

CHAPTER VI

AGRICULTURAL DEVELOPMENT IN NEPAL

Nepal, largely an agricultural economy and land based is poorly endowed with natural resources. Agriculture accounts for over 60% of the G.D.P. and about 80% of export earnings and almost 90% of the labour force is employed in this sector. Agricultural performance is heavily influenced by Nepal's topography which has been responsible for wide disparities in resources and income. Rural areas (where about 95.1% of the total population live in settlement of less than 10,000 inhabitants) of the mountains and hills regions are characterised by food deficit, labour surpluses and income at the subsistence level, while terai region enjoys food surpluses and income well above the country's average. (1)

Although Nepal is predominantly, an agricultural country but owing to difficulty of farming in hill regions only 1/6th (16.9% approx) of the total land area is under cultivation. In the terai and inner terai, the percentage rises to about 70% of the approximate land distribution is as follows. (2)

TABLE 6.1 LAND DISTRIBUTION IN NEPAL

<u>REGION</u>	<u>AREA IN '000 HECTARE</u>	<u>PERCENTAGE</u>
Mountain	130	6
Hills	756	32
Terai	1445	62
Total Nepal	2326	100

TABLE : 6.2 DISTRIBUTION OF NET CULTIVATED AREA OF TERRITORIAL ZONE (1978-79)

TERRITORIAL ZONE	NET AREA HECT (000)	AREA AS % OF TOTAL CULTIVATED AREA	UNDER CULTIVATED AS % OF GEOGRAPHICAL AREA	PER 000 POPULATION (HECT.)
Mountain	195.02	7.15	4.07	196
Eastern	78.17	2.87	6.32	170
Central	17.34	0.64	2.44	314
Western	99.51	3.65	3.46	207
Hills	965.35	35.40	17.44	177
Eastern	358.74	13.15	25.08	205
Central	399.36	14.64	17.52	163
Western	207.25	7.60	11.35	144
Kathmandu Valley	47.04	1.72	42.88	68
Inner Terai	239.36	8.78	15.52	239
Eastern Terai	53.63	1.97	11.43	187
Central	82.47	3.02	17.37	208
Western	103.27	3.79	17.26	327
Terai	1280.36	46.95	49.33	284
Eastern	840.00	30.87	59.02	253
Central	221.71	8.13	60.73	328
Western	216.64	7.94	26.96	429
All Nepal	2727.13	100.000	18.72	212

SOURCE : APROSE NEPAL DISTRICT PROFILE 1978-79, 2. CULTIVATED AREA FOR 1978-79

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TABLE : 6.3 DISTRIBUTION OF CULTIVATED LAND BY AGRONOMIC CLASSIFICATION AND TERRITORIAL ZONE (1978-

-79)

Territorial zone	Total cultivated land			Irrigable low land/khet			Dhanhar Chahar	
	Total	Low land	Up land	Total	Abal	Doyam		Sim
1	2	3	4	5	6	7	8	9
Mountain	100.00	7.90	92.70	100.00	1.93	52.70	43.24	2.12
Eastern	-	-	-	-	-	-	-	-
Central	100.00	7.90	92.70	100.00	1.93	52.70	43.24	2.12
Western	-	-	-	-	-	-	-	-
Hill	100.00	23.04	76.96	100.00	6.68	25.90	52.90	14.52
Eastern	100.00	19.38	80.66	100.00	4.27	24.93	59.54	11.26
Central	100.00	27.99	72.01	100.00	8.79	26.88	46.93	17.41
Western	100.00	13.66	86.34	100.00	2.49	19.36	70.34	7.82
Kathmandu Valley	100.00	50.15	49.85	100.00	24.65	30.26	37.19	7.89
Innteterai	100.00	40.63	54.37	100.00	21.69	46.62	30.24	1.44
Eastern	100.00	38.37	61.63	100.00	25.40	44.48	29.03	1.09
Central	100.00	34.43	65.53	100.00	30.88	45.37	23.35	0.44
Western	100.00	48.28	51.72	100.00	13.27	48.47	35.90	2.36
Terai	100.00	77.69	22.31	100.00	25.28	53.37	20.60	0.74
Eastern	100.00	78.95	21.05	100.00	24.48	54.55	20.02	0.96
Central	100.00	81.34	18.66	100.00	25.89	58.83	15.07	0.21
Western	100.00	67.41	32.54	100.00	28.79	39.00	31.84	0.31
Nepal	100.00	58.00	42.00	100.00	22.98	49.42	25.16	2.14

Contd2A/-

NON IRRIGABLE UP LAND/PAKHO/BHIT

TOTAL. 10	ABAL. 11	DOYAM 12	SIM 13	CHAHAR 14
100.00	8.51	38.84	46.26	6.29
-	-	-	-	-
100.00	8.51	38.84	46.26	6.39
-	-	-	-	-
100.00	6.18	21.35	51.16	21.31
100.00	2.74	19.76	52.32	25.19
100.00	11.08	23.82	48.41	16.69
100.00	2.02	16.32	70.24	11.41
100.00	37.36	62.54	-	-
100.00	48.73	30.94	19.22	1.11
100.00	29.92	32.96	34.25	2.87
100.00	51.45	29.56	10.34	0.66
100.00	57.07	31.49	10.85	0.59
100.00	93.38	5.27	1.07	0.28
100.00	92.74	6.95	0.31	-
100.00	89.35	2.79	5.95	1.91
100.00	98.06	1.94	-	-
100.00	40.92	18.97	29.14	10.98

Note Only Mustang district

Only Dandelahera dist.

Source : Ministry of land reform - Department of survey (cadasteal) HMG N. Kathmandu.

The pattern of land use type in Nepal can be more vividly seen in the following table :-

TABLE : 6.4 LAND USE IN NEPAL (1968)

<u>Land use type</u>	<u>Area (sq. kms.)</u>	<u>Percentage</u>
1. Agricultural land	18,310	12.93
(a) Hilly Region	6,000	4.24
(b) Terai region	12,310	8.69
2. Forest land	45,325	32.02
(a) Hilly region	28,819	20.36
(b) Terai region	16,506	11.66
3. Miscellaneous land	77,942	55.05
(a) Un Reclaimable land	27,058	19.11
(b) Reclaimable land	18,989	13.41
(c) Snowed land	21,121	14.92
(d) Land under river beds, roadsides, canal etc.	10,774	7.61
Total	1,41,577	100.00

Source : Commerce Annual No. 1981 page 219

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Nepal suffers from the lack of irrigational facilities. Of the total cultivated land area (23,28,000 hect. in 1989) only about 12% (1,95,000 hectares) is irrigated. One estimate states that only about 90,000 hectares of land under cultivation have irrigation facilities during the wet season and about 25,000 hectares during dry season from the government operated irrigation schemes. The total land with irrigation facilities does not exceed 15% of 3.1 million hectares during the wet season. (3).

The distribution of cultivated land by agronomic classification and territorial zone is as following :-

The gross cropped area in Nepal has increased substantially since 1961-62 mainly due to increase in area under cultivation. Driven by hunger, farmers have brought a substantial average of pasture or forest land under the plough. Total cultivated area rose from 1685 thousand hectares in 1961-62 to 2326 thousand hectares in 1977-78 a rest of 38.05% in 15 years or nearly 2.5% per year. (4)

Cereal grains like rice, maize, wheat, millet, jowar, bajara, sugarcane, jute, oilseeds, and various tropical crops are grown both in the terai and the hilly parts of Nepal. The northern region of it grow barely, buchwheat, potatoes, The annual export of rice and paddy to India is about 30,000 metric tonnes with an earning of about Rs.300 million maize is the second

to paddy in importance which is mostly consumed by the hilly people. Western Nepal is a big wheat producing area. The total area covered by cash crop is approximately 2,23,000 hectares. Jute, sugarcane and tobacco are the chief cash crop grown in various regions of terai. Potato cultivation covers a wide range from terai to Tibetan plateau. India is the main market to potatoes. Tea production is confined to the eastern districts of Ilam and Jhapa. (5).

