another through Indian territory, and warehousing space in the port of Calcutta. It also specifies that the two countries will endeavor to make available to each other commodities which one country needs from the other. More specifically among the commodities needed are listed the following:

- (a) By Nepal: Gasoline, kerosene, diesel oil, coal and corrugated steel sheets.
- (b) By India: Semal and other softwood used by the match industry, sleepers for railways, magnesite and rice.

THE INDUSTRIAL ENTERPRISE

Act of 1961

1. The Act as amended in 1961, 1963, 1966 and 1968 is the instrument still in force that sets the policies and procedures on industrial development in Nepal. Industries are first classified according to size:

- (a) Cottage and village industries: capital investment below NR 50,000 1/
- (b) Small industries: capital investment from NR 50,000 to NR 500,000
- (c) Medium-size industries - NR 500,000 to NR 1,000,000
- (d) Large-scale industries - Above NR 1,000,000
- (e) Industries related to defense (of any size)

The Act also classifies industries in four groups for the purpose of assigning incentives to them.

2. Category A industries apparently have the highest priority, but as a group it is too comprehensive and not well defined. It includes: import-substitution industries (without setting clear-cut minimum values added, maximum content of imported materials, or other economic criteria); export-oriented industries based on local materials (in undefined "maximum quantities"); and basic industries assisting in the development of agriculture or other sectors, such as agricultural tools, fertilizer, cement, and iron (no definition on what this "assistance to development" consists of is given). Incentives granted to Category A industries are:

- Protective duties for a minimum of 5 years. (Neither the amount of protection nor the maximum term for their application is given.)
- Total or partial duty exemption on imported machinery, parts and basic raw materials.
- Income tax holiday for a maximum of 10 years
- Convertible foreign exchange made available for importation of machinery, parts and foreign technicians.

1/ This definition may clash with the general definition of industry given in the Act: "Any corporation or firm employing more than 20 people, or more than 10 people if mechanical power is used".

Foreign exchange made available for repatriation of capital (up to 10 percent of the profits) or for profit remittances (up to 25 percent of the profits).

In the case of iron industries (again undefined), HMG may guarantee a minimum 5 percent profit on capital invested, provided the enterprise pays a 40 percent tax on all profits if said profits are more than 10 percent on investment.

3. Industries related to tourism and cottage industries are included in Category B. They enjoy incentives similar to those in Category A, except that the tax holiday is only for 5 years, so that practical differences with the preceding group become blurred. There is no provision for foreign exchange for repatriation of capital or profit remittances in the cottage industries.

4. Category C is for industries processing indigenous raw material (ghee, bristles, herbs, etc.). No explanation is given of the differences between these raw materials and those used by Category A or Category B industries. Incentives granted to these industries are similar to those for Category A, except that the tax holiday extends for 5 years and that foreign exchange would be made available only after consideration of the industry's usefulness.

5. Category D is for export-oriented industries requiring imported raw materials. What constitutes an export-oriented industry is not clearly defined. Incentives granted to Category D industries are in any case the same as those available to Category A, except that foreign exchange earned through exports should be higher than foreign exchange required for imported raw materials. No mention, however, is made of an overall balance in which foreign exchange for capital costs, debt repayment and interest, and profit depreciation and royalty remittances or other payments for technical assistance and personnel are included.

6. Industries not included in any of the categories (although it is difficult to imagine how any industry would not fall into one or another of them) or falling into more than one category, can also obtain incentives by HMG deciding in which category they should be placed. The procedures to be followed are not mentioned. No income tax exemption shall be extended to rice milling, oil extraction, flour milling, timber industries, printing, furniture making, confectionery, bakery, bricks and tiles, candy and tobacco products, stationery, soft drinks, knitted goods, jute pressing, and a few other activities. HMG will decide whether other incentives can be granted to the industries listed above.

MINING

1. Non-ferrous metals were worked in Nepal in past centuries and a few tons of iron ore smelted by cottage installations from high-grade specular minerals. No ore deposit has been found in recent times that would give Nepal a great comparative advantage. However, prospecting for minerals has been carried out only to a limited extent, and it is too soon to know whether mining will or will not have an important role in the future economic development of Nepal.
2. The main studies carried out so far have been: (a) feasibility studies on magnesite deposits near Naubise (with aid from the Federal Republic of Germany); (b) stratigraphic studies for petroleum and surveys on phosphate deposits in Dharan, and iron ore and lignite in Central Nepal, carried out by People's Republic of China; (c) preliminary studies on sedimentary formations in Western Nepal (by USSR experts); and (d) reconnaissance and general mineral investigation carried out by Indian and U.S. aid. What has not yet been undertaken is a plan for the aerophotographic survey of large areas, followed by geochemical and surface prospecting and finally by audits and drilling to determine the extent, physical characteristics and fine contents of ore bodies. This work will require considerable technical assistance. Lack of an extensive road network will add to the difficulties.
3. Some companies formed to exploit mineral resources have been unsuccessful and have closed down. The Nepal Mines and Minerals Co. tried to exploit non-metallic minerals: talc, kaoline and ochre. An Indian firm had intended to exploit copper ores in the Chisapani area, but the equipment was never installed and is now idle. Other enterprises have failed to exploit mica in significant quantities. There are, however, several companies which are still prospecting for ores, among them the Ganesh Himal Co. and the Nepal Minerals Supply Co., both exploring for complex lead-zinc and copper-cobalt-bismuth minerals.
4. A deposit at Pulchoki, near Kathmandu, is said to have 10 million M.T. in proven or probable reserves of 56.5 percent iron ore. In 1971 ECAFE mining consultant found favorable prospects for the exploitation of this deposit and recommended the carrying out of feasibility studies for the establishment of a small iron and steel plant. A 50,000 MT/yr plant has been proposed, but the market for its output has not been proven. A more ambitious project would reduce iron in electric furnaces using expected cheap power from a giant power plant still in the early planning stage. In the meantime, drilling and excavation of audits to find or prove additional reserves are being carried out.
5. Over 25 million MT of high-grade magnesite deposits have been found in the Central Valley. German private companies are interested as well as Indian users. In the 1971 India-Nepal Treaty of Trade and Transit, magnesite is one of the few products which both countries offer to supply to each other within their capabilities. A plant to process between 100 and 500 tpd of high-grade magnesite for export is being studied.

6. Limestone adequate for cement manufacture exists near Hetaura. Preliminary estimates of reserves of 10 million MT are to be confirmed. Plans for a 100,000 MT/yr cement plant are under study. However, no prospecting for gypsum needed in cement manufacture has yet been undertaken and even the plant now under construction, near Kathmandu, will have to be supplied with imported gypsum. The market outlook for a new plant has not yet been sufficiently studied.

7. Surveys and studies on the possible development of mining industries must be carried out before the real impact of these activities on the Nepalese economy is known. The following projects are included in the Fourth 5-Year Plan: petroleum investigation in Western Nepal; aeromagnetic survey in Western Nepal; geological-mineral exploration of deposits (mainly for copper) also in Western Nepal; gas investigation in the Central Valley; preparation of a detailed geological map of the country (this seems to be an ambitious undertaking); detailed investigations and feasibility studies on the Kharidhunga magnesite deposits; surveys of the Tanahu, Gorkha and other possible copper deposits; investigation and feasibility studies on chemical and cement-grade limestones; studies of pegmatites in Northern Nepal; and survey of some phosphate rocks. Also considered in the Plan are NR 2 million for feasibility studies on cement, glass, fertilizers, building stones, marble, concrete products, lime, ceramics and a small iron and steel plant based on the Pulchoki deposits. The amount budgeted for these studies does not seem to be sufficient to ensure that first-class final studies will become available to HMG.

PUBLIC INDUSTRIAL CORPORATIONS

1. The public corporation as an institutional form for producing and marketing goods and services has existed in Nepal since 1937 when Nepal Bank Ltd. was organized. Since then 43 additional public corporations have been established in such diverse areas as manufacturing, public utilities, construction, wholesale and retail trade, transport and communications, finance, insurance, real estate and business services. Most of this growth of the sub-sector occurred during the 1960's when 39 of the 44 public corporations were organized. The choice of the corporate form has been deliberate. At the outset, it was believed that the structure and procedures of the government departments that might otherwise carry out public commercial functions were not appropriate for this purpose. Accordingly, semi-autonomous corporations were established in the belief that their relative freedom would enable them to operate in an efficient business-like fashion. As indicated below, this objective has not always been consistent with other objectives for public corporations particularly in regard to pricing policies.

2. In the industrial sector, there are 15 public manufacturing corporations and 4 industrial supporting corporations, as shown in the following table:

Public Manufacturing and Supporting Corporations

<u>Corporation</u>	<u>Year Registered</u>	<u>(Rs 1000)</u>		
		<u>HMG</u>	<u>Other</u>	<u>Share Capital</u> ^{/1} <u>Total</u>
<u>Manufacturing</u>				
Raghupati Jute Mill	1946	4,650	2,488	7,133
The Timber Corporation of Nepal	1960	6,286	600	6,886
Nepal Footwear Products, Ltd.	1963	200	300	500
Nepalese Carpet, Ltd.	1964	100	-	100
Nepalese Craft, Ltd.	1964	100	-	100
Janakpur Cigarette Factory	1964	27,226	-	27,226
Birganj Sugar Factory	1964	40,718	-	40,718
Banabari Leather and Shoe Factory	1965	8,093	-	8,093
Chandeswari Cotton Textiles	1966	180	-	180
Nepal Tea Development Corporation	1966	6,738	-	6,738
Agricultural Tools Factory	1969	5,638	-	5,638
Dairy Development Corporation	1969	3,354	-	3,354
Brick and Tiles Factory, Ltd.	1970	14,000	-	14,000
Balaju Small Tools	1970	-	900	900
Rastruja Rice Milling	1970	1,000	-	1,000
<u>Industrial Support</u>				
Nepal Industrial Development Corporation	1959	30,929	6,500	37,429
Balaju Industrial Estate	1960	-	4,204	4,204
Hetauda Industrial Estate	1963	-	6,446	6,446
Small Industry Development Corporation	1970	2,500	2,500	5,000

/1 As of mid-July 1971, most of the paid-up share capital shown in the column headed "Others" was contributed by public enterprises.

3. Since the mid-1950's, the official policy of the government has been to rely primarily upon private interests to implement successive industrial development plans and to limit public investment to defense-related industries, and to high-priority industries for which private financing was not forthcoming. Thus, the Fourth Plan (1970-75) states that it is the policy of the government "to encourage the establishment of industries mainly in the private sector. If found to be necessary, only one or two industries (not identified) would be set up in the public sector." Although this policy may have had some general applicability, it is clear that a number of public industrial corporations have been established for reasons other than the inadequacy of private initiative and/or resources. Thus, the four industrial supporting corporations shown in the table were established in the public sector in the belief that they were not appropriate for private investment. Several industrial corporations have been established primarily because foreign assistance was offered. Thus, the People's Republic of China financed the leather and shoe and brick and tile factories, and is financing the new textile mill now under construction; Russia provided the funds to construct the sugar, cigarette and agricultural tools factories; and the United States

provided local currency support for two industrial estates and financed a modern saw mill at Hetaura. Finally, several formerly private corporations such as the Raghupati Jute Mill, which experienced financial and other difficulties, have come under government control.

4. In addition to these several exceptions to the general policy of relying primarily upon private investment for industrial development, there is evidence that the policy itself may be changing. Speaking to the Nepalese Chamber of Commerce and Industry, the Minister for Commerce and Industry stated recently that in regard to industrial growth, the principal question was how the country should industrialize and not who should take the initiative. He added that the government can no longer wait for private interests to step the pace of industrial investment and that in the future an increasing amount of public investment in the sector would be undertaken.

5. Data on the performance of the public industrial corporations is quite inadequate but on the basis of available evidence, it is reasonably clear that performance, and particularly financial performance, has been generally poor. Thus, a substantial number of the publicly owned factories, including sugar, timber and tea, have been operating well below capacity and consequently, at high cost. Quality control is also a major problem as are product design in consumer goods industries, sales promotion, market structure, and inventory management. But the principal overall deficiency of the public industrial corporations is that they have absorbed public resources in far larger amounts than they have returned in dividends. Thus, in 1970-71, it was estimated that the government's total equity and loan investment in industrial enterprises amounted to about Rs. 133.4 million on which no dividends were received in 1970, and only Rs. 21,000 in 1971. Similarly, a recent estimate of cash flows between all public enterprises (including industrial, financial, trading and other types) and the government from 1968/69 to 1972/73, indicates that government transfers to enterprises amounted to about Rs. 352 million; dividends paid to the government were about Rs. 98 million, of which Rs. 80 million was from the Rastra Bank. The net flow of resources from the government to enterprises other than the Rastra Bank therefore amounted to about Rs. 330 million. In 1968/69, 37 public enterprises recorded financial profits of about Rs 20 million of which 70 percent was earned by only two enterprises, the Janakpur Cigarette Factory and the National Trading Corporation. Even this outdated estimate of financial profits is suspect because the evidence suggests incomplete accounting including less than full depreciation, interest and amortization costs.

6. Several reasons account for the weak financial position of public corporations: several of them have not been producing long enough to achieve an efficient level of operation; for others their prices have been influenced by the government and are too low to cover costs; the feasibility of some factories was not fully analyzed at the outset and these are operating far below full capacity; industrial managerial skills are very scarce and this scarcity is aggravated by frequent rotation of top management and lack of effective managerial training. Finally, and perhaps most important, the

principal of autonomy appears to have been carried to the point where most of the public industrial corporations tend to operate outside a policy framework which provides specific guidance regarding production and financial performance, pricing, incentives, dividends, and other critical factors affecting the corporations' contributions to the government's resource position.

7. This is indeed a serious problem. With regular and development expenditures rising rapidly, the appearance of sizeable and increasing budget deficits in the last two or three years, and the likelihood that foreign assistance may be levelling off, all suggest that the government will soon be facing an acute resource mobilization problem with serious consequences for development. The net drain of public industrial corporations on the government's resources is a significant factor in the slow growth of resource mobilization. It may be debatable whether certain types of public services, such as water and electricity should be subsidized, but there is little justification for subsidizing public industrial corporations. Indeed, the government's principal objective for these corporations should be the generation of a substantial financial surplus for investment in new industrial enterprises or in other sectors.

8. How can such a policy be implemented? Without attempting to answer this question, it is suggested that the answer will be found in resolution of the following issues:

- (1) The means of exercising greater control over the corporations without undermining the rationale for autonomous entities.
- (2) The establishment of a uniform accounting system for all public industrial enterprises and requiring preparation of up-to-date operating and financial statements.
- (3) Setting financial performance goals in terms of operating surpluses and transfers to the government.
- (4) Providing effective management (including training) and a system for rewarding good performance and penalizing poor performance.
- (5) Full cost pricing (including a reasonable profit) by public industrial corporations with an appropriate grace period for new corporations to allow them to reach an efficient level of output.
- (6) Detailed planning of public investment in the industrial sector both as a means of identifying specific projects to be undertaken in the future, and to indicate to private interests those industrial areas where the government expects to take the initiative.

- (7) Possible liquidation of public enterprises which, on examination, are likely to continue to be a drain on public resources.
- (8) The desirability of disposing of some public enterprises to the private sector and absorption of some of the corporations into an agency of the government.

STATISTICAL APPENDIX

<u>Table No.</u>	<u>Title</u>
1	Contribution of Industry to GDP
2	Production of Selected Industrial Commodities
3	Estimated Cumulative Official Foreign Loans and Grants
4	Nepal's Imports from India
5	Volume and Value of Production of Selected Industries

Table 1: CONTRIBUTION OF INDUSTRY TO GDP

	1964/65		1969/70	
	<u>Current Market Prices</u> (Rs mil.)	<u>Current Market Prices</u> (Rs mil.)	<u>Deflated to 1964/65 Prices</u> (Rs mil.)	<u>Equivalent US\$ Million</u>
Manufacturing	83	278	219	27.4
Mining	1	1	1	0.1
Cottage Industries	<u>392</u>	<u>656</u>	<u>516</u>	<u>64.8</u>
Subtotal	476	935	736	92.3
Construction	123	192	151	18.9
Trade	309	274	215	27.1
Transportation and Communications	91	158	124	15.6
Public Utilities	4	15	12	1.5
Ownership of dwellings	654	729	573	72.0
Other Services	170	256	201	25.3
Financial Institutions	69	128	101	12.6
Government	<u>82</u>	<u>199</u>	<u>156</u>	<u>19.7</u>
Total GDP excluding Agriculture	1,978	2,886	2,269	285.0
Agriculture	<u>3,915</u>	<u>6,563</u>	<u>5,159</u>	<u>648.2</u>
TOTAL	<u>5,893</u>	<u>9,449</u>	<u>7,428</u>	<u>933.2</u>

Table 2: PRODUCTION OF SELECTED INDUSTRIAL COMMODITIES

		<u>1961/62</u>	<u>1964/65</u>	<u>1965/66</u>	<u>1966/67</u>	<u>1967/68</u>	<u>1968/69</u>	<u>1969/70</u>	<u>1970/71</u>	<u>1971/72¹</u>
Jute	M.T.	15,034	18,735	17,325	12,191	13,975	12,601	13,315	13,284	9,453
Sugar	M.T.	2,320	7,300	9,912	4,410	6,399	12,844	16,238	14,534	7,483
Cigarettes	Millions	249	414	636	954	1,165	1,677	1,466	2,083	724
Matches	Thousand Gross	314	361	444	465	427	468	516	491	n.a.
Synthetic Textile	Thousand Meters	-	1,000	1,293	2,098	2,685	3,541	2,354	984	48
Nylon Buttons	Thousand Gross	10	185	n.a.	n.a.	188	278	366	308	n.a.
Shoes	Pairs	-	1,107	29,836	20,095	28,654	32,102 ²	41,983	65,757	41,921 ²
Tanned Leather	M.T.	n.a.	3	59	37	64	100	139	147	n.a.
Stainless Steel	M.T.	-	-	232	381	738	2,419	933	357	99
Tea	Kg.	n.a.	n.a.	2,643	8,351	13,641	17,323	20,000	25,663	n.a.
Catechue	Kg.	-	-	-	-	-	94,640	170,180	69,980	-
Soap	M.T.	n.a.	834	n.a.	2,368	360	336	1,110	111	639
Bricks	Thousand	-	-	-	-	-	11,780	22,978	24,228	19,643
Tiles	Thousand	-	-	-	-	-	95	658	675	n.a.
Biscuit & Confectionery	Tons	-	-	-	-	-	932	799	1,095	n.a.
Iron	Tons	n.a.	1,400	-	n.a.	1,379	2,500	2,900	3,000	n.a.
Woolens (except carpets)	M.T.	-	16	35	14	17	28	-	-	-
Wood	m ³ (s)	-	-	-	-	878,313	452,672	984,125	-	-
Mustard Oil	Litre	-	-	-	-	700,874	1,240,070	5,230,022	-	-

¹ Data for nine months.

² Main factory only.

Source: Central Bureau of Statistics, Department of Industries, Ministry of Commerce & Industry - Fourth Plan, National Planning Commission. The data from the sources is often conflicting.

Table 3: ESTIMATED CUMULATIVE OFFICIAL FOREIGN LOANS AND GRANTS^{/a}
(NR million)

	<u>Total</u>	<u>For the Industrial Sector</u>
People's Republic of China	204.4	20.5
Germany (Fed-Republic)	11.0	-
India	1,089.0	12.1
Japan	0.5	-
New Zealand	0.5	-
Switzerland	34.2	17.1 ^{/a}
United Kingdom	26.2	0.6
USSR	217.2	112.6
United States	<u>1,141.0</u>	<u>204.7</u>
	<u>2,724.9</u>	<u>367.6</u>

^{/a} From 1951 through middle of 1971, except for Indian aid which is through April 1972.

Source: Unpublished Nepalese official sources.

Table 4: NEPAL'S IMPORTS FROM INDIA
(NR Million)

Year	Food (including live animals for food)	Beverages and tobacco	Textiles, carpets, trunks, suitcases, etc.	Metals, minerals, fuels, lubricants and related materials	Animal and vegetable oils and fats	Chemicals and drugs	Manufactured goods chiefly by hand	Machinery and transport equipment	Miscellaneous manufactured articles	Miscellaneous	Total
1956/57	35	17	12	12	8	8	38	5	7	2	166
1957/58	38	13	9	10	10	7	47	5	10	1	150
1958/59	42	27	8	13	10	9	91	6	12	3	218
1959/60	64	21	13	19	5	12	107	9	19	5	270
1960/61	47	27	20	25	10	22	185	24	16	2	375
1961/62	62	39	23	37	11	26	193	25	23	2	460
1962/63	91	60	30	46	12	23	296	33	27	1	599
1963/64	95	35	27	72	15	35	237	30	39	3	596
1964/65	101	58	81	72	17	38	352	50	36	1	806
1965/66	127	53	35	83	11	43	322	64	64	3	763
1966/67	93	11	63	70	5	28	142	25	37	1	465
1967/68	83	7	40	42	10	32	167	29	29	1	460

Source: Central Bureau of Statistics

Table 5: VOLUME AND VALUE OF PRODUCTION OF SELECTED INDUSTRIES

Product	Unit	Q U A N T I T Y				Sales Value (NR Million)
		1961/62	1964/65	1968/69	1970/71	1968/69
Jute	000's MT	15.0	18.7	12.6	13.3	52.5
Sugar	000's MT	2.3	7.3	6.4	14.5	33.9
Cigarettes	Millions	249.0	414.0	1677.0	2083.0	49.8
Matches	000's Gr.	314.0	361.0	468.0	491.0	8.8
Synthetic Fabric	Mil. M.	-	1.3	3.5	0.9	62.1
Shoes	000's pair	-	1.1	32.1	65.8	1.7
Stainless Steel Utensils	MT	-	-	2419.0	357.0	80.8
Wood	000's cu. ft.	n.a.	n.a.	453.0	n.a.	8.2
Woolens	MT	n.a.	16.0	28.0	n.a.	2.1
Mustard Oil	000's liters	n.a.	n.a.	1240.0	n.a.	5.9

Source: Statistical Annex, Table 8.1 HMG, Central Bureau of Statistics.

SECTION IV

POPULATION AND FAMILY PLANNING

ACRONYMS

NHS	-	Nepal Health Survey
CBR	-	Crude Birth Rate
GFR	-	General Fertility Rate
CDR	-	Crude Death Rate
IMR	-	Infant Mortality Rate
WFP	-	World Food Program
CSM	-	Corn-Soya-Milk
FP/MCH	-	Family Planning/Maternal and Child Health Project
FPAN	-	Family Planning Association of Nepal
IPPF	-	International Planned Parenthood Federation
NMEO	-	Nepal Malaria Eradication Organization
ANM	-	Auxiliary Nurse Midwives
AHW	-	Auxiliary Health Workers
CBS	-	Central Bureau of Statistics
KAP	-	Knowledge, Attitude & Practice Survey

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ANNEXES

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I. DEMOGRAPHIC BACKGROUND, SITUATION AND PROSPECTS

A. Situation and Topography

1. To understand fully Nepal's demographic situation, account must be taken of its situation and topography. With an area of 140,075 km², and the shape of an elongated rectangle, it stretches some 800 kms along the Himalayas. Nepal is landlocked between the Chinese Province of Tibet to the north and India to the south.
2. Although a relatively small country, Nepal exhibits a wide range of terrain from the high Himalayas to the low Terai plains in the south less than 250 kms away. The Terai, a narrow (65 km) belt which is the northernmost extension of the Gangetic Plain, has a hot, tropical climate and was formerly characterized by endemic malaria. Except in Western Terai, malaria has now been controlled and has had the double demographic effect of reducing mortality and opening up the Terai to migratory movements. To the north run the forested Siwaliks (or Chure Hills), rising abruptly from the plain to a height of some 1,500 meters. Closely parallel, and sometimes merging with the Siwaliks, run the Mahabarat Lekh, a steep rugged range with no settlement over 2,000 meters. These two ranges are separated by low, wide valleys (duns) resembling the Terai in climate and vegetation, and sometimes referred to as the Inner Terai. Between the Mahabarat Lekh and the crest line of the main Himalayas lie the Nepal midlands, or "Pahar" country, a broad hill complex which, though considerably dissected, has a subdued topography. This region, ranging in altitude from 600 to 2,000 m, is well cultivated and has been the principal focus of Nepali settlement. Behind the high Himalayas, traversed by the deep gorges of the Karnali, Gandaki and Kosi rivers, a series of wide river valleys run parallel with the main ranges. These are the Bhotia valleys and their harsh environment merges into the Tibetan plateau. In northwest Nepal, a final mountain zone, the Tibetan Marginal Mountains, forms the watershed between the Gangetic river system and that of the Tsangpo in Tibet. Each of these principal regions has distinguishable sub-regions and the country offers a wide variety of environment, economic opportunity and population patterns.
3. Population distribution is closely controlled by topographic variety and is very irregular. Population concentration is based on agricultural opportunity and migration has taken place from the Hills to the Terai. In 1961, one-third of the population lives in the Terai which covers only 21 percent of Nepal's total surface; by 1971, the proportion had risen to 37 percent. But even within the Terai, there are large differences in population density. The Western Terai, with 374 people per km² is no more densely populated than the Mountains and Hills, while the Eastern Terai has 1,380 and the Central Terai, the most densely populated area, has 741. The Kathmandu Valley occupies only 0.4 percent of Nepal's surface but in 1961 accounted for some 5 percent of its total population, giving densities of over 5,000 per km². Urban densities in Kathmandu city exceed 55,000 per km², comparable only with those in Calcutta and

Bombay. The Hill regions cover 78 percent of the total area of the country and carried 62 percent of its population in 1961; by 1971, this proportion had dropped to 58 percent. In the settled areas, lying mainly below 1,500 m, the population density is about 320 per km². Dividing the country by primary river basin, and excluding the Kathmandu Valley, some 45 percent of the population in 1961 lived in the eastern (Kosi) region, with densities three times higher than the western (Karnali) region.

B. The People

4. Nepal is a meeting ground of two civilizations. Over the centuries the land has been settled by immigrants from Tibet and India. At present, the population is divided on racial lines that parallel the geographical zones. In the high mountainous regions of the north the people are mainly of pure Mongoloid stock. In southern Nepal, where the land is flat and the sun is hot, the people are indistinguishable from their neighbors across the border in India. They are of Aryan stock.

5. The migrants met in the central region, which became the home of the Gurkha tribes. These people are now a blend of Mongoloid and Aryan physical traits and of Tibetan and Indian cultures. It is there, at the point where the two civilizations came into contact, that a peculiarly Nepalese culture has emerged. The Kathmandu Valley, political heart of Nepal, has generated a cultural life which is original. With a history going back more than 2,000 years, the valley is said to have given the world the pagoda and a style of wood sculpture which influenced Chinese art.

6. The religions of Nepal divide along the same geographical lines. Buddhism predominates in the north, Hinduism in the south; in the central region many practise an amalgam of the two. Figures of Buddha take honored place in Hindu temples, figures of Shiva in Buddhist shrines.

7. Owing, however, to the influence of the Indians from the priest and warrior castes - many of them comparatively recent arrivals since they fled India before the Moghul invaders - the concept of tribe has given way to that of caste. This almost nation-wide acceptance of the Indian caste structure is symbolic of the predominance of Indian culture in Nepal. Nepali, the national language, bears a close relationship to Hindi. The joint family, structured as in India, is the basis of social organization throughout much of the country. The predominance of Indian and Hindu cultural influences is also the consequence of the fact that access to India is easy, to Tibet difficult.

8. The cultural differences between Kathmandu and the other regions, including the racial, linguistic, religious and caste differences which characterize the nation, have not, however, generated conflict. There is

no tradition of continuing enmity or violence between any of the peoples. Nepal is polyglot, but it is tolerant and largely harmonious. Although the harmony among the Nepalese was reinforced by their economic interdependence, their well-being has always depended on harvests and on conditions of the land - 90 percent of the population derives its living from agriculture. The majority of farms are run on a subsistence basis.

C. Total Population

9. The household census of 1971, held before the population census of the same year, enumerated a population of 11.3 million. If these figures are accepted, the population of Nepal has doubled since the first census in 1911 or even since the 1930 census.

<u>Census</u>	<u>Total Population</u> (In thousands)	<u>Average Annual</u> <u>Growth rate</u> (Percent)
1911	5,639	
1920	5,574	-0.1
1930	5,533	-0.1
1941	6,284	+1.2
1952-54	8,257 /a	+2.3
1961	9,413 /a	+1.6
1971	11,290 /a	+2.0

/a Excluding those absent from home.

The apparent fluctuations in the annual growth rate level are probably the result of differential completeness of enumeration at various censuses and do not simply reflect genuine changes. For instance, the 1930 population is expected to have been particularly under-enumerated as a threat of war between Nepal and Tibet made the population fear that the purpose of the census was to prepare conscription lists and this resulted in a deficient count of males.

10. Complete results of the 1971 population census will not be available for a considerable time but some figures are known for five of the country's 75 districts (Kathmandu, Lalitpur, Bhaktapur, Kavre and Chitwan). The total population of those districts is 1,046,000 according to the population census and only 985,000 according to the household census. Thus, without taking into account any possible population census under-enumeration, the household census in those districts appears to have under-enumerated the population by 5.8 percent. For each district the household census figure is lower than the corresponding population census figure. The range of under-enumeration is from 4.1 percent to 9.3 percent. If the average under-enumeration of 5.8 percent is maintained over the rest of the country, the population census

would show a total population of 11,900,000 i.e., 700,000 more than the household census figure. This would imply an annual growth rate of 2.3 percent in 1961-71 which, with the exception of the period between 1941 and 1952-54, would be the highest rate recorded. In fact, it almost certainly is the highest intercensal rate, since the 1952-54 census is known to have been much more carefully conducted than that of 1941 and, most probably, under-enumeration occurred to a much smaller extent in 1952-54 than in 1941. A further factor is that in 1941 a large number of males were not counted as they were in the army and out of the country.

11. It appears that in recent years the population of Nepal has been increasing considerably faster than ever before. Largely because of internal migration, however, the increase has not been uniform in all parts of the country. Population increased much faster in the Terai and the Kathmandu Valley than in the Hills.

