AGENCY FOR INTERNATIONAL DEVELOPMENT
WASHINGTON, D. C. 20523

BIBLIOGRAPHIC INPUT SHEET

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Batch 97

1. SUBJECT CLASSIFICATION

A. PRIMARY
Development and economics DA00-0000-G726

B. SECONDARY
General--Nepal

2. TITLE AND SUBTITLE
An economic study of the area around the alignment of the Dhanagadi-Dandeldhura road, Nepal

3. AUTHOR(S)
Rana,R.S.J.

4. DOCUMENT DATE	5. NUMBER OF PAGES	6. ARC NUMBER
1971	172p.	ARC

7. REFERENCE ORGANIZATION NAME AND ADDRESS
AID/ASIA/USAID/Nepal

8. SUPPLEMENTARY NOTES (Sponsoring Organization, Publishers, Availability)
(In CEDA study ser.no.1)

9. ABSTRACT

10. CONTROL NUMBER
PN-AAG-316

11. PRICE OF DOCUMENT

12. DESCRIPTORS
Economic analysis
Regional planning
Roads
Nepal

13. PROJECT NUMBER

14. CONTRACT NUMBER
AID/ASIA/USAID/Nepal

15. TYPE OF DOCUMENT

AID 590-1 (4-74)

CEDA STUDY SERIES

NUMBER 1

UNDERTAKEN FOR THE NATIONAL PLANNING COMMISSION SECRETARIAT
HIS MAJESTY'S GOVERNMENT OF NEPAL

AN ECONOMIC STUDY OF THE AREA AROUND THE ALIGNMENT OF THE DHANAGADI–DANDELDHURA ROAD, NEPAL

Ratna S. J. B. Rana

CENTRE FOR ECONOMIC DEVELOPMENT AND ADMINISTRATION
TRIBHUVAN UNIVERSITY CAMPUS
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Price: Rs. 40. 00

Printed in Nepal at :— Progressive Printing Press Thahity, Kathmandu

FOREWORD

In undertaking this first research project for the Centre for Economic Development and Administration, Dr. Rana has broken new ground. This is the first attempt in Nepal to define the service area of a road and to visualise a road as an integral part of the development of the region it services. The objective of the project was to lay the framework of socio-economic research on the basis of which techno-economic surveys to test the feasibility of the investment programmes suggested here may be undertaken. It must be understood that a broad survey like this can only point to some of the possible ancillary programmes needed to make the investment on the road pay-off. Whether any ancillary investment is the best feasible one needs to be tested against possible other alternatives and this cannot be done by a social scientist unaided by technicians.

However, the forceful manner in which the study brings out the need to coordinate the efforts of various ministries in choosing projects, which mesh together, will have continuing significance. The fact that the roads department located its project independently and that no other ministry such as agriculture or industry made any significant investments in the same region, has clearly subtracted from the value of the road. It therefore highlights the need for the ministries to make joint decisions, particularly in location. The roads to Kathmandu and Pokhara have exhausted the possibilities for connecting the Tarai with large population complexes which are economically active and so those of roads which are economically viable without supporting investment programmes. All other north-south roads will be either of the Dhanagadi-Dandeldhura or Kathmandu-Kodari variety. Thus in each of these backward areas there is the problem of generating economic activity so that an exchange of goods and services through the pipeline of the road becomes possible. It is to be hoped that in the future the nature of the economic activity to be generated and the potential for regional development as a whole will be considered before aligning roads.

One major finding of Dr. Rana's research is that the present alignment from Dandeldhura to Dhanagadi seems difficult to understand economically. The natural movement of traffic and the economics of the region indicate that a connection of the major western hill centre, Doti, with the major rail-head across the border at Mahendranagar would have been the logical choice for a road in this region. It was perhaps a purely technical, engineering approach which dictated the choice of Dhanagadi and Dandeldhura as terminal points and the alignment as being along the least populated area in between. However, there is a great need to carry out surveys on a techno-economic basis before choosing the alignment of a road. Viewing a road as an integral part of the region's total development naturally means aligning

it in such a way that it can play a vital role in regional development within the given technical constraints. Road building should not be an Euclidean exercise to find the shortest distance between two points.

Another factor that needs to be carefully considered is the question of time-lags. If, say, the region requires horticultural development, seedlings should be planted almost at the same time as the road is begun, so that when the road is finished, fruits will be available to travel down it. The synchronisation of different types of development so that they become cumulative is indeed a major consideration.

This leads to the more fundamental question of what patterns of organisation and management are most apt for this kind of regional development ? What role does the social character of the area dictate for its local organisations ? How can our administrative system be best adapted to this purpose ? How can the Panchayat structure and the resources it could command be mobilised and integrated with government-run projects ? An economically integrated region will not necessarily mesh with Anchal or district borders. If the different administrative units of such a region are to work together, the time has come to work out a bold new idea for a regional development authority.

The Centre has been fortunate to find a man of Dr. Rana's outstanding academic record who has been willing to apply his capabilities to research in one of the most backward and difficult regions of Nepal. The credit for this work must go entirely to him and his team. It is with pride that we present the work of this team.

Pashupati Shumshere J. B. Rana
Executive Director

Kirtipur
June 28, 1970

PREFACE

In recent years, road building in Nepal has gained considerable momentum. Since increased accessibility and mobility are important variables in the developmental equation of a country, road building in Nepal may be considered an important factor in the success or failure of her entire developmental efforts. However, all too often road building is engineered by merely weighing its costs and benefits as a means of moving people and goods. Other important considerations such as the demands imposed by further development needs, growth potentials likely to result from road construction and the possibilities of trade-offs between capital investment in road construction and other economic programs are often not weighed. Moreover, decisions on road construction are often based upon traffic projections regarding what may be expected to happen, rather than on what may be made to happen.