Rice is planted on more than half of the million 5 acres on which food grains are grown with lesser amount of crop wheat, millet and barley sown on the rest. Another 0.5 million acres are used each year to raise cash crops, the most important of which are oil seeds, potatoes, jute, sugarcane and tobacco. Cash trading is still not practiced in many parts of the economy.

One study found that annual agricultural production between 1966 and 1973 rose at only 12% despite the annual increase in cultivated area of 1.8%. Thus, yield annually decreased 0.8% because of initial low productivity on new lands, with production lagging behind population growth, surplus rice production for export fell from half a million metric tonnes in the early 1960 to less than 2,00,000 tonnes in late 1970s. (6)

Until Nov. 1964. when the government of Nepal began the actual enforcement of land act, the total cultivable

land in the kingdom was shared by 450 families. A total of about 8 million people were depending on about 36 million acres of cultivated land. The actual teller was as Wolf Lanijinsky said, living under the ragged edge of penury. He also had pointed out in this report to the King in 1962 that tenants were paying as much as 80% of their crop as rent to land owners. (7)

Official statistics indicates that nearly half of the farm families of Nepal belong to the small category with holdings of less than 0.5 hectares each. Their average income is Rs.1016 per year in the hills and Rs.1456 in the terai. Since each family in Nepal consists of 5.3 persons on an average, annual per capita income of about half of Nepal's population amounts to no more than Rs.191 in the hills region and Rs.274 in the terai. Moreover, about 10 percent of Nepal's farm production has a holding of less than 0.1 hectare, that is to say, they are virtually landless. (8).

Since half of the national income is earned by an estimated 13% of the population the wealthiest 3% earn more than 1/2 the of the total, of course, low per capita income in a subsistence economy may not signify an impoverished living standard if every family owns sufficient land, but the average hill family in Nepal must serve on only one acre of land even less than in Bangladesh. (9)

Approximately 3,25,000 hectares of anable land is still left in the kingdom. With the growth of population and the Hindu law of inheritance in vogue in the country further division and fragmentation of land holdings has an adverse telling effect on agricultural growth the major source of national income in Nepal. (10)

The worst economic problems are concentrated in the hill and high mountain region where 2/3rd of Nepal's population ekes out a living on only 2/3rd of the National's cultivated area. Food grain deficits have developed in many areas, varying between 1,50,000 to 2,00,000 metric tonnes annually for the hill areas as a whole. With no alternative source of employment and no developed export potential. Only government subsidies and repatriated earnings from migrant labour in India or the terai have enabled hill residents to buy the food grains they need from other areas. (11)

Settlement in high lands and transhuman

The northern part of Nepal the economy is different from the rest of other areas. The northern part is mostly inhabited by people of tibetan stock. The village economy of this area does not allow the concentration of productive process in a single locality. The farming economy is based upon yok breeding. Yak breeding necessitates continous movements of hards and hards men from pasture to pasture and even agriculture at the high

altitude involves a seasonal shifting of labour from one place to the other. The resulting system of transhumane is basically different from the pastoral nomadism of central Asian people. The migrations of people of other Tibetan stock do not range over wide areas and a virtually unlimited number of potential camp sites but are confined to narrowly prescribed movements between a few settlements inhabited only temporarily but permanent in so far as they constitute extensions of landed property of individual families.

The original impetus to the dispersal of holdings over a number of settlements came undoubtedly from the herdmen requiring solid dwellings and stores for fodder within reasonably easy reach of the various pastures grazed by their yak in the course of a year. But the advantage of settlement at different levels of altitude for the development of agriculture must soon have become apparent and today the ownership of land in subsidiary settlements is not confined to yak owners.

The annual cycle of agricultural operations outlined represents the totality of the farming work of a village community, but there are considerable variations in the amount of efforts devoted by individual families to the cultivation of land. Not all families own land in subsidiary villages and those whose holdings are concentrated in the locality of their main domicile are free of agricultural work during times

when others are busy on their fields either in gunsa (low lying) or yersa (high lying) settlements.

While agriculture has always provided the high landers with the bulk of their food supply, the breeding of yak and other cattle adds much needed proteins to their diet. Traditionally ownership of yak was considered one of the most important status symbols and the care of cattle is considered a manly and honourable occupation richman, who would never put their hands to hoe, unhabit atingly undergoes a good deal of hardship when they take their heads to the high/pastures and spend weeks and months in the discomfort of primitive year-dwellings. To own a head of yak, is the aim of many a socially ambitious man and invest their savings in yak.

Periodic movements from pastures to pasture are an essential elements of the high landers cattle cum farming economy. Their extent and range however, varies with the size of herds, The owner of a small herd may lease his yak for five months in the year on the main village move with his animals to higher pastures for another gunsa-settlements. A man owning thirty or more yak, on the other hand, may keep them only one month out of twelve in the main village and take them even during part of the winter to some high yersa settlements.

Thus for greater part of the year, herdsmen have to live at considerable distance from the village where they have their large and comfortable houses. (12).

The present man-land ratio in Nepal is 30 per 100 hectares of cultivated land. While the average size of holding comes roughly 1.3 hectares. As the cost of cultivation are financed by the tenant the existing method of cultivation which is largely traditional does not permit a relatively large unit of farm.

Further, the size of the farm depends on the pressure of population rather than on the fertility of its soil or any better utilization of agricultural labour. According to 1971 census, the density of population in cultivated areas is 5757 per hectare. The population increase is now at 2.5 per annum. No wonder that the capital output ratio of the agricultural sector is some what at 7.1 which is evident of a high cost agriculture economy in Nepal. (13)

It is also seen that in 1961 75% of the farm households had holdings below one hectare and owned only 25% of the total cultivated land (area) while 25% of the farm households controlled as much as 75% of the cultivated area.

The following table starting the average for the different groups of Nepals farmers illustat the fact that a large number of cultivated area is concentrated among big and large cultivators.

**TABLE : 6.5 AVERAGE SIZE OF CULTIVATED HOLDINGS AMONG THE
FOUR GROUPS OF NEPALESE CULTIVATORS**

<u>Cultivators</u>	<u>Average size of cultivated holdings (acres)</u>
Big farmers	29.23
Large farmers	16.65
Medium farmers	9.83
Small farmers	3.56
All farmers	11.25

Source : Jha K.K. Agricultural finance in Nepal Page - 30

The average size of land holdings and operational holdings among different geographical region is also found in unevenly distributed. The table below depicts the fact.