<u>Region</u>	<u>1971 Population</u> (In thousands)	<u>Increase 1961-71</u>	
		<u>Absolute</u> (In thousands)	<u>Percent</u>
Kathmandu Valley	586	126	27.2
Hills	6,564	739	12.7
Western	2,009	212	11.8
Central	2,333	386	16.6
Eastern	2,222	141	6.7
Terai	4,140	1,012	32.4
Western	414	143	52.6
Central	968	323	50.1
Eastern	2,758	546	24.7
Nepal	11,290	1,877	19.9

D. Age Distribution

12. Most people in Nepal do not know their exact age. At censuses, age is usually estimated by relating the date of birth to some local event with which the respondent is familiar. This causes appreciable errors in age distribution, particularly if age is considered in single years. In view of this, neither the 1952-54 nor the 1961 censuses give single year age distributions for the whole of the population. In both censuses, five-year age groups are used, with the exception of ages 0 to 4 when single years are given. The 1961 census gives, in addition, the single year age distribution for a 1 percent sample of the population. The 1971 census is expected to give a single year distribution for the whole population.

13. Both the 1952-54 and 1961 censuses show a young age distribution for the population of Nepal with almost 40 percent aged under 15 and another 10 percent aged 15-19. Figures available for five districts from the 1971 census show the same proportion as in 1961 for the population aged under 15 but a somewhat larger proportion for those aged 15-19. As four of the five (all except Kavre) are districts where immigration is considerable, this may explain the higher proportion of 15-19 year olds since male emigration is pronounced in that age-group. Similarly, 0-14 year olds may be relatively under-represented in those districts. In fact, in 1961, when the total Nepal proportion of under 15 year olds was 39.9 percent, that for the four districts was only 37.7 percent. Thus the total Nepal proportion of 0-14 year olds in 1971 will probably be higher than the 39.9 percent found in the four districts. In fact, because of the recently increased rate of internal migration, the proportion of 0-14 year olds in the five districts may well be even more of an under-estimate of the total Nepal proportion than the corresponding 1961 figure was. This would, therefore, indicate a substantial increase in the proportion of young people in the past decade.

Census	Percent Age Distribution		
	0-14 Years	15-59 Years	60 Years +
1952-54	38.5	56.5	5.0
1961	39.9	54.6	5.5
1971 /a	39.9	54.5	5.6

/a Five districts only.

E. Marriage

14. Nepal is a country of very early and almost universal marriage. Less than 1 percent of the population remain single throughout life and, in 1961, only 5 percent of women aged 20-24 had not married. In the same year, 25 percent of women aged 10-14 were reported as already married.

<u>Age</u>	<u>Percent Married, 1961</u>	
	<u>Males</u>	<u>Females</u>
6 - 9	3.0	5.3
10 - 14	10.7	24.9
15 - 19	36.7	74.3
20 - 24	73.6	94.7
25 - 29	89.8	98.1
30 - 34	95.3	99.0
35 - 39	97.3	99.2
40 - 44	97.9	99.3
45 - 49	98.4	99.4
50 +	98.8	99.5

15. Although marriage occurs early throughout the country, there are large regional differences. It occurs earliest in the Terai where 45 percent of females aged 10-14 and 90 percent of those aged 15-19 were reported married in 1961. In the Hills, marriage occurs later and the corresponding figures in 1961 were 19 percent and 72 percent. The Kathmandu Valley, with a relatively more urban population, has the latest marriage patterns with only 10 percent of females aged 10-14 married in 1961 and only 58 percent of those aged 20-24.

16. Age at marriage is also related to literacy. Only 1.8 percent of women aged 10 or over were recorded as literate, i.e., able to read and write, but their marriage patterns were quite different from those of illiterate women. Thus, among women aged 10-14 in 1961 only 10 percent of the literate, but 25 percent of the illiterate, were married. For the 15-19 age group, the figures were 55 percent and 75 percent respectively.

17. There are no complete data from the 1971 census to enable a comparison of marriage patterns but the data available for the Kathmandu, Lalitpur and Chitwan districts show a very significant change towards later marriage. For the three districts combined, the proportion of married females dropped between 1961 and 1971 from 13.7 percent to 4.7 percent for the 10-14 age-group and from 59.3 percent to 45.2 percent for the 15-19 age-group. As the districts are among the areas expected to have received large numbers of emigrants from the Hills in recent years, not much significance could be placed on those figures at this time.

F. Fertility

18. In the absence of birth registration, almost the only estimates of fertility are those derived from census data and from the Nepal Health Survey (NHS) (1965-66). As census figures are affected by age misreporting and age-sex selective mis-enumeration, some fertility indicators based on

census data will not be discussed until later, when adjustments to the census figures are considered.

19. The 1961 census shows an average completed family size of 5.11 live births for women aged 50-54 which may be compared with 6.0 live births found by the NHS. In addition to older women, it seems probable that young women have also under-reported the number of live births. Thus, although 74 percent of women aged 15-19 were reported married, only 18 percent were recorded as having borne a child. Similarly, among those aged 20-24, 95 percent were reported as married but only 71 percent stated that they had at least one child. The age-specific percentage distribution of females by parity is given in Table 1.1 of Annex 2.

20. There are considerable variations between regions in the reported completed family size. The Inner Terai has the highest completed average family size with 5.85 live births, followed by the Hills with 5.43 while the Terai has the lowest with only 3.95.

<u>Region</u>	<u>Average Family Size</u>	
	<u>20-24 Years</u>	<u>50-54 Years</u>
Inner Terai	1.52	5.85
Hills	1.27	5.43
Terai	1.37	3.95

Although women in the Terai have a comparable number of live births to those in other regions at ages 20-24, their completed average family size appears to be much lower than elsewhere. It is not known to what extent the figures reflect genuine fertility differentials. A cause possibly contributing to the apparent differences may probably be higher infant and child mortality rate in the Terai, particularly in the past. It is known that when mothers are questioned as to the number of live births they have had, they are less likely to report the children that died than those that lived.

21. The NHS provides various estimates of the crude birth rate (CBR) which range from 39 to 66 per 1,000 population. With the exception of the lowest and highest estimates, all others are within the range of 51 to 57 per 1,000. The lowest estimate is based on the number of women saying they were currently pregnant. Although an adjustment is made for women in the first three months of pregnancy who may not be certain yet that they are pregnant, it ignores the possibility of women falsely denying any current pregnancy. In fact, when the results of urine tests were also considered, the estimate of the CBR increased from 39 to 57 per 1,000. Even when the results of urine tests were considered alone, the CBR was still estimated to be as high as 52 per 1,000. From the number of births recalled by the interviewed married females in the previous 12 months, the CBR was estimated at 53 per 1,000, while from the total number of births recalled in surveyed households during the same period, it was estimated at 66 per 1,000. Finally, the number of infants alive in households at the time of the survey and the number of infants recalled as having died in the previous 12 months led to an estimate of 56 per 1,000 as the CBR. Perhaps the most reliable indicator

is that based on a current pregnancy history combined with a urine test, which estimated the CBR at 57 per 1,000. Allowing for miscarriages, the crude live birth rate is then estimated at about 52 per 1,000. This figure does not, however, take into account induced abortion, the extent of which is not known. The NHS also obtained estimates of the general fertility rate (GFR), the ratio of births to women in reproductive ages. Again, the estimates varied widely from 136 to 257 per 1,000.

22. The NHS report also shows that 25 percent of women had their first child at age 16 or less, 31 percent at 17, and 44 percent at 18 or more. Although these figures seem plausible, given the early marriage patterns prevailing in Nepal, there are almost no means of verifying them. The NHS also found an early marriage pattern but much more so than that reflected by the census figures discussed earlier. Thus about 31 percent of females were found to have married when aged less than 10 while another 39 percent married while aged 10-14. There are no directly comparable census figures but the proportions found married by age are quite out of line with the NHS figures. Thus, even in the Central Terai region which showed the earliest marriage pattern among all regions in Nepal, only 24 percent of females aged 6-9 were married in 1961 and only 60 percent of those aged 10-14. The NHS figures are based on retrospective histories of females many of whom have been married for a long time. Unless there has been a massive tendency towards later marriage in the last few decades, either the NHS distribution of age at marriage is excessively young or the census percentages of females married by age under-estimate the occurrence of early marriage. Although early marriage may be less frequent in recent years, considerable doubt remains on the reliability of the NHS figures. Another interesting aspect of the NHS data is that although 31 percent of females were estimated to have married when aged less than 10, no females reported onset of menses at such young ages. The modal age for the onset of menses was 14, and until that age there were more married than menstruating women. Similarly, the average age at marriage was 13.1 while the average age at the onset of menses was 14.4.

23. The NHS found that the average age at final pregnancy for women aged 50 or over, who had given birth to at least one child, was about 37 which seems rather low. About 12 percent of the women reported a final pregnancy at an age less than 27 and this appears as too high a proportion.

24. While the NHS attempts to estimate age-specific fertility rates, they are based on such small numbers and there are so many obvious errors that they may not be considered as even remotely reliable.

25. The age and parity distribution of females delivering in selected hospitals in recent years has been computed but is of only limited use since, as already indicated, it is not representative of all deliveries -- women delivering at hospital tend to be much younger and to have less children, even for their given young age distribution, than other women. Thus, nearly 50 percent of all deliveries were to women under 25. Overall, 36 percent of women delivering were having their first child. Similarly, as many as 87 percent of women aged 15-19 and 51 percent of those aged 20-24 were having their first child. The data are given in Table 1.2 of Annex 2.

G. Mortality

26. As in the case of fertility, mortality estimates may be derived only from either defective census data or from limited NHS information.

27. The 1961 census asked for the number of deaths in the previous 12 months but the results indicate marked under-reporting. From those data, the crude death rate (CDR) is estimated at 13 per 1,000 population and the infant mortality rate (IMR) at 77 per 1,000. These figures are far too low and they do not relate to the sex and age-specific survivorship rates obtained by comparing the 1952-54 and 1961 census data even though those rates are, in general, over-estimates because of the more complete enumeration in the latter census. An interesting aspect of the rates is, however, their regional variation, particularly in the IMR. The Hills and the Kathmandu Valley had the lowest IMR -- 66 per 1,000, followed by the Inner Terai -- 85 per 1,000, while the Terai had the highest -- 112 per 1,000. Among smaller regions, the lowest rate was found in the Eastern Hills -- 61 per 1,000, and the highest was in the Central Terai -- 164 per 1,000. In view of the known relatively healthier conditions of the Hills, it is probable that the observed differences are to a large extent genuine.

28. The significance of the figures given above lies in their relative sizes and not in their absolute levels. Mortality and, in particular, infant and child mortality, have been grossly under-estimated by the census returns. The IMR of 77 per 1,000 obtained by the census contrasts sharply with estimates ranging from 130 to 208 per 1,000 obtained by the NHS. Even the upper limit of that range is very likely too low. In discussions with one of the authors of the NHS report, it was agreed that infant mortality is almost certainly higher than the data indicated. Empirical observations by closely involved officials have led to IMR estimates as high as 300 per 1,000. In addition, mortality of children aged under 1-4 is likely to be very high, even for the given high level of infant mortality. The NHS found that 56 percent of all deaths occurred children aged under 5. This figure compares with 44 percent from the 1961 census.

29. The exact level of infant and child mortality is not known. The NHS found that, on the average, women aged over 50 recalled 6.0 live births (probably an under-estimate), only 3.0 of which were still alive. Malnutrition and malaria were for a long time major reasons for the high IMR, although the former is probably less important now. Pneumonia, caused by extreme temperature changes, and gastroenteritis largely account for the high child mortality rate. A factor contributing to the high mortality rate following gastroenteritis is the tendency to avoid giving water to patients suffering from diarrhea which frequently leads to death from dehydration. The critical age for children appears to be about 18 months when weaning takes place.

30. Some evidence of a recent drop in mortality may be found in the comparison of widowhood rates in 1961 and 1971 for the three districts for which data are available from the latest census. For both sexes, widowhood rates dropped considerably, particularly in the younger age-groups. Two of

those districts are, however, relatively urban and it is not known to what extent improvement in health conditions associated with lower mortality in those areas would extend elsewhere.

H. Migration

31. The Nepalese are a very mobile population and Nepal has, since the middle of the 19th century, been a net exporter of population. Thousands of Nepali men emigrated to join the Gurkha regiments in British and Indian armies, others went to seek work in the tea plantations in Assam and West Bengal, while many men were employed in security posts in the major Indian cities. According to the 1961 Indian census, there were almost 500,000 Nepalese-born persons living in India. Of these, two-thirds lived in Uttar Pradesh, West Bengal and Bihar States. The sex ratio ^{1/} of Nepali residents was 128 overall, but of Nepalese who had lived in India for less than one year, there were over four times as many males as females. Of the total of 280,000 males, 87 percent were employed -- compared with 57 percent for the total male population of India. About 80,000 Nepalese migrate to India annually, and of these some 60,000 return from one to five years later. Data from the 1961 Nepal census indicate that the migrants come mostly from the Hill regions. Just over 300,000 were reported as absent from Nepal for at least six months, and of these over half came from the Western Hills.

32. As malaria control has improved in the Terai the region has also become a focus of migration, both for Nepalese from the Hills and, in increasing numbers, for Indians from the adjacent State of Uttar Pradesh. The magnitude of the migratory flows is not known. The border with India remains open, with little control or check of population movement; this situation will not change in the immediate future. The complete results of the 1971 census are awaited before any estimates of migratory patterns and numbers can be made.

33. Of the five districts (out of a total of 75) for which data are available, the four in the Bagmati zone show little in-migration from other zones. Kathmandu district had the highest proportion of in-migrants, but this was less than 4 percent of the total Nepalese-born population. For the districts of Kavre, Lalitpur and Bhaktapur, less than 1 percent were born outside the Bagmati zone. An examination of the sex ratios does indicate, however, that within the zone there is considerable movement from the rural areas to the cities of Kathmandu, Bhaktapur and Lalitpur. Particularly in the age-groups 15-19 and 20-24, males considerably outnumber females in the cities. In Kathmandu, for example, the rates are 117 and 121 in the district, and 134 and 154 in the city. Even in Bhaktapur, which remains less "developed" than the other two cities, and still retains its character as an agricultural market town, the contrast between the rate of 116 and 105 for these age groups in the district, and 133 and 120 in the city, is still striking. Migration into Kathmandu district from outside the Bagmati

^{1/} The ratio of males per 100 females.

zone is heavily male-dominated; one-and-a-half times more men migrate inwards than women.

34. The only other district for which 1971 census data are available is Chitwan in Marayani zone which borders on India and geographically falls mainly in the Inner Terai. More than 49 percent of the native-born population was born outside Narayani zone. Of the immigrants, 58 percent came from Gandaki zone to the northwest, an area dominated by the Annapurna Himal and Lamjung Himal with relatively limited areas for cultivation. Almost 29 percent came from adjacent Bagmati zone, and a further 7 percent from Dhanlagiri zone which is comprised mainly of the high Himalaya, the arid Bhotia valleys and Tibetan Marginal Mountains. Although more males than females emigrated into Chitwan, the proportion is not unduly heavy -- 105 for the population overall compared with 111 for the immigrant population. It is very noticeable, however, that there are more females in the 20-34 age-group. This would indicate that Chitwan itself is an area of out-migration, but these in-migrant age-groups are also predominantly female.

35. Although it was the site of a resettlement scheme as early as 1954, and is situated in the region with the largest 1961-71 intercensal growth rate, Chitwan district is typical of the considerable movement of people from the hills permanently settling in the Terai and Chure Hills. In the period 1961-71, population increase in the Mountain and Hill regions did not exceed 17 percent, while in the Central and Eastern Terai the population was a third larger, and in the Western Terai twice as large in 1971 compared with 1961. To some extent the Terai has replaced India as the goal of the Hill migrant. The reasons for the migration are pressure on land resources. (Of the total area of Nepal, 40 percent is not usable for agriculture, being either too high, too steep, or too infertile, and a further 30 percent is forested. It is estimated that only 13 percent of the land area is cultivated, whilst 90 percent of the population rely on agriculture for their livelihood.) No accurate study has been made of the pressure of population on resources in the Hill and Mountain regions, where agricultural density is about four times that of the Terai region. All suitable land available for agricultural production in the Hill region is already occupied. The result has been (a) fragmentation of holdings until the average family holding is just under 0.3 hectares; (b) out-migration of males who have no economic holdings; and (c) the gradual but definite encroachment on to steeper slopes which are not suitable for agriculture, even under the intensive terrace cultivation practiced in the region, and denudation of the forest area. Severe erosion is clear evidence of this pressure.

36. Within the country itself, there is a strong seasonal flow of people moving down from the higher Hill region in winter to the lower areas. This movement has not been measured, or adequately described, but probably involves over a million people with their animals, trekking down into the warmer hill valleys to graze their flocks before returning in the spring with salt and manufactured goods. The population of a Hill bazaar such as Pokhara is likely to double in winter. Population mobility is at its highest when rivers are low and fordable.

37. Other important population movements have been (a) the return of Gurkha soldiers following the run-down of British military bases in southeast Asia; (b) the influx of refugees from Tibet which started in 1960; and (c) the return of Burmese and Indian-born Nepalese to Nepal.

I. Literacy and Languages Spoken

38. Only 9 percent of the population aged 10 or more in Nepal were enumerated as literate in 1961 (defined as able to read a book and write a letter). By sex, 16 percent of males and only 2 percent of females were literate. Urbanization is perhaps even more a determining factor for literacy than sex. Thus, literacy was higher for women in urban areas than for men in rural areas; 19 percent and 15 percent, respectively. Overall, 39 percent of the urban and 8 percent of the rural population were enumerated as literate. Regional differences exist, but with the exception of the relatively high literacy in the Kathmandu Valley, they are minor. Kathmandu was the district with the highest percentage of literate children aged 10-14, 50 percent of boys and 28 percent of girls, while certain districts in the Western Hills (Jumla, Achham and Salyan) had the lowest, less than 5 percent for boys and almost zero for girls. No figures are available from the 1971 census to measure the impact of recent efforts to expand educational opportunities.

39. About 60 languages and dialects are spoken in Nepal. Nepali is the main language; in 1961, it was the mother tongue of 51 percent of the population. It is the mother tongue of the majority in Western and Eastern Hills and in Eastern Inner Terai. It is also the main mother tongue in Central Inner Terai and that of a large minority in Kathmandu Valley and in Western Inner Terai. Nepali is relatively unimportant as a mother tongue in the whole of the Terai.

J. Religion

40. Hinduism is the main religion in Nepal. In 1961, 88 percent of the population were Hindus, 9 percent were Buddhists and 3 percent were Muslims. In all regions Hinduism was the major religion. Buddhism is mainly found in the Western and Eastern Hills. In some districts in those areas, such as Sindhupalchok and Nuwakot, and also in Chisapani district in Central Inner Terai, where immigrants from Burma of Nepali origin have resettled, the proportion of Buddhists was between 40 percent and 50 percent. Muslims are found particularly in the Terai where they formed 10 percent of the total 1961 population.

K. Urbanization

41. There is evidence of urbanization in recent years, in particular for young males. In 1952-54, there were 10 localities with a population of

at least 5,000 (defined as urban) and which had 2.9 percent of the total population of Nepal. In 1961, the number of such localities was 16 with 3.7 percent of the population. Also in 1961, males aged 15-34 formed 38 percent of the urban but only 32 percent of the rural population. The internal migration of young men is clearly shown by the relative increase between 1952-54 and 1971 in the number of males aged 15-34 living in towns (no comparable figures are available for 1961). Thus, in the 20-24 age-group, there were 54 percent more males and females living in Kathmandu in 1971; in 1952-54 there were 17 percent more. Lalitpur and Bhaktapur, the second and third largest towns, respectively, also show increases but at a lower level.

<u>Age</u>	<u>Males per 100 Females in Kathmandu City</u>	
	<u>1952-54</u>	<u>1971</u>
15-19	102	134
20-24	117	154
25-29	114	140
30-34	112	124

L. Nutrition

42. Information on nutrition is very limited. The NHS collected some data on food consumption, but it was done on a 24-hour recall basis and at one season of the year only. In 1966 and 1967 the Ministry of Land Reform, Agriculture and Food undertook two food consumption surveys in the villages of Kusa Deis and Batutechoun respectively. The Survey concluded that the average intake of calories and iron was adequate, of protein near adequate, and that of riboflavin and vitamin A was low. The sample size was, however, very small and it is not possible to draw these conclusions for the Nepalese population as a whole. Diet varies widely according to agricultural opportunity, socio-economic status, and cultural patterns. In the Terai, which accounts for 80 percent of the sown acreage, rice is the main food grain. In the remainder of the country, barley, maize and wheat are of importance. Millet and potatoes are important crops, the latter serving as one of the staple foods in the Himalayan region. The rugged terrain inhibits the distribution of food stuffs. Among other factors limiting the transfer of grain from the food surplus areas of the Terai to the food deficit areas in the Mountain and Hill regions are the high cost of internal transport, ease of communications with India, proximity to the grain deficit States of Uttar Pradesh and Bihar, and higher prices obtainable in India. Beef is not eaten for religious reasons; fish is generally not available.

43. Health aides are expected to provide nutrition education to pregnant mothers and pre-school children. They receive some nutrition education during their six weeks training course. Health aides do not have the equipment for food demonstration programs. The critical age for child survival is at 18 months when the child is weaned and immediately put on largely indigestible grain foods. The World Food

Program proposes to distribute skim milk and CSM (Com-soya-milk) to mothers and babies through the Nepal Children's Organizations which will, in turn, use Family Planning/Maternal and Child Health (FP/MCH) centers, mission hospitals, the Red Cross, etc., as outlets. An FAO consultant has recommended that the distribution of these foods should be linked to basic nutrition education.

M. Abortion

44. There are no data on induced abortions, which are illegal in Nepal, but it was suggested to the mission that the legalization of abortion would be an important step towards a reduction of fertility. In the Kathmandu Maternity Hospital, 85 percent of all abortion cases seen, the majority of which were among women of higher parity, were said to have been induced illegally.

N. Population Projections

David Projections

45. The most widely used set of projections extending for more than the next 10 or so years is that prepared by David. ^{1/} Population figures are given for the period 1970-95 in steps of five years and under different fertility assumptions ranging from no change in fertility to a 50 percent reduction by 1995. The base population in 1970 is taken as 11.4 million and is based on a projection from the 1961 census figure of 9,829,000 as adjusted by Krotki and Thakur. Other initial assumptions include a general fertility rate of 45, which corresponds to a sex-age adjusted birth rate of about 50, and a life expectancy at birth of 37.5 in 1956-61. No net migration is assumed. It is possible that the base population assumed by David -- 11.4 million -- is somewhat on the low side and that his assumption of life expectancy at birth of 37.5 years in 1956-61 may be rather too high. Until, however, the 1971 census data have been analyzed, David's projections provide, on the whole, probably the most reliable figures available on future population estimates. Some details from the projection figures are given in Tables A-3 to A-7 of Annex 2.

46. The projections show that in the 25-year period 1970-95 the population of Nepal would double from 11.4 to 22.7 million if there is no drop in fertility. With a 25 percent drop, it would increase to 20.6 million and with a 50 percent drop to 18.4 million.

1/ A. S. David, National Development, Population and Family Planning in Nepal, Kathmandu, 1968.

Projected Total Population
(In millions)

<u>Fertility Reduction</u> (percent)	<u>1970</u>	<u>1975</u>	<u>1980</u>	<u>1985</u>	<u>1990</u>	<u>1995</u>
0	11.40	12.90	14.72	16.91	19.56	22.75
5	11.40	12.89	14.67	16.79	19.31	22.32
10	11.40	12.88	14.61	16.66	19.06	21.89
15	11.40	12.86	14.56	16.53	18.82	21.46
20	11.40	12.85	14.51	16.40	18.57	21.02
25	11.40	12.84	14.45	16.28	18.32	20.59
30	11.40	12.82	14.40	16.15	18.07	20.16
35	11.40	12.81	14.35	16.02	17.82	19.73
40	11.40	12.80	14.29	15.89	17.58	19.31
45	11.40	12.78	14.24	15.76	17.33	18.88
50	11.40	12.77	14.19	15.64	17.08	18.45

47. Within the projection period, the annual rate of population growth would increase from about 2.5 percent to 3.1 percent if there is no fertility drop while it would remain almost static if there is a 25 percent drop and it would decrease to 1.5 percent if there is a 50 percent drop. The crude birth rate would remain virtually constant at its 1970 level of 45 if there is no fertility drop but would decrease to 36 under a 25 percent fertility drop or to 26 under a 50 percent fertility drop. Under all projections, the crude death rate is expected to decrease from about 20 to about 13. The proportion of children under 15 is expected to increase from 42 percent to 45 percent if there is no fertility drop but to decrease to 40 percent under a 25 percent fertility drop or to 34 percent under a 50 percent fertility drop.

World Bank Projections

48. A second set of long-range projections is that prepared by the Bank for the period 1970-2001. For the base year 1970, a total population of 11.2 million is assumed as estimated by the United Nations. For the same year, age-specific fertility rates are estimated from regional models showing a gross reproduction rate of 2.95 while life expectancy at birth is estimated at 41.7 years. Projections are based on two groups of fertility assumptions. Under the high assumption, fertility remains constant while under the low assumption it drops to a total of 50 percent reduction in the gross reproduction rate by 2000. The same mortality assumptions are made for both sets implying an increase in life expectancy to 56.9 years by 2000. No net migration is assumed. Details of the projections are shown in Tables 1.8 and 1.9 in Annex 2.

49. The Bank's and David's projections support each other since on the whole, assumptions are similar. The only major difference between the two sets is in their assumptions of the base year population; the mission assumes 11.2 million while David assumes 11.4 million. Recent evidence from the 1971 census suggests that the United Nations estimate, also used by the Bank, is too low and that even David's assumption may be too low. If the base population in the mission's projections is increased

from 11.2 million to 11.4 million, the adjusted figures for the total population are much closer to David's totals.

	<u>Projected Population in 1995</u>	
	<u>No Fertility Drop</u>	<u>Fertility Drop /a</u>
	(In Millions)	
World Bank (Unadjusted)	21.7	17.9
World Bank (Adjusted)	22.3	18.5
A. S. David	22.7	18.9

/a The figure shown for David's projection corresponds to his assumption of a 45 percent drop in fertility. That figure was chosen as being closest to the mission's implied drop of 46 percent.

II. FAMILY PLANNING PROGRAM

A. Family Planning Development

50. Family planning services are provided as one of the vertical programs operating under the general direction of the Department of Health. In 1966, the late King Mahendra declared that family planning was essential to ensure the continued development of the country's human and economic resources. Earlier awareness of family planning was stimulated in 1956 by the Nepal Medical Association in collaboration with the Pathfinder Fund. Subsequent development included the formation of the FPAN in 1958, which was reorganized in 1965 and admitted to membership of the Indian Ocean Region of the International Planned Parenthood Federation (IPPF) in 1969. The government program started in November 1968 with the creation of a semi-autonomous Board to develop a Family Planning (FP) and Maternal and Child Health Project (MCH). At first, the State Minister of Health was Chairman with Departmental Secretaries as members. He was succeeded by a chairman appointed in a personal capacity, and on reorganization in 1971, the Director General of Health Services was made ex-officio Chairman.

B. Structure of Health Services

51. Health services in Nepal are rudimentary and unevenly distributed. The Department of Health is headed by a Director General, assisted by two deputies responsible for curative and preventive services respectively. Five zonal health offices were opened during the Fourth Plan (1970-75). None, however, are properly staffed and fully operational. Plans to establish district health offices in seven of the 75 districts have not thus far materialized. At the peripheral level are health centers, health posts and hospitals. During the Third and Fourth Plans, existing health centers have

been, or will be, converted either into 15-bed hospitals or health posts. At present, 153 health posts exist but many are not fully functional because of inadequate staff, buildings, and/or equipment. In principle, a health post will be established in the Terai for every 25,000 people, and in the Hills for every 10-15,000 people. The Fourth Plan provides for a total of 250 health posts by the end of the period. The effective operational zone of a health post is very limited -- to no more than a three to five mile radius. Because of the lack of intermediate administrative levels, peripheral health services have to be controlled directly from Kathmandu.

52. In addition to the services administered directly by the Department, there are four "vertical programs" run by autonomous agencies under the aegis of the Department of Health. Of these, the Nepal Malaria Eradication Organization (NMEO) is the largest, covering a population of some six million people in the Hill areas below 4,000 ft from the Terai. Each household is visited once every 20 days and the visiting program is well supervised with a ratio of one supervisor to every house visited. During a 20-day round a house visitor in Khaski district covers, on average, 32 villages, 1,044 houses and some 5,400 people. From the district malaria office, a shuttle of couriers keeps contact with the visitors taking out supplies and wages, and returning with slides and reports. The Chief Officer of the NMEO has important administrative powers of hiring and firing personnel, adjusting salaries and allowances, and a direct line of executive command to the lowest staff level. The incidence of malaria has been brought to a low level (2.44 per 1,000 population in 1971). With the exception of the Western Terai, the malarial areas have been brought into a consolidation phase. Serious problems are still posed by the impact of malaria cases (30.0 percent of all positive cases in 1971), uncontrolled settlement in the Terai, and the presence of a newly-incriminated vector in the Terai.

53. The other vertical programs are concerned with tuberculosis control (largely limited to the Kathmandu Valley), leprosy control, smallpox eradication, and FP/MCH.

54. With the possibility of reduced U.S. assistance, the malaria program may be facing serious financial problems. Expenditures in FY1971 totalled NRs 14.8 million (of which USAID provided NRs 8.4 million) and NRs 15.2 million in FY1972 (of which USAID provided NRs 6.1 million). Funds available for the final three years of this Plan period total only some NRs 10.0 million. The government established a review team, with WHO and USAID support, to "frame the minimum requirements of the program to maintain the gains achieved so far with great efforts and costs, so as to enter into organized and integrated Basic Health Services." To test health services integration, two pilot areas have been established in Khaski and Bara districts respectively. The former was established in December 1971 and was visited by the mission. In Khaski district, there are virtually no health services in the rural areas and the objective of the pilot scheme is to test the effectiveness of turning the NMEO house visitor into "polyvalent deliverer of health services." In addition to their malaria responsibilities, the house visitors are given responsibility for smallpox vaccination, tuberculosis, leprosy, health education and family planning. For the latter

function, the house visitor receives two days training. Except for a system of tracing defaulters which had just been started, the mission was told that "integration" had meant little change in practice. In practice, it appears to mean "coordination". The review has recommended integration carefully phased with the expansion of basic health services.