This report, conducted under contract to the National Planning Commission Secretariat and the Ministry of Finance of His Majesty's Government of Nepal, deals with selected districts of Far Western Nepal, particularly those in which Dhanagadi-Dandeldhura Road is now under construction. It is concerned not with providing a justification, economic or otherwise, for the Dhanagadi-Dandeldhura Road, but to compile basic information directed towards formulating guidelines for incremental investment within the region to complement the ongoing investment in the road construction. In doing so, we have stressed the economic structure of the region because we believe that such knowledge must precede formulation of specific developmental programs. We have also stressed the hills in this study because, comparatively speaking, the problems of the Tarai lie not so much in alleviating existing problems, but in avoiding some serious problems that will probably arise in the future which we hope have been dealt with sufficiently.

In the preparation of this report we have suffered from several constraints which are noted in the text. These have also been responsible for our inability to apply quantitative techniques to test some of our judgements in objective security. On occasion, we may have also run a risk of overlapping ideas, for this became somewhat unavoidable in discussing inter-related subjects.

Data used in the preparation of this report were collected from various government offices and agencies in Kathmandu as well as in the Zonal, District and Village Panchayat headquarters within the area of study. In addition, a six-week field study from November 15th to December 26, 1969 was carried out during which information was obtained by administering questionnaires. The following persons were primarily involved in this task:

Bhim Dev Bhatta, Tribhuvan Choudhary, Santa Bahadur Gurung, Kashi Nath Joshi, Nilmani Sharma and Surendra Prasad Wagley. They were also responsible for the processing and compiling of the data used in this report. Tribhuvan Chaoudhary, in particular, has been most helpful from the initiation of this project through its final preparation. To all of these people, I wish to extend my sincere appreciation.

A great many people in the field, government offices and elsewhere have contributed their time and efforts in aiding this project, and I would like to express appreciation to all these people, even though it is not possible to mention them individually. Above all, I am greatly indebted to William B. Douglass who provided criticism and suggestions from the inception of this project through actively participating in the field-work and doing the basic processing and compilation of data. His contribution to this report has been quite indispensable. For their helpful comments at various stages of this study, I am also thankful to my collegues at CEDA. Suggestions and criticisms provided by Shri Pashupati Shumshere J. B. Rana, Executive Director of CEDA, in particular, have substantially improved the final manuscript. His cooperation in writing a foreword to this report, in addition to much other help, is also gratefully acknowleged. Without his continued encouragement and unfailing support, it would not have been possible to do the job. To Indra Pradhan, the Project-in-Charge of the Dhanagadi-Dandeldhura Road, I wish to extend my sincere appreciation for his ungrudging co-operation during our sojourn at Dhanagadi. I also with to acknowledge the helpful comments from Dr. Harka Gurung and Dr. John Beyer on an earlier draft of this report.

A vote of special thanks is accorded to Devendra Kumar Gurung, Jayanti Sharma, Aishwarya Man Shrestha, Padma Nath Tiwari, Puru Kumar Thapa and Shiva Narayan Choudhary who showed a great deal of patience and professional skill in typing the manuscript. Thanks are also due to Nagendra Raj Sharma and Santa Bahadur Gurung for seeing this report through the press.

Last but not least, on behalf of the Centre for Economic Development and Administration, I would like to express my special appreciation to the Ministry of Finance and the National Planning Commission Secretariat for having provided assistance, financial and otherwise, for the preparation of this report.

Ratna S. J. B. Rana

CONTENTS

CHAPTER I

SUMMARY

This study deals with selected districts of Far Western Nepal where the Dhangadi—Dandeldhura Road is being constructed and incorporates Kailali and Kanchanpur in the Tarai and Doti and Dandeldhura in the hills. The Dhangadi—Dandeldhura Road forms the first section of the Mahakali-Seti Zones road network which will ultimately link with the East-West Highway system and is planned for completion in 1973. Extending for 145 kilometers (91 miles), this road will link Dhangadi and Dandeldhura traversing across the districts of Kailali, Doti and Dandeldhura and is expeteed to cost Rs. 72,500,000 (approximately US $ 7,178,218), seventy-five percent of which will be borne by U.S. AID although administrative responsibility for its construction and maintenance remains with His Majesty's Government of Nepal.

The main objective of this study is not to provide a justification, economic or otherwise, for the Dhangadi-Dandeldhura Road, but to compile basic information directed towards formulating guidelines for incremental investment within the region that will complement the on-going investment on the road construction. This study is based on information collected from various offices and agencies in Kathmandu and the area itself. Informations were also collected during a six-week field study by using questionaires and inquiring many informants at various levels of local government and in the public sphere. As this study touches upon so many aspects of regional economy and area development activities, the analysis has relied heavily upon an observational and subjective-intuitive approach rather than on methodology derived from any specific social science discipline.

The main constraints involved in preparation of this report were insufficient time and inadequacy of information. While this study was intended to provide a basis for planning and has involved discussions on regional definition, relative potential and economic activities, in no way does it purport to be a regional plan for the area being dealt with.

The Dhangadi-Dandeldhura Road passes through two distinct geographic areas— the hill and the Tarai— each characterized by its own ecology and economy. The former consists of extremely irregular surface configuaration with varying altitudes. Much of this area is characterized by steep slopes, little level land, soil erosion and widespread deforestation. As such, vast areas are either uncultivable or support only marginal agriculture which is confined to river valleys and the slopes immediately above them where there is scope for irrigation. Here annual rainfall average 89—102 centimeters (35-40 inches), progressively decreasing westwards and occurs mostly during the summer months. It is not only insufficient for year round cultivation but is also uncertain as a result of which this region is subject to recurrent period of droughts. These marginal lands do not produce enough food to meet the requirements of its population, necessitating a great dependence upon outside employment either in Tarai or India. The only activity yielding a significant generation of cash income in the region is the production of ghee.