TABLE : 6.6 AVERAGE OF LAND HOLDINGS/OPERATIONAL HOLDINGS BY REGION IN NEPAL

<u>Region</u>	<u>Average size of land holding in hect.</u>	<u>Average size of holding in hectare</u>
Mountain	-	0.56
Hills	0.56	0.74
Innter terai	2.43	-
Terai	2.41	1.63
Nepal	1.23	-

Source : CBS Kathmandu, NPC Nepal

Fragmentation of holdings too are seen both in terms of size of parcels as well as number of parcels and their distribution. Farm management study indicates 4.3 fragments of cultivated land per household in hills with average size of each fragment as 0.11 hectage. In comparison, number of fragments for terai is 3.8 per household with average size of each fragment as 0.95 hectare. Moreover data of agricultural credit survey indicated that 96.99% holdings in the hills and mountains are below 0.5 hectare in comparison to 72.21% holdings in terai. Holdings above 0.57 hectare are only 3.01% in hills, while 27.79% in terai. Thus this fantastic imbalance in land holdings between hills and terai results in increasing differentiation in terms of income distribution and emigration within the peasantry. Consequently, hilly farmers are much more valuable in respect of size of operational holding, number of fragments per household and cultivated area per fragment in comparison to their counter parts in the terai. (14)

LOW PRODUCTIVITY IN AGRICULTURE

Agricultural development which means an increase in agricultural productivity results in an increase in output and income in general. In case of Nepal the low and even declining rates of productivity of main crops grown in both terai and hilly regions is the root cause of 7.19 million people subsisting and incomes below poverty line. Average yield per hectare of paddy, maize, millet and wheat are in order of

1.97 metric tonnes 1.80 metric tonnes, 1.40 metric tonnes and 1.12 metric tonnes in 1974-75. In these crops most of the developed and several developing countries had average yield ranging from 3 metric tonnes to 5 metric tonnes per hectare in 1971. With further dissemination of improved technology, productivity gap between these countries and Nepal where adoption rate is likely to be slow will become even greater by 1980-81 and thus Nepal's agricultural products are likely to become some of the most inefficient produced. As a matter of fact, yield rates of all food crops declined during 3rd and 4th plan, except some improvement in paddy and millet, the yield rates of which were, however, remained in 1974-75 below these of 1964-65 as shown in table below :-

TABLE : 6.7 AREA, PRODUCTION AND YIELD RATES OF FOOD CROPS

IN NEPAL (1964-75)

PARTICULARS	YEAR	FOOD GRAINS	PADDY	MAIZE	WHEAT	BARLEY	MILLET
Area in 000 hectares	1964-65	1758	1101	437	100	24	96
	1969-70	1970	1173	433	226	26	112
	1974-75	2142	1242	458	291	28	126
Production in 000 metric tonne	1964-65	3270	2209	854	126	26	63
	1969-70	3450	2241	795	268	24	124
	1974-75	3781	827	827	332	26	143
Yield rate (MT/HA)	1964-65	1.86	2.00	1.95	1.26	1.08	1.52
	1969-70	1.75	1.91	1.84	1.17	0.93	1.41

Source : Ministry of food and agriculture HMG

Note : N/A indicates data not available

There is no simple explanation of low and declining productivity in agricultural of Nepal. It results from a complex of factors such as poor natural resources, soil erosion, especially in hilly areas, lack of capital and current inputs, technological backwardness under developed human skills and social environment. (15)

According to one expert, the reason for the shortfall in agricultural production is that the targets set were extremely ambitious when compared to available resources, both physical and human. Another reason is the lack of organised implementary machinery which created problems in proper co-ordination among the various projects. Undoubtedly the serious lack of trained personnel is most important in what is referred to as middle level man power (including field workers in health and agricultural extension, and lower executive and clerical grades) where wages are low, promotion prospectus poor, and back up in terms of both technical advice and of material assistance seriously defective, the lack of trained personnel and poor coordination within the bureaucracy only reinforce a low level of success in devising and carrying out effective development projects within all overall planning framework. (16)

TABLE : 6.8 PERCENTAGE OF LABOUR FORCE ENGAGED IN AGRICULTURE '7

<u>Countries</u>	<u>Labour %</u>	<u>Countries</u>	<u>Labour %</u>
United Kingdom	3	Peru	46
U.S.A.	4	Burma	64
Australia	4	India	68
Belgium	5	Indonesia	70
France	14	Pakistan	70
Nepal	90	Ethopia	85

TABLE : 6.9 FIELD (Kg/Hect.) IN 1971

<u>Countries</u>	<u>Rice</u>	<u>Wheat</u>	<u>Cotton</u>
Japan	5250	-	-
U.S.A.	5200	2280	490
India	1717	1307	151
Pakistan	1600	1080	300
Argentina	-	1390	240
France	-	3860	-
U.K.	-	4400	-
Nepal	2241*	265*	-

Note : * Indicates in 000 MT/000 hectares.

Source : FAO production year book - 1971

The important indicies mentioned above namely the degree of dependence on agriculture for employment and the

proportion of national income derived from it, have remained more or less constant despite of completion of four development plants.

INDEBTEDNESS OF AGRICULTURE

The subsistence level of farming accompanying with low productivity in agriculture result in indebtedness of the farmers in Nepal. It is found that 60% of the farmers borrowed during a given year. A large part of their borrowing are for family expenditure and undebted at the end of the year. Very little of borrowed money is spent on improvement of (productivity) productivity resources of agriculturist. In addition, a sizeable part of the borrowed money is used to pay land tax. It follows that agriculture has not reached the stage where farmers can make a productive use of credit and there by increase agricultural production.

The rate of interest of borrowed money is high. The rate varies between 21 to 30% per annum for more than 50% of total borrowing. Borrowings are generally against personal security. The proportion of borrowings secured by mortgage of land and precious metals is small, thus indicating that in rural areas, the security which a farmer can offer is limited to land.

However, the debtor's repayment capacity depends to a large extent on his contribution in farming business. This

implies that the land which is a means of production for the former must not be alienated. The repayment capacity is very low. The production of proportion of repayments to total liabilities that is the total outstanding at the end of year plus repayment made during the year, is 34%. The repayment capacity decreases from big to small cultivators.

What is matter of concern that is a large part of debt has been incurred for unproductive purposes, high rates of interest, state farm return and low repaying capacity of farmers. All these makes the burden heavy. (17) All these can be substantiated by the given table below :-

TABLE : 2.5/10 PROPORTION OF DEBT AND BORROWING AMONG NEPALESE CULTIVATORS

A. PROPORTION OF BORROWING FAMILIES AMONG THE FOUR GROUPS OF CULTIVATORS

Group of Cultivators (1)	Total No. of farmers (2)	No. of farmers reported borrowing (3)	As percentage of (2)
Big farmers	34	21	62
Large farmers	24	15	63
Medium farmers	48	28	58
Small farmers	36	21	58
All farmers	142	85	59.60

B. Proportion of indebted families among the four groups of cultivators

<u>Group of cultivators</u>	<u>Proportion of indebted families</u>
Big farmers	47.06
Large farmers	54.17
Medium farmers	56.25
Small farmers	56.25
All farmers	54.71

C. Average debt per family and per indebted family among four groups of cultivators (in Rs.)

<u>Group of farmers</u>	<u>Debt per family</u>	<u>Debt per indebted family</u>
Big farmers	621	1,320
Large farmers	649	1,198
Medium farmers	327	581
Small farmers	187	337
All farmers	379	705

Source of table	A' K.K.Jha	Page No. 37
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According to agricultural credit survey report in 1969 the proportion of institutional finance in the total borrowings of the farmers was only 21% of that of private credit, agencies 79% and the private credit agencies charges as high as 50% rate of interest.

The initial institutional arrangement for the distribution of agricultural credit in Nepal was formation of cooperatives since 1950. In the first plan it is stated,

If cooperative movement is developed in a healthy and efficient manner, it will progressively abolish excessive rural indebtedness, contribute significantly to the raising of living standards and develop among the members of the cooperative societies versatility, capacity of organisation self reliance and ability to conduct their own affairs in an honest and democratic way'.

Inspite of this wishful thinking cooperative system failed to achieve the derived objectives. Hence, a cooperative bank was established in 1963 with authorised capital of Rs.5.00 million to enable the farmers their credit needs.