55. In FY1971-72, the annual health budget was 4.8 percent of the national budget. It totalled NRs 52 million, of which two-thirds were funded from the development budget and the remainder, including salaries and drugs, from the regular budget.

Budgetary Allocations FY1971-72
(NRs - in Millions)

<u>FY1971-72</u>	<u>Development Budget</u>	<u>Regular Budget</u>	
Preventive	21.8	4.5	26.3
Curative	5.2	13.0	18.2
FP/MCH	<u>7.5</u>	-	<u>7.5</u>
	34.5	17.5	52.0
 <u>FY1972-73</u>			
Preventive	24.6	NA	NA
Curative	4.6	NA	NA
FP/MCH	<u>5.8</u>	-	<u>5.8</u>
	35.0	22.0	57.0

The health budget for FY1972-73 does not include provision for paramedical training; this is borne by the education budget.

56. The per capita expenditure of the 1971-72 budget was NRs 4.8 million, distributed as follows:

	<u>NRs - In Millions</u>
Malaria Eradication Project	1.30
FP/MCH Project	0.60
Smallpox Eradication Project	0.20
Tuberculosis Control Project	0.01
Leprosy Control Project	0.01
Curative and Other Health Services	<u>2.68</u>
 TOTAL	 4.80

57. There is a serious shortage of doctors, paramedical and other health services staff. In 1971, there were only 311 doctors (one per 36,300 people), 158 graduate nurses, 223 auxiliary nurse-midwives (ANMs), and 405

auxiliary health workers (AHWs). There are two schools of nursing (one of which is mission-operated), three training schools (for assistant nurse-midwives) and one for AHWs. Health posts are now staffed primarily by AHWs (male and female), who have had two years of training. ANMs are mainly used for hospital duties.

C. Family Planning Organization

58. The Project Board is responsible for FP/MCH policy and meets monthly; it comprises representatives (nominally of Under-Secretary rank) of the Ministries of Health, Education and Finance, and the Planning Commission. Executive responsibility for FP/MCH rests with the Project Director. He is supported by a Deputy Director and six sections covering general administration, fiscal administration, supply and procurement, evaluation and statistics, information and education, and training. The project is responsible for running FP/MCH clinics in the districts. At the most senior field level is the Regional Medical Officer (an FP/MCH appointment despite the title), of which four posts have been established. By December 1971, 27 of the 75 districts had been staffed by FP/MCH officers. Twenty five officers were first appointed in early 1970; they were graduates with three months training in FP/MCH. Five more officers will be appointed during the Fourth Plan period. Each officer has responsible supervisory responsibility for FP/MCH under one district, but there are exceptions where officers cover clinics in adjacent districts. There are at present 90 centers, of which 10 are in Kathmandu district, the majority of which are attached to hospitals and health posts. It is proposed to expand these to 250 during the Fourth Plan period. The project uses AHWs and ANMs to staff its centers. After basic training, both categories receive special orientation in FP/MCH work. A category of paramedical workers, peculiar to the FP/MCH project is the Health Aides. They are under the direction of the Board which is responsible for laying down their numbers, type of training, and duty stations. Health Aides must have eight years of schooling and then receive a six weeks training course. They are usually young (early 20's) and usually selected from the district in which they will eventually serve. They comprise about 40 percent of the total staff and are primarily concerned with making surveys of priority couples, motivation, distribution of contraceptives and simple medications.

59. In the early development of the program, there was considerable friction between medical officers and district family planning officers. Often, FP/MCH clinics were established with little regard to the existing pattern of health services. FP/MCH staff were paid better allowances which created jealousies. The situation is clearly much better now, but it is questionable whether, with its scarce human and financial resources, Nepal can afford to run an organization essentially working parallel with the Health Department.

60. The program offers four methods of contraception -- oral contraceptives, condoms, IUDs and vasectomy. In the Maternity Hospital in Kathmandu, female sterilization is practised but only in connection with gynecological or obstetric cases. In the FP/MCH clinics, all contraceptives are prescribed

free. Since the project started, the IUD has declined both numerically and in relative importance. This was probably due to severe side effects which generated negative rumors in which the social factors were as important as the medical ones. It is also probably due to the fact that most women accept examination and treatment only by lady doctors, who are in short supply and concentrated, in any case, mainly in the Kathmandu Valley. Board approval has been given to the use of paramedical staff for IUD insertions, but no action has been taken. The largest number of new acceptors come for condoms. Although condoms have been given in previous years by SIDA, India, Pakistan, and the Pathfinder Fund, the major source of supply is from USAID. Silver-Tex is the brand of condoms imported, and Ovrul-28 and Ovulen-FE-28 are the oral contraceptives used. The mission noticed that neither condoms nor oral contraceptive packets were date-marked, which must create supply problems, particularly with condoms. There is a liberal oral contraceptive distribution program. Oral contraceptives may be issued by all project staff, including Health Aides, providing the responses of the clients to seven indicator questions are satisfactory. Up to three cycles are distributed at a time to new acceptors depending on the distance the client lives from the clinic. Vasectomy is of relative importance in the program, and has been promoted mainly in temporary camps, many of which were served by mobile teams using USAID-financed helicopters or STOL aircraft. Doctors receive a payment of NRs 20 for each vasectomy performed and NRs 5 for each IUD insertion. There are no other diffuser incentives and no acceptor incentives. No customs or excise duties are imposed on contraceptives entering Nepal. Trials of Depo-Provera, involving 45 women, are being held in a clinic in the Kathmandu Valley.

D. Family Planning Budget

61. Budget allocation for the FP/MCH project rose from NRs 98,000 in FY1960-67, to NRs 2 million in FY1968-69, and to NRs 7.5 million in FY1971-72. In the latter year, the project accounted for 14 percent of the total (development and regular) health budget, and 6.7 percent of the national budget. Although not finalized, it is anticipated that the budget for FY1972-73 will be cut back to NRs 5.8 million (US\$574,000). This was explained by the fact that the previous years budget included NRs 3.0 million for construction which will not be repeated. In the budget, provision is made for:

<u>Item</u>	<u>NRs - In Millions</u>
Publication and Education	0.6
Training	0.3
Research and Evaluation	0.2
FP/MCH Services	3.5
Administration (Salaries, etc.)	<u>1.2</u>
TOTAL	5.8

E. Foreign Assistance

62. Considerable assistance, in the form of financial support, provision of air transport, foreign training, contraceptive supplies, and advisory services, has been provided by USAID. Between 75 percent and 80 percent of the operating and construction budget was provided by USAID; this proportion will drop to 66 percent in FY1972-73. Insofar as the project has close links with the Health Department, WHO advisers provide advice in paramedical training and the development of health services, particularly in "integration". WHO does not, however, provide answers directly to the FP/MCH program. UNICEF provides drugs and medications for MCH work, and has provided some vehicles. Until April 1970, it was also providing supplies of dried milk but stopped when WFP agreed to take over this program. For a variety of reasons, mostly concerned with the problems of Bangladesh, no milk has arrived since. The first shipments of milk and of CSM (a multi-purpose high protein food) are expected in August. Policy is apparently not to distribute stocks of milk and CSM, but to prepare them as food and distribute them through schools, clinics, etc.; the difficulties involved in this approach are not inconsiderable, and it may do little to prevent leakage to the bazaars. The IPPF gives considerable financial support and occasional advisory assistance to the FPAN. The United Nations, mainly through the Population Division of ECAFE, has provided short-term advisory services in connection with statistical collection and analysis.

F. Family Planning Service Delivery

63. In present operational circumstances, FP/MCH clinics are usually held two days per week. During the rest of the week, Health Aides carry out their priority couples survey and do house visiting from the center at which they are based. To test the feasibility of a different staffing pattern, a pilot project involving two districts (Trisuli and Banke) has been started. In these districts, Health Aides from several Panchayats have been selected for six weeks additional training and have returned to live in or near the Panchayat in which they will operate. Each Health Aide has supplies of contraceptives and refers patients for MCH services, IUD insertions, vasectomies, etc. to the nearest clinic. The Health Aides are expected to make full use of Panchayat leaders and of their local influence. This type of decentralization may well prove to be the most effective way of delivering service and of following up new acceptors, which is now scarcely done at all.

G. Education and Information

64. The Education and Information program is directed at three main audiences. The first is population education for politicians and community leaders. The second is aimed at parents using mass media and individual motivation work. In this connection, use is made of a priority couples

survey -- a refined use of the Indian concept of an eligible couples register. A house listing of all couples is made, with the names and ages of parents and the number and sex of children under five and the number of children over five. A system of points is then applied to each couple and a rating A, B, or C in describing order of priority is assigned to each. The purpose of the survey is to identify couples for motivation. In addition to individual contacts, mass media are used. With a low (about 10 percent) level of literacy, the radio is the most important of the mass media. Although Panchayats collect fees for radio receivers, the government has no figures of the total number of sets. Estimates put the number of licensed sets at 100,000 and the number of unlicensed sets at 30-50,000. Of the total, about one-third are in the Kathmandu Valley. The FPAN uses the radio to broadcast family planning information and the FP/MCH project buys commercial time to put across family planning spot announcements. Posters, calendars, a bi-monthly magazine, and pamphlets are also used to create an awareness of family planning among the general public. Films are also being used, both by the FP/MCH project and the FPAN. Apart from assistance with the production of a family planning film, the Ministry of Communications has not been involved in the project's information work. The third audience comprises the school-going population. With the cooperation of the Ministry of Education, elements of population education have been included in a reform program for secondary school science. This has involved in-service teacher retraining, material production, and curriculum re-writing. An Education and Communications Manual has been produced by the Information Section for field operations. The concept of direct mailing has been pretested among a small sample of 50 persons in the Kathmandu Valley; it produced ambivalent results and the low level of literacy raises doubts as to its general application.

65. The Center for Economic Development and Administration which was established in July 1969, could play an important part in research and in stimulating policymakers to consider population as an important planning element. The Center held a seminar on "Population and Development" in July 1971, with the assistance of USAID, and is preparing to start three research projects covering (a) population and policy change, (b) migration, and (c) labor-intensive development.

H. Data Collection and Evaluation

66. Within the FP/MCH structure, there is a small Evaluation Section responsible to the Deputy Project Chief. Its staff consists of an evaluation officer, an assistant evaluation officer, a demographer and some minor part-time clerical assistance. According to the draft prepared by the FP/MCH project for incorporation in the current Fourth Five-Year Economic Plan, the full-time staff of the Evaluation Section would expand to 15 by 1975 while 20 coders and 50 interviewers would have been included in 1970-71 on a part-time basis. The second year of the Plan is currently approaching its close and there has been no significant expansion in the staff of the Evaluation Section nor does any extensive recruitment appear likely in the near future.

67. Initially, the Evaluation Section was expected to play a dynamic role in the continuous assessment of family planning activities. The

collection of reliable and adequate data, their processing and analysis and the feedback of findings were considered indispensable to the efficient functioning of the family planning campaign. Later, however, the loss of momentum, which affected other aspects of the project, extended to the Evaluation Section. Its main preoccupation appears now to be merely the collection and processing of elementary data for the annual report of the FP/MCH project. More seriously, very little effort appears to be made to check and improve the quality of the data or to ensure that they are reported less erratically from the field.

68. The Evaluation Section obtains most of the data it uses from the family planning record, a card filled by the FP/MCH centers for each acceptor of family planning services. A copy of each new record is sent monthly to the Evaluation Section. The record covers most directly relevant types of demographic and social information and it also includes questions on medical history, mainly used to identify pill contra-indications. With only slight differences, the same type of card is used for female acceptors and for vasectomy cases. A register is also kept by the centers which record every visit made by clients and, in the cases of pills or condoms, the quantity supplies. Any more detailed comments on visits to the center are, theoretically, entered in the client's family planning record but, usually only the date and quantity of supplies taken are entered. The FPAN uses the same types of form as the FP/MCH and a copy of the record of each new acceptor is also sent to the Evaluation Section. FP/MCH and FPAN centers are required to supply monthly returns of the total number of new acceptors by method and of pill cycles and condoms distributed and, in the case of FP/MCH, summary data on services other than family planning.

69. Despite the initial intention that a family planning record should be completed for every acceptor, virtually no information is usually obtained from condom acceptors. A record is kept which may or may not be sent to the Evaluation Section, but it contains almost no details. Even for acceptors of other methods, copies of the record are often not sent or sent late. Only the monthly summary returns appear to be submitted punctually. Thus, in early August 1971, when the most recent annual report was prepared covering the year to end June 1971, the number of records returned was only 71 percent of total new acceptors (excluding condoms) as derived from the monthly summary data. It was not known how many additional records were received after publication of the report.

70. Contacts between the Evaluation Section and the field force are not as close or as frequent as would be desirable. No doubt, at least partly, this is because the Section has only a very small staff and it is difficult to visit the field regularly and train fieldworkers. At the same time, field personnel cannot leave their duties to attend frequent meetings elsewhere. Despite difficulties, however, what is needed, after an initial training period, is close supervision of field workers' actual performance to ensure that data supplied are as accurate as possible. In view of the usual problems of data collection from largely illiterate and innumerate populations, it is important that at least errors due to the fieldworkers are minimized. The quality of the data should be more closely checked both by on-the-spot visits and by a more careful examination of the submitted returns.

71. Without a doubt, the area where the most urgent reform is needed is the follow-up process. Fieldworkers are generally left to decide by themselves on the follow-up visits to make. There is a general directive that pill cases should be given priority but, since very little is known of most condom users and since IUD acceptors form only a small minority, the value of such a directive is doubtful. The timing and number of follow-up visits also depends very much on individual fieldworkers. In theory, an entry is made in the family planning record of any follow-up visit and of its outcome but there is no check and no information is forwarded to the Evaluation Section. The almost complete lack of supervision results in a situation where follow-up visits in Nepal practically do not exist. The direct outcome of this is the extremely low continuation rates discussed later in this report.

72. One of the main activities of the Evaluation Section was originally planned to be the organization of the follow-up system and of follow-up surveys. Almost nothing has, however, been done. Several months ago, the centers were asked to provide data from the records on acceptors who had dropped out, but only 14 centers complied out of 86 qualifying. It is difficult to accept assertions that serious attempts had been made to obtain the missing data when even the FP/MCH center housed in the same building as the Evaluation Section had not reported. It would be difficult to over-emphasize that, particularly while the program is basically pill-and-condom-oriented, the development of an efficient and extensive follow-up system based on home visits is indispensable. At the same time, follow-up surveys must be carried out to measure continuation rates more fully than is possible from the records kept at the centers. Such surveys would also attempt to identify the characteristics and study subsequent contraceptive behavior and pregnancy history of drop-outs, and to establish reasons for termination.

73. Almost no data are available on the nation-wide commercial sales of contraceptives. In addition to Sajhaswasthya Sewa Pharmacy, which retails, at low cost, supplies purchased from FP/MCH, a number of private importers, distributors and retailers also exist. Although total sales are not expected to be large, this has not been verified. The trend in sales over time could also be a significant indicator of family planning awareness. The Evaluation Section should attempt to obtain such data, and this should not be a very difficult task. In fact, during visits to a number of pharmacies, the mission found a most cooperative attitude towards its enquiries. In addition, data on the import of contraceptives are submitted to the Central Bureau of Statistics (CBS) by customs offices. Processing of that data runs, however, years late. A demand should be made to CBS for an analysis of the figures.

74. There are no mechanized data processing facilities at present available to the Evaluation Section. Although the family planning record is pre-coded, tabulations are prepared by hand. Moreover, clerical support is not adequate. This often leads to a loss of interest in the collection and analysis of data. CBS should be requested to carry out the processing of data collected on a continuous basis. While CBS is having its own difficulties in the analysis of the census data, alternative arrangements

will need to be made for the processing of ad-hoc data. In this connection, some strengthening of clerical support is necessary.

I. Performance Statistics

75. The FP/MCH Project began in February 1968. Performance statistics of the project are available as from July 1968, coinciding with the beginning of the financial year 1968-69. Prior to that date no exact data are available on the number of acceptors, but the number of continuing users was negligible.

76. At the end of calendar year 1971, i.e., 3-1/2 years after the date when statistics began to be available, the total number of new acceptors was 95,000. The number of new acceptors increased almost three-fold from 1968-69 to 1969-70 but the increase between 1969-70 to 1970-71 was only about one-quarter. Judging from the figures of the first six months, any increase in 1971-72 may well be smaller still. The FPAN accounts for about 22 percent of all acceptors but its share of new acceptors has been decreasing and it was only 14 percent in the last six months of 1971-72.

77. The target number of acceptors at the end of the current Five-Year Plan in 1975 was set at 329,000, i.e., an estimated 15 percent of married females aged 15-44. This figure includes about 38,000 acceptors before the beginning of the Plan period. The total target was subsequently split into annual targets, but the exact basis of the splitting could not be explained. The target for 1970-71, the last complete financial year, was set at 18,603. Although this figure was exceeded by more than 100 percent, there would have to be a very rapid acceleration in the number of acceptors in the remaining three years if the target is to be anywhere nearly approached. It should be pointed out that the target is for acceptors and not for current users.

78. The most common method adopted is condoms. About 48 percent of all acceptors, FP/MCH and FPAN, chose condoms and their proportion is gradually increasing. The pill was the method chosen by 34 percent of the acceptors. Vasectomy accounts for 14 percent and IUD for 4 percent. The popularity of vasectomy and IUD has dropped very substantially since the first year of FP/MCH operations, although IUD cases seem to be on a slight increase recently. The FPAN relies even more than the FP/MCH on condoms which is the method chosen by 79 percent of all its acceptors. Those choosing vasectomy and the pill make up about 8 percent and 13 percent respectively. IUD is almost negligible as a method among FPA acceptors. Total acceptors, FP/MCH and FPA, by year and method are given below. Figures for FPA acceptors alone are given in Table A-10 of Annex 2.

New Acceptors

<u>Year</u>	<u>Vasectomy</u>	<u>Pill</u>	<u>IUD</u>	<u>Condom</u>	<u>Total</u>
1968-69	3,292	1,355	1,183	1,972	7,802
1969-70	3,888	10,263	1,109	14,480	29,740
1970-71	4,441	13,496	711	18,785	37,433
1971-72 /a	<u>1,600</u>	<u>7,141</u>	<u>615</u>	<u>10,661</u>	<u>20,017</u>
TOTAL	13,221	32,255	3,618	45,898	95,992

/a First six months only.

79. At the end of FY1970-71, there were 86 FP/MCH centers in Nepal. They were spread in 43 of the country's 75 districts but their density varied considerably between the major regions. Thus, on the average, the ratio population/centers was about 39,000 in the Kathmandu Valley, 118,000 in the Terai (including Inner Terai) and 190,000 in the Hills. A target of the current Five-Year Plan is the expansion to 260 centers by 1975 with more emphasis outside the Kathmandu Valley.

80. Figures on the distribution of pills and condoms by the FP/MCH project and the FPA were obtained for financial years 1969-70 and 1971-72, and for the first six months of 1971-72. The number of pill wallets distributed increased sharply between 1969-70 and 1970-71 from 36,000 to 63,000. For the first six months of the current financial year, it was 36,000 which suggests a more moderate increase. During the same period, the number of condoms went up from 267,000 to 327,000 and it was 195,000 for the first six months of 1971-72.

<u>Year</u>	<u>Contraceptives Distributed</u>	
	<u>Pills</u> (Wallets)	<u>Condoms</u> (Units)
1969-70	36,329	266,519
1970-71	62,865	327,098
1971-72 /a	36,306	195,153

/a First six months only.

81. Two distinct types of commercial sales of contraceptives exist. Sajhaswasthya Sewa Pharmacy purchases pills from FP/MCH at 20 paise per cycle and sells them at 50 paise per cycle. The same buying-and-selling prices per pack of 12 apply to condoms obtained from FP/MCH. The brands involved are Ovral and Ovulen for pills and Silver-Tex for condoms. Since the arrangement took effect in July 1971, 2,200 pill wallets and 23,328 packs of condoms were sold. Although pill sales are modest, the number of condoms sold by the pharmacy, which operates only in Kathmandu, may be as much as about three-quarters of that sold by the FP/MCH and FPA in the whole of Nepal. Ordinary commercial distributors also exist but, as indicated earlier, total sales in the country are not known. Allied Pharma, the sole

importers and distributors in Nepal of Lyndiol, Gynovlar, Primovlar, Anovlar and Minovlar have reported a total distribution of 3,044, 2,858 and 1,229 wallets in 1970, 1971 and the first four months of 1972 respectively. Before 1970, annual distribution did not exceed 1,000 wallets. From discussions held in Kathmandu, it seems unlikely that total annual sales through ordinary commercial channels would currently exceed 10,000 wallets. There is even less information on the sales of condoms but one major retailer, Nepal Medical Hall, reported approximate monthly sales of 100 dozen Gold Dollar brand at NRs 2 per dozen.

82. The FP/MCH project, in addition to family planning services, provide ante- and post-natal services, medical treatment to infants and pre-school age children, and smallpox vaccination. The relative increase in the number of new family planning acceptors between 1969-70 and 1971-72 (assuming that acceptors in the first six months of the year will form one-half of total acceptors in the year) was very similar to increases of new acceptors for most other services. The increase in new family planning acceptors was 46 percent, while other increases were between 31 percent and 39 percent, with the exception of smallpox vaccinations which increased by only 19 percent, and of the number of pre-school age children treated which increased by 75 percent. These figures provide one indication that family planning may not be losing ground to other services provided by the FP/MCH project. The data are shown in detail in Table A-11 of Annex 2.

J. Acceptors' Characteristics

83. Acceptors' characteristics are available for the periods 1969-70 and 1970-71. However, not all centers fully reported such details. For 1969-70, the proportionate response is not known but in 1970-71 figures are available on 71 percent of vasectomy, pill, or IUD acceptors. As already pointed out, no details are available for condom users. In this section, some summary information is given, largely on 1970-71 acceptors. Where significant differences are known to exist from the 1969-70 acceptors, they are mentioned. Additional data are given in Tables A-12 and A-13 of Annex 2.

Age

84. On the average, couples accepting the pill were the youngest, followed by IUD and vasectomy couples. The average age of pill acceptors was 29.7. This compares with 30.9 for IUD acceptors and 32.3 for the wives of vasectomy acceptors. Vasectomy acceptors' average age was 37.9 while that of the husbands of IUD acceptors was 36.2 and of the husbands of pill acceptors 35.1.

Average Age of Acceptors, 1970-71

<u>Method</u>	<u>Wife</u>	<u>Husband</u>
Vasectomy	32.3	37.9
IUD	30.9	36.2
Pill	29.7	35.1
All Methods	30.4	35.8

Children Born

85. The average number of children born to new acceptors in 1969-70 was 7.1, 5.8 and 5.5 for vasectomy, IUD and pills respectively. No corresponding data are available for 1970-71 but the number of surviving children did not differ materially between the two years and in 1969-70 was 5.0, 3.9 and 3.4 for acceptors of vasectomy, IUD and pills respectively. It is difficult to compare with precision the parity of acceptors to those for the population as a whole since no reliable data exist for the latter. Therefore, any comparisons must be rather vague. Nevertheless, the available evidence suggests that, in the same age-group and on the average, family planning acceptors probably have had no more live births and, almost certainly, have a considerably larger number of surviving children than the population as a whole. At around age 30, the average difference may be as much as about two surviving children. The sex ratio of surviving children shows a higher than average male proportion, particularly among vasectomy and IUD acceptors. Thus, in 1969-70, male exceeded female living children by about 40 percent for acceptors of those two methods, but only by about 12 percent for pill acceptors. This may be associated with a tendency in some sections of the population to accept family planning services, particularly methods where greater commitment is involved, only when a certain number of sons has survived.

<u>Method</u>	<u>Average Number, 1969-70</u>	
	<u>Children Born</u>	<u>Children Alive</u>
Vasectomy	7.1	5.0
IUD	5.8	3.9
Pill	5.5	3.4
All methods	5.9	3.8

Limiting or Spacing Births

86. Of IUD acceptors, 27 percent stated that they would, or possibly would want to, have more children later. For pills, the proportion was 46 percent. Acceptors who stated that they wanted no more children were 1 percent and 54 percent respectively.

87. Of all new acceptors, 89 percent stated that they were referred to the centers either by Health Department and FP/MCH Project staff (58 percent) or by friends (31 percent). All other sources accounted for only 11 percent.

Panchayat Secretaries referred 11 percent of all vasectomy acceptors but they play only a very minor role in referring people to other methods.

Regional Variation

88. Some regional differences exist in the popularity of the various methods but, on the whole, they are not very large. Thus in 1970-71, condoms was the method chosen by 58 percent of acceptors in the Terai but by only 40 percent of those in the Hills. The pill is more common in the Hills (48 percent) than in Kathmandu Valley or the Terai (35 percent). Outside the Kathmandu Valley, IUD acceptors are an almost negligible proportion.

Percentage Distribution of Acceptors by Method, 1970-71

<u>Region</u>	<u>Vasectomy</u>	<u>IUD</u>	<u>Pill</u>	<u>Condom</u>	<u>All Methods</u>
Hills	12	-	48	40	100
Kathmandu Valley	8	11	35	46	100
Terai	6	1	35	58	100
All Regions	8	3	38	51	100

K. Continuation Rates

89. Very little information is available on pill and condom continuation rates and no information on those of IUD. Similarly, there are no available data on method changing but its extent appears to be very limited. The available information on pill and condom continuation rates is discussed below.

Pill

90. The only available complete data are the monthly number of new acceptors for FY1969-70 and FY1970-71 and the corresponding total number of wallets distributed (Table 1.12 of Annex 2). There are no figures on the number of wallets distributed to old, as distinct from new, acceptors. New acceptors may obtain up to three and old clients up to six wallets, but the actual distribution of the number supplied is not available. Despite these uncertainties, all indications are that continuation rates are extremely low. For instance, there is evidence that new acceptors at the end of 1971 formed only a slightly larger proportion of all current users than they did about two years earlier. As there was no major change in rate of recruitment of new acceptors within that period, this suggests a very high drop-out rate. Under certain plausible assumptions, the total number of pill users at the end of 1971 may be of the order of only 3,000 about half of whom would have joined for less than one month. This compares with a total number of acceptors to the end of 1971 of over 25,000. The only direct, although limited, data available certainly point to extremely low continuation rates. These related to 3,013 pill users during FY1970-71 (22 percent of all acceptors that year) at FP/MCH centers. They show that

only 22 percent of all those on the pill return to the center for re-supply after the first visit and only 2 percent are still taking them after one year. On the basis of these continuation rates, the earlier estimate of about 3,000 continuing users at about the end of 1971 would not be too low.

Condoms

91. For condoms also, no reliable continuation rates are available. The indications are, however, that the vast majority fail to return for re-supply after the first visit to the center. Thus, the number of total condoms (i.e., to new as well as to old acceptors) divided by the number of new acceptors only (since there are no data on the old) was 18.4 in 1969-70 and 17.4 in 1970-71. No complete data are available on the number of condoms issued on each visit. However, a sample check carried out in the Kathmandu area, showed that about 75 percent of all new acceptors obtained five packs of three condoms at the first visit and that the average number was 16.3 condoms. Therefore, new acceptors would account for 89 percent of all condoms distributed in 1969-70, for 94 percent of those distributed in 1969-70 and for 94 percent of those distributed in 1970-71. Although, because of inadequately-kept records, it is possible that some old acceptors may be recounted as new ones, the available data suggest that probably less than 10% of new acceptors return for re-supply.

92. From the meager available evidence and even under the most optimistic assumptions on the continuation rates of IUD recipients, the number of current users for all methods at the end of 1971 is unlikely to exceed one-quarter of the 96,000 acceptors to that date. Vasectomy cases would account for over 50 percent of current users while the combined users for all other methods may not exceed 10,000 as compared to 82,000 acceptors of those methods. As the number of new vasectomy cases is decreasing and the IUD is chosen only by a minority, the evidence strongly suggests that family planning in Nepal is making very slow progress indeed.

III. CONCLUSIONS

A. Operational

93. Family planning was referred to in the Fourth Plan under the heading of Health Services. The only targets recorded were the number of district offices to be raised to 40 from 25, and the number of clinics was set at 260 by the end of the period. Details of the Fourth Plan issued by the FP/MCH Project put the goal at limiting the population of Nepal to 16 million people over a 30-year period. It details the cost and number of staff required to achieve the targeted facilities. There is now an awareness that they cannot be achieved and the Deputy Project Director has submitted a revised plan for the next two years. Only five more districts will be staffed by District Family Planning Officers and the complete total of ten maternity units at village level has been abandoned for reasons of economy.

The opportunity might well have been taken at this period to undertake a complete review of the effectiveness of the family planning program and modify its organization and methodology in the light of the experience of the past three years.

94. The program appears to have lost momentum in that its capacity to consolidate the modest rise in the numbers of new acceptors is not being realized. For this, several factors appear to be responsible. Although there is awareness among some policymakers of the population problems of the country, there appears to be no real political commitment to fertility control in the face of pressure from other economic, human and political problems. The population is now growing at a rate of about 2.5 percent per annum which is significantly higher than the 1.95 percent growth rate postulated by the Fourth Plan for the period 1971-76. Instead of a population of 11.2 million which the projections in the Plan suggest, the total population for 1971 is much closer to 12 million. This is, in itself, a serious conclusion, but also points to the continuing aggravation of an already seriously imbalanced population-resource relationship. The mission was told on several occasions that until more data on the country's population problems were available, it would be difficult to convince policymakers of their urgency. In a country where there is already strong evidence -- both factual and visual -- to suggest that limited agricultural resources are already overburdened increasing social and economic tensions may not await reasoned analysis. The collection and analysis of demographic data must be given high priority. As it is, there is a risk that even the 1971 census data may not be properly analyzed largely because of inadequate supervision and the lack of qualified personnel. Although plans exist for the recruitment of an expatriate demographer who would be responsible for the analysis of the census data, for carrying out a demographic survey, and for setting up a pilot registration scheme, implementation is well behind schedule. The mission strongly hopes that administrative indecisions, which are at present holding up progress, will be eliminated at an early stage.