Lying south of the foot-hills, the Tarai districts consist of mostly flat land with an average annual rainfall of about 76-89 centimeters (30-35 inches). Until recently, there were only a few permanent settlers, the Tharus, because of its malarial climate. However, because of the success attained by the malaria eradication program, this region is attracting settlers from the surrounding hill districts where economic condition has been steadily deteriorating. In recent years, this region has been an area of accelerated colonization by the hill people which is expected to increase in the near future. Despite such colonization, this area still has one of the lowest population densities as well as favorable balance between its population and resources. Although limited absorption of the hill people is feasible in this region, uncontrolled and continued large scale immigration into this area is certain to bring harmful repurcussions in the economic ecology of both the Tarai and hill districts.

In assessing the probable area of influence of the Dhangadi-Dandeldhura Road, a number of factors appear to be significant. The road does not link up any area of population concentration at both ends, including the Indian side of the border. Dhangadi itself, while not the largest market in the area, is however an important market and administrative center. The settlement at Dandeldhura proper is relatively small. It is a traditional administrative center but not a commercial center of great significance other than for the areas immediately around it.

In Kailali and Kanchanpur the largest population concentrations and some of the fastest growing areas lie at the far western border, around and south of Mahendranagar and in the eastern section of Kailali district. The first 81 kilometers (50 miles) of the Dhangadi Dandeldhura Road goes through an area of low population density with the exception of areas around Dhanagadi. After passing the Mahabharat Lekh the road bypasses the densely populated Ruwa Khola valley and continue through a relatively unpopulated area until reaching the Ghatal Doti valley below the settlement of Dandeldhura proper. The surrounding areas are quite densely populated forming a band running along the Seti River and its principal tributaries to Doti and onto Achham to the east. On the western side of the road there is little in way of settlement activity with the main area of potential, Jogbura, being more easily reached from Mahendranagar than from the road. With the exception of individual river valleys and the areas along the Seti, this region generally does not produce adequate food due to the terrain and inadequate rainfall.

Based on these considerations, it is felt that the Dhangadi-Dandeldhura Road, while facilitating solutions to existing problems (particularly in the hills) will not by its mere existence bring about solutions to any of them. In the Tarai it is expected that the influence of the road will initially not extend for more than several hours of walking distance on either side. The only concentration of activity in the Tarai portion of the road could be expected near Tigri at the future inter-section of the East-West Highway, in addition to the area around Dhangadi. Development at Godavari, where the road enters the foothills, will take place at least on a temporary basis around the site of the main workshops for the road project. Once in the hills, until reaching the Mahabharat Lekh, the road cannot be expected to have any significant influence on areas other than Jorayal and possibly Gadsera. Between the Mahabharat Lekh and Dandeldhura, the road will immediately provide access to areas in the east, primarily the Ruwa Khola valley. Its main influence, particularly in view of the low population densities along the alignment, will be its terminus at or near Dandeldhura proper.

So far as the hill districts are concerned, the initial value of the road will primarily lie in what can be brought into the area rather than in what will be transported out. It is difficult to foresee a high rate of passenger traffic being generated from the area in view of lack of cash income and the poor economic conditions of those who migrate south either on

a seasonal or a long-term basis. The extent to which ghee is exported through the road will be directly dependent upon the prices offered in Dandeldhura and indirectly on the extent to which necessary imported commodities will be available cheaply.

The greatest initial utilization of the road and the most important aspect of its long-term influence will be in the movement of needed goods and supplies into the area. The availability of necessary commodities in the hills at prices lower than those now prevailing will obviously represent a savings to those housholds who presently buy goods in the hills but for those who must travel to the Tarai or India to seek employment, savings in convenience would be overweighed by the differentials in cost. Travelling to border towns with loads is also self-employment during the slack season.

The main contribution that the road should make to the economy of the area will be in facilitating the availabity of the basic imports required to increase agricultural yields and other developmental activities. For the most part, these are the types of development that will create a basic sufficiency of food that will support the development of other cash generating activities. In this aspect, the road should have an impact over a large area and it is also this form of influence that is most likely to generate a further spread of influence.

Needless to say Far Western Nepal is predominantly agricultural where the overwhelming proportion of the total work force is engaged in rural economic activities and where a corresponding fraction of the people live in small villages. Hence, this region has a rural problem where markets are small and where the scale of operations in both agriculture and ancillary activities is inadequate and largely inefficient. Despite the importance of agriculture in the economy of the region, the per capita income derived from each hectare of cultivated land is low which is due mostly to the pressure of population on land. Agricultural technology has remained stagnant and the quality of the land has steadily deteriorated due to soil exhaustion and erosion. Because area expansion of the cultivated land is no longer possible, a large number of persons share the limited cultivated land, thereby giving low per capita income.

The cropping pattern of the region is characterized by the predominance of foodgrains cultivation. Among the commercial crops mustard is the most important. In the Tarai paddy followed by mustard and maize are the common crops. In the hill districts wheat is the most important and then maize followed by paddy. As a single crop paddy covers the largest area due to its ability to produce more food per unit of land area than any other grain; the next important crop from the viewpoint of area covered is maize with approximately 24 percent of the cropped area under it. Wheat occupies about 17 percent of the total cropped area. Other foodgrains include barley and millet. The predominance of foodgrains cultivation and their pattern of regional distribution may be attributed to the high pressure of population on land with the result of compulsion for food self-sufficiency, lack of opportunity for cash-oriented farming due to absence of markets and the physical determinants of crop production

such as soil and climatic conditions.

According to the *Cereal Grain Production, Consumption and Marketing Patterns*, approximately 103,779 metric tons of cereal grains were produced in the four districts being dealt with in 1964-1965. Although this figure would indicate a regional self-sufficiency in foodgrain production, the actual situation was far from being so because of the regional imbalance between population and production. The main foodgrain production of the region consists of paddy, maize, millets, wheat and barley. As regard to production trend, a decrease in the overall production of paddy was observed. With the exception of paddy and millet, other foodgrains showed considerable increase in their production trend for the entire region between 1965 and 1968, the main contributing factor being a change in the cropping pattern with areas previously under paddy cultivation being given to the production of other foodgrains which was probably due to the drought that had prevailed during this period.