But since the operation of the co-operative Bank covered only members of the co-operatives, farmers, outside the cooperatives were deprived of institutional credit. Further,

the bank failed to disburse loans to provide loans to agro-based industries like dairy, cattle farming etc. In view of these deficiencies the co-operative Bank was converted into the Agricultural Development Bank in 1967 with an authorised capital of Rs.50.00 million, of which 51% is subscribed by the Government and the rest is covered from the share holders contribution and other sources. The primary objective of the Bank are to institutionalise agricultural credit, reduce farmer's dependence on village money-lenders and land lords (to curb the predominance of private credit agencies) and evolve a production oriented credit programme. In successive amendments the function of the bank is extended to provide loans to the tenants to buy land which they have been cultivating, to provide short, medium and long term loans for agricultural development to individuals, co-operatives, villages committees etc. to make available fertilisers, implements, pumps etc. to provide loans to agro-based industries and to extend normal banking facilities in rural areas. In order to meet the resource need of the Bank, Nepal Rastra Bank has been providing concessional loans to this Bank under the refinance schemes. The Bank also received financial assistance from international agencies like Asian Development Bank.

During 1968/69 to 1979/80, i.e. 12 years, the agricultural Development Bank, provided a total of Rs.1,336,7 million credit to the agricultural sector (on the average Rs.1114

million per annum) On an annual basis, however, loan disbursement increased steadily upto 1974-75 but declined in 1975-76, shot up again in 1976-77 and 1977-78 and slackened recently, i.e. in 1978-79 and 1979-80. By purpose, agricultural production, agro-industry marketing and warehouse construction account for the major portion of loan disbursed by the Bank. (18)

The Cropping Pattern

From the view point of climate and topography, large areas of agricultural lands in both the central hill region and the terai are capable of yielding more than one crop a year. During the 19th century, however, multi cropping appears to have been seldom practised, mainly because of the particularly elephants, and the scarcity of irrigation facilities. According to Hamilton, "in the dry season the elephants return to the lower ranges of hills, but in the rainy season they abandon these forests and are then very destructive to the crops, which indeed prevents natives from being so attracted to the cultivation of rice..... although the country is best adapted from the culture of this grain, the farmers content themselves chiefly with inner crops of wheat, barley and mustard."

On the contrary, in the hill region, cattle were let loose in the fields during winter season to graze on the stubble after the rice crop was harvested, thereby hindering the cultivation of wheat, barley and other winter crops. Although

rice-lands in that region could also grow winter crop but in most places, as Hamilton noted, this is most judiciously omitted, judicious because the dropping of cattle operated as fertilizer, thereby raising the yield of rice crop during the monsoon season. Moreover, peasants are reluctant to cultivate winter crops because of, as old fields observed the excess of artificial irrigation in the ters' (high land) However, irrigation facilities remained undeveloped because of peasants inability or unwillingness to finance irrigation schemes. (19).

Measures to increase agricultural production were confined for most parts to an extension of the area under cultivation. Efforts to extend the cultivated area during the 19th century were concentrated mainly in the terai region. The reasons are obvious. This region possessed considerably potential for development because of relatively low density of population and extensive tracts of cultivatable lands and forests. Proximity to the markets of northern India increased the commercial value of its timber and other natural resources and also facilitated trade in agriculture commodities. In the later part of the 19th century a big spurt in the economic actually in the northern India mainly because of the development of railway transport facilities which had touched the Nepal India border at several points, had inevitably spread efforts

of on the terai region of Nepal. It led to an increased demand for construction materials, such as, timber and boulders, which were readily and adundantly available in the terai region of Nepal. Of greater importance was the filling the new transport facilities gave the production and export of agricultural commodities such as rice and jute from the terai region. These opened up unprecedented prospects of agricultural expansion in the terai region. Thus, the land and natural resources of the region constituted the major source of income of the Ranas, the land owing elite and also to the government of Nepal. (20).

The method of cultivation

The method of cultivation in Nepal is as yet, very primitive. The agricultural implements which were found in use by krikpatrick in 1973, are still being used practically with out any substantial improvement. As attempts in the government level have been made so far either on a limited scale or in an improper way, the rural folks (through illiterates and ignorant but liberal and respective towards any change for better) have not fully convinced that the so-called better alternatives in agricultural tools and techniques are really superior to their own old ones.

While the improved types of implements are known btt little to the peasantry, the number of traditional implements now available do not sum to meet the needs. The Halo (plough) which is most universally used major farm equipment in the country, is in such short supply that there is on an average

not even one per family in three out of four examined in Pokhra. About 40% of the families do not possess any Halo at all, while more than half of the families possessed not more than one per family. There is but one family out of 212 having more than Halos at their disposal. Even in the case of a simple but essential implement like Kuto (large hae) the position is not encouraging. The number of families have not even one kuto at their disposal accounts on the whole for a high as 44.8% and in all the villages the overwhelming majority of the families have not more than two kuto each. The bull is the only source of draught power in agriculture. But about 40% of the families do not have any bulls at all, while majority of them have only one or two bulls. The poor farm equipment is an indication of the low capital formation accounting for low yield of land.

Another problem of the country deforestation causing large scale soil erosion and landslides in the mountains regions river bank cutting and fragment floods in the plains, have contributed to a quick and continuous washing away of fertile soil from the country. The scientific plant breeding or plant protection from pestilence has yet to be introduced in the country. It is reported that plant pests are at present causing destruction of about 1/5th of agricultural output every year. During the different five year plan periods, insec-

ticides, chemical fertilizers and better seeds were used only a few places on an experiment basis. All these shows that Nepal has yet to make considerable progress in agro-technical fields. (21).

Progress under plans

The formal initiation of economic planning by the government of Nepal in 1956 has failed to stikulate significant growth in production per head. One Nepalese economist has observed, for example, of the first plan (1956-61) that overall the results were not satisfactory, and of the second plant (1961-65) that the implementation of the plan did not produce any marked impact on the economic condition of the common people, largely because during the plan period the national income was population increased by 6%. Finally he remarked of the third plan (1966-70), that what ever general growth observed was probably due to traditional factors of increased labour force, additional land (brought under cultivating) changes in weather conditions and so on, and not due to any quantitative improvement of any sizeable increase in the magnitude of factors of production. The fourth plan (1970-75) recognised that although a number of developmental works have been undertaken in different sectors of the economy, there has not been virtually any not worthy change in the basic condition of agriculture. (22).

Envisaging an outlay of Rs.10,087 million (34% of the total outlay) nearly three-times higher than the fourth plan, the fifth plan (1975-80) sought to accord top priority in the allocation of funds to development of agriculture. Major schemes were to be initiated for employment generation in the field of agriculture and industry. (23).

The 1975-76 was declared as the Agriculture year with the campaign for encouraging farmers to use modern inputs and techniques, diversify cropping pattern and adopt multiple cropping system. But the actual production in 1979-80 fall short of target by 30% in both food grains and cash crops. The production target was not met in any crop not only relative to target but also absolutely. (24)

During the 1977-82 period, paddy production, for example, decreased from 2.28 million metric tonnes to 2.83 million metric tonnes. In 1982-83 Nepal produced 3.4 million metric tonnes of food grains for 15 million people and during the same year India produced 145 million metric tonnes as against 95 million in the sixties and cluna produced 345 million metric tonnes as against 318 million in 1980. When the export of rice is deducted food grain available to the people was even less. Poor means of transportation to deficit areas is and additional handicap. (25).