95. The question of family planning cannot be considered in isolation from the problems arising from very high rates of infant and child mortality. While there is no evidence that infant deaths are a spur to higher fertility, it is clear that in a society where a mother may expect to lose probably more than half the children she bears before they reach adulthood, she will have little incentive to adopt family planning without some indication that her children will survive. This problem is complicated by the clear preference for sons rather than daughters. The mission does not accept that this means that FP and MCH must be organized in one administrative unit. It would appear to be less wasteful of human and financial resources if those now devoted exclusively to FP and MCH were used to build up an effective peripheral health infrastructure. At the same time, it must also be capable of providing family planning services. Instead, however, of being almost the only family planning carrier, the health services must be regarded as only one of several outlets. Emphasis on family planning is still required and the priority which was accorded at the end of the Third Plan (1969) must be restored. This could best be done, in the mission's judgment, by retaining the concept of an autonomous Board but transferring it, without its MCH responsibilities, to a department where the fullest use of all

government and voluntary facilities and organizations could be made to extend the program; this might well be the Prime Minister's Office. Carefully phasing its development with an expansion of health posts and referral facilities, the family planning Board should also develop an organization whereby Health Aides, as the basic family planning field staff, effectively maintain regular, scheduled visits to the homes of eligible couples. Follow-up is presently almost non-existent and the efforts to recruit new acceptors are almost completely wasted. What is required is not a system which reproduces the field plan of the NMEO, but adopts its essential features of regularity and efficient supervision and communications. The main virtue of the NMEO is discipline, and this is what will be required by a recast family planning organization. There are problems of recruitment and staffing. Because family planning is funded from the development budget, project staff are mostly employed on a temporary basis with consequent lack of security of tenure. The family planning Board must be given more discretion in deciding on the qualifications and conditions of staff employment, in a manner similar to that exercised by the NMEO. Closer supervision of field staff is essential. Health Aides are too young and too much emphasis is placed on educational attainment as a qualification of recruitment. This considerably restricts the latitude of selection, because only very young people have the necessary qualifications.

96. While women are reluctant to be treated by male doctors, and strong social factors inhibit institutional and supervised domiciliary deliveries, available maternity facilities are being increasingly used, particularly by primipara. The average stay in hospital after delivery is less than three days -- and sometimes only a few hours -- but the opportunity for giving family planning information, and for motivation, could be made better use of. In this respect, the mission considers it unfortunate that all the ten village maternity centers have been dropped from the Fourth Plan revision.

97. With the need to consolidate the actual number of acceptors must come a considerable improvement in the collection of basic data. The mission found that the collection system itself was well suited to the needs of the program but required more effective supervision. Returns are not being sent on time and some not at all; there is inadequate completion of forms and little effective checking; many forms, such as the MCH records, contain information which is not collected, let alone made use of, and there appears little follow-up in the form of regular inspection visits from the center to the field.

B. Research Priorities

98. In almost every aspect of population growth and control, data are lacking, unreliable or incomplete. The resulting general uncertainty and confusion over demographic prospects is not the least important reason why real appreciation of the level of actual and future population pressure is confined to a few individuals only. At the same time, despite the large inputs to the family planning project, there is almost no assessment of its

activities. The data discussed earlier indicate that, were such an assessment to take place, it would very likely show up a largely stagnant and ineffectual project. Nevertheless, without such an evaluation, however uncomplimentary it might prove, there will be little to spur the project to implement the necessary changes. The following is a brief list of some of the areas where research is essential.

General Demography

99. The three projects listed hereunder have already been discussed in connection with the UNFPA proposals:

Analysis of the 1971 census data;

Demographic survey; and

Vital registration pilot scheme.

Family Planning

100. The present staff of the Evaluation Section lack the following:

Follow-up Survey

In a program relying as much on condoms and pills as that in Nepal does, it is imperative that an efficient follow-up system exist. This should provide for regular visits to clients who have either missed their appointments or, in the case of condoms, have not come to the center for re-supply for a long time. As this is not done so far, not only are drop-out rates very high but also very little is known concerning clients who have discontinued. To obtain some information on such clients, a follow-up survey is of the highest priority. The survey should mainly aim to identify drop-out cases and the reasons for drop-out, to establish continuation rates and to study contraceptive behaviour and pregnancy history subsequent to drop-out.

Knowledge, Attitude and Practice Survey (KAP)

Almost nothing is known at present for the population as a whole, on any of the major areas that could be covered by a KAP survey and which are of direct relevance to a family planning program at such an early stage of development. For instance, one of the conclusions of the NHS was that there is no widespread feeling in Nepal against family planning. Verification and quantification of factors such as this are important in planning the strategy of a family planning program. Of particular concern to a KAP survey would be the study of the relation between the level of infant and child mortality and family

planning involvement. In fact, this relation is such an important element in the future development of family planning services that it may well justify a survey in itself, particularly if no KAP study is to be carried out at an early date.

Operations Research

Much more information is required on operational aspects of the program. Areas of particular interest are communication and information effectiveness, personnel performance, and means of establishing and maximizing the efficiency of re-supply and follow-up systems.

101. It is doubtful whether the present staff of the Evaluation Section by itself would be able to successfully carry out research of the type described above. Although the section chief has received training abroad, it will probably be necessary to rely on foreign assistance for any such research, at least until additional Nepalese have been trained.

ANNEX 1

OBSERVATIONS ON DEMOGRAPHIC DATA

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OBSERVATIONS ON DEMOGRAPHIC DATA

A. Population Censuses

1. It is reported that the first Nepal census was taken before the middle of the 19th century and before the Rana family came into power, and that censuses have been held at regular intervals since. The results of any such early censuses are however, unknown, and even their existence is doubted by some. Whatever the case, the earliest available data are from the 1911 census. Subsequent censuses were held in 1920, 1930, 1941, 1952-54, 1961 and 1971. From the first four censuses, only total population figures and some regional sub-totals exist. The usefulness of the latter are, however, limited not only as a result of doubts on their accuracy, but also because of uncertainty on the boundaries of the areas to which they refer. The last three censuses have been carried out under the responsibility of the Central Bureau of Statistics (originally known as the Department of Statistics), established in 1950.
2. The 1952-54 census was the first in which an effort was made to meet scientific criteria. It appears that the UN recommendations for World Census, 1950, were taken into consideration and a pilot census was held in the town of Balopa. Enumeration began in 1951 but, following the disturbances related to the uprising against the Rana regime, work was abandoned. Subsequently, it was decided to carry out the census of the East in 1952 and that of the West in 1953. In fact, the latter was not held until exactly two years later. A report, prepared with the assistance of a UN statistical expert, was published in 1958. It is clear that the census has not avoided under-enumeration and other errors. In addition, the splitting of the census into two distinct periods complicated certain parts of the analysis of the results. The tables presented have been selected with discrimination and, although some of the figures are either obviously wrong or doubtful, their relevance cannot usually be disputed. Moreover, an attempt has been made to evaluate the quality of the census results and adjustments are suggested to the total figure and to the sex and age distributions. Not a minor recommendation of the 1952-54 census report to the foreign observer is the existence of an English version.
3. Most studies of the demographic situation in Nepal are based on the results of the 1961 census. Although it is probable that the accuracy of that census is superior to that of 1952-54, considerable errors still exist. Some of these will be discussed later. The report is in ten volumes and was published between 1967 and 1969. Thus, the delay was considerably longer than that in producing the 1952-54 census report, despite the more limited data processing facilities available at the earlier period. Although it is true that the report of the 1961 census is much more detailed than that of 1952-54, many of the tables, the preparation of which presumably contributed to the overall delay, are of doubtful relevance or of only minor interest.

4. The latest population census of Nepal was carried out in June 1971, following a household census earlier that year. The household census provided an estimate of total population by geographic areas but, with very minor exceptions, no results are yet available from the population census. This, of course, is not surprising since the time interval is still short. There is, however, cause for concern as the stage reached in processing the census data is well behind schedule. For the first time, the processing of the census data is being done by computer. The government has acquired an IBM 1401 machine with 16K core and has obtained, through USAID, the services of an expatriate to direct the appropriate section set up within the Central Bureau of Statistics (CBS). The expert, a systems analyst, has had similar previous experience, notably in the data processing of the 1963 Sierra Leone census, and has been in Kathmandu since 1969. A major part of his functions is the training of programmers and operators in preparation for the census. Coding began soon after the census was taken and punching of the cards started in August 1971. Initially, it was hoped that about one million cards would be punched and verified monthly. At that rate, and using one card per individual, that operation would end in about one year. Rather optimistically, most tabulations were hoped to be finished by the end of 1972. Progress so far has been at a much lower rate than anticipated. The number of cards punched and verified to date is not much more than one million and the current rate is only about 300,000 cards per month. Unless this is increased, punching and verifying alone would take at least four years after the census before it is completed. Punching has been completed for only five of the country's 75 districts with that for a sixth district about to be completed.

5. In the 1971 census, two questionnaires were used -- one for individuals and another for households. Most major areas were covered and, for the first time, detailed fertility questions were included (the 1961 census only asked for the total number of live births to married women). Even given the expected deficiencies, possibly considerable, of the data, it would be reasonable to expect to gain at least some insight into the all-important issues of fertility and mortality. In other areas, more careful consideration of the questions would have increased confidence in the validity of the information collected.

6. Since the questionnaires were to be completed in the vast majority of cases by enumerators, it could have been possible to reduce errors by issuing comprehensive fieldworkers' instructions. It appears that instructions were in fact issued but it has not proved possible to trace a copy of any such manual. Following discussions held with officials concerned, there is some doubt on the importance attached to those instructions and on the quality of the enumerators' training.

7. The coding of the information is much more closely scrutinized and it is probably less open to arbitrary decisions than the filling of the questionnaires. Even here, however, the lack is felt of expert guidance geared to the requirements of the professional user of the data. For instance, if the number of live births is not given it is assumed to be, and is coded, zero. There is no doubt that in many cases this is correct, but this is by no means always so. In fact, techniques have been developed

by which it is possible to estimate the proportion of cases for which this is true. To do so, however, the number of "not given" must be available but as a result of the coding used, this will not be known.

8. In addition to the individual questionnaire, there was, as mentioned earlier, a questionnaire for households. This was a most complicated document, with almost no relation to what is at present feasible in Nepal. Detailed information was required on every member of the household who in the preceding year left home for at least six months, died, married (males only), divorced (males only), and is physically or mentally handicapped. The processing of these data has not yet started and, in view of the complexity of the questionnaire, any results that may eventually be obtained should be considered with extreme scepticism.

B. Vital Registration

9. Nepal does not have a vital registration system. One of the functions of the Panchayat Secretaries is the registration of vital events but is not enforced. No legal provisions have been made requiring the public to register such events. Estimates of vital rates are based on population censuses but they vary substantially. Another effort to estimate vital rates was made by the National Health Survey (NHS) in 1965/66. However, largely because of sampling errors, the estimates obtained could serve only as a general indication of the level, rather than be used as precise figures. In fact, the NHS itself gives different estimates of each variable according to the method of estimation used. It is hoped that the analysis of the 1971 census will provide more up-to-date and, perhaps, more accurate data. It is essential that a system be established for the collection of data enabling the estimation of vital rates on a continuing basis. Proposals for such a system exist and they will be considered later.

C. Surveys and Studies

The National Health Survey

10. The National Health Survey followed a contract between the Ministry of Health in Nepal and the Thomas A. Dooley Foundation. The purpose of the survey was to provide the Ministry with basic data to be used in its planning and in measuring the progress of future health work. On the basis of an agreement between the Foundation and the School of Public Health University of Hawaii, the School in cooperation with the East-West Center of the University, designed the plan for the survey, provided professional advice, processed the data and assisted in the writing up of the report which was published in 1969. ^{1/}

^{1/} R. M. Worth and N. K. Shah. Nepal Health Survey 1965/66, University of Hawaii Press, Honolulu, 1969.

11. The aim of the survey was to examine the entire population of one village out of every 1,500 -- 24 villages were selected randomly with a total population originally estimated at about 6,500. The villages were spread over all main regions in the Hills and the Terai. However, because of delays and financial difficulties, only 18 villages were covered plus an additional area in urban Kathmandu. Three of the missed villages were in the west-central mountains and the other three in higher hill areas of the eastern mountains.

12. To carry out the survey a single team was in the field consisting of an advance party of four and a medical team of seven. The team was supported by helicopter from a base laboratory in Kathmandu, which was staffed by one administrator and two laboratory technicians. Slightly over two weeks were spent on the average in a village gathering demographic, nutritional and sanitational data from each household. The total population in the 18 villages was 6,321, apparently larger than expected. It was planned to examine every person for an assessment of disease prevalence but only 5,011 persons, 79.3 percent of the total, were actually examined. Fieldwork lasted for somewhat under one year. Information was obtained on fertility, mortality and reproductive attitudes, beliefs and practices.

Other Studies

13. No other systematic attempts have been made in Nepal to obtain demographic data from direct observations. There are a number of studies aiming to assess current rates of population growth or to project the population from available data. Some of those will be considered later.

D. Health Statistics

14. There are 55 hospitals, 36 health centers and 253 health posts in Nepal. Of the hospitals, 40 are under the Ministry of Health, one is military and 14 are private. The number of health posts is shortly to be increased by 20 and the current five-year plan allows for an expansion to 250 by 1975.

15. Every hospital, health center and health post is required to submit a monthly return to the Ministry of Health with summary statistics. For hospitals, these include age and sex breakdown of patients admitted, the number of women delivered and the condition of the new born and of all patients discharged. For out-patients only the sex is required and whether adult or child. Health centers and health posts are asked to submit similar information to that of hospital out-patients and the number and type of vaccinations done. Since 1964, hospitals also submit an individual discharge report on a sample of cases discharged. Until 1966, this was done on a 10 percent basis (case numbers ending in 0) but since that year a 20 percent sample is used (case numbers ending in 0 or 5). The individual reports provide information on age, sex and religion, principal condition treated, condition at discharge and, for maternity cases, whether normal or complicated delivery.

16. All statistics are forwarded to the Statistics Section of the Ministry of Health. The staff consists of an officer in charge with some minor clerical assistance. A WHO consultant-statistician is attached to the section. The monthly summary returns submitted by the hospitals, health centers and health posts are processed by the Statistics Section and annual activity reports are prepared. Although, however, almost all hospitals submit returns, many centers and posts do not. Thus for the year ending April 1971 (Nepali year 2027), only 21 out of 36 health centers and 50 out of 114 health posts (excluding 39 which were not established at the beginning of that year) sent returns regularly. No serious effort appears to have been made to obtain the missing data. Moreover, individual discharge reports submitted by hospitals after 1966/67 have not yet been processed. The forms are kept in files and no use is made of the data.

17. It is true, however, that although the returns could provide some information on morbidity, they are of only very limited use in studying fertility and mortality. Patients delivering or dying at hospitals form only a limited proportion of the total and they are highly selective by age and socio-economic background. Thus in 1970/71 there were only 6,201 deliveries at hospitals. This probably does not represent much more than 1 percent of all deliveries in that year. Similarly, there were only 1,687 deaths in hospitals during the same year. A very brief examination of the data on individual discharge reports showed a remarkably young age distribution of patients dying, inconsistent even with the high mortality patterns prevailing in Nepal. This reflects the relatively greater reluctance of the aged to go to hospitals. In this connection, it is interesting to note that, also in 1970/71, an additional 2,015 patients were discharged in a critical condition. The age distribution of these patients is older than that of patients who died and it is related to the belief, particularly prevalent among the aged, that if they died in hospital the soul would not rest. Hence, when the time of death approaches, they are taken home.

E. Data Collection

18. The general impression in Nepal is of the existence of only very meagre data on almost every aspect of population and population growth. It is generally accepted that fertility and mortality are both very high and that there is appreciable internal migration and movement across the border with India. Reliable figures are, however, almost non-existent. The 1971 census should provide some additional information when it has been analyzed but the lack of adequate supervision of the fieldwork probably implies that the figures would need considerable adjustment.

19. In the absence of adequate data, it is difficult to make a persuasive plea for population control. This is particularly so when it is suspected that mortality is very high and it is, therefore, sometimes thought that population pressure does not exist. Realization of the consequences of a possible rapid and large improvement in health conditions, as has been

achieved elsewhere, while fertility remains high, is handicapped by the lack of data. Moreover, future impact of population control efforts will be difficult to measure in the absence of data. The household questionnaire of the 1971 population census aimed at collecting some relevant information but the effort was so ambitious and ill-planned that it is doubtful whether any useful information whatsoever will be obtained.

20. It is essential that a systematic effort be made to obtain adequate population data from which vital statistics could be calculated. This is so, not only for the study of future patterns of population growth but also to establish current fertility and mortality rates for the whole country and for various sub-groups.

F. The UNFPA Project

21. The UNFPA has prepared a proposal for a demographic statistics project which is likely to be accepted by the government. Its objectives are to:

- (a) analyze the 1971 population census data;
- (b) undertake a demographic survey for estimation of population growth, fertility, mortality and migration rates; and
- (c) set up a pilot vital registration scheme in order to evolve a registration system suitable for Nepal.

22. Under the project, UNFPA would provide an expert on demography, equipment, materials and administrative support over a period of three years at a total cost of US\$136,000. The government would make available existing staff at the Central Bureau of Statistics (CBS) to carry out the demographic survey and would provide data processing facilities at CBS. In addition, it would instruct the Panchayat Secretaries to register vital events.

23. The demographic survey would be carried out using area sampling and the follow-up method. The 1971 census would provide the first round of the survey and twice yearly re-visits would be made in the selected areas to record changes in the intervening period. An experimental round was planned in Bhaktapur for December 1971 but this was not carried out; in fact, the whole project is well behind schedule. The sampling would be in two stages: first, 20 districts out of a total of 75 would be selected and, within these, 341 wards out of the country's approximately 35,000 wards. The overall sampling fraction would be just short of 1 percent, covering about 120,000 persons in about 24,000 households. But the fraction would vary considerably between areas, ranging from 6.62 percent in the Kathmandu Valley to only 0.45 percent in the Hills. Such a differential sampling fraction would make the project more feasible, but it is a very serious

limitation, particularly as it is the Hill's area for which data are particularly scarce. The Hills form about 70 percent of Nepal's area and contain nearly 60 percent of the population; it would be a mistake to assume that their social and cultural diversity would be adequately covered by sampling less than 0.5 percent of their inhabitants.

24. Another problem area where there are reservations is the reliance of the demographic survey on CBS staff to carry out fieldwork. The experience of other expatriate personnel with the CBS does not always show a smooth relationship. There is no guarantee that the demographer heading the UNFPA project would always meet with cooperation in carrying out his duties and that CBS staff would be available for fieldwork whenever required. It would be preferable if the budget provided for the employment of part-time personnel to do the fieldwork and be responsible only to the head of the project.

25. According to the project, a pilot registration scheme would be set up in the Kathmandu Valley. It would comprise initially only three Panchayats (about 6,000 population) and would be gradually extended to cover an entire district. If the results are satisfactory, one or two other areas would be added in other regions during the third and fourth year of operations.

26. In principle, the project could provide much needed demographic data. The heavy reliance, however, on the Kathmandu Valley throws doubts on the extent to which the data could represent population growth patterns in Nepal. This does not imply that the project would be of no use. An effort should be made, however, to extend the coverage of the Hills. A possible way of doing this would be through the Panchayats. As already mentioned, one of the responsibilities, albeit a neglected one, of the Panchayat Secretaries is to record vital events. As villages consist of only about 2,000 people and are fairly compact, this should not be too difficult. Village residents are generally well-known to each other and, for example, only about 100 births would occur on the average, in a village each year. Ad-hoc visits in a sample of villages could be made to check the accuracy of the reporting. A system of inducements and penalties could be devised if necessary. This system could also be used in the villages containing wards included in the regular sample frame. Fieldworkers, in the course of their bi-annual visits, would check the Panchayat Secretary's returns for those wards. This would provide a measure of the feasibility of the approach and training for the Secretaries.

G. Adjusted Estimates of Recent Population Growth Estimates

27. Following the publication of the 1961 census report, a few studies have been made aiming to adjust the census results, to estimate population growth rates and to project future population size.

Sex and Age Distribution

28. Sharma ^{1/} accepts the total population figure of 9,413,000 obtained by the census. However, he adjusts the 0-4 age-group for under-enumeration. He adjusts the 5-69 five-year age-groups, using a three-point smoothing formula and he splits the 70+ age-group into smaller groups. Krotki and Thakur ^{2/} estimate a total under-enumeration of 416,000, i.e., 4.2 percent of the adjusted total population figure of 9,829,000. Adjustments are confined to ages 0-24. Under-enumeration is found to be particularly heavy for males and to a smaller extent for females aged 0-4, males and females aged 15-19 and males aged 20-24. They estimate some over-enumeration in the 5-9 age-group for both sexes.

Fertility

29. Sharma assumes a sex-age adjusted birth rate of 40 per 1,000, based on the enumerated population aged 0-4 and 5-9 in 1961, giving a crude birth rate of 43 per 1,000 in 1956-61. David ^{3/} uses a sex-age adjusted birth rate of 50 per 1,000. Krotki and Thakur adjust the birth rate from 34 per 1,000, based on the number of births reported as having occurred in a period of 12 months before the census, to 48 per 1,000. Chandrasekaran ^{4/} assumes a sex-age adjusted birth rate of 50 per 1,000, based on the enumerated population aged 5-9 in 1952-54, giving a crude birth rate of 49.8 per 1,000 in 1955-60.

Mortality

30. Sharma assumes a low mortality, measured by an expectation of life at birth of 37.5 years for both sexes in 1955-60, and by a subsequent increase of one-half year per year. David accepts Sharma's assumption. Thakur and Krotki adjust the crude death rate from 13 per 1,000, based on the number of deaths reported as having occurred in a period of 12 months before the census, to 33 per 1,000. Chandrasekaran assumes 30.0 years as the life expectancy at birth for both sexes in 1955-60 and a subsequent increase of one year annually.

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- 1/ K. R. Sharma, Population Projection for Nepal, 1961-1981; Central Bureau of Statistics, Kathmandu; 1968.
 - 2/ K. J. Krotki and H. N. Thakur, Estimates of Population Size and Growth from the 1952-1954 and 1961 Censuses of the Kingdom of Nepal; A paper prepared for presentation at the annual meeting of the Population Association of America, Boston, Mass., 1968.
 - 3/ A. S. David, National Development, Population and Family Planning in Nepal; Kathmandu, 1968.
 - 4/ C. Chandrasekaran, Advisory Service Report on Evaluation of Family Planning Programme: Current Rate of Population Growth in Nepal; 1969.

Growth Rate

31. Sharma estimates a growth rate of 1.9 percent per annum in 1956-61. David's high fertility, low mortality assumptions give a growth rate of 3 percent per annum. Krotki and Thakur arrive at a growth rate of 1.5 percent per annum.

ANNEX 2

STATISTICAL APPENDIX

<u>TABLE NO.</u>	<u>TITLE</u>
1	Age-Specific Percentage Distribution of Females by Number of Live Births, 1961
2	Age-Specific Percentage Distribution of Births by Previous Parity; Selected Hospitals, Recent Years
3	Population Projections for Nepal, 1961-95
4	Population Projections for Nepal, 1975-95
5	Population Projections for Nepal, 1975-95
6	Projected Average Annual Crude Birth Rate for Nepal, 1970-95
7	Projected Average Annual Crude Death Rate for Nepal, 1970-95
8	Population Projections for Nepal, 1970-2000
9	Population Projections for Nepal, 1970-2000
10	Family Planning Association Acceptors by Year and Method
11	New Acceptors of Family Planning - Maternal and Child Health Services by Year and Type
12	Age Distribution of New Acceptors by Method, 1969-71
13	Age-Specific Average Number of Living Children per New Acceptor, by Method, 1969-71
14	Family Planning Performance by Month, 1968-71

Table 1: NEPAL: AGE-SPECIFIC PERCENTAGE DISTRIBUTION OF FEMALES BY NUMBER OF LIVE BIRTHS, 1961

Age	Average	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
15-19	0.25	81.7	13.7	3.4	0.8	0.3	0.1										100.0
20-24	1.33	29.0	33.6	21.6	9.9	3.9	1.2	0.5	0.2	0.1							100.0
25-29	2.49	9.3	21.4	24.4	20.2	13.3	6.6	2.8	1.2	0.4	0.2	0.1	0.1				100.0
30-34	3.51	5.3	12.0	17.0	18.7	17.9	13.0	7.9	4.3	2.1	0.9	0.4	0.2	0.1	0.1	0.1	100.0
35-39	4.26	4.4	9.0	12.4	14.8	16.0	14.1	11.1	8.1	4.9	2.7	1.4	0.6	0.3	0.1	0.1	100.0
40-44	4.78	4.1	8.2	10.9	12.3	14.2	12.9	11.2	9.3	6.8	4.4	2.9	1.4	0.8	0.3	0.3	100.0
45-49	4.95	4.2	8.3	10.5	11.6	13.2	12.3	10.8	9.3	7.1	5.1	3.5	1.9	1.2	0.5	0.5	100.0
50-54	5.11	3.8	8.0	10.0	11.0	12.8	12.2	10.9	9.7	7.6	5.5	3.8	2.1	1.4	0.6	0.6	100.0

Source: 1961 Census report.

Table 2: AGE-SPECIFIC PERCENTAGE DISTRIBUTION OF BIRTHS BY PREVIOUS PARITY; SELECTED HOSPITALS,^{/1} RECENT YEARS

Age	Previous Parity													Total	Base
	0	1	2	3	4	5	6	7	8	9	10	11	12+		
Under 20	86.5	11.9	1.3	0.3										100.0	797
20-24	50.9	26.9	14.1	5.4	1.9	0.5	0.2	0.1						100.0	2,210
25-29	19.9	20.2	24.8	16.4	10.5	4.8	2.0	1.1	0.3					100.0	1,468
30-34	8.8	10.3	14.1	18.1	16.8	14.0	9.0	3.8	3.1	1.0	0.7	0.1	0.2	100.0	834
35-39	4.2	4.6	8.1	13.3	13.1	15.1	15.1	9.5	7.9	5.4	1.9	0.8	1.0	100.0	518
40-44	4.2	3.0	4.6	6.8	8.9	11.8	15.5	11.0	9.3	8.9	8.0	3.4	4.6	100.0	237
45-49	(2)	(1)		(2)	(2)	(1)	(2)	(1)	(2)	(4)	(4)	(2)		100.0	23 ^{/2}
TOTAL	36.4	18.2	14.1	9.8	7.0	5.0	3.7	2.1	1.6	1.0	0.6	0.2	0.3	100.0	6,087

^{/1} Sri Pouch Prasiti Griha, April 1971 - May 1972.
 Bir Hospital, April 1971 - May 1972.
 Shining Hospital, Pokhara, January 1968 - May 1972.

^{/2} Base too small for percentages.

Source: Data gathered by the Mission from Sri Pouch Prasiti Griha, Bir Hospital, and Shining Hospital.

Table 3: POPULATION PROJECTIONS FOR NEPAL, 1961-95^{/1}
(In thousands)

Age	Census		1975	1980	1985	1990	1995
	1961	/2					
Males							
0-4	773	979	1,130	1,308	1,518	1,766	2,067
5-9	670	804	910	1,058	1,235	1,444	1,693
10-14	565	706	786	892	1,041	1,218	1,426
15-19	505	643	691	771	877	1,025	1,201
20-24	444	526	622	671	751	857	1,004
25-29	387	442	506	601	650	730	836
30-34	336	346	424	487	581	631	712
35-39	298	288	331	407	470	563	614
40-44	222	276	272	315	390	452	544
45-49	194	221	258	256	298	372	433
50-54	171	185	202	238	238	279	350
55-59	113	140	164	182	215	217	256
60-64	103	104	119	141	158	189	192
65-69	51	75	82	95	115	130	157
70+	68	64	86	106	129	156	168
All Ages	4,900	5,799	6,584	7,530	8,666	10,030	11,675
Females							
0-4	743	934	1,080	1,251	1,452	1,689	1,977
5-9	641	757	860	1,004	1,174	1,374	1,611
10-14	538	655	738	844	984	1,154	1,353
15-19	482	590	638	720	823	966	1,136
20-24	425	467	569	616	699	802	945
25-29	429	396	447	546	595	678	781
30-34	373	336	377	428	526	576	659
35-39	288	313	319	360	411	508	556
40-44	250	288	296	303	344	395	491
45-49	192	242	270	279	288	329	380
50-54	186	194	223	252	262	272	312
55-59	114	154	174	203	231	242	253
60-64	129	115	133	153	180	207	219
65-69	56	78	93	110	128	152	177
70+	83	84	101	125	153	186	227
All Ages	4,929	5,604	6,318	7,191	8,249	9,529	11,079
Both Sexes	9,829	11,404	12,902	14,720	16,915	19,560	22,754

^{/1} Assuming no fertility drop.

^{/2} Adjusted figures.

^{/3} Estimated figures.

Source: 1961 Census report and Mission estimates; assumes no fertility drop.

Table 4: POPULATION PROJECTIONS FOR NEPAL, 1975-95¹
(Thousands)

<u>Age</u>	<u>1975</u>	<u>1980</u>	<u>1985</u>	<u>1990</u>	<u>1995</u>
<u>Males</u>					
0-4	1,096	1,203	1,320	1,447	1,578
5-9		1,027	1,136	1,257	1,387
10-14			1,010	1,120	1,241
15-19				994	1,105
20-24					974
All Ages	6,550	7,393	8,338	9,395	10,568
<u>Females</u>					
0-4	1,047	1,151	1,263	1,384	1,509
5-9		974	1,080	1,195	1,320
10-14			954	1,062	1,177
15-19				937	1,045
20-24					916
All Ages	6,286	7,060	7,937	8,924	10,025
Both Sexes	12,836	14,454	16,275	18,320	20,594

¹ Assuming fertility drop of 25%; figures not shown are the same as those corresponding in Table 3.

Source: Mission estimates; assumes fertility drop of 25%.