Generally speaking, on non-irrigated land the summer crop is either paddy or millets; land under paddy is followed by wheat during winter whereas that under millet is followed during this season or vice versa. Maize is usually cultivated on lands which are dry for paddy but moist for the millets. The peak period for agricultural activities is May to November and the period from middle of November until April is the slack season.

The size of holding per household showed a wide regional variation although as a whole the average size of holding amounted to 3.11 hectares. When the size of holding was broken in terms of the quality of land — *khet* (wet) and *pakho* (dry) – it was observed that the proportion of *khet* to the total land holding was higher in the Tarai districts than in the hills.

The manner in which other resources are mobilized, namely labor and capital, to exploit the land holding is primarily dependent upon a number of interrelated factors such as the size of holding, number of persons per household and the social structure of the population. In the hill districts labor is generally supplied by members of the households. In the Tarai those landowners who have holdings too large for the family to handle usually employ contract tenants drawn from the class of the landless. Rich landowners fulfil their capital requirements from their own savings whereas poorer cultivators rely upon the village moneylenders.

Livestock raising is an integral part of farming in both the Tarai and hill districts. While animals are mainly kept for providing draught power and manure, they also provide a major source of cash income in the hill districts from the sale of ghee. In general, the quality of most of the animals is very poor which seems to be inversely correlated with the number of animals as well as the supply of fodder. The main problem of animal husbandry in the hill districts is the acute shortage of fodder and grazing, and wide fluctuations in their availability from year to year caused by uncertain and uneven rains. Fodder supply is more abundant in the Tarai districts than in the hills due to the relatively smaller number of

animals per hectare of cultivated and forest lands. In 1962 the livestock population density averaged 12 per hectare of cultivated land in Doti and Dandeldhura as compared to 2 per hectare in Kailali and Kanchanpur. As such, even the supply of fodder that comes from the stalks of harvested grains is relatively substantial in the Tarai districts.

The distribution patterns of vegetation is determined by variations in rainfall, temperature, altitude, slope, exposure, soil and drainage patterns. While there are areas of forest scattered throughout the region being dealt with, concentration occurs mainly in the Tarai districts where forests cover over 50 percent of the total area. In the hill districts forest coverage approximates 25 percent of the total area and for the most part these hill forests are inaccessible and their utilization is purely for local purposes. The forests in the Tarai have not been fully utilized of their potential because of the lack of transport inputs which the Dhangadi-Dandeldhura Road will furnish to some extent. However, this alone will not be sufficient for a fuller utilization of the forest resources unless their products are hauled in a form that will minimize the rates of transport cost to the price of these products. At present, the most serious forestry problem is encroachment. New settlers in the forest land encroach on already exploited or virgin forest areas. Other problems include the cutting of wood by the peasants to construct homes and for making agricultural implements. Also villagers have the privilege of removing dead wood as fuel which is subject to abuse. Effective means to discourage encroachment and destruction of the forest have not been implemented as yet.

Agricultural resettlement is being pursued in order to relieve the population pressure in adjoining hill districts. One problem that arises from relocating many hill people in the Tarai is that the only means of obtaining additional land is through forest encroachment. Thus, production techniques will have to be improved or else it would mean more people realizing less returns from the land than formerly. Furthermore, since a major factor in the economy of the hill districts is the production of ghee which is dependent upon the winter pasturage of the hill animals in the Tarai forests, what happens to these forests will profoundly affect the patterns of ghee production in the hills. A simultaneous increase in the production of fodder by utilizing the sub-marginal lands as well as reduction of existing herds with more selective breeding seems to be an obvious solution to this problem. If resettlement is to benefit the regional economy in the long run, it must be controlled and channeled in a planned way.

In terms of annual increase of population between 1954 and 1961, the figures ranged from an average of 1.5 percent in the Tarai districts to 1.6 percent in the hills. Although the increase in population of the hill districts appears to be an outcome of a natural population growth, the rapid increase of population in the Tarai seems to be a result of a large scale emigration into the area. What is significant to note is that despite the increasing numbers of population absenteeism in the hill districts over the past two decades, the population seems

so be growing as rapidly as ever.

In general, two types of migration may be distinguished. The seasonal migration commences from early November until March or April during the period of agricultural slack season after which migrants return to their original home. The long-term migration usually occurs during the winter season which results in leaving the hills permanently. Additionally, there appeared some migration from the higher to the lower elevations in the hills owing to the eradication of the malaria in the latter.

In assessing the economic effect of population distribution, it is necessary to relate population with the arable land area. From this point of view, the hill districts have a much greater pressure of population than the Tarai districts. The former supports roughly eight times as many people per hectare of cultivated land than the latter. The pronounced variations in the distribution of population and arable land have been the main source of general inequalities in the living conditions of the people in the Tarai and hill districts. As the hill districts are already burdened with a larger population than the Tarai, further increase in population without subsequent increase in income generating activities in the former will soon assume a critical dimension.

What affects the interregional trade and movement most between the hill and Tarai districts is the type of commodities available in the respective areas, the linkage patterns of population concentrations in these districts and the location of the Indian border towns through which exports to and imports from India are channelled. The hill districts have very few exports and with the exception of ghee, the other exports such as hides and skins, wool, livestock, locally produced paper and medicinal herbs are of much less importance. The amount of imported commodities are much greater and include some foodgrains, cloth, salt, tobacco, sugar and gur, kerosene, metal and metalware, soap and a veriety of other manufactured goods. In general all of the exports from the hills are sold directly at the Nepal Tarai or Indian boarder markets by individual hill people, thus eliminating the role of middlemen. The four main centers at border points where much of the trade is carried out are Jhulaghat, Mahendranagar, Dhanagadi and Rajapur.