<u>Year</u>	<u>Food grains</u>	<u>Cash crops</u>
1961-62	3151	184
1962-63	3166	234
1963-64	3176	313
1964-65	3272	225
1965-66	3350	327
1966-67	3356	243
1967-68	3478	282
1968-69	N.A.	N.A.
1969-70	N.A.	N.A.
1970-71	3486	624
1971-72	3496	660
1972-73	3303	662
1973-74	3706	682
1974-75	3781	669
1975-76	3908	685
1976-77	N.A.	N.A.
1977-78	3585	798
1978-79	3692	810
1979-80	3196	799

Source : Annual Budget Nepal

Note : N.A. - Not available (26).

Production Characteristics of Agriculture

Without meaning to divorce the two components of a social phenomenon indissolubly bound together in a relation of dialectic interaction, for the sake of convenience and clarity of expression it would be worth while to depict first the production and distribution characteristics of the Nepali agriculture and subsequently articulate them. In the production characteristics it is sought to analyse the mode of appropriation of nature by the society or the state of the forces of production, and in distribution the mode of appropriation of the social product by the individual member of the society, or the nature of the relations of production.

Since appropriation of nature in primary production takes place through the interactions of the factors of production, namely land labour, techniques of production etc. and an immediate aim is to delineate the spatial configuration of the development process in the agricultural sector, it would be befitting to start with the portrayal of major attributes of principal factors of production in a given special setting.

CONDITIONS OF FACTORS OF AGRICULTURAL PRODUCTION :

Land It is the basic material elements of production in agriculture, occupies a progressively more dominant place in

the overall production process with the historical descending order of social mode of production. In the particular case of Nepal, marked by extreme natural differentiation of space and comparatively low social differentiation, the physical extent and agronomic quantities of distribution of cultivable land over the geographical space should exercise an even more important role in the articulation of the agrarian spatial structure.

As may be recapitulated there is extreme skewedness in the spatial distribution of cultivated land in the country. To have a better idea of the distribution pattern at the more disaggregated level, following table has been constructed through the competition of data from diverse source. The natural advantage enjoyed by the terai over the rest of the country is the matter of agricultural production is once more confirmed. The high % of geographical area under cultivation in eastern (59.02) and central (60.73) Terai and Kathmandu valley (42.88%) against low (17.44%) in Hill and inner terai (15.52%) and exceedingly low (4.07%) in the northern most mountain, is easily explicable within the Ricardian Frame of land use pattern, and further helps to differentiates the zones of natural advantages in terms of distribution of vital means of agricultural production, the land. However, the comparatively low share of the geographical area in the central hill (17-52%) should be accounted for by the non-precise delimitation of zonal boundary with the inclusion of a large section of mountain area in

it, that in western terai (26.96%) by the historical accident of late opening up of the area for human habitation and that in inner terai (15.52%) by both the above factors (but inclusion of hill areas in this case) and should not unduly under rate their potential for agricultural production.

Distribution of cultivated land relatively to the production of the area expresses the population pressure on land, and this criteria too places the terai (284 hect/1000 population) and the hill region (171 hect/1000 population) Though distribution of cultivated land relative to the rural population should have provided a better picture of the population pressure on land (Kathmandu valley and terai would have further improved their position with their higher share of urban population) in view of the high % of urban population in primary production activities, it was considered more fudicious to view the pressure on land in terms of the total population.

Distribution of cultivated land by quality is here analysed through its classification into conventional

- (i) irrigable low land or khet or deranahar
- (ii) non-irrigable up land or pakho or bhiti and their further categorisation into abal, deyam, sim, and chakar, in the decreasing order of agronomic capacity. The decreasing order from terai to mountain in the distribution of cultivated land by agronomic quality both in term of upland low-land classification and subsequent sub-

classification into four grades, is quite unmistakable. In the east west territorial dimension, however, no dist. trend is observable except for the discreminble low quality of land in the western parts of the country.

LABOUR

Labour, the principal source of value in all production assumes a more direct form in primary production, a lower the stage of social mode of production higher is the share of direct labour in production. Also since direct labour is agricultural production constitutes of human and animal labour it would be worth while to take stock of them seperately.

(1) Human Labour

As noted earlier the non-comparable definitions of economically active population in the subsequent censuses would not permit a temporal analysis of the general attributes of the agricultural labour force in a territorial frame. Hence our attempt here would be confined to the analysis of the same with reference to a single part of time i.e. 1971.

Although it is difficult to generalise on ideal land labour ratio for a given level of development of the social productive forces, the density of agricultural labour per cultivated hectare in Nepal can be safely regarded to be on the higher side. In the territorial frame, the density figures for hills (5.66) mountain (5.47) specially central hill

(6.28) and the eastern mountain (6.93) may be viewed as alarming. It may be useful to recapitulate in this context that whereas an optimum labour force in any production is an essential prerequisite, an excess labour is a drain as the value created by necessary labour and is both a cause and effect of structural under-development.

Economically active persons in the age group of 15-59 (or 15-64) years are conventionally regarded as the real productive labour in any branch of industry, and in societies marked by extra economic compulsions against the employment of female labour for productive activities, or because of the faulty definitions of economically active population, the said age group of productive labour may be further qualified by the exclusion of only the male labour. Hence the zone wise index of the nature of agricultural labour force is sought to be constructed by calculating the percentages of male labour 15-64 years of age to the total agricultural labour, and expectedly the quality of labour is seen progressively declining from the south to the north. At the risk of preempting the

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verifications through the subsequent pages, this phenomenon could be tentatively explained two ways. Firstly, the higher share of the male labour in terai (86-68%) and inner terai (71.55%) compared to that in hill (61.47%) and mountain (60.15%) may be attributed to the higher degree of feudalization in the north, and thus increasingly displacing the female from productive activities as one moves from north to south. Secondly, the higher share of child and old age labour i.e. labour below 15 years and above 64 years of age, in hill (17.39%) and mountain (16.13%) compared to that in terai (13.32%) could be partly a reflection of higher magnitude of out-migration of adult labour for the former areas.

(11) Animal Labour

The extent of use of animal labour in production varies as a positive indicator of development in primitive societies to a negative one in modern societies based on mechanisation. In the case of Nepal, much of the ploughing of agricultural land in the mountain areas was done by teams of men till the 1950s. Religious prejudice also forbids the use of bullock labour in the Kathmandu valley to this day, hence the distribution of live stock population per cultivated hectare may mean something more than merely the extent of the use of animal labour in production. For want of a separate inventory on draught animals, the number of cattle and buffalo per cultivated hectare was sought to be used as a proxy for available animal labour per

cultivated area, but the disproportionality higher values for mountain (5.67) hill (4.22) and Kathmandu valley (4.97) compared to inner terai (3.30) and terai (1.96) seem to reflect more the independent role of animal husbandary in the economic life of mountain and hill than anything else. This is further confirmed by the almost identical ratios in the distribution of livestock population per cultivated hectare. However, observed lesser variation in the distribution of animals per household indicates that the territorial inequality in the ratio of animals per cultivated area may be merely the reflection of inequality in the distribution of land as noted earlier than that in the distribution of animals. One study gives a decisive edge to terai as against hill in the distribution of bullocks per farm and per cultivated hectare.

Other factors of production :

(i) Irrigation : In the absence of any authentic enumeration of indigeneous informal irrigation system that faced the bulk of the irrigatable low land as indicated in table the organised and Government sponsored irrigation system seems to cover a mere 0.198 million hectare or less than 10% of the total cultivated land, by 1980 against 0.103 million hectare in 1975 and 0.0015 million, hectare in 1955. This is a pathetic low by any standard of comparison. In the

spatial frame the meagre provision is heavily concentrated in terai and inner terai thus indicating the state's territorial bias in channelising development.