Table 5: POPULATION PROJECTIONS FOR NEPAL, 1975-95¹
(In thousands)

<u>Age</u>	<u>1975</u>	<u>1980</u>	<u>1985</u>	<u>1990</u>	<u>1995</u>
<u>Males</u>					
0-4	1,062	1,099	1,123	1,128	1,097
5-9		995	1,038	1,069	1,081
10-14			978	1,023	1,056
15-19				964	1,009
20-24					544
All Ages	6,516	7,257	8,011	8,761	9,470
<u>Females</u>					
0-4	1,015	1,051	1,074	1,079	1,049
5-9		944	986	1,016	1,029
10-14			925	969	1,001
15-19				908	954
20-24					888
All Ages	6,253	6,930	7,625	8,320	8,979
Both Sexes	12,769	14,187	15,636	17,080	18,450

¹ Assuming a fertility drop of 50%; figures not shown are the same as those corresponding in Table 3.

Source: Mission estimates; assumes fertility drop of 50%.

Table 6: PROJECTED AVERAGE ANNUAL CRUDE BIRTH RATE FOR NEPAL, 1970-95

<u>Fertility Reduction</u> (Percent)	<u>1970</u>	<u>1975</u>	<u>1980</u>	<u>1985</u>	<u>1990</u>	<u>1995</u>
0	44.6	44.9	44.7	44.4	44.0	43.7
25	44.6	42.8	41.0	39.2	37.5	35.7
50	44.6	40.8	37.1	33.6	30.1	26.2

Source: Mission estimates.

Table 7: PROJECTED AVERAGE ANNUAL CRUDE DEATH RATE FOR NEPAL, 1970-95

<u>Fertility Reduction</u> (Percent)	<u>1970-75</u>	<u>1975-80</u>	<u>1980-85</u>	<u>1985-90</u>	<u>1990-95</u>
0	20.1	18.5	16.8	15.2	13.6
25	20.0	18.1	16.4	14.7	13.3
50	20.0	17.8	15.9	14.1	12.8

Source: Mission estimates.

Table 8: POPULATION PROJECTIONS FOR NEPAL, 1970-2000¹

	<u>1970</u>	<u>1975</u>	<u>1980</u>	<u>1985</u>	<u>1990</u>	<u>1995</u>	<u>2000</u>
Total Population (In thousands)	11,240	12,574	14,230	16,267	18,747	21,746	25,408
Males	5,592	6,264	7,098	8,122	9,370	10,878	12,724
Females	5,648	6,310	7,132	8,144	9,377	10,868	12,684
Crude Birth Rate (Per 1,000)	43.2	44.0	44.7	44.9	44.5	45.7	45.5
Crude Death Rate (Per 1,000)	22.0	20.4	18.9	17.3	15.5	15.4	14.5
Growth Rate (Percent, Per Annum)	2.13	2.36	2.58	2.76	2.90	3.05	3.19
Total Fertility Rate	6.070	6.070	6.070	6.070	6.070	6.070	6.070
Life Expectancy At Birth: (In Years)							
Males	40.1	42.1	44.1	46.3	48.8	51.5	54.5
Females	43.2	45.2	47.7	50.2	53.2	56.2	59.2

¹Mission estimates; assumes no fertility drop.

Source: Mission estimates.

Table 9: POPULATION PROJECTIONS FOR NEPAL, 1970-2000^{/1}

	<u>1970</u>	<u>1975</u>	<u>1980</u>	<u>1985</u>	<u>1990</u>	<u>1995</u>	<u>2000</u>
Total Population (In thousands)	11,240	12,466	13,775	15,095	16,440	17,850	19,293
Males	5,592	6,209	6,868	7,529	8,203	8,907	9,630
Females	5,648	6,257	6,908	7,566	8,237	8,943	9,663
Crude Birth Rate (Per 1,000)	43.2	40.1	37.0	33.3	30.9	28.6	26.3
Crude Death Rate (Per 1,000)	22.0	19.8	17.8	15.8	14.1	12.5	11.1
Growth Rate (Percent, Per Annum)	2.13	2.03	1.92	1.74	1.68	1.60	1.52
Total Fertility Rate	6.070	5.487	4.859	4.173	3.733	3.374	3.081
Life Expectancy At Birth: (In Years)							
Males	40.1	42.1	44.1	46.3	48.8	51.5	54.5
Females	43.2	45.2	47.7	50.2	53.2	56.2	59.2

^{/1} Mission estimates; assumes 50% fertility drop in 1970-2000.

Source: Mission estimates.

Table 10: FAMILY PLANNING ASSOCIATION ACCEPTORS BY YEAR AND METHOD

<u>Year</u>	<u>Vasectomy</u>	<u>Pill</u>	<u>IUD</u>	<u>Condom</u>	<u>Total</u>
1968-69 ^{/1}	617	603	11	5,813	7,044
1969-70	417	665	17	5,006	6,105
1970-71	416	797	26	3,831	5,070
1971-72 ^{/2}	306	568	17	1,879	2,770
TOTAL	1,756	2,633	71	16,529	20,989

^{/1} Estimate.

^{/2} First six months only.

Source: Data supplied by the Nepali authorities.

Table 11: NEW ACCEPTORS OF FAMILY PLANNING -
MATERNAL AND CHILD HEALTH SERVICES BY YEAR AND TYPE

<u>Type of Service</u>	<u>1969-70</u>	<u>1970-71</u>	<u>1971-72</u> ¹
Ante-natal	5,989	6,119	3,948
Post-natal	1,254	1,583	870
Infants	12,094	13,063	7,938
Pre-School Age Children	16,405	21,336	14,363
BCG Immunization	9,192	9,102	6,282
Smallpox Vaccination	10,846	9,891	6,462
Family Planning ²	23,635	32,363	17,247

¹ First six months only.

² Excluding FPA.

Source: Data supplied by the Nepali authorities.

Table 12: AGE DISTRIBUTION OF NEW ACCEPTORS BY METHOD, 1969-71
(In Percent)

<u>Age</u> ^{/1}	<u>Vasectomy</u>		<u>IUD</u>		<u>Pill</u>	
	<u>1969-70</u>	<u>1970-71</u>	<u>1969-70</u>	<u>1970-71</u>	<u>1969-70</u>	<u>1970-71</u>
15-19	-	-	2.5	0.8	5.2	4.9
20-24	2.8	1.4	21.1	18.7	25.6	23.1
25-29	13.9	11.9	20.9	27.5	25.1	26.6
30-34	22.4	23.6	35.3	28.7	22.4	24.2
35-39	26.8	26.7	13.1	14.6	13.4	13.0
40-44	20.6	20.2	5.1	9.1	6.7	6.5
45-49	8.3	9.5	1.8	0.6	1.6	1.7
50+	5.2	6.7	-	-	-	-
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0

^{/1} The age distribution for vasectomy is not directly comparable to those for the other methods. As wives of acceptors are, on the average, about 5 years younger than their husbands, a broad comparison could be made between the figure for any vasectomy age-group and that for the preceding age-group in other methods.

Source: Data supplied by the Nepali authorities.

Table 13: AGE-SPECIFIC AVERAGE NUMBER OF LIVING CHILDREN
PER NEW ACCEPTOR, BY METHOD, 1969-71

<u>Age</u>	<u>Vasectomy</u>		<u>IUD</u>		<u>Pill</u>	
	<u>1969-70</u>	<u>1970-71</u>	<u>1969-70</u>	<u>1970-71</u>	<u>1969-70</u>	<u>1970-71</u>
15-19	<u>1</u>	<u>1</u>	1.7	1.0	1.1	1.0
20-24	2.8	3.1	2.7	2.4	2.1	2.0
25-29	3.3	3.4	3.4	3.4	3.3	3.1
30-34	4.3	4.3	4.4	4.2	4.2	4.2
35-39	5.3	4.8	4.9	5.0	4.7	4.9
40-44	5.8	5.5	6.4	6.0	5.3	5.5
45-49	6.5	6.2	5.3	5.2	6.2	5.8
50 +	7.3	6.2	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>
All Ages	5.0	4.8	3.9	3.9	3.4	3.5
Living Sons	2.9	NA	2.3	NA	1.8	NA
Living Daughters	2.1	NA	1.6	NA	1.6	NA
Dead Children	2.1	NA	1.9	NA	2.1	NA
TOTAL Live Births	7.1	NA	5.8	NA	5.5	NA

1 No new acceptors in this age-group.

Source: Data supplied by the Nepali authorities.

Table 14: FAMILY PLANNING PERFORMANCE BY MONTH, 1968-71 ¹

Year & Month	Total	New Acceptors				Contraceptives Distributed	
		Vasectomy	IUD	Pill	Condom	Pill (Wallets)	Condom (Units)
July 1968- June 1969	7,802	3,292	1,183	1,355	1,972	N.A.	N.A.
<u>1969</u>							
July	811	92	19	450	250	1,716	3,917
August	5,881	360	132	1,089	4,300	2,891	56,893
September	1,414	260	56	322	776	1,344	15,532
October	1,806	224	42	770	770	2,984	16,669
November	2,445	154	98	1,250	943	3,912	16,736
December	1,210	133	42	458	577	2,766	14,933
<u>1970</u>							
January	1,747	363	337	808	239	2,407	4,851
February	3,773	512	86	1,253	1,922	3,610	40,970
March	2,083	440	35	828	780	1,933	10,918
April	2,668	562	117	917	1,072	4,048	24,000
May	2,731	458	105	1,076	1,092	4,057	22,265
June	3,171	330	40	1,042	1,759	4,661	38,802
July	2,695	291	69	1,236	1,099	7,121	28,324
August	2,464	204	32	1,062	1,162	3,996	13,734
September	1,777	135	17	663	962	2,308	17,516
October	2,723	317	57	1,090	1,259	5,051	28,752
November	3,305	304	53	1,161	1,787	5,728	40,636
December	2,610	282	30	939	1,359	3,901	21,252
<u>1971</u>							
January	3,839	710	74	1,317	1,738	5,339	21,881
February	3,882	593	73	1,278	1,938	6,699	35,767
March	2,441	335	61	799	1,196	3,926	20,439
April	3,020	407	67	964	1,582	3,858	34,698
May	3,508	361	84	1,521	1,542	6,714	25,295
June	5,189	452	94	1,466	3,157	8,224	48,796
July- December	20,017	1,600	615	7,141	10,661	36,306 ²	195,153 ²

¹ FPCH and PPA.

² FPCH only.

Source: Data supplied by the Nepali authorities.

SECTION V

POWER

ABBREVIATIONS

kV	=	Kilovolt	=	1000 volts
KW	=	Kilowatt	=	1000 watts
MW	=	Megawatt	=	1000 kilowatts
kWh	=	Kilowatt hour	=	1000 watt hours
GWh	=	Gigawatt hour	=	1000000 kWh
kVA	=	Kilovolt amperes	=	volt amperes
ha	=	hectares		
M.cu.m.	=	Million cubic metres		
ED	=	Electricity Department of the Ministry of Water and Power.		
NEC	=	Nepal Electricity Corporation.		
ADB	=	Asian Development Bank.		

Note on kWh:

One kWh is the energy consumed by an average hot plate in one hour or by an average electric oven (4kW) in 15 minutes. A 100 W lamp would consume 1 kWh in ten hours.

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SUMMARY

i. Nepal has no known resources of fossil fuels. However, the land stretching between the Himalayas and the Gangetic Plains has a very high hydroelectric potential. Theoretical estimates go as high as 83000 MW. Only the Karnali River basin has so far been systematically explored; however, some preliminary surveys are being carried out in the Kankai and Babai areas. A UNDP financed study (1966) identified ten possible schemes ranging in potential capacity from 18 to 1800 MW with a total of 6800 MW for the basin.

ii. The total installed generating capacity is only about 55 MW, 45 MW of which is devoted to public supplies. In 1970/71, electricity generated was about 70 million kWh, corresponding to a per capita consumption of less than 6 kWh per annum. Nepal Electricity Corporation (NEC) a totally government-owned utility, provides service in the capital town of Kathmandu and the surrounding townships. The Electricity Department of the Ministry of Water and Power (ED) is responsible for supplies in the Hetaura-Birganj Corridor. These two areas are interconnected by a 66 kV transmission line and are supplied by 41.5 MW of generation capacity consisting mostly of hydroelectric plants which were generally constructed by friendly countries on a grant basis. The remaining 13.5 MW, mostly diesel, is scattered around the country among five other public supply undertakings (operated by ED and three private companies) and a multiplicity of individual industrial and service plants. Power demand in the Kathmandu Valley has been growing at an average annual rate of about 21.5 percent over the past 10 years, mainly due to an increase in the number of domestic consumers, and reached 17.5 MW in 1971/72. The forecast growth for the next 8 to 10 years is about 20 percent, and seems to be rather conservative since only a quarter of the total number of domestic dwellings are now supplied. The remaining three-quarters depend for lighting and cooking on kerosene, wood-fuel and other types of energy whose supplies are not dependable due to costly and difficult transportation conditions.

iii. In the other electrified centers (Biratnagar, Rajbiraj, Dharan, Pokhara and Butwal) the growth of consumption has been very slow. The high cost of electricity due to the small size of the operation and the high cost of transporting diesel fuel are the main reasons for stagnation. Only Biratnagar has any possibility of growth in the near future. Ample supplies at reasonable costs are now available for this area from the recently commissioned Sunkosi irrigation project on the Indian side of the border.

iv. Nepal's development strategy in the power sector is based on development of the country's hydroelectric resources due to the lack of other indigenous energy reserves. However, in the newly developing areas where the expected demand is too small to permit the economic development of hydroelectric schemes, the government is aiming to develop the load with diesel installations, or along the border by means of imports from India.

v. The existing generating capacity in the Kathmandu area is expected to meet the demand up to 1975-76. Thereafter, additional supplies will become available by 132 kV transmission line from the 15 MW Gandak hydroelectric project now under construction by Indian Authorities on Nepal territory near the border, and from an 18 MW run-of-the-river project now in the planning stage at Devighat on the Trisuli River immediately below the tailrace of the existing Trisuli plant. These two projects should meet the demand in Kathmandu up to 1978 or 1981 depending on the rate of growth, and will release existing diesel plants in the valley to extend or initiate power supplies in other areas.

I. THE CURRENT POSITION OF THE POWER SECTOR

Background

1. Beginning in 1911 with the installation of a small 500 kW hydroelectric station to supply the Royal Palace, the use of electricity in Nepal gradually spread into Kathmandu and surrounding townships in the Kathmandu Valley. Over the years, other small scale hydroelectric and diesel stations were installed in the country but no appreciable growth in consumption of electricity was apparent until the early 1960's.

2. In 1959, some meaningful planning for the distribution system in the Kathmandu Valley was undertaken for the first time with the assistance of U.K. experts. Implementation of the resulting plans was partly financed by the U.S.A. Within a short time, existing generating facilities were fully loaded and from 1962 to 1965 the growth of demand was met by the installation of small diesel plants completely financed from local resources. Between 1965 and 1972 sizeable hydroelectric plants at Panauti (2.4 MW), Trisuli (18 MW) and Sunkosi (10 MW) were added to the power system serving Kathmandu. These plants were financed on a grant basis by the USSR, India, and The Peoples Republic of China, respectively.

3. Since the early 1960's power supplies have been extended to most parts of the Kathmandu Valley and to Hetaura and Birganj, two towns selected for future industrial development in the corridor extending south from the Kathmandu Valley to the Indian border. Power demand within this extended Central System has since been increasing at the very high compounded annual rate of 21.5 percent. As a result, power generation increased from 11.2 million kWh in 1962/63 to 66.2 million kWh in 1971/72. ^{1/}

4. This small area, however, is the only one with such a high rate of expansion. The remainder of the country is still without electrical power except for very few small industrial or other special service plants scattered throughout the land and some small scale public supplies at five other locations: (a) Biratnagar, the second most important civic and industrial center, supplied since 1945, (b) Dharan, supplied since 1964, (c) Rajbiraj, (d) Pokhara and (e) Butwal. The last three centers have been supplied during the last three years. The town of Nepalganj had public supplies from 1964 to 1967, but when some of the diesel generating units broke down public supply was abandoned. The past history of electric supply in most of these towns has been one of endless technical difficulties in operation and little or no growth.

5. The low level of electrification is mainly the result of (a) the predominance of unsophisticated agriculture, (b) the very low income levels and (c) an almost complete lack of urbanization. About 90 percent of the

^{1/} This estimate is based on actual generation during the first nine months of the fiscal year.

people depend upon agriculture. The GDP is about US\$70-80 per capita, a large part of which is thought to be subsistence and only 4 percent of the population live in urban centers. The lack of proper planning and maintenance of electrical equipment in the past have also contributed to stagnation of demand outside the Kathmandu Valley.

6. Nepal, although a small country, is one of the few in the world with a very high but still undeveloped hydroelectric potential. Estimates of this potential are as high as 83,000 MW ^{1/} which is comparable to the combined installed hydroelectric capacity of Canada, the U.S.A. and Mexico. Only the Karnali River basin has so far been systematically explored. A study of this basin, financed by UNDP, was undertaken during 1963-66 and the report identified ten possible schemes, with potential capacities ranging from 18 MW to 1800 MW and a total capacity of 6800 MW. However, Nepal has no other known indigenous resources of commercial energy and is completely dependent on imports for the small quantity of fossil fuels used in the country.

7. Despite its enormous hydroelectric potential, Nepal's per capita power production is one of the lowest in the world. The present total installed generating capacity is about 55 MW. This includes the very recently commissioned 10 MW Sunkosi hydroelectric station. Of the total capacity, 33 MW is hydroelectric, 18 MW is diesel and 4 MW is steam generated. Public service accounts for 45 MW, about 80 percent of the total capacity; the remaining 10 MW is shared between various industrial agencies and the private sector. The largest unit sizes are 3350 kW in hydro, 1900 kW in diesel and 1400 kW in steam stations. Total generated power in 1970/71 was about 70 million kWh corresponding to a per capita figure of less than 6 kWh per annum. This compares with the 1964 world average of 867 kWh and with a 1964 average of 116 kWh for developing countries.

8. The Central Power System supplies the capital and surrounding townships in the small Kathmandu Valley together with the Hetaura and Birganj corridor extending southward to the Indian border. This power system contains 92 percent (41.5 MW) of the installed capacity devoted to public service. The remaining 3.5 MW is divided between Biratnagar (1.8 MW), Dharan (0.2 MW), Pokhara (1.0 MW) and Butwal (0.5 MW).

9. The distribution of existing electric equipment by zones and its breakdown into captive and public service categories, are shown in Tables 1 and 2. The detailed characteristics of the major hydroelectric and thermal installations are also shown in Tables 3 and 4. The attached map shows the geographic location of the installations.

^{1/} However, it is not known what percentage of this potential can be economically developed.

The Central System

10. In this system, power is supplied by five hydroelectric stations with a total capacity of 31,590 kW and eight diesel stations with a total capacity of 9,980 kW. The more remote hydroelectric stations are linked to the load centers in the Kathmandu Valley by 188 circuit miles of 66 kV transmission lines. Most of the other power stations feed directly into the 160 mile, 11 kV primary distribution circuit. The total capacity of transmission transformers, including the capacity of stepdown transformers (11 kV and 3.3 kV) is about 75,000 kVA and the total capacity of distribution transformers is about 45,000 kVA.

11. The Central System presently serves about 43,000 domestic consumers and 600 industrial and commercial consumers in the Kathmandu Valley. Annual sales however, are at very modest levels, about 29 million kWh domestic sales and 9 million kWh industrial sales in 1971/72. ^{1/} Annual per capita sales are about 28 kWh in the valley compared to national averages of 57 kWh and 103 kWh in the neighboring countries of Pakistan and India, respectively.

12. The 1971/72 peak load on the Central System was about 17.5 MW and in 1972/73 total production in the system is expected to reach about 70 million kWh ^{1/} per annum. The difference between total production, 70 million kWh, and total annual sales, 45 million kWh (including about 9 million kWh in the Hetaura-Birganj corridor) is accounted for by about 1.5 million kWh for internal use in the power facilities and 21.5 million kWh losses in the system. These losses, about 30 percent of gross generation, are very high by any standards and it is believed that there is considerable unauthorized use by some consumers.

13. The plant and equipment in the Central Power System is owned and operated by two separate entities: (a) Nepal Electricity Corporation (NEC), a totally government owned company with a considerable degree of autonomy, and (b) the Electricity Department of the Ministry of Water and Power (ED).

14. NEC owns and operates the diesel power stations and the distribution facilities located in the Kathmandu Valley, as well as four hydroelectric stations with a total capacity of 21.5 MW and associated transmission facilities. The Corporation is managed by a six member board. Financial statements for 1969/70, show revenue from electric sales of Rs. 7,811,000 (US\$781,000 equivalent) and operating expenses of Rs. 7,676,000 (US\$767,000) including a royalty of Rs. 2,121,000 (US\$210,000) paid to the government. This gives a rate of return of 2.6 percent on net fixed assets before payment of royalties. However, the 1969/70 financial statements include only 11 months of revenues against 12 months of expenditures in order to bring the revenue period into line with the correct calendar months. Results in a normal year should, therefore, be much better.

^{1/} Based on nine months' actual sales and production.

15. ED's ownership and operational responsibility in the Central System covers only (a) the power installations in the Hetaura-Birganj corridor comprising two diesel stations with a total capacity of 5,030 kW and associated transmission and distribution facilities and (b) the 10 MW hydroelectric station recently constructed on the Sunkosi River at a site near the Tibetan border to the north of the Kathmandu Valley. ED sells the output of the Sunkosi station to NEC, but purchases energy from NEC for distribution in the Hetaura-Birganj corridor.

Biratnagar Area

16. The second most important area in which electric power facilities are concentrated is the southern part of the Kosi zone centered around the town of Biratnagar. As can be seen from Table 1, total installed capacity in the zone is 6,220 kW. This capacity represents 62 percent of the installed power equipment outside the Central System.

17. Five of the country's principal thermal power stations with a total capacity of 5,720 kW are located in this area. Total production from four of these stations (excluding the fifth which is located at a British military camp) was about 13 million kWh in 1970/71. Of this amount, 8 million kWh was produced by captive plant leaving only about 5 million kWh for public sale by the Morang Hydro Electric Supply Company (MHESC). This privately owned undertaking with 60 percent government participation, supplies 1,486 domestic and 49 industrial consumers. In 1970/71, sales to domestic customers were 1,345,000 kWh, to industry 2,750,000 kWh and to municipalities for water supply and street lighting about 125,000 kWh. Total sales were 4.22 million kWh with losses of about 15 percent which are within acceptable limits.

18. Power supplies available to MHESC are supplemented by imports from India over 33 kV transmission lines owned by India and operated by ED. There is another 33 kV line from India to Rajbiraj owned and operated under the same conditions. Until March 1971, the peak supply available to the two towns of Biratnagar and Rajbiraj was limited to 420 kW. A 15 MW hydroelectric station, constructed by Indian authorities on the Sunkosi River in India, very close to the Nepalese border, was commissioned in March 1972. Since then, available power has increased to 6,700 kW. Before commissioning of this plant, the price of energy at the border was IRs. 0.27/kWh (US\$3.7 equivalent); the price has since been reduced to IRs. 0.10/kWh (US\$1.7 equivalent).

Remainder of the Country

19. ED is currently extending the 33 kV lines from Biratnagar to Dharan to increase supplies to that area which is presently served by a 200 kW diesel unit owned by Dharan Electricity Corporation. It is expected that construction of this extension will be completed in 1972/73.

20. The two remaining public supplies in Nepal, those at Pokhara (an ED operation) and at Butwal (a private undertaking) generated about 1 million kWh and 100,000 kWh, respectively.

II. FUTURE PROSPECTS AND INVESTMENT PLANS

The Central System

21. This system, as mentioned earlier, has been in a very dynamic state since the early 1960s. The rate of growth of peak demand and generation has been about 21-22 percent. Sales have increased somewhat faster (at 24 percent excluding the effect of sales in the Hetaura-Birganj corridor) due to an appreciable decrease in the system losses (from 51.5 percent in 1963/64 to 30 percent in 1971/72).

22. This high rate of growth is very likely to continue for a number of years. NEC plans to connect 5,000 to 6,000 new domestic consumers to the network annually for many years to come as the distribution network penetrates into new neighbourhoods. This is not an unrealistic expectation since on an average about 5,600 new domestic consumers have been connected to the network every year over the past five years, and in spite of this high rate of connection the number of applicants for the electric service appearing on the waiting list has remained at around 5,000 to 6,000. Moreover, the total number of dwellings so far receiving electric service is only about one-fourth of the total of 170,000 in the service area. The new domestic consumers will contribute appreciably to the future demand as they have in the past. In fact, the domestic category has so far been accounting on average for about 70 percent of total sales, thus representing the dominant element in the fast growth registered in the past. This is illustrated in Chart 1 where the curve representing total generation runs almost parallel to the curve representing the total number of consumers.

23. This extension of service to new consumers is not the only basis for future growth of demand. Past consumption per domestic consumer has been rising at only 4.5 percent per annum and now stands at the modest level of only 47 kWh/month/consumer. This corresponds to an annual per capita consumption of about 28 kWh for the population of the Kathmandu Valley which is much lower than the 1964 average national per capita domestic consumption of power in some countries of the developing world. (For example, the corresponding average per capita consumption was about 28 kWh in Kenya, 45 kWh in Bolivia, 46 kWh in Guyana, 48 kWh in Liberia, and 68 kWh in Mauritius). There is, therefore, plenty of scope for growth.

24. A second factor that may cause a more intensive use of electricity relates to the total energy picture prevailing in the Valley. Statistics concerning the total energy available to the public have not been compiled. Nevertheless, from the quantities of woodfuel and kerosene consumed, it can be estimated that the per capita consumption of total energy (commercial

and non-commercial) is appreciably below 100 kg. of coal equivalent compared to 250 kg. of coal equivalent in India. Any public pressure for increase of this low level will be directed toward electric supplies due to:

- (a) the non-existence of known commercial resources other than the hydroelectric potential;
- (b) the high transportation costs in the country;
- (c) the rising world prices of petroleum;
- (d) the increasingly high population density and the consequent decrease in per capita level of the limited non-commercial energy resources in urban centers; and
- (e) the increasing depletion of forest resources on the Hills surrounding the Valley.

25. As new industrial and commercial projects are implemented and the economy develops as a whole, they will exert a marked influence on the demand structure for power.

26. The high rate of increase in the total demand for power is likely to continue for perhaps another seven to ten years. Assuming a constant growth rate of 20 percent (slightly lower than the past growth rate of 21.5 percent), a maximum demand of about 30 MW may be expected in 1974/75 and 52 MW in 1977/78 as shown in Table 7. A lower growth rate tapering down to 10 percent by 1977 gives a maximum demand of 49 MW in 1979/80. These forecasts are shown in graphical form in Chart 1. The monthly variation of demand has also been estimated, but only on the basis of 20 percent growth, and for the four months of the year covering high power demand and low hydroelectric capability. The results are shown in Chart 2. This chart also shows available hydro generating capacity by months over the years together with diesel capability ^{1/} during the dry months. The hydroelectric capability curves are based on data given in Tables 9 and 10. These curves show that maximum demand occurs at the beginning of the dry season when the full generating capability of the plant cannot be used for several months each year. They also show that the existing maximum generation capability will not be sufficient to meet the demand and that some slight difficulty may be experienced in February 1975.

^{1/} Excluding the contribution of units to be transferred shortly to locations outside the Central System service areas.

27. For the following year additional supplies will be available from the Gandak Project ^{1/} over a 132 kV transmission line to be constructed by ED between Gandak and Hetaura. ED, the sole agency empowered to construct major generation and transmission facilities for the public sector, has also included in its investment program for the Central System the construction of an 18 MW hydroelectric scheme at Devighat immediately below the tailrace of the existing Trisuli power station. Construction of the Gandak-Hetaura 132 kV transmission line will cost about US\$3 million equivalent including interest during construction, with a foreign exchange component of about US\$1.6 million equivalent. It will be financed by a loan of US\$3 million equivalent from the Asian Development Bank (6 percent interest and 30 years repayment period including three years of grace). The Devighat hydroelectric station will cost about US\$11 million equivalent and will be financed completely from the government's own resources.

28. The additional supplies from the Gandak station will be made available to the Central System over the planned 132 kV transmission line. In addition to that, supplies from the Devighat Project will meet requirements only up to 1978 if demand continues to grow at 20 percent per annum, or up to 1981 if the growth tapers down to 10 percent over a period of five years. These limitations are illustrated in Charts 1 and 2 where past trends and future estimates of power generation and sales are shown together with the generating capability of the power plant at the time of peak demand.

29. Plans for constructing power generation facilities to meet the demand after 1978/80 are in a very preliminary stage. Several sites such as Kulighani and Kaligandaki are being considered for hydroelectric development. However, no detailed study of any of these sites has been undertaken so far and nothing is known about their relative merits.

Biratnagar Area

30. Power generation and sales in the Biratnagar area have not shown any appreciable growth since public supply was first introduced in 1945. Total peak load on the power stations in the area, together with imports from India, has remained at about 2,500 kW since 1967/68. The officers of ED claim that this stagnation is due to lack of adequate generating facilities in the area and that if such facilities had been available, the load would have grown at a rate similar to the high rate of growth in the Kathmandu Valley.

^{1/} This is an irrigation canal project of 15 MW capacity under construction by the Indian authorities on Nepalese territory near the border. It has been agreed that Nepal will purchase energy from the project until the load builds up to 10 MW at 60 percent load factor when the project will be handed over to Nepal.

31. With this in mind, an elaborate preliminary feasibility report was prepared for a 35 MW multipurpose hydroelectric scheme on the Kankar River involving construction of a 50 m. high dam and development of irrigation facilities for about 35,000 ha. The latest estimates of power demand for the area are given in the "Revised Preliminary Report on the Kankai Project" dated May 1970 which states that the load is expected to grow to about 16 MW in 1975/76 and about 23 MW by 1979/80.

32. A report on the Kankai Project prepared in September 1971 by the Asian Development Bank (ADB) does not agree with this forecast. This report, prepared in response to a government request for financial assistance for construction of the project, estimates peak demand at only 4-6 MW in 1975/76 and 8-11 MW in 1979/80. The ADB staff apparently feel that there is a strong element of uncertainty in expected peak demand. They also feel that implementation of the whole project would be too ambitious due to the high investment costs and the number of specialists required to introduce the proposed large agricultural program. Consequently, it was decided to finance only the first stage of the project -- the irrigation of a small area (6700 ha.) by means of a weir and run-of-river canal. The construction of the dam and power station together with irrigation of the remaining 30,000 ha. was not included.