Seasonal movements primarily originate for reasons of (a) buying and selling of goods, (b) temporary employment and c) pasturing of animals. Most people have a tendency to go to Mahendranagar rather than Dhanagadi because Mahendranagar is closer to Tanakpur. This pattern is likely to change after the completion of the Dhanagadi-Dandeldhura Road but at the disadvantage of Mahendranagar, disrupting the traditional patterns of movement in the region.

Although Dhanaghdi is less important than Mahendranagar in terms of overall patterns of both exports and imports, as a rice market and storage depot Dhanagadi is very important. Another important commodity which is imported into the hills from Dhanagadi is salt. A large proportion of the Indian salt comes in via Dhanagadi and is exported into the hills

following the same routes as rice.

Reinforcing the importance of the family unit as the basis of agricultural production is that the families conduct most of their own trade and movement of goods in the area under consideration. The overall primary weekness of the area's economy--the lack of adequate cash generating overall surplus of specific commodities – stems from and is true of most of the individual household economy in the area. The widespread seasonal migration out of the hills to seek employment in the Tarai and in India is motivated by need for imported goods. The income received from employment in the Tarai or in India indicates the heavy dependence of this area on outside sources for cash income. The extent of this dependence varies in relation to the amount and quality of land they own, the produce from this, and on what other source of income is available.

The existing agricultural pattern in the hills require high labour inputs from May to November and then a slack period follows during which little agricultural labor is required. Several patterns of movement take place at this time. While a part of these movements is confined within the hills, involving trips to administrative centers and to some extent market centers, most of it is towards the Tarai and India. Within the districts of Doti and Dandeldhura there appeared to be roughly discernable divisions between areas that depended more heavily on Mahendranagar than on Dhanagadi, although this varied according to the type of goods being pruchased, the main exception being cloth which was often purchased at Tanakpur. In both Doti and Dandeldhura, many of the shops depended on the Mahendranagar and Tanakpur markets for most of their goods. The villages in the central areas of Dandeldhura District and in the south depended primarily on Mahendranagar and Tanakpur for their purchases with some exceptions in favour of Dhanagadi. The areas in northwestern Dandeldhura were probably split between Jhulaghat and Mahendranagar.

During winter months 30 percent of the households had members leaving the hills to seek employment in the Tarai or India. Achham was ranked highest in seasonal migration with Dandeldhura next and Doti as generally lower. Many households seeking employment in the Tarai take their animals with them and sell the ghee and milk produced to nearby village or markets. The amount of agricultural produce sold appeared to be relatively small and usually limited to households with larger land holdings which were generally well off. In general, the main commodities being taken out for sale or barter were animals, usually buffalo, and ghee. Most of the animals were taken to Manendranagar or Tanakpur where higher prices were obtained. Almost all of this marketing was done by individual households. Another reason for going to the Tarai would be to supervise or live on lands held there.

The interrelationships existing between the various forms of seasonal migration tend to make projections of the impact of the Dhanagadi–Dandeldhura Road somewhat complex. The increased availability of improved agricultural inputs will have a gradual tendency to increase the margin of economic stability for the hill households, although as often pointed out in the

hills, this will first benefit those who have cash to purchase them. The impact of hill markets on the Tarai and India may not be greatly affected by the road. This is based on the assumption that these groups will be most likely to still migrate seasonally as entire or partial household units.

Posible complementary development in the area, in view of the contraints posed by the economic conditions generally extant in the hills, will have to depend more than in other areas of Nepal on careful initial planning with regards to financing, execution and time lags involved and scope of impact. With a large proportion of households likely to remain dependent on cash income generated during the agricultural slack season, the reception towards such approaches as voluntary labor and lower wages for public work projects is not likely to be feasible.

The present study has concentrated primarily on the economic situation in the hill districts accessed by the road which was mostly motivated by the feeling that the marginal situation in the hills require more immediate action than does the relatively better situation in the Tarai. Another factor is that it is not apparent that the present road will alter the transportation and movement patterns in the Tarai to the extent that it can in the hills. Although the overall economy of the Tarai is relatively better than in the hills, this is not intended to indicate that there are no problems or inequalities existing. However, the average Tarai household is able to produce a surplus in agricultural output often both in cereal grains and in cash crops and the condition of nonlandowners is also relatively good.

In reviewing past and present developmental activities in the area, the administrative machinary appeared to be a critical bottleneck in implemnting such activities. Apart from the problem of absenteeism among high ranking staff, other problems encountered were generally related to finances for budgetting, proper technical advice, arrangement for procuring and distributing of supplies and transmitting instructions, or simply the logistics of supplies, distribution and information. Particular developmental activities were examined which included minor irrigation projects, cooperative societies, Agricultural Development Bank, land reform and compulsory savings scheme, agricultural extension, cottage industry and various Panchayat projects. For reasons given above, all these developmental activities had less than encouraging results. What needs to be done is some introspective thinking on the part of the planners and policy makers in order to discover what went wrong and why before undertaking more developmeatal activities.

Since there is no possibility of a large-scale industrial development in the near future, present developmental programs will have to de based upon a consideration of the available agricultural resources in the area. Another rationale for concentrating on the agriculture sector is that it is the single most important activity in terms of both income and employment. As land is most important agricultural resource in the area, emphasis will have be placed on mainly ensuring a more efficient utilization of this resource. The strategy to be followed would

be (a) to have a radical change in the land use patterns based on scientific and economically more remunerative lines and (b) to develop a well-knit market stucture providing a transportation link to enable the economy of the region to be more responsive to developments in the output sectors.

Changes in land use paterns will involve the allocation of land for forests, pasture and agriculture with regards to the need and techno-economic possibilities for these purposes. In the hill districts afforestation programs should be set up in order to counter soil erosion. Erosion control could be aided by a rational grazing system in which a portion of the pasture is kept closed alternately for some period to prevent overgrazing and to let the grass grow fully.