Despite the frequently involved physiographic constraints of extreme ruggedness of terrain in the ready extension of irrigation facilities in the country, expert opinion of concede a further 0.3 million hectare in hill/mountain and 1.1 million hectare in terai as potentially irrigable cultivable land

(ii) Modern Inputs

The extent of use of modern inputs namely fertilisers improved (HYP) seeds, pesticides, farm measures for the development of production forces in agriculture. In the context of Nepal, however, till the crystallization of agrarians crisis in many of the under-developed countries by the mid-sixties, and the subsequent state intervention to solve the crisis within the status quidist frameworks under the able patronisation of international finance capital, use of modern inputs had been virtually unheard of. In the short period thereafter any amount of rhetoric of planned development, under the source archaic social dispersation could not have extricated the nepalese agriculture from its obysmal conditions of stagnation. Inspite of the impressive but spenious statistical projection of growth rates of use of modern inputs with a rock bottom datum line the absolute position of the agriculture economy as amplified by the measure of use of chemical fertilisers per cropped

area (CCA) remains the lowest amongst the community of countries in the region. The very fact that the share of chemical fertilisers in the total value of modern inputs used in the country in 1970-71 and 1978-79 respectively constituted 94.35% and 90.69% followed by 3.02% and 6.17% of improved seeds, 2.18% and 1.38% of agricultural machinery and tools and 0.45% and 1.79% of pesticides should leave no illusion about the real state of use of other inputs and hence foreclose the need to disseminate their spatio temporal distribution pattern separately. Farm management study carried out in 1968-69 had estimated only 3% of the total cultivated land under improved seeds and only one tractor for about 4300 hectares of cultivated land, whereas the more recent estimate put tractor horse power per 1000 agricultural workers in Nepal among the lowest in Asia.

TABLE : 6.12 POSITION OF VARIOUS COUNTRIES OF ASIA IN THE USE OF CHEMICAL FERTILIZER PER HECTARE OF ANABLE LAND IS AS FOLLOWS (in 100 gms)

<u>Country</u>	<u>1961-65</u>	<u>1967</u>	<u>1972</u>	<u>1977</u>
Bangladesh	44	106	200	371
India	31	71	167	253
Japan	3052	3874	3895	4281
Nepal	4	14	49	73
Pakistan	34	99	228	351
Sri Lanka	448	542	487	536
Asia	118	185	310	454

Source : FAO Fertiliser year Book - 1978

In the horizontal dimension the concentration of use of modern inputs is seen heavily biased in favour of the already well endowed agricultural zone of Kathmandu valley, Central inner terai and eastern and central terai. Kathmandu valley alone with only about 3% of the total cropped area is known to have consumed 56.26% and 32.05% of the total value of modern inputs in 1970/71 and 1978/79 respectively. Statistically the glaring disparity in the use of modern inputs by the conventional ecological hydrographic zones for 1978/79 is manifested in a staggering 308.75% coefficient of variation for the same. The only redeeming feature is the observed high rate of growth of use modern inputs in hills which however could be a more statistical illusions view of the still abysmally low absolute value and a very low reference base.

Share of factors in aggregate production

Relative share of primary (land, human and animal labour) and modern (fertilisers, machineries, agro-chemicals etc.) factors in production should provide a ready generalisation of the date of productivities forces in agriculture. Hence, in the absence of more polished inventory a simple measure of factor share constructed by an earlier scholar by way of dividing the value of each inputs by the sum of values of all materials inputs at constant prices is sought to be reproduced as in the following table with the logical reservation about the method

The fact that traditional factors of production namely land and human and animal labour, constitute nearly 99% of cost of production and modern inputs only about 1% in the whole of Nepal eloquently speaks of the pathetic state of agriculture in the country. Insignificant variation in the composition over the territorial dimension except perhaps the central hill, which includes Kathmandu valley, and central terai, also signifies a yet lower of social differentiation in the vertical and horizontal dimension in the country.

Level of growth and production

The absolute measure of level and growth of agricultural production is of crucial significance for a society dominated by use value production for it embodies the very basis of social reproduction. Hence it would be pertinent to evaluate the situation first with respect to the principal crops by the conventional ecological hydrographic zones, and summaries the total picture subsequently.

TABLE : 6.13 AGRICULTURAL INPUTS BY TERRITORIAL ZONES

Territorial zone	Area under public irrigation % of		Annual growth rate	Value of modern inputs				Annual growth rate %
				1978-79		1970-71		
				per hect (Rs.)	% of total value	Per hect (Rs.)	% of total value	
-6								
Mountain	-	-	-	5.22	0.49	N.A.	N.A.	-
Eastern	-	-	-	9.83	0.42	-	-	-
Central	-	-	-	3.16	0.03	-	-	-
Western	-	-	-	0.94	0.04	-	-	-
Hill	1.59	1.52	+23.38	22.85	11.98	1.24	1.54	+249.18
Eastern	-	0.02	-	22.75	4.06	-	-	-
Central	1.59	1.15	+14.12	31.00	7.10	-	-	-
Western	-	0.35	-	6.99	0.82	-	-	-
Kathmandu Valley	5.85	2.39	+ 1.77	529.44	32.05	363.35	56.26	+4.28
Inner terai	8.62	18.32	+69.28	31.85	8.04	-	-	-
Eastern	-	0.03	-	12.45	0.70	-	-	-
Central	9.25	18.15	+72.31	61.81	6.31	-	-	-
Western	0.37	0.14	-	12.46	1.21	-	-	-
Terai	83.93	77.77	+22.17	36.00	47.44	12.79	42.20	+27.34
Eastern	73.49	60.89	+18.31	38.51	33.44	-	-	-
Central	1.02	12.06	+451.8	43.22	10.41	-	-	-
Western	9.42	4.82	+5.83	17.21	3.59	-	-	-
Nepal	100.00	100.00	+25.06	44.48	100.00	21.29	100.00	+18.18

TABLE : 6.14 FACTORS SHARES IN AGRICULTURAL PRODUCTION. (27)

	Land	Human	Animal	Fertiliser	Improved	Tractors	Pumpsets	Agro- chemical	Total
	labour	labour	labour		seeds				
Hill : Eastern	43.93	38.68	17.36	0.02	0.02	-	-	-	100.00
Central	33.15	53.00	11.02	2.13	0.30	-	-	-	100.00
Western	32.42	55.79	11.50	0.10	0.13	-	-	-	100.00
Far western	34.81	49.00	16.68	-	0.01	-	-	-	100.00
Teraf Eastern	36.51	44.00	19.04	0.12	0.22	0.03	0.01	0.01	100.00
Central	40.82	39.38	17.40	0.67	0.71	1.00	0.01	0.01	100.00
Western	36.51	35.96	26.35	0.23	0.80	0.12	0.02	0.01	100.00
Far Western	37.19	33.44	28.99	0.07	0.30	0.01	-	-	100.00
Nepal	38.51	42.89	17.49	0.49	0.38	0.22	0.01	0.01	100.00

Table : 6.13 Source : AFROSC Kathmandu Agriculture inputs corporation, Kathmandu

Table : 6.14 Source : CEDEA Kathmandu (1976)

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Development of Agriculture

Nepal's economy is predominantly agriculture and therefore it plays crucial role both from consideration of employment and food production. The recent performance of agriculture has not been satisfactory. Minimum attention should be given therefore to development agriculture sector by providing essential inputs to small farmers, by improving irrigational facilities and by providing HYV seeds and modern fertilisers. Improvement in irrigation facilities not only helps existing crops but also helps adopt multiple cropping which in turn creates employment substantially. Evidence from studies across many countries in Asia indicates that the introduction of modern varieties has in general led to a higher labour inputs per acre, but a decrease in labour inputs per tonne of the product.