33. It is evident that electric service offered to consumers in the Biratnagar area has been inadequate both in quantity and in quality. The price of electricity has been too high in comparison to other available forms of energy as well as in comparison to average income. Both of these inhibiting factors have now been eliminated since additional supplies are available from the Sunkosi irrigation canal project in India which was completed recently at a site very close to the border. According to a 1954 contract between Nepal and India, 50 percent of the energy to be generated by this project is assigned to Nepal. The contract also provides that the same amount of power (6,700 kW) will be made available to Nepal from the 132 kV grid of the Bihar Electricity Board during periods when the irrigation canal is not operating. A second contract signed in November 1971 fixed the price at IRs. 0.1/kWh (about US\$1.4) for a period of ten years. Because of the availability of this low cost power, the government of Nepal is reviewing tariffs for public supplies in the Biratnagar area with a view to making appropriate reductions.

34. Very fast growth in demand may be experienced under these improved supply conditions which may justify the opinions held by ED staff. The power resources available from India may consequently be fully utilized and the area may experience shortage of supplies in the near future. The load growth in the area should, therefore, be closely watched and the whole situation, including the construction of the Kankar project, reviewed in about two years.

Remainder of the Country

35. ED has a program for introducing public supplies to 10 separate centers all located close to the Indian border along Terai. The program involves importing electricity from India at all ten locations and the

export of electricity from one point in the Central System to the Indian grid.

36. This scheme for exchanging up to 5,000 kW of power between the two countries is included in the November 1971 agreement. It will benefit both countries in many respects and Nepal's benefits may be summarized as follows:

- (a) securing supplies at lower prices at these ten locations (since prices to Nepal would reflect the benefits from comparative economies of size);
- (b) ability to build the load at these locations up to levels where they can economically be interconnected and permit development of national resources in an economic manner;
- (c) ability to benefit from excess capacity that presently exists during peak and off-peak hours in the Central System; and
- (d) gaining valuable experience in negotiating and operating power transactions with India.

The locations of exchange of power and the proposed dates for implementing the schemes are shown on the attached map together with the proposed 33 kV line extension.

37. The last item in the ED investment program concerns the transfer of all diesel units in the Kathmandu Valley, except those at the Mahendra power station, to other parts of the country such as Biratnagar, Nepalganj, Bharatpur and Bhairawa areas.

III. SECTOR CONSTRAINTS

38. The overall government strategy for development of the sector is sound. It is based on the development of indigenous resources which consist of hydroelectric potential while, at the same time, recognizing that, in the newly developing areas with low demand, the load must be met by diesel units or in the case of border areas, by imports from India. Nevertheless, there are several important problems which need to be resolved. These relate to (a) the general pricing policy (b) the existing planning practices in the electric power sector, and (c) the present institutional arrangements for power supply.

Pricing Policies

39. Electricity pricing is a difficult exercise and to some extent electricity tariffs are determined as a result of compromise based on what the market will bear and upon development policy. Moreover, the fact that there are numerous generating units operating at different costs and serving different consumer groups with different loads, complicates the issue.

Electricity Tariff for Domestic Consumption
and Cost, 1970/71 /a

	<u>Bhairawa</u>	<u>Palpa</u>	<u>Janakpur</u>	<u>Kathmandu</u>
Cost per kWh without interest charges	0.43	0.93	0.40	0.60
Cost per kWh with interest charges	0.60	1.10	0.45	-
Tariff rate per kWh	0.50	-	0.50	0.20

/a "Public Sector Enterprises and Pricing of Product and Services", B. B. Pradhan, January 1973, page 22.

40. By the beginning of 1971, the electricity tariff in the Kathmandu area was reduced by N.E.C. from 35 paisa per unit to 20 paisa per unit for domestic consumption. The main rationale behind this decision was the belief that a reduction in prices would lead to higher consumption during off-peak hours thus leading to an increase in the load factor. The cost of kerosene for one unit equivalent of electric energy was estimated to be about 19 paisa. The tariff reduction did not, however, result in any acceleration of growth of consumption, because if demand for electricity is elastic with respect to income, it is inelastic with respect to price, especially under the prevailing economic conditions in Nepal.

41. This did little to improve the financial position of NEC, which was already unsatisfactory before the introduction of this price reduction. Tariff changes introduced around the middle of FY 1970/71 resulted in a sharp deceleration in the growth of revenue as shown in the following table:

N.E.C. FINANCIAL OPERATIONS
(Rs. 100,000)

	<u>1968/69</u>	<u>1969/70</u>	<u>1970/71</u>
1. Current expenditure including depreciation	52.47	76.76	81.38
2. Revenue	64.01	78.11	86.13
3. Current surplus	11.54	1.35	4.75
4. Current surplus as percent of capital assets	.012	.001	.005
5. Current surplus if 10 percent return	95.10	97.60	98.80
6. Difference between 5. and 3.	83.56	96.25	94.05

While royalty charges are included in current expenditure, the NEC statement does not include total capital assets nor is any account taken of interest charges. An adjusted NEC statement would therefore show still more disappointing financial results. As it stands now, the NEC statement shows a surplus of Rs. 47,500. Assuming that NEC ought to generate 10 percent return on its capital assets, the current surplus should have been Rs. 988,000.

42. The price reduction represents a large subsidy to the domestic power consumer. Since it did not serve the intended purpose and is clearly uneconomic, it should, as a first step, be withdrawn immediately in order to improve NEC's financial position. In general, it appears that present pricing of many public goods and services serves none of the government's objectives effectively: it does not encourage efficient use of resources; it does not generate resources for investment; and it does not serve regional and income distribution objectives. The government should review its pricing policies at an early date.

43. Outside the Kathmandu area, the problem is more complicated. On the demand side it involves consideration of (a) the domestic energy demand, especially in the densely populated areas, (b) the possible growth in the use of tube-well and lift irrigation and the consequent demand for energy, and (c) the additional energy demand that might be created by the development of planned regional centers. These developments may make it economically feasible to utilize agricultural processing equipment and other industrial facilities much larger in size than existing facilities and thus increase the demand for energy. Such developments may also increase commercial activity with its particular energy demand. On the supply side, it is necessary to consider all possible resources including (a) the non-commercial indigenous resources such as woodfuel, vegetable

residues, dungcake, charcoal, etc., (b) the import of different types of energy such as coal, kerosene and electricity, and (c) the indigenous commercial resources consisting of the hydroelectric potential. There are important questions relating to these problems.

- What types of demand should be met and particularly at what prices?
- What is the optimum resource mix in meeting these demands?
- What are the economic, social and political implications of replacing non-commercial energy resources with commercial types, and also of replacing imported energy with indigenous supplies?

44. These general policies have so far neither been dealt with in sufficient detail nor in a systematic manner, and the problems have been solved on an ad-hoc basis. This lack of proper policy decisions based on detailed study of economic and social factors is probably one of the reasons for the extreme fragmentation of electricity demand outside the Central System. This fragmentation has resulted in individual unit sizes too small to permit the economic development of local hydroelectric potential. The country has continued to depend on imports of fossil fuels for about 40 percent of the total power generation capacity and for other energy uses despite the existence of vast hydroelectric resources.

Planning Practices

45. The problem of planning for the specific power projects is also important and deserves very close attention. The only organization authorized to deal with major planning in the country is ED. Its personnel is also responsible for power operations (in the Central System, in Rajbiraj and in Pokhara), construction activities and planning development of the vast hydroelectric resources of the country for the purpose of exporting power to India. With all of these tasks to perform, ED's limited personnel is overburdened and as a result, great difficulty is experienced in properly fulfilling some of these responsibilities.

46. In the past, planning has not been properly undertaken in relation to the needs of the country. All aspects of the planning and construction of the four main projects, Panauti, Trisuli, Sunkosi (near Tibet) and Gandak hydroelectric schemes, were directly undertaken by the donor countries, and projects constructed during the 1960's in the Kathmandu Valley were diesel plants decided upon as emergency measures to meet the steeply rising demand. In the rest of the country, local initiative was left to solve the problems related to electric power. However, Nepal has now reached the stage where systematic planning is of great importance. Although the next stage of power plant construction is to be a replica of the Trisuli scheme, the Devighat project will not be adequate to serve the increasing demand for very long and a new project will have to be started soon. A detailed survey

of the hydroelectric resources around the Central System area should be undertaken as soon as possible. The existing hydroelectric structures should also be critically reviewed to improve their capacity for daily, weekly and yearly retiming of energy available from the Central System. These surveys and reviews should be followed by a ranking study of all the reasonably-sized schemes in the area to determine the most economical sequence of steps to be taken in the evolution of power supply in the Central System. Once an investment program has been drawn up, detailed feasibility studies of individual projects should follow. Planning for other areas should follow similar lines. The existing "Master Plan" is not much more than a list of projects together with some of their characteristics. It is based mostly on very preliminary reconnaissance and map studies and does not consider the relative merits of projects. Present activities in the name of planning are therefore focused on detailed feasibility studies of projects which have been selected almost arbitrarily.

Institutional Arrangements

47. Of the two important government-owned organizations in the field of public power supplies in Nepal, NEC is an autonomous entity while ED is a department of the government. A public power utility is essentially a commercial business wherein the mechanisms of day-to-day operations as well as those of planning, communications, control, accounting, procurement, labor relations, incentive systems, etc., differ greatly from those required in government departments. ED, by virtue of its being a government department, is denied a reasonable degree of autonomy essential for the successful operation of its power supply activities. The results of this lack of autonomy are apparent in its day-to-day supply operations. For instance, construction of a 20 mile, 33 kV transmission line from Biratnagar to Dharan has been underway for the last three years and is still far from completion. Consumers in Dharan will not be able to benefit for another year from the low cost energy that has become available from the Indian Sunkosi project. Similarly, construction of a very short line (2 miles) between Birganj (Nepal) and Raxaul (India) had not even started in May 1972 although according to the agreement signed in November 1971, Nepal could have begun selling power over this line to India in April 1972. The reasons for these delays are presumably related to some procurement methods, or approval formalities of work orders, or some other bureaucratic practice essential for other activities of the government, but similar difficulties are not apparent in the operations of the autonomous NEC.

48. The problem of economy in human resources, especially the scarcity of skilled manpower in the sector, is aggravated by the multiplicity of independent organizations dealing with power supplies in Nepal. There are five separate entities dealing with public services for a total installed capacity of only 45 MW. Each entity must, for instance, keep at least one first class diesel maintenance technician for the regular maintenance and repair of its diesel equipment. Since there are not enough skilled technicians available in the country, part of the equipment belonging to some of the companies is poorly maintained or neglected which may result in irreparable damage. The history of operations of the Morang Hydroelectric

Company and the company which once existed in Nepalganj bear witness to such occurrences. Similar difficulties arise from the uneconomical use of all other technical and administrative manpower under existing conditions, and the integration of these undertakings, at least on a regional basis, should result in significant economies.

IV. LARGE SCALE POWER DEVELOPMENT FOR EXPORT

49. It has long been known that Nepal has vast hydroelectric resources, far greater than its possible internal requirements for the foreseeable future, and that this constitutes one of the few known major natural resources that could be exploited. Nepal is naturally desirous of tapping this enormous potential; however, the only existing market which could absorb the output of large scale development in Nepal is in northeastern India (in the States of Uttar Pradesh, Bihar, Bengal and the national capital, Delhi). Some of the proposed projects could be developed to produce electricity for this market at prices which would make it competitive with the indigenous resources available in India. This point is well demonstrated in the UNDP financed feasibility report relating to the Karnali River Basin projects prepared in February 1966.

50. This report shows that by constructing a 207 m. high concrete dam at a site on the Karnali River near Chisapani, it would be possible to impound sufficient water to produce 8350 GWh of firm energy annually by means of an 1800 MW power station operating at 55 percent load factor as well as producing 2350 GWh of secondary energy annually. The report indicates that in Uttar Pradesh alone there would be a deficit of power generation of about 650 MW by 1974/75. This gap will presumably continue to grow since by that time Uttar Pradesh would have exhausted all of its low cost hydroelectric resources. (Uttar Pradesh has no known fossil fuel resources and it imports coal for its thermal power stations from the Bihar - West Bengal coalfields, some 600 miles away).

51. Some of the secondary benefits would be transportation on the lake and access to the hills, development of fisheries, recreational improvement and irrigation of 350,000 ha of land. For India conservation of water ^{1/} of the order of more than 7,000 M. cu. m of live storage, as well as its flood control side effects, are additional attractions.

^{1/} According to "India-Irrigation and Power Projects" published in April 1970 by the Central Water and Power Commission, India is presently constructing a 125.6 m high dam on the Ramganga River at a cost of Rs. 1,000 million solely to secure about 2,000 M.cu.m. of live storage.

52. A major problem is the financing of the project, which is estimated at roughly \$700-\$800 million. It is also estimated that the construction of the first stage (two 300 MW units out of a proposed six units with 1800 MW capacity) would take, even under the best circumstances, no less than 10 years.

V. CONCLUSIONS AND RECOMMENDATIONS

53. Abundant water resources and the related large hydroelectric potential in Nepal are among its most important natural assets. Although the hydroelectric potential is one of the largest in the world, 40 percent of existing electric plant consists of steam and diesel units dependent upon coal and diesel fuel imported from India. This heavy reliance on expensive imports is a result of the nature of demand outside the Central System which is characterized by small scattered quantities where the use of electricity is essential. The remaining demand for energy in domestic, commercial and industrial sectors is partly covered by the use of other commercial and non-commercial types of energy such as woodfuel, dung-cake and kerosene. Part of the demand is presumably not met at all and some of the population live in complete darkness when kerosene supplies are interrupted. This situation is partly a reflection of the state of the economy but it is also partly a result of the absence of a rational policy-making mechanism as explained above. Since such policy decisions involve considerations outside the competence and jurisdiction of one single ministry, but are related to the departments of electricity, agriculture, irrigation, forestry, treasury, commerce and industry, it is believed that the Planning Commission is the proper agency for resolving these problems.

54. The Central System which accounts for more than 90 percent of the power installations devoted to public service in Nepal and which has grown rapidly in the past, is likely to experience similar rates of growth for the next 7 to 10 years as service continues to be extended to new areas in the service region. The increased supplies will be directed mostly to meeting domestic requirements in lighting and cooking since no other known resources of commercial energy other than hydroelectricity exist in the country to satisfy this basic domestic demand and because the demand in the Central System is large enough to make it possible to tap this resource at commercial prices. The existing facilities together with those planned for construction in the near future (Devighat) will cover requirements only up to 1978/80. Thereafter, shortages are likely to be experienced. In order to avoid hasty decisions to alleviate such shortages, a systematic study should be undertaken in the near future to determine the most economical development for the power sector. This study should plan for a period of at least 15 years and it should include (a) a detailed forecast of the total demand for energy, (b) a determination of the most economical supply structure (relative amounts of different types of energy), (c) a review of the characteristics and main features of existing installations to establish some means of retiming the power production potential of the Central System, (d) a determination of suitable hydroelectric sites reasonably

close to the Central System and reasonably detailed investigations in relation to these sites and the cost of their development, and (e) a comparison of various alternatives and a determination of the most economical sequence of projects to be constructed in order to meet future power requirements at the lowest possible cost.

55. It is extremely important for the successful operation of power utilities that they be free from the bureaucratic restraints of a government department and that they be given the necessary autonomy to enable them to take timely and effective action. In practice, this has been done in other areas by giving them administrative and financial autonomy. Therefore it is recommended that the power operating branches of the Electricity Department be separated from the government administration and incorporated in an autonomous body. Thus relieved of its operational responsibilities, ED could better concentrate on planning, regulation and other problems such as developing large scale projects for export purposes.

56. The waste of human resources and the consequent loss of operational efficiency resulting from extreme fragmentation of the power industry should be rectified. Integration of all utilities would bring: (a) better expertise to even the small installations; (b) standardization throughout the country; (c) reduction in the quantity of spares; and (d) fast replacement in case of serious damage to equipment. The existence of regular commercial flights to most regions where present utilities are located facilitates such integration. It is therefore strongly recommended that all existing public power operations be integrated under one autonomous body to be responsible for all future public supplies throughout the country.

57. The Biratnagar area and the ten other centers on the Indian border to be electrified in the near future, are very likely to experience rapid growth of demand since they are, or will be, receiving electricity from the Indian grid and will therefore benefit from the relative economies of size. The implementation of these small projects may in fact prove to be one of the most important steps taken in the direction of countrywide development since they have the possibility of improving the basic welfare of large numbers of people, and the power markets in these locations could grow to sizes sufficiently large to justify further development of indigenous resources. No effort should be spared in the speedy construction of transmission lines inside Nepal to enable the country to benefit from this Indian aid. It is also recommended that a close watch be kept on the growth that will be realized in the Biratnagar area, and in the light of these observations and with the help of additional data which will be acquired over the next two years, the technical, economic and financial feasibility of the Kankai project should be reviewed.

STATISTICAL APPENDIX

<u>TABLE NO.</u>	<u>TITLE</u>
1.	Zonal Distribution of Existing Generation Equipment - 1971/72
2.	Distribution of Generation Equipment by Type of Service
3.	Principal Hydro Power Stations
4.	Principal Thermal Power Stations
5.	Kathmandu - Hetaura - Birganj System-MW and GWh Generation and Sales Past Data and Future Estimates
6.	Kathmandu - Hetaura - Birganj System-Installed and Programmed Generating Capacity
7.	Kathmandu - Hetaura - Birganj System-River and Canal Discharges at Main Power Stations Sites and Available Power Generation

Table 1: ZONAL DISTRIBUTION OF EXISTING GENERATION EQUIPMENT - 1971/72
(In kW)

<u>Zone</u>	<u>Hydro</u>	<u>Steam</u>	<u>Diesel</u>	<u>Total</u>
Mechi	-	60	235	295
Kosi	-	1,400	4,820	6,220
Sagarmatha	-	25	80	105
Janakpur	-	-	610	610
Bagmati	31,590	-	6,280	37,870
Narayani	-	1,850	5,495	7,345
Lumbini	500	750	130	1,380
Gandaki	1,000	-	30	1,030
Dhaulagiri	-	-	-	-
Rapti	-	-	-	-
Karnali	-	-	-	-
Bheri	-	125	-	125
Seti	-	-	15	15
Mahakali	-	-	-	-
	<u>33,090</u>	<u>4,210</u>	<u>17,695</u>	<u>54,995</u>

Source: Power Statistical Journal of Nepal, Ministry of Water and Power, Department of Electricity, April 1972.

Table 2: DISTRIBUTION OF GENERATION EQUIPMENT BY TYPE OF SERVICE

	<u>Installed Capacity</u> (kW)
H. M. G.	16,080
Other Electric Utilities	<u>28,890</u>
Sub-total - Utilities	44,970
Industrial Agencies	7,810
Private Sector	<u>2,215</u>
Total	<u>54,995</u>

Source: Power Statistical Journal of Nepal,
Ministry of Water and Power,
Department of Electricity, April 1972.

Table 3: PRINCIPAL HYDRO POWER STATIONS

<u>Station</u>	<u>Name of Utility</u>	<u>Type</u>	<u>Installed Capacity (kW)</u>	<u>Unit Capacity (kW) & no. of Units</u>	<u>Year of Commission</u>
1. Trisuli	NEC	run-of river	18,000	3,000 x 6 3,000 x 1 (stand-by)	1969/70
2. Panauti	NEC	run-of river	2,400	800 x 3	1963/64
3. Pharping	NEC	storage reservoir	500	250 x 2	1911
4. Sundarikal	NEC	storage reservoir	640	320 x 2	1934
5. Sunkosi	ED	run-of river	10,050	3,350 x 3	1972
6. Pokhara	ED	storage	1,000	250 x 4	1968/69
7. Tinau	Butwal Power Co.	run-of river	50 <u>450</u>	50 x 1 225 x 2	1969 1972
TOTAL			<u>23,040</u>		

Note: The first five stations supply the Central System.

Source: Power Statistical Journal of Nepal, Ministry of Water and Power, Department of Electricity, April 1972.

Table 4: PRINCIPAL THERMAL POWER STATIONS^{/a}

<u>Station</u>	<u>Utility</u>	<u>Installed Capacity (kW)</u>	<u>Unit Capacity (kW x no. of Unit)</u>	<u>Prime Mover</u>
1. Mahendra	NEC	1,700	425 x 4	Diesel
2. Patan	NEC	1,500	1,500 x 1	Diesel
3. Teku	NEC	500	250 x 2	Diesel
4. Lainchour	NEC	500	250 x 2	Diesel
5. Naxal	NEC	500	250 x 2	Diesel
6. Bhaktapur	NEC	250	250 x 1	Diesel
7. Hetauda	ED	4,470	1,490 x 3	Diesel
8. Birganj	ED	560	280 x 2	Diesel
9. Birganj	Birganj Sugar Mill	1,850		Steam Turbine
10. Janakpur	Janakpur Cigarette Factory	560	60 x 1 250 x 2	Diesel Diesel
11. Biratnagar	Morang Hydro- electric Co.	1,700	1,028 x 1 411 x 1 261 x 1	Diesel Diesel Diesel
12. Biratnagar	Biratnagar	2,250	1,400 x 1 400 x 1 450 x 1	Steam Turbine Diesel
13. Dube	Dube Straw	366	366 x 1	Diesel
14. Dharan	Dharan Electric Co.	200	100 x 2	Diesel
15. Dharan	British Mili- tary Camp	1,200	400 x 3	Diesel
16. Bhairahawa	Mahendra Sugar Mill	770	500 x 1 250 x 1 20 x 1	Steam Turbine
TOTAL		<u>19,162</u>		

^{/a} The first eight stations supply the Central System, but stations No. 2 through 6 will shortly be transferred to other centers in the country. Stations No. 11 through 15 are all in the Far Eastern Terai.

Source: Power Statistical Journal of Nepal, Ministry of Water and Power, Department of Electricity, April 1972.

**Table 5: KATHMANDU - HETAURA - BIRGANJ SYSTEM MW AND GWh
GENERATION AND SALES PAST DATA AND FUTURE ESTIMATES**

<u>Years</u>	<u>System Peak MW</u>	<u>Generation</u>		<u>Sales</u>	
		<u>Rate of Growth (%)</u>	<u>GWh</u>	<u>GWh</u>	<u>GWh</u>
-----Actual-----					
1962/63			11.2	4.5	
1963/64			13.7	6.4	
1964/65	3.8		16.6	8.0	
1965/66	4.8	26.3	19.6	9.8	
1966/67	6.7	39.6	25.5	12.7	
1967/68	8.2	22.3	30.4	16.8	
1968/69	9.6	17.1	36.1	20.5	
1969/70	11.6	20.8	44.9	27.1	
1970/71	13.86	19.4	53.6	35.3	
1971/72 ^{/a}	17.50	26.3	49.8	34.0	
-----Estimated-----					
					<u>Lower Rate of Growth Estimates</u>
					<u>System Peak MW</u> <u>Rate of Growth (%)</u>
1972/73	21	20	80	56	21 20
1973/74	25	20	95	69	25 18
1974/75	30	20	114	86	29 16
1975/76	36	20	137	107	33 14
1976/77	43	20	165	132	37 12
1977/78	52	20	198	163	40 10
1978/79	63	20			44 10
1979/80					49 10
1980/81					54 10

^{/a} First nine months only.

Source: Nepal Electricity Corporation.

Table 6: KATHMANDU - HETAURA - BIRGANJ SYSTEM

INSTALLED AND PROGRAMMED GENERATING CAPACITY

<u>Plant Name</u>	<u>Diesel D or Hydro H</u>	<u>Year Commissioned or Interconnected</u>	<u>Plant Capacity MW</u>		
			<u>Name Plate</u>	<u>Maximum</u>	<u>Firm</u>
Pharprug	H	1911	500	500	500
Sundarikal	H	1934	640	640	640
Mahendra	D	1956	1,700	1,530	1,530
Pananti	H	1965	2,400	1,600	1,600
Trisuli I	H	1966	9,000	9,000	6,000
Hetauda	D	1968	4,470	4,000	4,000
Birganj	D	1968	560	500	500
Trisuli I + II	H	1970	21,000	21,000	13,700
Sunkosi	H	1972	10,050	10,050	3,510
Gandak	H	1976	15,000	15,000	7,190
Devighat	H	1977	18,000	18,000	13,000

Total System Capacity

	<u>Year</u>	<u>Name Plate</u>	<u>Maximum</u>	<u>Firm</u>
Hydro	1970	24,540	23,740	16,440
Hydro/Diesel	1970	30,570	29,770	22,470
Hydro	1972	34,590	33,790	19,950
Hydro/Steam	1972	40,620	39,820	25,980
Hydro	1976	49,590	48,790	27,140
Hydro/Steam	1976	55,620	54,820	33,170
Hydro	1977	73,620	72,820	46,170

Source: Nepal Electricity Corporation.

Table 7: KATHMANDU - HETAURA - BIRGANJ SYSTEM

RIVER AND CANAL DISCHARGES AT MAIN POWER STATIONS SITES AND AVAILABLE POWER GENERATION

Month	Average Monthly Discharge (m ³ /s)				Maximum Possible Power Generation (MW)						
	Trisuli River	Sunkosi River	Gandak Canal	(1) Small Plants	(2) Trisuli	(3) Sunkosi	1972	1976	1977	(6) Total (4+5)	(8) Total (6+7)
							(4) Total (1+2+3)	Addition (5) Gandak	Addition (7) Devighat		
July/Aug.	358.0	136.0	282	2.74	21.00	10.05	33.79	15.00	18.00	48.79	66.79
Aug./Sept.	342.0	138.0	173	2.74	21.00	10.05	33.79	15.00	18.00	48.79	66.79
Sept./Oct.	182.0	117.0	169	2.74	21.00	10.05	33.79	15.00	18.00	48.79	66.79
Oct./Nov.	94.0	53.6	163	2.74	21.00	10.05	33.79	15.00	18.00	48.79	66.79
Nov./Dec.	60.4	28.7	234	2.74	21.00	7.88	31.62	13.82	18.00	45.44	63.44
Dec./Jan.	44.0	19.5	317	2.74	21.00	5.35	29.09	13.02	18.00	42.11	60.11
Jan./Feb.	34.0	15.0	432	2.74	16.00	4.12	22.86	12.45	15.30	35.31	50.61
Feb./March	29.8	13.2	424	2.74	14.00	3.62	20.36	7.64	13.41	28.00	41.41
March/April	29.1	12.8	424	2.74	13.70	3.51	19.95	7.46	13.10	27.41	40.51
April/May	30.5	13.2	455	2.74	14.40	3.62	20.76	7.19	13.72	27.95	41.67
May/June	53.2	20.5	313	2.74	21.00	5.63	29.37	10.33	18.00	39.70	57.70
June/July	72.4	28.1	295	2.74	21.00	7.71	31.45	13.99	18.00	45.44	63.44

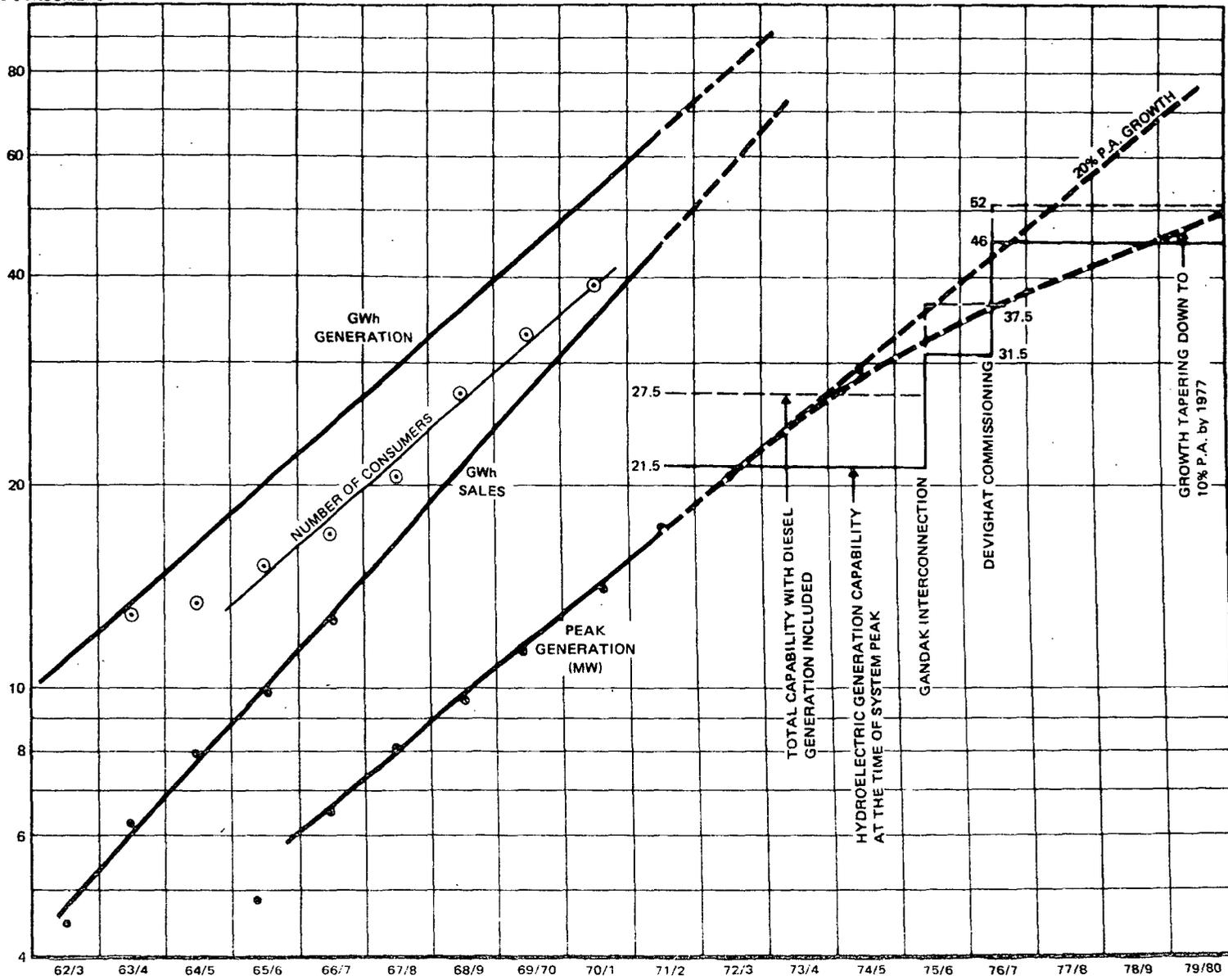
Available head at Trisuli power station 50.0 m
 Sunkosi 30.5 m
 Gandak (under const.) 5.49m
 Devighat (planned) 50.0 m

Source: Nepal Electricity Corporation.