The present cropping pattern will have to be changed if an increase in income is to be gained. The most significant change could come from intensifying the cultivation of cereal grains in the Tarai districts. In the hills, cultivation of foodgrains should be in the valley bottoms and the immediate slopes above them, reserving the upper terraces for raising fruits and other tree crops. In cultivating foodgrains the area under maize and pulses should be stabilized while rice should be increased by extending irrigation. Other changes in cropping patterns would be to grow soybeans, chilli peppers and potatoes in the hill districts. Truck farming too should be encouraged in both the Tarai and hill areas since vegetable production will bring about higher returns per unit area of land than cultivation of any other foodgrains.

In order to implement horticultural development it will be necessary to strengthen the existing government organization and to provide more funds. The following pre-requisites will also have to be met : more horticultural stations and orchard nurseries should be established, farmers will have to accept fruit culture at the cost of foodgrain production, the government must provide for long-term subsistance loans at nominal rates of interest, priority should be given to irrigation projects, and fertilizers and improved varieties of seeds should be made available to the farmers. Also techniques in the control of diseases and pests will have to be taught. Soil conservation is another necessary problem that will have to be dealt with especially in the hill districts. Extension services will be needed to impart training to the farmers and the area of operation for each extension worker should be reduced.

The success of the proposed horticulture program will by and large depend upon the availability of adquate credit on easy terms. Credit should be made available at the local level through the Ward Committee, Village Panchayat and cooperatives or other organized agencies. The major investment of funds should be for irrigation facilities.

Animal husbandary might be another developmental activity which could supplement the farmer's income. The main items of this prorgam would be to improve the existing breeds, extend veterinary facilities and increase the feed supply. Also better pasture nangement shouid be undertaken so that uncontrolled grazing could be kept in check.

An organized market system is of great necessity to help the cultivators switch over to the cultivation of high value crops. The main task would be to create a number of market centers of reasonable size to which individual villages could be functionally related. Then adequate transportation facilities will have to be set up so that the commodities could be exchanged inter or intra regionally. Thus, it is necessary to formulate guidelines as regards to market structure and transportation networks as part of the overall development of the region being dealt with. Some persons might feel that a road will be self-generating in response to increased mobility whereby villages will progressively transfer more and more of their business transaction to those in the large market centers and thereby make steady inroads into the region's economy. This is unlikely to happen because there are very few market centers and they are cut off from one another; the activities that support these centers are on a small scale and finally, there is a lack of incentive in a large segment of the merchant community. For the purpose of a rapid development and transformation of the area, the structure of the existing market centers will have to be strengthened and new ones will have to be created at convenient intervals of space and time. Market centers will have to be primarily transport determined to facilitate the easy movement of men and materials. The road system should consist of arterial routes and feeder approach roads, the former linking the district centers and the latter linking village clusters with regional market centers.

In order to accomplish developmental programs along the guidelines suggested above, some kind of investment plan is necessary which should take into consideration (a) the total investment volume, (b) the allocation of the total investment among various economic sectors and (c) distribution of the total investment within the District and Village Panchayats of the region under consideration. Cost-benefit analysis is an appropriate approach in carrying out such an investment plan of which a methodological discourse is clearly beyond the scope of the present report.

Investment allocations for developmental activities are limited by critical shortage of capital, markets, skilled labor supply and managerial and administrative personnel. Thus, it becomes necessary that investment allocations be made on some selective basis in terms of growth potential of areas referred to as "growth centers" or "growth poles". Such centers are characterized by dynamic economic growth and are generally identified in terms of the following attributes: rapid urbanization, industrial activity related to the region's resources, existence of external economies leading to the formation of industrial complexes, rising per capita income to support an increasing amount of service activity and employment, a relatively high level of educational services and a stock of related social overhead facilities sufficient to support continuing population and urban growth, transformation of agricultural activities from subsistence to cash crop farming and finally an atmosphere conducive to further spurts of growth and change. However, the area under consideration is primarily rural. Hence, the attributes described above are not really applicable, although they are helpful in clarifying the concept of growth centers. A more logical approach would be to analyse the comparative growth rates of the area under consideration among various sub-areas relative to

the whole area itself over a specified period of time. Next the differential growth rates of these sub-areas could be clarified, measured, explained and predicted. Since such an approach was not possible for dearth of statistical information, a growth center was considered as a spatial unit which has relative agronomic advantage over other such units within the region under consideration and where with the access to other areas to be provided by the Dhanagadi-Dandeldhura Road will make agricultural development imminent. This "input-output" access refers to the relative advantages and disadvantages of each region for the activities of any given industry or of all activities combined with respect to assembly of inputs and distribution of outputs. Thus the agricultural output per unit area will be regarded as a rough index of potential growth in agricultural development. In applying this criterian, the availability and amount of foodgrains for sale in the villages were used as an indicator of agricultural growth wherever direct information of crop yields were unavailable. According to this criterian, the following areas appeared to be growth center or perhaps emergent as growth centers in the future : Dhanagadi, Mahendrangar, Tigri Silgadi-Doti, Dandeidhura, Jorayal, Ruwa Khola, Ghatal Doti, Wandedungar Sain, Patan and Jogbura.

Dhanagadi appears to be a potential growth center in the region. It is the zonal and district capital and seat of major governmental agencies within the region and is also a market center. This area has a good potential for irrigation and its soils and climate seem to be capable of supporting an intensive farming system. Mahendranagar is an important trading center and is also the zonal and district headquarter for governmental agencies. Mahendranagar has attracted migrants and has a good potential in the development of forest and agro-based industries. Tigri lies in a favorable location with good quality land but more important, the Dhanagadi-Dandeldhura Road and the East West Highway will intersect here thereby increasing the service facilities. Dandeldhura proper and Silgadi-Doti are both market and administrative centers, thereby possessing some potential as growth centers. Factors against Dandeldhura developing include its location along a narrow ridge, relatively small settlement with just a few shops, little land for expansion and no water supply on top of the ridge. Silgadi-Doti is a fairly large market center serving a large segment of the far western hills and is the only area that possesses the advantage of size and urbanization in the hill districts under consideration. Jorayal Valley, Ruwa Khola, Ghatal Doti, Wandedungar Sain, Patan and Jogbura have good potential as growth centers because of their physical endowment with respect to productive agriculture. The areas that will be most favored by the access to be provided by the Dhanagadi-Dandeldhura Road are Ghatal Doti followed by Ruwa Khola and Jorayal.