Use of appropriate technology

To improve the low productivity of resources, it becomes necessary to use improved technology. However, it is seen that the new improved technology may have a mixed impact on employment generation. Various studies have indicated that where the level of technology is not too high, the intensity of labour requirements is high and hence there is a positive impact on employment. However, as the level of technology increases such as introduction of tractors, mechanical reapers and harvestors there is a negative impact on labour as they have

serious labour displacement potential. Therefore the technology advances could well reduce employment and add to the scarcity of resources, such as energy. Hence, the appropriate technology must be selected by assessing its impact, both long and short term. The backlog of simple technological improvements indicates that there are immense unexplored possibilities in the hills as well as in the terai. Therefore, technological innovation should focus on improvement of local crop varieties as well as in finding new varieties suited to high altitude dry-land and slope areas in order to increase yield from the existing land in the hills.

Land reform : The effective implementation of land reform also should be given due consideration. The uneven distribution of land results into low productivity which in turn restricts the employment generating capacity of land. In many Asian Countries employment generation is sought through distribution of land, there by increasing productivity and bringing in new areas under cultivation. In Nepal too, employment generation is being attempted at to a ability of land resources to provide a continued expansion of employment opportunities is constrained over a period of time. This is particularly true for a country like Nepal where cultivable land is scarce.

Water Management : An important area of priority is water management. The capital and energy requirements of providing

additional irrigation facilities are bound to be high. Therefore, the possibilities of improving efficiencies of utilisation of the already available water resources should be given high priority. The user's participation in an institutional form is desirable.

Development of non farm activities

Utmost attention should be given in diversifying the economy with a view to creating employment opportunities in non farm activities. They are industries and handicrafts and local stimulated small scale infrastructural schemes it is recognised that scope of labour absorption in agriculture is rather limited even if favourable developments took place in cropping intensity and multiple cropping water management, in the increment of HYP acreage, adoption of appropriate technology etc.

Diversification of agriculture based activities

Diversification of agricultural based activities from subsistence crops cultivation to other on farm activities such as cash crops, livestock activities sericulture and related off farm processing activities may have the effect of improving employment opportunities.

Public works programmes

The landless labours constitute a bulk of the labour force in Nepal, therefore means and ways of finding employment to this

sector of the labourers. These should be continuous skill upgradation programmes so that they can acquire skills in demand.

Small Farmers

The small farmers constitute a dominant unit of production in the agrarian economy of Nepal. Since they faced production and market uncertainties which constrain his income and ability to employ other measures such as improving input delivery system, improving their access to the infrastructure and orienting the institutional structure to their needs became necessary. (28)

Conclusion

In 1983 an indepth study of the agricultural strategy in Nepal completed by the Asian Development Bank has identified the problems that effect the nations economy.

The study observed that five successive development plans brought about little improvement in Nepal's agricultural production despite increased investments. It reveals that a well defined strategy for agricultural development was missing and that planning was not effective. Policies based on short term considerations were restricting agricultural growth. All these short coming had to be rectified before agriculture could get a boost.

It stressed the need to lower the ceiling on long holding 16.10 hectares in the terai and 4 hectares in the hills. At

about 6% farmers owned almost 44% of land and 55% less than 12%. The average size of farm holdings of this 55% is 0.21 hectares.

Although land reforms introduced in 1964, identified 1,80,000 tenants and temporary identification ship were issued about 40% of them were left out. The derive for identification of tenants has petered out for lack of political commitment, under the circumstances, a large number of tenants remain share croppers with neither motivation for resources to increase production. The report, thus recommended further reform in tenure system with a view to enhancing motivation and the litters access to inputs and growth.

Rapid ecological deterioration in the hill areas, which constitute 2/3rd of the land mass is said to be a limiting factors in agricultural development. Other causes include ragged topography and limited accessibility (which result in difficulty in supplying inputs) micro-climates and ecological riches which require great diversity in cropping practices and varieties.

The study observed that the reason for the lack of progress in agriculture was mainly organisational and institutional deficiencies. The whole process of decision making is slow. Authority and responsibility were centralised in a few hands

at the national level instead of being different at the regional and district levels.

The Asian Development Bank, thus, proposed a strategy for undertaking several activities over the next 20 years. Projection of environment and optional land use should be the components of all policy decisions concerning the agricultural sector specially decisions on future development of water resources, forestry and migration and re-settlement.

Estimates indicate that the total capital investments during the next three five years plan periods (1985-2000) would range from 1.8 billion for a low investment scenario to 3.4 billion for high investment options. The funds would be spent mainly on irrigation, general agricultural development, livestock, fisheries and forestry. The report thus, suggested reconstructing of economic policies taking into account their likely impact on agriculture. (29).

To conclude, according to Director of the Centre for Economic Development and Administration (CEDPS Dr. G.R. Agarwal, agriculture has remained the backbone of the economy and it will play a dominant role in Nepal's development in future years also, considering the slow pace of industrial development. (30).

INDIA'S ROLE FOR MODERNISATION OF AGRICULTURE IN NEPAL

In a predominately agricultural country like Nepal need for the development of irrigation facilities is obvious. The impact of agricultural growth has far reaching significance in the economic development of the country. The progress in this primary sector is essential for Nepal to meet the growing food requirements for the country as well as to supply raw materials like jute, sugarcane, tobacco, oil seeds, etc., for supporting the industries since agricultural commodities account for a major share of Nepal's exports, it is also a primary source for paying for the imports of goods during the period of transaction towards modernisation. For India, also an economically self sufficient Nepal would be a great asset since it would bring political stability in the country.

With the objectives in view, India has been collaborating with the Nepalese government in the field of irrigation. She has extended assistance in a number of minor and medium irrigation projects, particularly in the terai region. All these projects which have been completed at an estimate cost of Rs.2.5 crores (about) intend to provide irrigation facilities for over 1,10,000 acres of land. Apart from these comparatively minor irrigation projects, India in Nov. 1964 concluded an agreement with Nepal on Chatra Canal project, the biggest irrigation

scheme of Nepal. This project would provide irrigation facilities for about 2 lack acres in the eastern parts of Nepal and is being executed through the River Valley Project Development of Bhar (India) at an estimated cost of about Rs.11.00 crores. The following table shows the irrigational scheme which are operating under India's assistance.

TABLE : 6.15 IRRIGATIONAL SCHEME IN NEPAL WITH INDIAN ASSISTANCE

<u>NAME OF PROJECT</u>	<u>TOTAL EXPENDITURE</u>	<u>AREA TO BE IRRIGATED</u> ⁽³¹⁾
Chatra Canal Project	1033.6 lacs	1,82,000 acres
Teeka Bhairav	6.6 -do-	75,000 acres
Mahadev Kola	1.8 -do-	3,800 acres
Budh Neelkanth	0.6 -do-	2,000 acres
Knothu Kola	3.9 -do-	1,800 acres
Godavari Khola	4.1 -do-	2,000 acres
Lower Vijaipur	8.7 -do-	7,200 acres
Farvatal	19.3 -do-	1,200 acres
Baglung	0.8 -do-	400 acres
Bundhara	28.5 -do-	7,200 acres
Jinao	6.4 -do-	5,000 acres
Jhoaj	17.4 -do-	15,000 acres
Hardinath	3.4 -do-	9,000 acres
Manusmara	27.2 -do-	5,376 acres
Aishokhola Kulo	0.1 -do-	120 acres
Bashan Khola	1.2 -do-	1,500 acres

Source : Impact of Indian economic aid and assistance on the Development of Nepal by S.K.Chaturvedi

India also embarked upon the rural development programme with a view to improving the economic and social condition of the masses engaged in agriculture of Nepal. Under this light, a programme of village development was chalked out and India agreed to provide Rs. four crores initially for utilisation during 1959-61. The scheme envisaged economic and social development of the rural areas through village development blocks by increasing food and agricultural production, development of horticulture, improvement of village communication. The main emphasis in the programme was on the development of people's initiation and productivity. Under this programme, 13 village development blocks came into operation. In addition, 3 intensive valley schemes were also taken upto meet the all round development needs of the pokhra, lalitpur and palung valleys (Bhaktapur) After the initial agreement reached on March 31 1991, a fresh agreement was entered into cimmitting Rs.112 laacs for expenditure during 1961-62. Impressive achievements were made in almost all fields of activity under the programme especially in agriculture and animal husbandary. The programme, however, came to a close after the government of Nepal decided to channelise the development of rural areas through the panchayats in the interests of a uniform pattern of development through out the country. (32).