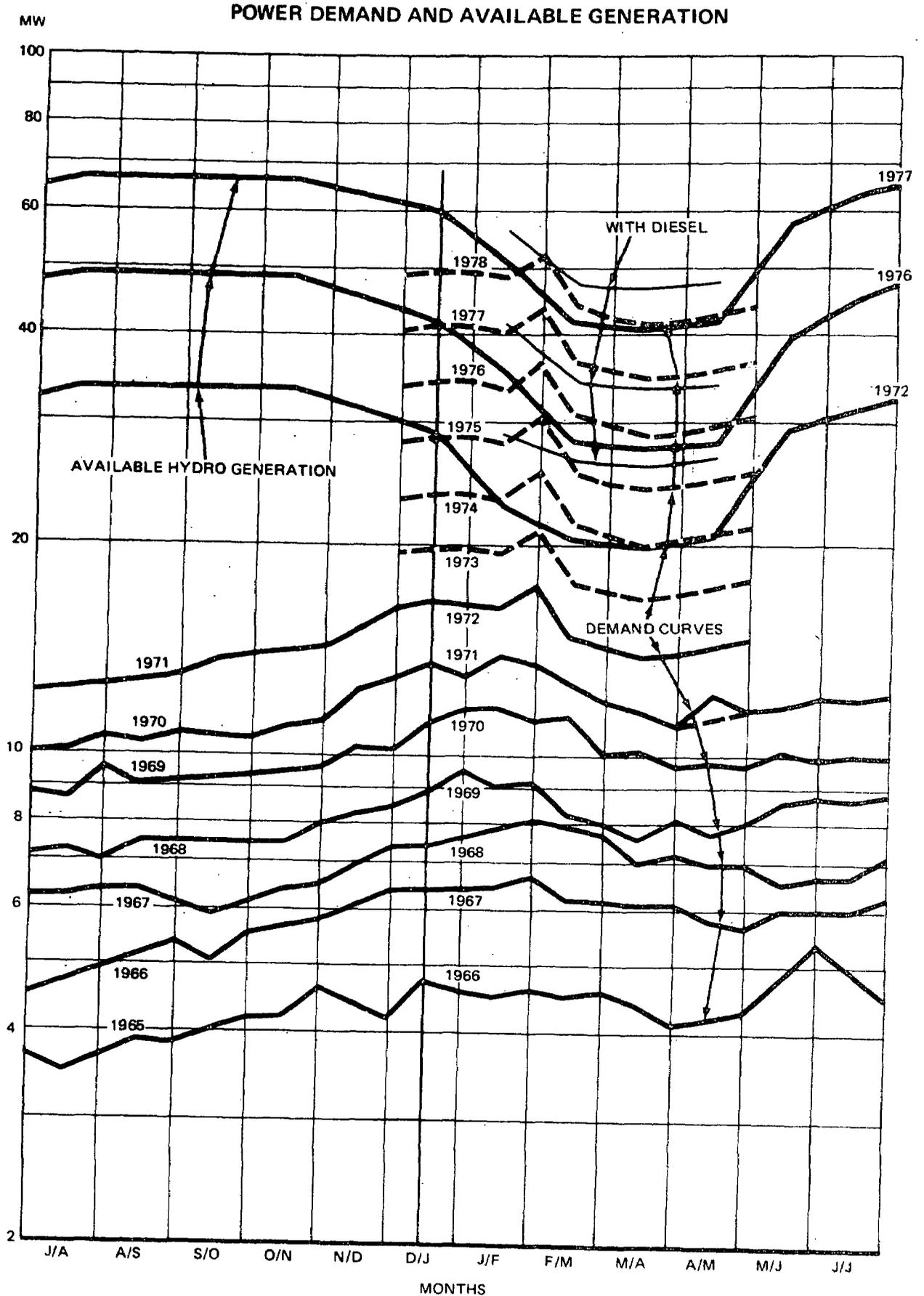
NEPAL - POWER SECTOR
KATHMANDU - HETAURA - BIRGANJ SYSTEM

NUMBER OF CONSUMERS, GENERATION AND SALES TRENDS WITH PROPOSED INVESTMENT PROGRAM

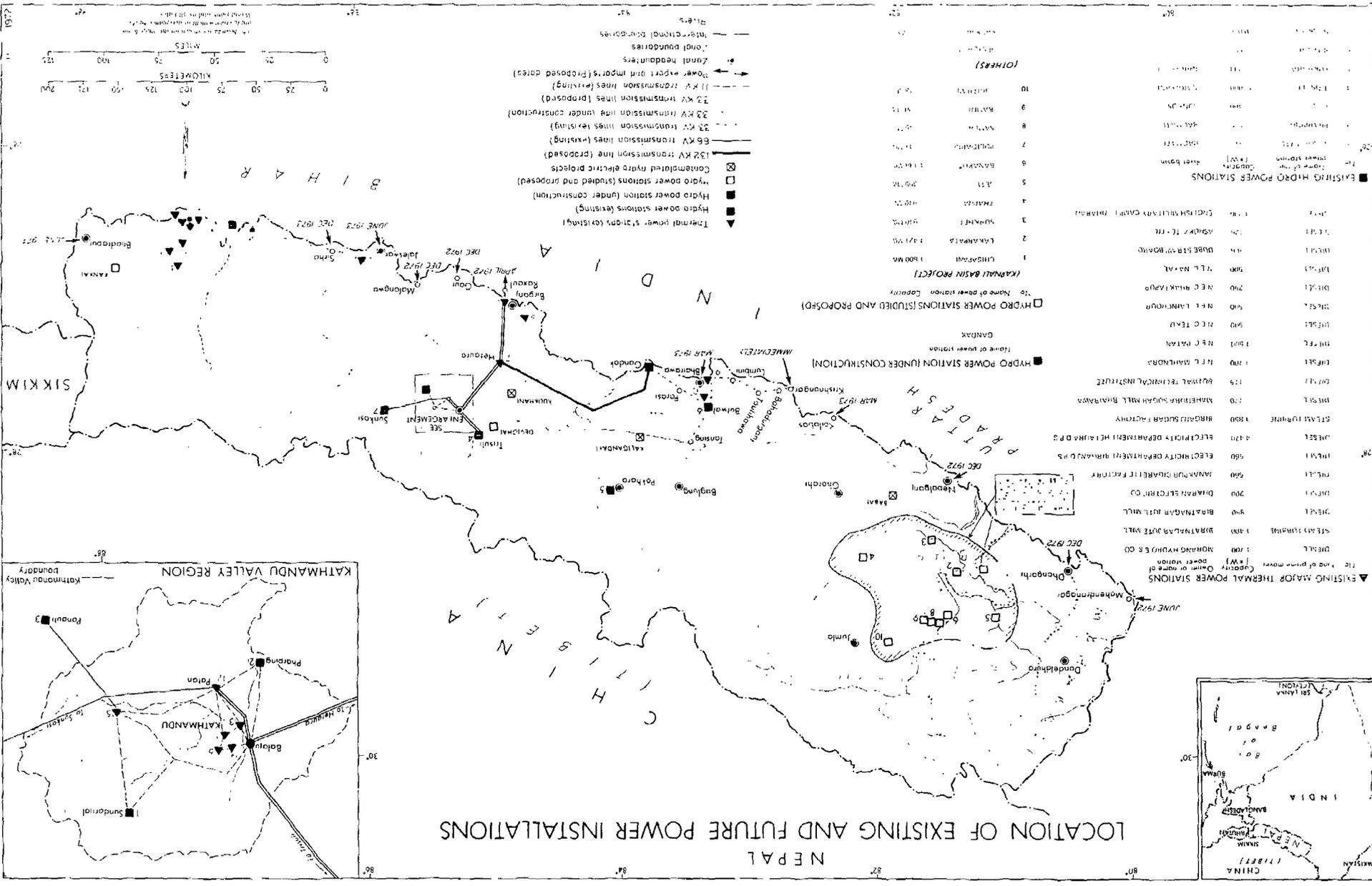
MW & GWh
1000 CONSUMERS



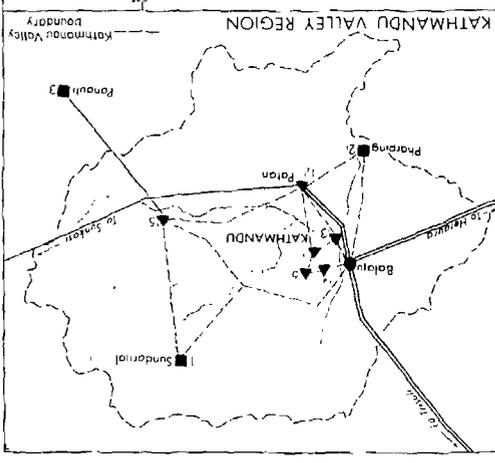
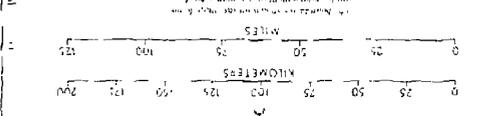
NEPAL - POWER SECTOR
KATHMANDU - HETAURA - BIRGANJ SYSTEM



NEPAL LOCATION OF EXISTING AND FUTURE POWER INSTALLATIONS



Sl. No.	Name of power station	Capacity (MW)	Year of prime mover	Type
1	Chitwan	1000	1972	Thermal
2	Lakshman	1000	1972	Thermal
3	Sunamti	1000	1972	Thermal
4	Thapli	1000	1972	Thermal
5	Ati	1000	1972	Thermal
6	Banahat	1000	1972	Thermal
7	Pokhara	1000	1972	Thermal
8	Satish	1000	1972	Thermal
9	Ratna	1000	1972	Thermal
10	Others	1000	1972	Thermal
11	Chitwan	1000	1972	Hydro
12	Lakshman	1000	1972	Hydro
13	Sunamti	1000	1972	Hydro
14	Thapli	1000	1972	Hydro
15	Ati	1000	1972	Hydro
16	Banahat	1000	1972	Hydro
17	Pokhara	1000	1972	Hydro
18	Satish	1000	1972	Hydro
19	Ratna	1000	1972	Hydro
20	Others	1000	1972	Hydro



SECTION VI

TRANSPORT

TABLE OF CONTENTS

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STATISTICAL APPENDIX

MAP

Introduction

1. Nepal's geographic setting indicates the basis for the country's transport links with the outside world. Land-locked Nepal is located about 700 kilometers from the nearest seaport. High mountains along the northern border with China have a limiting influence on communications. In contrast, the continuation of the Gangetic plain of northern India into southern Nepal favors development of transport and trade between Nepal and its southern neighbor.
2. Development of the internal transport system is difficult and costly because of the mountainous terrain covering two-thirds of the country. The world's highest mountains which extend the entire length of northern Nepal present a formidable barrier to the building of transport facilities. Moreover, the central part of the country, known as the Hill country, is criss-crossed by somewhat lower but nevertheless rugged mountains and by swift-flowing rivers. In the south, the relatively flat Terai is far more favorable for construction of transport routes.
3. Throughout the country marked seasonality of rainfall causes wide variations in stream flow and, as a result, navigability of rivers is very limited. The rainfall, which is extremely heavy during the monsoon season, causes extensive damage to roads and severely limits both porter and air transport.
4. The population is estimated at 11.2 million (1971 census) which is growing at an average rate of 2 percent per annum. Approximately one-third of the population lives in the Terai which constitutes one-sixth of the total area of the country. The more extensive Hill Region contains two-thirds of the population. Nepal's overall population density is about 80 per square kilometer. In eastern Terai the density is nearly three times this level while in far western and northern areas the density is far below the national average. A particularly notable factor is that more than half a million people are concentrated in the Kathmandu Valley located about 150 kilometers by road from the Terai. Biratnagar, a Terai city with a population under 50,000, is the largest city outside the Kathmandu Valley.
5. Over 90 percent of the population is engaged in agriculture. The great majority of these agricultural people are subsistence farmers, particularly in the Hill areas, and their present use of transport is slight. In the Terai, however, rice is produced in sufficient quantities to permit exports to India and these shipments move across the border at many points. Another important export commodity is jute which is produced and processed in the southeast Terai near Biratnagar and is exported (via Calcutta) largely to Europe. Imports (mostly manufactured goods) from India and other countries enter Nepal through other border cities, particularly Biratnagar, Janakpur, Bhairawa and Nepalganj. The principal movement of population in Nepal is within the Kathmandu Valley, between Kathmandu and Birganj, and along existing roads in the southeastern Terai. There is substantial seasonal movement of people between the Hills and the Terai, and a large and growing permanent migration from the Hills to the Terai is also in evidence.

I. THE INTERNAL TRANSPORT SYSTEM

Main Roads

6. The first road of real importance in Nepal was the 123-kilometer highway from Kathmandu to Bhainse, completed in 1956, which was subsequently extended to the Indian border at Birganj. This road is the key link between Kathmandu and both the Terai and India. A highway from Kathmandu to Kodari connects the Nepalese capital with China although this route has not been of much economic significance for either domestic or international trade. Work has recently been completed on a road extending westward from Kathmandu to Pokhara, a growing tourism center. Another road, recently completed, connects Pokhara to Bhairawa near the Indian border, thus providing a second north-south route linking the Hills and the Terai. Much of the road construction effort of the past few years has, however, been concentrated on the so-called East-West Highway, which, according to Government plans, will span the entire country with a 1000-kilometer main artery through the Terai; less than half the planned route has been completed, mainly portions in the eastern area. In eastern Nepal a road from Biratnagar, near the Indian border, to Dharan provides a significant north-south route linked with the East-West Highway.

7. The pace of all-weather road construction has increased during recent years (Table 1). From 1955-1965, an average of 45 km of all-weather roads was built annually. Between 1965 and 1972, this annual average has been 163 km. In mid-1972, the network of all-weather roads totaled 1,580 kilometers of which 1,080 kilometers were paved and 500 gravel. A detailed breakdown of the road system by particular road segments is shown in Table 2.

Feeder Roads and Porter Trails

8. The development of feeder roads, that is secondary and tertiary roads, has not received as much stimulus as the building of main all-weather roads. Between 1965 and 1972 the total length of earth roads decreased from 1,890 to 1,250 kilometers, a decline of 10 percent, while over the same period the total length of all-weather routes increased from 436 to 1580 kilometers (260 percent). Undoubtedly, a considerable part of the earth roads of earlier years has been converted to surfaced roads and building of new non-surfaced roads has lagged. The limited development of feeder roads is borne out by the mission's observation that very few feeder roads enter the main roads. As a result, while the important population centers are served by roads, many rural people do not have adequate access to the road system.

9. Vast areas of the country are not served by roads at all and most of the population relies on a network of trails. This network in the

mountains and foothills, estimated by consultants ^{1/} at about 10,000 kilometers, has been developed over centuries. The trails, often steep and narrow, are used by porters and to a lesser extent pack animals. In recent years, the government (Roads Department) has taken an interest in trail improvement including provision of modern suspension bridges. USAID first financed the building and erection of suspension bridges, three of which have been installed and three more are being built. The first highway credit of the World Bank Group includes provision of five suspension bridges. Building of these modern suspension bridges not only reduces the length of certain trails significantly, but also permits porters to operate during the rainy season on trails involving river crossings that are otherwise impassable.

Motor Vehicles

10. A total of 12,279 motor vehicles, (excluding motorcycles) were operating in Nepal in 1972. As indicated in Table 3, the number of vehicles has increased sharply except during the period 1969-1971. These totals do not precisely represent the operating fleet because they have not been fully deflated for vehicles retired from service. Of the total motor vehicles in the country in 1972, automobiles and jeeps represented 57 percent, trucks 37 percent and buses 6 percent. No evidence has been found that the size of the fleet is inadequate for the country's present needs.

11. Historical data on motor vehicle traffic are very scarce and the few isolated statistics available do not represent measures of general growth in traffic. Some notion of traffic growth can be inferred, however, from increases in vehicle inventories as presented above. On the important Kathmandu-Birganj road the average daily traffic (vehicles) increased about 13 percent annually between 1963-64 and 1968-69. The average daily traffic in 1971 was found to be 190, 88 percent of which consisted of trucks, 7 percent buses and 5 percent jeeps and cars. The annual tonnage of freight on this route, as indicated in Table 4, was recently estimated at 212,000 tons, a very high proportion of the total being northbound freight. While reliable statistics on other roads are not available, it is known that traffic levels are substantially less than those indicated for the Kathmandu-Birganj route. Vehicle traffic on two other roads is shown in Table 5. Motor carrier traffic of the Nepal Transport Corporation as presented in Table 6, has reached about 34,000 tons of freight and nearly 6 million passengers, but it is not known what percentage of total motor carrier traffic this represents.

12. The average cost of truck transport (average revenue of truck operator) is about NR 1 per ton kilometer on the Kathmandu-Birganj route. These costs reflect the common use of 5-ton Tata trucks. A factor tending

^{1/} COMTEC/ALPINA/MACCHI "UN-HMG Nepal Road Feasibility Study" Part A December 1970, p. 163.

to cause the trucking cost level to be high is the substantial imbalance in traffic on this route; most southbound vehicles are empty because of the lack of traffic demand in that direction. Truck transport costs based on a 50 percent load factor have been estimated to range from MR 0.79 to 1.25 for paved roads and NR 1.18 to 1.64 for gravel roads, depending on grades and curves.

Air Transport

13. Air transport in Nepal began in 1950 with the construction of an airport in Kathmandu and the inauguration of services between Kathmandu and Patna. From 1953 to 1958 Indian Airlines provided local services within Nepal as well as international services to and from India. The Royal Nepal Airlines Corporation began operations in 1960 and now operates all domestic services as well as international services to India and Thailand.

14. The internal air transport system has been expanded to include service at 15 airports and 8 STOL strips (Table 7). The STOL strips, served by 6-passenger Pilatus Porter aircraft, are located in mountain areas where population centers are small and traffic is low. In the mid-sixties improvements were made at four airports in the Terai, namely, Biratnagar, Janakpur, Simra and Bhairawa. At present, the Asian Development Bank is financing improvements of airports in Kathmandu, Pokhara, Bhairawa, Biratnagar and Simra. Domestic air service (except at STOL strips) is provided primarily in DC 3 and Twin Otter aircraft. AVRO 748 aircraft and one Boeing 727 jet delivered in late 1972, are used for international service.

15. The number of domestic air passengers carried, as shown in Table 8, increased during the five-year period ending in 1970, from 74,023 to about 208,000 while international passenger traffic rose from 41,746 to 101,330 passengers carried in the same period. Thus both domestic and international passenger traffic have increased sharply in recent years. A substantial part of this passenger traffic, as indicated in Table 9, has been carried by RNAC. The volume of air freight in Nepal has been very small primarily because of the high cost of air transport. Freight carried by RNAC totaled 2,527 tons in 1965-66 and the tonnage has fluctuated above and below this level since that time; it was only 2,302 tons in 1969-70 (see Table 10).

16. Since extensive areas of Nepal are not served by the road network, air transport provides a useful means of passenger transport between many widely scattered population centers. Movements of administrative personnel as well as emergency services and some small amounts of urgently needed supplies are made possible by this service. Unfortunately, domestic air operations are curtailed for periods up to 4 months during the rainy season. Since porter transport is also very restricted during this monsoon season, access to remotely located communities is very poor indeed.

International Routes

17. Infrastructure: Certain transport facilities are utilized largely to move commodities comprising the export and import trade of the country and thus may be considered elements of the international routes carrying Nepal's foreign trade. Imports originating in India move by both rail and road to various border points, among which Birganj is particularly outstanding. From Birganj the imports destined for the Kathmandu Valley are transported, in part, by truck directly to the valley and in part to Hitaura where goods are transloaded to the Hitaura-Kathmandu ropeway. Imports originating overseas enter India at the port of Calcutta and move largely by rail (there is also some truck movement) to Birganj and then to Kathmandu as indicated. Nepal's rice exports move by truck from points of production in the Terai to northern Indian markets directly, or to Indian railheads for transloading and rail haul to such markets. Jute exports are transported a very short distance by truck from jute mills in the Biratnagar area to the Jogbani railhead from which the commodity moves to Calcutta.

18. The 41-kilometer ropeway between Hitaura and Kathmandu began operations in 1964. Its length is about one-third that of the road between the same points. Annual capacity of the line in each direction is about 50,000 tons over the past few years, as shown in Table 11, actual traffic northbound has ranged between 17,000 and 37,000 tons; southbound traffic is almost nil because of the small volume of surpluses produced in the Kathmandu Valley. Currently, the ropeway handles only 15 percent of the 250,000 tons of northbound traffic on this corridor. Financial results of the ropeway operation have been disappointing.

19. Railways first made their appearance in Nepal in 1927 when a narrow-gauge line was built from the border city of Raxaul in India through Birganj to Amlekganj in Nepal, a distance of 48 kilometers. Because of traffic decline in the mid-1960's, operations were discontinued on all but 6 kilometers of this line. Today the railway functions only as a terminal area facility for transferring goods between the rail terminals in Raxaul and Birganj. Equipment on the line is indicated in Table 12. Because the gauge (2'6") of this line differs from that of the Indian lines (meter gauge) extending east, west and south of Raxaul, all throughshipments by rail must be transloaded at Raxaul. Traffic on the six-kilometer link was only 33,583 tons in the year 1970-71 (see Table 13). It seems doubtful whether continued operation of this narrow-gauge line is economically justified.

20. Another narrow-gauge line was built in Nepal in 1930, extending from Jaynagar, an Indian city near the Nepal border, through Janakpur to Bizalpara, a distance of 53 kilometers (see Table 12). Because of gauge differences between this line and the Indian rail line extending south of Jaynagar, transloading of traffic is necessary at that point for through rail shipments. Freight traffic on the Nepal line has declined in the four year period ending 1970-71 from 35,027 to only 27,686 tons (see Table 13). A total of 715,277 passengers were also carried on this railway in 1970/71.

This line is not very important either as an international rail link or as a domestic transport facility and is finding it increasingly difficult to compete with the growing road transport in the area.

21. Transport facilities within India that are of primary importance in the handling of Nepal's overseas trade are: (a) the meter-gauge railway lines from Raxaul to Barauni, Jaynagar to Barauni and Jogbani to Kathihar; (b) broad-gauge rail lines from Barauni to Calcutta and Kathihar to Calcutta; and (c) the port of Calcutta. Use of road transport for transit between Calcutta and Nepal was first recognized in the Trade and Transit Agreement of August 1971. This treaty also includes clauses that would provide the country with three godowns and an open space in the port of Calcutta.

22. Quality of Service: A fundamental cause of inefficiency in handling Nepal's transit trade is the lack of common railway gauge and the necessity of transloading at points of gauge change. Much pilferage and damage to freight occurs as a result of these transloading operations. Moreover, when freight cars are not readily available at the interchange points there are long delays in the movement of transit freight.

23. Shortages of Indian freight cars at the Jogbani railhead, where jute is loaded for transit to Calcutta, is a cause of long delays in shipment of Nepal's primary overseas export. Delays of a few weeks are not uncommon. Pressure on the Indian railways to deliver wagons when needed has not brought a satisfactory response. From the Indian railway's point of view there is little motivation to provide wagons promptly since Nepal's jute traffic of only a few thousand tons annually is a minor element in the railway's total traffic, and wagons sent north to Jogbani are nearly always empty rather than loaded.

24. Recognizing that rail services through India are quite unsatisfactory, the Nepal Transport Corporation will soon experiment with container-trucking operations for transit movements. Nepal's import goods arriving in the port of Calcutta will be loaded in containers, inspected and sealed by customs and then trucked to Nepal. Major service advantages anticipated are substantial reduction in pilferage and damage as well as more rapid delivery of goods. A problem, however, with the use of containers is that based on the present traffic pattern, the containers would generally be loaded in only one direction. Conceivably, containers carrying imported goods to Kathmandu could be unloaded there and then trucked to Biratnagar (beginning 1973 when the road is finished) for loading with jute before being returned by truck to Calcutta.

25. Suggestions of the Nepal Government for improving transit service include a very minor extension of the Indian meter-gauge line from Raxaul to Birganj, replacing the 6 kilometer narrow-gauge link. Another government proposal for improving transit service is the construction of a meter-gauge link from eastern Nepal to Bangladesh, and still another, the building of a broad-gauge link from Jhapa, Nepal, to New Jalpaiguri in India from which traffic could be sent to Chulna in Bangladesh. In view of the small volume of traffic involved in the latter case, it is doubtful whether this proposal has any economic merit.

26. Aviation: At present the Nepal flag air carrier provides international services only to India and Thailand, more specifically to New Delhi, Calcutta, Patna and Bangkok. The carrier intends to inaugurate services to other countries of South Asia using Boeing 727's received late in 1972. Foreign airlines serving Nepal are India Airlines, Thai International Airlines and Burma Airlines. Other international airlines have shown interest in negotiating traffic rights in Nepal.

27. Royal Nepal Airlines is a reasonably well managed company. Maintenance standards are good. The company's operations suffer, however, from two factors beyond its control: lack of telecommunication and the existence of grass runways, which cannot be utilized in rainy weather. These constraints should ease considerably when the on-going Asian Development Bank project of airport improvements and on-going and proposed World Bank Group telecommunication projects are completed.

II. ORGANIZATION AND POLICIES

Administration

28. The Ministry of Public Works and Transport has the responsibility for the national road network and the national system of airports and air navigation facilities. The Roads Department within the Ministry is headed by a chief engineer supported by superintending engineers covering the special fields of planning, design, construction and maintenance. The planning unit was established about two years ago and has relied heavily on expatriate expert support financed by UNDP. Also reporting directly to the chief engineer are the heads of several project offices concerned with liaison on construction projects financed by bilateral aid. Thus far, only two divisional offices have been established--one in Kathmandu and the other in Hitaura. The chief engineer recognizes the need for organizational improvements in the department and a UNDP financed team of advisors has recommended specific changes. Implementation of these recommendations, however, has been slow.

29. Local authorities rather than the Roads Department have the primary responsibility for local road and trail improvement. Nevertheless, the Roads Department has the responsibility to provide some technical assistance to such local authorities. Unfortunately, such assistance has been very limited and undoubtedly is at least partly responsible for the poor progress, mentioned earlier, in development of local roads and trail improvement.

30. The Department of Civil Aviation is responsible for the planning, development, operation and maintenance of airport and air navigation facilities in Nepal. The Director of Civil Aviation has two deputies, one concerned with technical matters and the other with administrative functions. The airport manager for Kathmandu airport reports directly to the Director of Civil Aviation rather than to a subordinate official of the department. Consultants provided by the Asian Development Bank are presently assisting

in its reorganization. An urgent need exists to provide for more delegation of authority and clearer lines of communication within the department.

31. Outside the Ministry of Public Works and Transport are two government corporations that have substantial responsibilities in the transport field. The Nepal Transport Corporation operates trucking and bus services, the ropeway and the two short rail lines. Until recently this corporation was subject to much criticism for inefficiency but a reorganization in early 1972 resulted in improvement of the administrative structure and management.

32. The other government corporation in the transport field--Royal Nepal Airlines Corporation--faced serious management problems for many years following its establishment in 1960. It sought to alleviate these difficulties through an agreement signed in July 1970, with Air France. Under this agreement, Air France has provided RNAC with the general manager, a financial officer, an operations officer and several short term specialists. The corporation has also been aided through the Colombo Plan by a technical specialist who has helped to improve technical standards and train Nepalese engineers.

33. Another transport corporation organized in Nepal is the Royal Nepal Shipping Corporation--a private firm created early in 1972. The firm chartered a ship of 12,578 deadweight tons and began operations between Calcutta and Western Europe carrying not only part of Nepal's overseas trade but also other trade. This Nepal flag shipping line was made possible by the enactment in 1971 of the first maritime law in the country. In authorizing the establishment of a Nepal flag line the government expected both improved shipping service for its overseas trade and savings in foreign exchange.

34. Management of private motor carriers operating fleets of vehicles in Nepal is dominated by Indian managers. There are seven such companies, each with about nine trucks, but their small fleets are supplemented by additional trucks obtained under contract with owner-operators, many of whom are Nepalese. There is clearly a shortage of experienced Nepalese managers of motor carrier operations. Nepalese employees of Indian-managed carriers are gaining useful experience essential for ultimate carrier management, but appropriate training programs should be introduced to facilitate the development of local managers.

35. Operators of trucks registered in India can operate within Nepal without restriction provided payments are made to the Nepalese Government of NR 50 per day. In contrast, Nepalese truck owners are subject to severe restrictions when operating in India. Nepalese carriers are required to obtain a single-trip permit from the Indian authorities to operate between Nepal and Calcutta. The criteria for issuance of such a permit are vague and two or three weeks are required to obtain the authorization if it is issued at all. The Indian Government should accord Nepalese carriers in India privileges as generous as the Nepalese Government accords Indian carriers in Nepal.

Transport Policies

36. Government policy regarding road transport pricing is to allow private motor carriers to price their services free of governmental restraint. The government does, however, influence transport prices indirectly in that it imposes on the carriers (and on other vehicle operators) certain types of user charges; these charges include license fees, road tolls and import duties and surcharges on fuel, vehicles and spare parts. In Fiscal Year 1970, revenue from road user charges is estimated at about NR 30 million compared with estimated government expenditures on roads (both capital and recurrent but excluding foreign aid) of NR 25 million.

37. However, in 1972, the Government introduced toll charges on all principal roads. For example, on the 179-kilometer Tribhuvan Rajpath the following schedule of charges was announced in July 1972:

	<u>Trucks and Buses</u>	<u>Jeeps and Cars</u>
	-----Nepalese Rupees-----	
Kathmandu - Khanikhola	4.50	3
Khanikhola - Daman	7.50	5
Daman - Hitaura	9	6
Hitaura - Pathalanyia	4.50	3
Pathalanyia - Birganj	<u>4.50</u>	<u>3</u>
Total	40.00	20

It is very doubtful if this type of user charge is economically justified. The system has serious limitations in that collection costs represent a high proportion of revenue collected and the system lends itself to abuse. Moreover, toll collections cause some delays in vehicle movement. Therefore, this type of user charge is inadvisable.