Most of the above areas indicate a potential for good agricultural developmpent. They are situated on river valleys. As such, they are well-watered and have deep alluvial soil. For this reason a multiphased agricultural development program should be carried out in these regions to increase crop yields and then to diversify by utilizing marginal lands and upper terraces, and possibly encourage livestock raising on adjacent ridges. Markets should also be

created in these areas. In order for development programs to succeed the governmet will have to make a substained effort to guide the selected areas continually throgh their growth.

In reviewing, the cultivable land in the hill districts have already reached a maximum level and the potential for increasing foodgrain production is limited. In the process of pushing cultivation into the marginal lands a great deal of natural vegetation has been destoyed which has caused an increase in soil erosion. Due to climatic hazards and lack of irrigation facilities, agricultural production is barely enough for subsistence in the hill districts. Thus, unless economic conditions improve in the hill districts, out-migration from these districts at an increasing rate is inevitable. There can be little doubt that such a migration will profoundly alter the economy of both the hill and Tarai districts. On the other hand, the potential for increasing agriculturai production in the Tarai is enormous and could be accomplished either by yield intensive or area extensive methods. While attaining maximum production from the existing cultivated land will demand a substantial amount of capital, achieving the same by expanding the cultivated area will mean destroying the forests. The lattlr alternative will lessen the population problem in the hill as well as its capital requirement will be relatively less, their but on a long-term perspective this may become a major obstacle to further progress. Extensive clearing of forests in the Tarai distiicts may have dysfunctional consequence in view of the dependency relation of the hill livestock for winter pasturage in these forests.

The Dhanagadi-Dandeldhura Road may not be sufficient to induce economic growth in the region, alhough it will permit a more effective abridgement of distance. Unfortunately, it does not coincide with the traditional movement of goods and people. However, the road will lead to a reduction in total resources required to produce and distribute a given volume of output per time period in the area accessed by it. The main contribution that the road will make to the hill economy will be in facilitating the import of basic inputs needed to increase the present agricultural yields.

The foremost recommendation in other that the Dhanagadi-Dandeldhura Road play a vital role in the development of the region would be to create a combination of circumstances, which in conjunction with the road, will initiate growth in the area. The main task will be to increase the productive capacity of the area such that the total net mobility is increased in terms of both tonnage of freight and number of people. The increase in productive capacity will raise income which in turn will attract more people. Increase in output will require more labor thereby demand for service will emerge, constituting a net growth for the economy. As the Dhanagadi-Dandeldhura Road will certainly change the present service dimension of transporting goods. It should be utilized in restructuring the present production activity towards market orientation and integrate the hill and Tarai districts. It is hoped that transportation rates will be regulated to prevent the road from falling into misguided enterprize. It is also hoped that arrangements will be

made for subsidizing selected commodities so as to promote interregional trade between the hills and the Tarai. The Dhanagadi-Dandeldhura Road should also be utilized in increasing the productive capacity in agriculture. In this regard, specific formulations of projects must be geared towards spatial orientation of economic activity in terms of the selected areas.

Since all these recommendations cannot be done simultaneously, a sequence of priorities within the initial area of influnce of the road should be undertaken and at the same time synchronize them to take care of developmental schemes. In the hill districs, primary utilization of the road should be a means to procure inputs such as fertilizers, and improved seeds required to increase agricultural yields. The road should also facilitate the agricultural extention workers to supervise their proper use. Adequate irrigationfaci lities are also necessary. Increase in grain production in the hills should be encouraged to provide a stable basis for specialization and diversification of activities in the primary sector, subsitution of cash for cereal crops, specialization in animal husbandry, primarily ghee production and shift to horticulture. Urgent consi- deration should also be given to soil erosion caused by deforestation and grazing which leads to a progressive lowering of productivity. Introduction of crop rotation and other soil conservation method along with land and water management should be listed among top priorities in development programs. In implementing any of these projects, approaches that will bring quick results on investments are required.

The economy of the Tarai is essentially based upon its farms and forests. Hence, the main role of the Tarai should be as a supplier of foodgrains for the hills and local population in addition to providing surplus grains and forest products for export to India. At present the surplus of grain is due to its low man-land ratio rather than a large total output per unit of resource input. However, in the long run the productive capacity of this region must be based upon increasing the total output in terms of per unit of resource input. Hence, emphasis should be given in making modern inputs available to the farmers with similar sets of priority order as in the hill districts. The difference is that this should be a long-range goal to make the Tarai continuallay a larder of grain production whereas in the hill districts this approach would be to create a foundation upon which other specialized activities could be initiated later.

There is a surplus labor force which cannot be absorbed by agriculture. Also with the opening of the Dhanagadi-Dandeldhura Road, the manpower required for porterage will be reduced, thereby leaving a substantial amount of hill people seasonally unemployed. It is in the forestry sector that the surplus labor could be utilized productively. In the areas accessed by the Dhanagadi-Dandeldhura Road, the standing value of timber should be increased with the lowering cost of transportation. Thus, industries related to sawmilling, charcoal making, plywood manufacturing, wood-pulping and resin tapping and distilation appear to be economically viable.