Under the veterinary assistance programme, for the first time, a full, fledged veterinary service consisting of 14 hospitals and 18 dispensaries was set up to meet the need of the whole country.

In addition, India made available Rs.40.00 lacs for the modernisation of central veterinary hospital in Kathmandu establishment of 32 veterinary hospitals and breeding centres in different districts, establishment of a central laboratory for the manufacture of needed vaccines for the prevention of rinder pesting among cattles. On June 13, 1970, the Central veterinary dispensary at Tripureswar in Kathmandu was inaugurated which cost Rs.2.30 lacs.

India has also been rendering assistance to develop facilities in horticulture where there had been very little development hitherto. Though embracing large varieties of territorial and climate proposition for the development of fruit cultivation, Nepal had hitherto little tradition of fruit growing. Under horticulture assistance scheme of Rs.40.00 lacs, establishment of research station of Pokhara trial orchards at Dhuribesi, Trisuli and Daman, orchard-cum-nurseries and fruit plantations have been under taken fruit and vegetable preservation have already made strides, 14 stations including 5 research stations have been set up so far.

Moreover, a high level Indian delegation has identified areas where fruits like peaches, plums, and mangoes and vegetables like potatoes and mushrooms can be grown on a commercial scale to raise production and improve the economic condition of Nepalese farmers. This team favoured an integrated approach to production, storage, marketing and processing. (33).

Thus, the Indian assistance aimed at an integrated economic and social development of rural areas by augmenting farm output (facilitating irrigational schemes), development of horticulture, improvement of livestock and village communications, crop development, forestry, etc. through development blocks. India also expressed her eagerness to train village level workers to take up these programmes by themselves.

SUMMARY

Agriculture provide livelihood to more than 90% of Nepal's population. About 65% of the GDP is estimated to have been derived from this sector, and 80% of the current exports consists of agricultural products.

The approximate percentage distribution of total cultivated area among the principal crops is as follows, paddy 55.7 maize and millets 24.7, wheat 6.5 potatoes 4.9, oil seeds 3.4, tobacco is generally doubled cropped. Thus, though the country, economy is basically agriculture-based, owing to reasons of topography and other conditions of under employment, only 2/7th

of the land (36 million acres) is either cultivated or cultivable.

The method of cultivation in Nepal is as yet, a very primitive and traditional. The agriculture implements as used are short in supply. The Halo (plough) Kuto (large hoe) Koo (digging hoe), etc. the traditional tools of agriculture in Nepal, are not even found in plenth to meet the needs of the peasantry. The majority of agricultural family have only one or two bulls. The farmers are also ignorant of the better alternatives in agricultural techniques. On the whole, technical improvement for the development of agriculture is absent in Nepal.

Before the commencement of the first five yearpplan in 1956 it was estimated that about 25,000 hectares of land was under irrigation. In 1980, about 12% of the total cultivated area (2.3 million) hectare is irrigated (approximately 1,95,000 hectares). Again, in distribution about 90% of the total irrigational facilities are concentrated in the terai. In the hill region and vertically the western part of the country (where rain fall is relatively low,) the irrigational facilities are extremely limited. Although a number of irrigation projects have been completed or commended by the government with the assistance of India or other foreign aid donors,

yet their potentiality have touched little. As these projects are expensive and takes long time, the government have accepted the minor irrigational schemes with low investment for increasing agricultural products quite promptly in short time.

The use of chemical fertilizer is the bey factor in the process of transition from the traditional method of area expansion to that of yield increase of agriculture in developing countries. It is estimated that total consumption of chemical fertiliser on average per hectare of anable land in developing countries is only 10kg, as against 50 or more kg per hectare in the developed countries. In Nepal, less than other countries, its use is relatively unknown to the cultivators. One of the most important needs for increasing agricultural production is chemical fertiliser, chiefly nitrogen and phosphates. In Nepal use of improved seeds and chemical fertiliser 1979-80 was about 2,918 metric tonnes and 20,963 metric tonnes respectively as against the amount used of only 36 metric tonnes and 592 metric tonnes in 1964-65. The Kathmandu valley takes the lion share of the national consumption if fertabisers consumption of Nepal in 1971-72 was only 3.8kg, per hectare which is absolutely low in comparison with other developing countries in south Asia (e.g. Bangaladesh) 7.8 Pakistan 13.6 India 16.5 and Srilanka 92.2kg/hectare).

Inspite of overall emphasis in agriculture (highest priority has been given to agricultural development

in the successive periodic plans of Nepal which comes roughly to more than 25% of the total financial outlay), the agricultural output could not have been increased so far commensurate with the growing needs during the various plans periods. Agricultural yield per person per hectare has been declining. For example, declined by 2.2% and the productivity has gone down by 3.42% over 1975-79 period. Foodgrains deficits are very much pronounced in the hill areas of Nepal (approx. 1,50,000 to 2,00,000 tonnes annually) where 2/3rd of the nations total cultivated land.

The man-land ratio in Nepal is 3 per hectare of cultivated land, while the average size of holding comes roughly 1.5 hectares. Nearly 50% of the farms families of Nepal belong with the holdings of less than 0.5 hect each with the growth of population and the Hindu law of inheritance in vogue in the country further division and fragmentation of land holding has an adverse telling effect on agricultural growth. The capital output ratio of the agricultural sector is at 7 : 1 which is evident of a high cost agricultural economy of Nepal.

The subsistence level of farming accompanying with low productivity in agriculture result in indebtedness of the farmers in Nepal. About 60% of the farmers borrow during a given year spent mostly on unproductive purpose. On the other hand, institutional finance constitutes only 21% where as private

credit agencies in the sphere of agricultural finance in Nepal. Although Agricultural Development Bank (previously co-operative Bank) of Nepal was established to curb the predominance of village money lenders and institutionalise agricultural credit but mutually it could any note worthy change in the basic condition of agriculturists.

Rapid ecological deterioration in the hill areas is indicated to be a limiting factor in agricultural development. Other causes include ragged topography and limited accessibility (which result in difficulty in supplying inputs), micro-climates and ecological riches.

Agricultural production also depends upon the availability of agricultural technicians like agronomists, technical assistance, etc. But in Nepal this technological backwardness is evident, though their number has increased from 1,400 in 1970-71 more than 3,000 in 1978-79.

Moreover, targets in agricultural production set under different plans in Nepal were extremely ambitions compared to available resources both physical and human lack of organised implementary machinery and lack of trained personnel has also created problems in proper coordination among different projects.

Thus, it indicates from the above statements that performance in the agricultural sector of Nepal has remained

very disappointing and feudalistic though different periodic plans were launched. To conclude, considerable attention should be stressed in the development of this sector since agriculture plays a dominant role as the backbone of national economy. (34)

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