38. Maintenance of roads appears to have been given insufficient attention. It was the observation of the mission that the important Tribhuvan Rajpath is seriously undermaintained. Because of rugged terrain and heavy seasonal rainfall, roads tend to deteriorate rapidly and a policy of properly maintaining roads is, therefore, of particular importance. The Roads Department has been somewhat handicapped in its road maintenance activity by a shortage of mechanized equipment; this deficiency will be reduced in the near future by the availability of such equipment under the present IDA credit. To some extent, bilateral aid has included programs of maintenance along with construction; there is considerable merit in the principle of the donor undertaking responsibility for maintenance after completion of road construction and then assisting the Roads Department in assuming that responsibility. In any event, it is of the utmost importance that the government adopt a policy of adequately maintaining its roads.

39. In addition to keeping the roads in proper repair there is much that can be done to prevent unnecessary damage. Overloaded trucks can cause extensive road damage, and thus, undue vehicle loading should be prevented. A proper step has been taken in that legal limits on vehicle weights have been enacted, but, while the precise limits are not known, it is understood that there is very little enforcement of the limits established. Such enforcement requires an adequate number of scales for checking vehicle weights. Both mobile and fixed-location scales in many countries have proved to be indispensable means of enforcing controls on vehicle weights and thus protecting roads from excessive damage. Nepal should have a similar program.

40. Overloading vehicles also causes their rapid deterioration and this is one of the reasons why so many of them are in a poor state of repair. Moreover, there is a shortage of adequately trained mechanics and spare parts which is attributed to some extent, to high import tariffs. Some relaxation of the tariff rates on vehicle parts seems essential to permit adequate maintenance.

41. With regard to transit through India, the Nepal Government should make every effort to negotiate with Indian officials, efficient transport and customs procedures concerning the use of containers. While employment of containers in transit operations is permitted in principle under the Trade and Transit Agreement of August 1971, details concerning rates, customs inspections and other matters have not been fully developed. In view of the inefficiency of present transit operations there is good reason for the Nepal Government to explore the possibilities for achieving improvements. The use of containers for either truck or rail transport may provide an effective means of reducing pilferage and damage to freight and, at the same time, expedite the flow of transit traffic.

42. Agriculture: By far, the most important economic sector is agriculture and there is no doubt that as it is characterized by subsistence farming, it will continue as the primary basis of economic life of the Nepalese people within the foreseeable future. Although the opportunities for expanding crop agriculture are limited, particularly in the Hills, substantial amounts of arable lands are available in the Terai, and a significant potential exists in terms of increased yields. Soils and climatic conditions are sufficiently diverse in the Hills and on the plains to permit a reasonably diverse and productive agricultural economy. Realization of this potential is handicapped, however, by the lack of transport infrastructure to facilitate trade in agricultural and other products. As previously indicated, there is a shortage of minimum-standard roads and improved trails feeding into existing trunk highways such as the Kathmandu-Kodari, Naubise-Pokhara and Kathmandu-Hitaura roads. Better access to these main roads is needed to enable farmers located in their hinterlands to reach markets for their products. Such transport development is essential to achieve significant progress for the many farmers who presently have no escape from subsistence agriculture.

43. There is very little trade in agricultural products between the Hills and the Terai. Government reports indicate that not only does the Terai have the potential for marketing its rice surpluses in the Hills, but also that the Hills have the potential for producing fruits and vegetables in exchange for rice. Currently, the rice surpluses are marketed in India but there are indications that the market may decline in the future as northern India expands its own grain production. If this transpires, then new markets for Terai rice would be needed. The extent to which the Hills region can change its agricultural economy in the manner suggested, needs intensive investigation. Any program to reorient agricultural production and trade in this manner would require concomitant development of roads connecting the Terai and the Hills. In any case, with the expected increase in rice demand as a result of population growth, unless production of foodgrains can be increased in the Hills, improvements in transport and storage facilities will be required.

44. Forestry: Nepal has substantial forest resources both in the Terai and in certain mountain areas. Those located in the Terai lie very near the Indian border and the principal market for forest products of that area is undoubtedly India. Because of the proximity of potential producing areas in the Terai to railheads and highways in India, the transport requirements in Nepal should not be large. Thus, transport is probably a less important constraint on the development of these resources than are other considerations such as management and technical capability. Nevertheless, some road development in potential logging areas of the Terai is essential, particularly in the Bardia and Banke areas.

45. Access to forest resources in the mountains is more difficult than in the Terai. In the Jiri Valley, for example, good softwood timber is found and a sizeable market for lumber exists in Kathmandu but road access is lacking. A recent SATA (Swiss) feasibility study for such a road recommended favorably on the proposed project and it appears that bilateral aid may be available.

46. Industry and Mining: Industrial development in Nepal has been very limited. Much of it is agricultural-based industry, such as rice mills in the Terai, jute mills in Biratnagar and sugar mills in Birganj. Other industries such as cement, cigarette and shoe factories have also been developed. Industry has generally been developed in the relatively large centers of population and much of the future growth is expected in these centers although small scale industry is likely to increase in scattered locations. The larger centers are located on blacktop roads and are therefore relatively well served by the primary road system.

47. Future growth of Nepalese industry producing consumer goods will be handicapped by a number of factors including the ready availability of Indian-manufactured goods, especially in the Terai, and the difficulty of controlling their importation. Another important influence on industrial growth is public policy concerning licensing of new firms. Limitations of technical skills and management capability are also major factors. In general, transport constraints are lesser deterrents to industrial development than these other considerations. Improvements in transport can, of

course, result in lower transport costs and a broader reach for raw materials and markets, thus permitting expanded production and marketing. However, it should be noted that transport would also be beneficial to sellers of imported manufactures by extending their markets.

48. Knowledge of mineral resources of Nepal is very limited although some geological investigations have been conducted in recent years: to date no substantial mineral ores have been discovered and therefore, it is not possible to indicate at this stage, what transport improvements will be required, if any, to develop mineral resources in Nepal.

49. Tourism: Important attractions in Nepal for foreign tourists are the Himalaya Mountains and the many interesting monuments located in the Kathmandu Valley. Primary requirements for development of the tourism potential of the country are facilities such as hotels, restaurants, communications and potable water supplies. These factors now are apparently more critical requirements than improved transport although there are certainly needs in the transport field. One of these needs is for more jet aircraft on international services to Nepal. Since RNAC has started using jet aircraft on its international routes it appears that services available to foreign tourists will soon be improved.

50. Certain airport improvements are required to facilitate the growth of tourism. The runway at Kathmandu airport needs extension and also improved navigation aids are required at that key airport. These improvements are being provided under current projects financed by ADB. In addition, the Pokhara airport needs improvement or replacement and this requirement is also being met under the ADB program. A number of STOL strips are being built by the Department of Civil Aviation in the mountain area, such as at Lukla near Mt. Everest, and these strips will facilitate the growth of tourism. In general, the improvement of air transport facilities and services appears to be proceeding well in terms of the needs for tourism development.

51. Many of the monuments in the Kathmandu Valley that constitute important tourist attractions are inaccessible by road. A number of short roads are needed to provide access to these sites. This road improvement program will be aided by the proposed Ring Road around Kathmandu for which bilateral aid has been committed.

52. Transport Investment: The Government of Nepal has given high priority to investment in the transport sector. Transport investment in the Third Plan was targeted at NR 570 million, or 35 percent of total expenditures in the public sector, and this goal was nearly achieved. Under the Fourth Plan, total public sector expenditures amount to NR 2,550 million, of which NR 1,010 million or 40 percent, is planned for the transport sector. While the requirements for transport development are certainly very great, there is some risk that an undue emphasis in this field may result in insufficient resource allocation to development programs that should complement the expansion of transport capabilities. In particular, resource allocation to transport should be more closely related to the need for achieving a better food grain balance in the country. While traffic statistics are limited

they suggest, and the mission's observations confirm, that traffic generation following completion of transport development projects has been small. To stimulate growth in the areas served by the roads, larger investments in agriculture and related programs appear to be essential.

53. Within the transport sector, road development has received heavy investment emphasis. Under the Third Plan 85 percent of sector expenditures was allocated to roads and under the Fourth Plan 80 percent is so allocated. Nearly all of the remainder in both plans is targeted for civil aviation. The government policy to concentrate its resources on road building rather than on other forms of transport facilities seems very sound. There appears to be no economic basis for construction of railroads in Nepal as suggested in a recent ECAFE report. Whether ropeways have a significant role to play in the country's transport is quite uncertain; the long-term outlook for the present ropeway is not promising in view of competition from road transport and the prospect for ropeways elsewhere await the results of a study being sponsored by the government. In terms of investment air transport ranks second to roads, and development of this subsector is justified on the basis of its vital relationship to tourism development and the need to provide some link to remote locations not reached by roads. The requirement for some trail improvement is recognized by the government in its Fourth Plan but since trails are primarily a local responsibility, little investment is earmarked by the Central Government for this purpose. Local areas need financial and technical assistance for transport development but they are not receiving it under present policies and programs.

54. Primary objectives of the Fourth Plan are to complete the East-West Highway and to build north-south roads connecting the Terai, Hills and mountain regions. Investment in the East-West Highway is planned at NR 438.6 million, or 54 percent of the total investment envisaged for all road development. While this route is undoubtedly a basic long-term requirement for a transport system, it is doubtful whether allocation of over half the total 5-year investment to this single route is warranted. Decisions to allocate large investments to the East-West Highway have not been based on detailed feasibility studies. Investment decisions on development of this route have been strongly influenced by aid donors, these external sources having provided nearly all of the funds for construction work on this route.

55. While completion of the East-West Highway is a primary goal in the transport sector of the Fourth Plan, it is very unlikely that this objective will be realized by 1975, the end of the plan period. Firm financial commitments have not been obtained from external sources for that portion of the planned road extending west of Butwal to the Indian border constituting nearly half the entire 1,000 km highway. Even if some external aid is soon provided for road work west of Butwal only a small portion of the western route could be completed by the end of 1975. There is a reasonable prospect, however, that by 1975 the portion of the East-West Highway extending east of Butwal to the border will be completed, although the planned paving of the 80 km gravel road between Narayangarh and Hitaura and bridging of the Narayani River (to be financed by ADB) will be completed sometime after this date.

56. The Fourth-Plan objective to develop so-called growth-axis roads is related to the plan concept of focusing regional development on selected growth centers. During the Fourth Plan period, efforts are to be made to select particular growth centers or regions where development programs would be concentrated. The growth centers are not analyzed nor even identified in the agriculture section of the plan. Yet the plan identifies in the transport sector, four growth-axis roads to be built "as stimulus to regional development" during the plan period. The existing roads between Kathmandu and Birganj and between Pokhara and Bhairawa serve two of the four growth centers. Clearly the selection of growth-axis roads should be based on detailed consideration of the resource base, particularly the agricultural potential of various regions of Nepal. There is no clear linkage, however, between agricultural and transport planning.

57. The relationship between agricultural development and road requirements was considered in the recent UNDP-financed road study, the first report resulting in the identification of 18 possible feeder roads within the Terai or connecting the Hills and the Terai. These roads totaling 953 km were estimated to cost an average of NR 1.6 million/km with a range from NR 800,000//km in the Terai to about NR 2 million/km in the Hills. Feasibility studies of these 18 secondary roads will be completed in August 1973 and draft versions of the report are now under review.

58. The results of good feasibility studies are, of course, of great importance as a basis for sound transport planning in Nepal. They do not of themselves, however, provide a sufficient basis for such planning. A need exists for an overall transport study which considers the total transport requirements of the country and establishes the basis for priorities among transport projects. At present, there is no adequate foundation for assigning priorities between the East-West Highway, various feeder roads as identified in the UNDP-financed study, realignment of the Rajpath (Kathmandu-Birganj) and other transport projects. A 1965 World Bank-financed study included a master plan for transport development which has been a useful development guide for a number of years. It should be recognized, however, that this study was handicapped by important informational gaps, particularly on land use and traffic volumes. A new overall transport study should seek to develop a larger data base and take account of the many changes in the road system that have occurred over the past several years. Such a study would provide a sound basis for specifying the development needs and priorities in the transport sector.

59. Transport planning and administration in Nepal are greatly handicapped by the inadequacy of data of many types. Because of the primary importance of road transport in the country a special need exists for systematic collection of data in this field. Particularly advisable is the periodic collection of traffic statistics at key points on the road system. This effort would be greatly facilitated by the introduction of mechanical counters at strategic locations on the principal routes. Such a system should be introduced as soon as possible and collection of data so scheduled as to permit comparisons of traffic levels from time to time. Effective

planning and administration in the transport field requires regular collection of many other statistics concerning all forms of transport including vehicle inventories by type and size of vehicle; traffic volume and commodity composition; operating costs; rates and charges for services; operating speeds and accident experiences; financial results of operators, and costs of facility construction and maintenance. Moreover, transport planning requires much detailed information concerning the economic potentials indicated in other sectors. A brief review by the mission of the available data of these various types indicates serious shortcomings.

60. The essential elements of a long-term transport plan in Nepal are: (a) development of minimum-standard roads as feeders to existing main roads, including the Kathmandu-Pokhara and Kathmandu-Kodari roads; (b) building or completing roads in the four growth-axis; (c) completion of the East-West Highway; (d) building of selected secondary roads connecting the Terai and the Hills; (e) improvement of Rajpath including realignment along a more direct route; (f) improvement of selected porter trails including especially the building of modern suspension bridges at key points; (g) development of STOL strips at important centers in the hills and mountains not served by roads; and (h) replacement of the remaining DC-3 aircraft with modern aircraft.

61. A proposal to build a second East-West Highway in the Hills connecting Pokhara to Surket or Jumla, and the Kathmandu-Kodari road to Dhankuta, is now under active consideration. Its building, while undoubtedly a long term requirement, may appear slightly premature. It may partly defeat the goal of growth-axis road development by diverting resources (including that of the private sector) to create some economic activities along the proposed second highway. There is indeed an obvious danger of seeing scarce resources being thinly dispersed with little impact on economic growth. Priorities among specific projects should be based upon consideration of overall transport system integration and the results of feasibility studies of such projects. Moreover, transport plans should be closely linked to development plans in other sectors, particularly the agricultural sector. Secondary roads connecting the Hills and the Terai should be developed as elements in regional development programs rather than as road projects per se. Project priorities should be based in substantial part on the need to realize a better balance in food grains.

62. An urgent need for careful determination of priorities in transport development is evident in that the probable future level of expenditures on road development is very modest in relation to the government's development plans. Expenditures on road development in the three-year period ending 1969-70, as shown in Table 14, averaged about NR 148 million. Remaining work on the East-West Highway would probably cost well over NR 1,000 million. Building the proposed 18 feeder roads for which studies have recently been completed, is estimated to cost over NR 1,000 million. The cost of realigning the Rajpath has been estimated by consultants at about NR 400 million. In addition, a number of other sizeable projects are included in current plans.

63. It is apparent that much of the currently planned road development will have to be delayed beyond the next few years. If not, such investments would be made at the cost of economic growth. Too much investment in road building will leave little resources to develop the production potential that roads are precisely meant to ensure. If the "no economic development - no roads - no economic development" vicious circle should be broken down at all costs, it would be erroneous to presume that transport facilities alone will automatically induce economic development, because it depends largely upon the external stimulus that government agencies will be able to provide in the realm of credit, irrigation, soil conservation, extension services, etc. In future Nepal may run the risk of overcapitalization in the road sector: having built a large capital base in this sector without giving enough attention, because of lack of resources, to ancillary production-oriented investments, the cost of maintaining that capital base may well damage the future resource position of the country. As stated above, road projects should not be implemented per se, but be considered as only one element, albeit fundamental, of production-oriented projects. As a matter of fact, this package approach is one of the merits of the growth corridor concept. The problem of determining project priorities is therefore an extremely serious one and steps should urgently be taken to devise an adequate basis for specifying priorities.

STATISTICAL APPENDIX

<u>Table No.</u>	<u>Title</u>
1	The Highway Network
2	Road System in Nepal as of 1970
3	Number of Motor Vehicles, by Type
4	Freight Traffic on the Kathmandu-Birganj Corridor, 1970-1971
5	Average Daily Traffic on Selected All-Weather Routes
6	Motor Carrier Traffic of Nepal Transport Corporation
7	Airports Served by Royal Nepal Airlines Corporation
8	Air Passenger Traffic
9	Passenger Traffic of Royal Nepal Airlines Corporation
10	Passenger and Cargo Traffic of Royal Nepal Airlines Corporation
11	Traffic on Kathmandu-Hitaura Ropeway
12	Railway Line and Rolling Stock
13	Railway Traffic
14	Expenditures on Road Construction, Maintenance and Administration

Table 1: THE HIGHWAY NETWORK
(Kilometers)

<u>Year</u>	<u>Paved</u>	<u>Gravel</u>	<u>Earth</u>	<u>Total</u>
1965	289	147	1,390	1,826
1966	n.a.	n.a.	n.a.	n.a.
1967	536	344	1,551	2,432
1968	n.a.	n.a.	n.a.	n.a.
1969	661	408	1,611	2,680
1970	820	433	1,495	2,728
1971	950	465	1,365	2,780
1972	1,080	500	1,250	2,830

Source: Nepal, Ministry of Public Works and Transport,
Roads Department.

Table 2: ROAD SYSTEM IN NEPAL AS OF 1970
(Kilometers)

	<u>Paved</u>	<u>Gravel</u>	<u>Earth</u>	<u>Total</u>
A. Highways				
Mahendra Highway				
Jhapa - Dhalkewar	0	150	106	256
Pathlanyia - Dhalkewar	54	0	32	86
Pathlanyia - Hitaura	27	0	0	27
Hitaura - Narayangorh	0	83	0	83
Tribhuvan Rajpath				
Kathmandu - Bhainse	115	0	0	115
Bhainse - Birganj - Raxaul	74	0	0	74
Arniko (Kodari) Highway	77	27	0	104
Sidhartha Highway	209	0	0	209
Prithvi Highway	0	40	136	176
B. Main Roads				
Nepalganj - Surkhet	0	0	25	25
C. Feeder Roads				
Dharan - Jogbani	50	0	0	50
Rajbiraj - Kunali	13	0	0	13
Kosi Road	0	52	0	52
Janakpur Town-Airport	3	0	0	3
Birganj - Kalaiya	0	11	0	11
Kathmandu - Trisuli	45	22	0	67
Bhairawa - Taulihawa	3	0	48	51
Bhairawa - Pakklihawa	6	0	0	6
Taulihawa - Khunuwa	11	0	0	11
Taulihawa - Lumbini	8	0	0	8
Nepalganj Road	6	0	0	6
Dhangarhi - Dandel dhura	0	23	27	50
Kathmandu Area Road	120	27	98	245
Other Feeder Roads	<u>0</u>	<u>0</u>	<u>1,002</u>	<u>1,002</u>
Total	<u>821</u>	<u>435</u>	<u>1,474</u>	<u>2,730</u>

Source: Nepal Planning Commission "Fourth Plan, 1970-1975".

Table 3: NUMBER OF MOTOR VEHICLES, BY TYPE

<u>Up to year</u>	<u>Jeeps and Cars</u>	<u>Trucks</u>	<u>Buses</u>	<u>Sub Total</u>	<u>Motor cycles</u>	<u>Total</u>
1964	2,362	1,352	290	4,004	1,089 /1	5,093
1965	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1966	3,761	1,834	426	6,021	449	6,470
1967	4,411	2,150	497	7,058	564	7,622
1968	5,142	2,534	561	8,237	675	8,912
1969	5,829	3,416	573	9,818	732	10,550
1970	6,065	3,461	535	10,061	846	10,907
1971	6,344	3,995	547	10,986	1,064	12,050
1972 /2	6,945	4,596	738	12,279	900	13,179

/1 This figure seems excessive in view of figures for later years.

/2 Figures for 1972 as of June of that year.

Source: Nepal, Ministry of Public Works and Transport, Roads Department.

Table 4: FREIGHT TRAFFIC ON THE KATHMANDU-BIRGANJ CORRIDOR, 1970-71
(12 months)

	<u>Metric tons</u>
<u>Motor Carrier</u>	
Birganj-Kathmandu	168,226
Kathmandu-Birganj	<u>11,770</u>
Sub-total	179,996
<u>Ropeway</u>	
Hिताura-Kathmandu	31,436
Kathmandu-Hिताura	<u>627</u>
Sub-total	32,063
Total	<u>212,059</u>

Source: COMTEC/ALPINA/MACCHI "Preliminary Investigation of
the Kathmandu-Raxaul Corridor", December 1971.

Table 5: AVERAGE DAILY TRAFFIC ON SELECTED ALL-WEATHER ROUTES
(1970)

	<u>Average Number of Vehicles Per Day</u>	
	<u>Monsoon Season</u>	<u>Dry Season</u>
Kathmandu - Birganj	202	182
Kathmandu - Trisuli	23	27
Kathmandu - Banepa	56	62

Source: COMTEC/ALPINA/MACCHI "Preliminary
Investigation of the Kathmandu -
Raxaul Corridor", December 1971.

Table 6: MOTOR CARRIER TRAFFIC OF NEPAL TRANSPORT CORPORATION

<u>Year</u>	<u>Truck</u> (metric tons)	<u>Bus /1</u> (No. of passengers)
1967-68	18,388	-
1968-69	25,308	-
1969-70	23,452	1,405,085
1970-71	33,583	5,741,792

/1 Bus traffic in Kathmandu Valley;
operations began in 1969.

Source: Nepal Transport Corporation.

Table 7: AIRPORTS SERVED BY ROYAL NEPAL AIRLINES CORPORATION

<u>Airports</u>	<u>Elevation (feet)</u>	<u>Runway Length (feet)</u>
Kathmandu	4,423	6,600
Simra	450	3,600
Janakpur	256	3,300
Rajbiraj	250	4,200
Biratnagar	235	3,300
Badrapur	300	5,000
Bharatpur	600	3,600
Meghauli	700	3,600
Gurkha	1,500	3,600
Pokhara	2,800	4,000
Bhairawa	358	3,300
Dang	2,100	2,730
Surkhet	2,400	3,600
Dhangarhi	600	3,300
Nepalganj	600	3,000

STOL Strips

Western Area: Jumla, Dhorpatan, Baglung

Eastern Area: Rumjatar, Lamidanda, Tumlingtar, Jiri, Lukla

Source: Royal Nepal Airline Corporation

Table 8: AIR PASSENGER TRAFFIC

<u>Year</u>	----- Number of Passengers Carried-----		
	<u>Domestic</u>	<u>International</u>	<u>Total</u>
1966	74,023	41,746	115,769
1967	95,683	52,014	147,697
1968	144,135	62,775	206,910
1969	163,453	83,744	247,197
1970	207,585 <u>/a</u>	101,330 <u>/a</u>	308,915 <u>/a</u>

/a Estimated

Source: UNDP Aviation Advisor to Department of Civil Aviation.

Table 9: PASSENGER TRAFFIC OF ROYAL NEPAL AIRLINES CORPORATION

<u>Year</u>	<u>Passengers Carried</u>	<u>Revenue Passengers Kilometers</u>
1966-67	165,676	19,750,000
1967-68	167,696	31,900,000
1968-69	190,232	39,560,000
1969-70	182,538	41,790,000

Source: Royal Nepal Airlines Corporation, Annual Report 1971

Table 10: PASSENGER AND CARGO TRAFFIC OF ROYAL NEPAL .
AIRLINES CORPORATION

<u>Year</u>	Passenger Traffic (No. of passengers)	<u>Cargo Traffic (metric tons)</u>		
		<u>Freight and Excess Baggage</u>	<u>Mail</u>	<u>Total</u>
1965-66	135,527	2,458	69	2,527
1966-67	165,676	3,463	78	3,540
1967-68	167,696	2,412	114	2,527
1968-69	190,232	2,426	117	2,543
1969-70	182,538	2,203	99	2,302

Source: Royal Nepal Airlines Corporation, Annual Report 1971

Table 11: TRAFFIC ON KATHMANDU-HITAURA ROPEWAY

<u>Year</u>	<u>Metric tons</u>	<u>Metric ton-kilometers</u>
1965-66	30,096	1,233,936
1966-67	17,064	699,624
1967-68	23,834	977,194
1968-69	37,166	1,523,806
1969-70	34,934	1,432,294
1970-71	33,123	1,358,043

Source: UNDP Transport Advisor to Ministry of Public
works and Transport

Table 12: RAILWAY LINE AND ROLLING STOCK
1972

	----- Rolling Stock -----			
	<u>Length</u> <u>(kilometers)</u>	<u>Steam</u> <u>Locomotives</u>	<u>Goods</u> <u>Wagons</u>	<u>Passenger</u> <u>Wagons</u>
Nepal Railway	6	3	37	0
Janakpur Railway	<u>53</u>	<u>9</u>	<u>60</u>	<u>22</u>
Total	59	12	97	22

Source: Nepal Transport Corporation

Table 13: RAILWAY TRAFFIC

<u>Year</u>	<u>Freight Traffic (Metric tons)</u>			<u>Passenger Traffic /a (No. of Passengers)</u>
	<u>Nepal Railway</u>	<u>Janakpur Railway</u>	<u>Total</u>	
1967-68	18,388	35,027	53,415	620,089
1968-69	25,308	37,484	62,792	697,888
1969-70	23,452	37,173	60,625	846,538
1970-71	33,583	27,686	61,269	715,277

/a Only the Janakpur Railway had passenger traffic

Source: Nepal Transport Corporation

Table 14: EXPENDITURES ON ROAD CONSTRUCTION
 MAINTENANCE AND ADMINISTRATION
 (millions of NR)

<u>Period</u>	<u>Development Expenditures</u> /a	<u>Ordinary Expenditures</u> /b	<u>Total</u>
1965-66	49.9	2.8	52.7
1966-67	82.0	4.7	86.7
1967-68	87.4	4.4	91.8
1968-69	134.1	5.0	139.1
1969-70	218.3	5.4	223.7

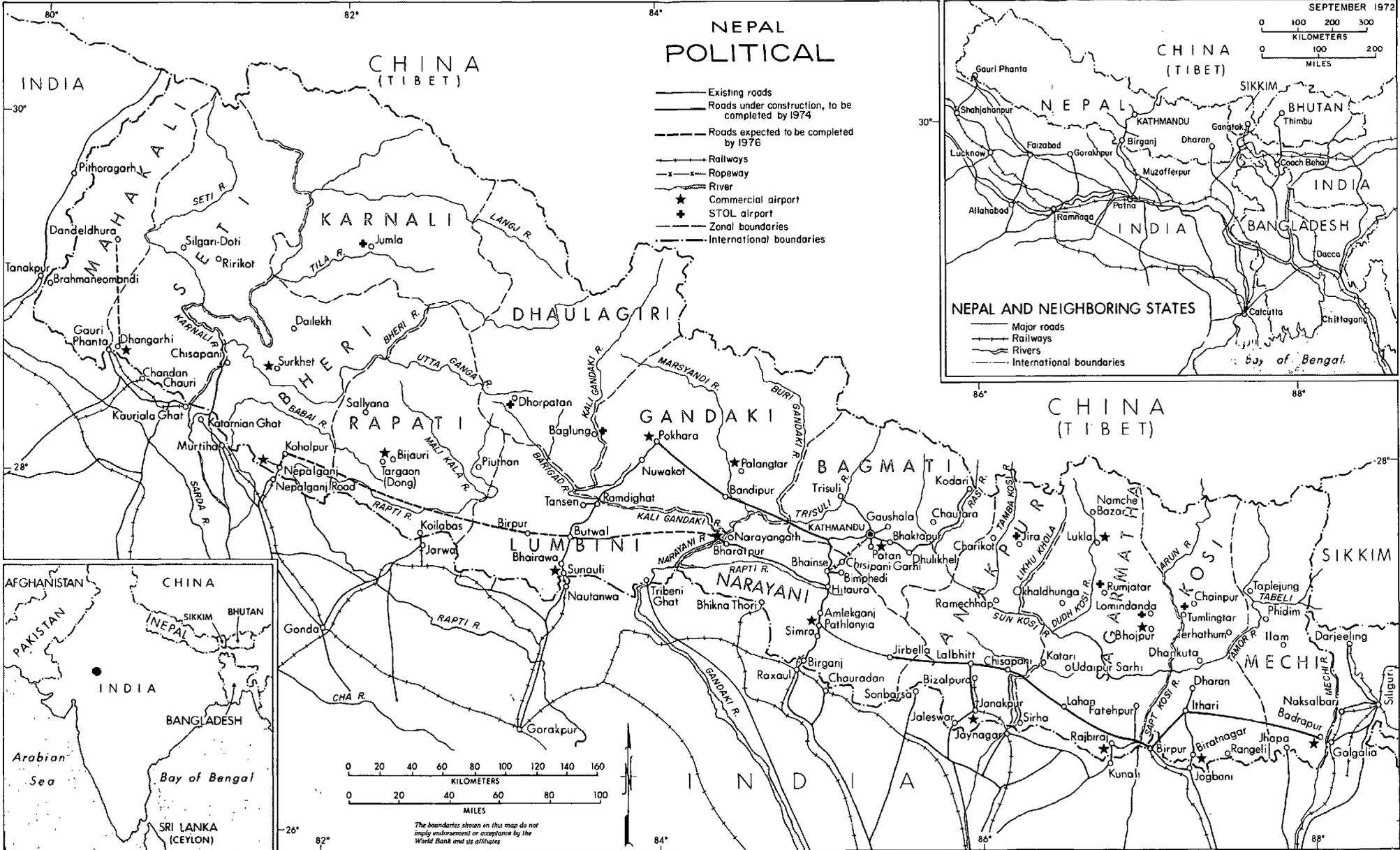
/a Construction and administration expenditures

/b Maintenance and administration expenditures

Source: COMTEC/ALPINA/MACCHI "Reconnaissance Survey," Part A Report, December 1970, p. 220.

NEPAL POLITICAL

- Existing roads
- Roads under construction, to be completed by 1974
- - - Roads expected to be completed by 1976
- Railways
- x - x - Ropeway
- River
- ★ Commercial airport
- ◆ STOL airport
- - - Zonal boundaries
- - - International boundaries



The boundaries shown on this map do not imply endorsement or acceptance by the World Bank and its affiliates