Another means of absorbing the surplus labor force would be to give priority in

developing a long-term public works program. Such programs could be directed towards developing road links, ponds, schools, bridges and networks of irrigation canals to provide water on a year-round basis for large areas. Programs such as these will require sound plans and availability of expert technical advice besides capital invesment. The District Panchayat should serve as the chief vehicle for implementing such programs, utilizing both local and central government resources. Since a comprehensive coordinated development plan would cut through adminstrative boundaries, the creation of regional development authority would seem to be most effective for this purpose. It would prepare the plans and action programs along with the capital expenditure budget, build and stimulate local institutions and offer incentives to entrepreneurs. Only through a program such as this can economic growth in the study area and returns on the Dhangadi-Dandeldhura Road be achieved.

CHAPTER II

INTRODUCTION

REGIONAL BACKGROUND

This study deals with parts of Far Western Nepal[1], subject to the following delimitations. Following the 1961 *Population Census* and also the 1962 *Agricultural Census* of Nepal, Far Western Nepal would consist of the Far Western Hills, Far Western Tarai and

[1] According to the 1961 *Population Census* as well as the 1962 *Agricultural Census*, Far Western Nepal includes the Far Western Hills, consisting of Darchula, Baitadi, Dandeldhura, Bajhang, Doti, Humla, Bajura, Achham, Mugu, Jumla, Dailekh, Tibrikot, Jajarkot, Surkhet, Rukum, Rolpa, Salyan and Pyuthan districts, and Far Western Tarai comprising the districts of Kanchanpur, Kailali, Bardia, Banke and the Dang-Deukhuri District in Wester nInner Tarai.

Far Western Inner Tarai. The area which this study is concerned with is the southwestern portion of this region consisting of Kailali, Kanchanpur, Dandeldhura and Doti districts and pheripheral areas (Fig. 1). For the purpose of the present report, we shall refer to the first two of these districts as Far Western Tarai and the rest as the Far Western Hills.

On account of their altitudinal differences and location in relation to the arrangement of the mountain chains and rivers, which in this region largely govern the patterns of economic activity, movements and social relations, the Far Western Hills and Tarai manifest distinct forms of economic adaptation each characterized by its own regionalism. The keynote of this situation is an imbalance between population and resources which has developed over the past years in these regions.

Far Western Hills

Traversed from east to west by parallel ranges rising successively from elevation of 915-1220 meters (3000-4000 feet) to over 6100 meters (20,000 feet), the hill districts of Baitadi, Dandeldhura and Doti are characterized by extremely irregular surface configurations. The terrain of this region is made up of numerous interlocking spurs and ridges and is drained by the Mahakali and Karnali river systems from north to south. As a result, much of this region is characterized by steep slope, little level land, thin soil and widespread soil erosion. However compared with Eastern Nepal, these conditions are relatively less so. Apart from the relief itself, overgrazing, use of tree leaves for fodder combined with the traditional practice of burning the forest during the dry season to insure fresh young shoots for pasturage in spring, the felling of trees to obtain wood for fuel, torch and construction purposes, as well as clearing of marginal lands for cultivation as the population increased have been the main contributing factors to increasing soil erosion.[2]

Annual rainfall averages 89-109 centimeters (35-40 inches), progressively decreasing westwards, and occurs mostly during the summer months (June--September). It is not only insufficient for year round farming operation but also uncertain as a result of which this region is subject to recurrent periods of drought. A contributing factor has been the destruction of forests on the upper slopes of mountains which previously checked rainfall run off and promoted the retention of moisture, permitting terrace cultivation on the lower slopes.[3] There is little doubt that an accelerated destruction of forest over the past few decades has greatly increased the magnitude and seriousness of the problem of soil erosion. At present large areas of the Far Western Hills have been denuded of forests; places below 2440 meters (8000 feet) retain very little forest cover, except in isolated patches in inaccessible areas, and secondary forest growth is seldom to be seen.

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[2] Charles McDougal, *Village and Household Economy in Far Western Nepal* (Kirtipur, Nepal: Tribhuvan University, n.d.), pp.3-4.

[3] Similar views are also expressed by John C. Cool. See his report, *The Far Western Hills: Some Long Term Considerations* (mimeograph, February, 1967), p. 3.

Because of the ruggedness of the relief, thin soil, low precipitation and bad drainage, vast areas are either uncultivable or support only marginally productive agriculture. Agricultural activity is confined to the little flat land in the river valleys where there is also scope for irrigation. It is in these valleys, or on the slopes of the ridges and spurs immediately above them that the main concentrations of population occur. However, production on river valleys alone cannot sustain the increasing population. Consequently, cultivation has been pushed onto the steeply terraced hill-slopes where reliable irrigation facilities are not available. Population has almost doubled over the past two generations while agricultural technology has remained unchaned. Although more land has been brought under cultivation by means of deforestation over the past years, accelerated erosion has minimized the net results; valuable top soil has deen removed and there are indications of a general decline in soil fertility, as more and more top soil is washed away and more nutrients are drawn from the soil while few are returned to it. As such, this region does not produce enouch food to meet the requirements of the people and has the highest per capita deficit in cereal grain production as well as the least amount of arable land per capita of any major region in the country. The result is a much greater dependence on employment outside the region either in Tarai or India for cash income used for purchasing a number of basic necessities most of which are imported from India. The only activity yielding a significant generation of cash income in the region is the production of ghee. Economic pressure resulting from the imbalance between the population and resources has been pushing the residents of this region to out-migrate, colonizing the nearby areas of the Tarai, or moving elsewhere in search of a livilihood.

Far Western Tarai

Lying south of the foothills (the Chure range) and adjoining the Gangetic plains of India, this is an area consisting of mostly flat land with an elevation of 80-91 meters (300-600 feet) above sea level and is drained by the Mahakali, Seti and Karnali rivers and their tributaries. The northern portion of this region immediately south of the foothills (the *Bhabar*) has an undulating surace configuralion covered with coarse debris formed of hill wash which is composed of highly porous gravel. South of this, the topogaaphy is mostly flat or gently rolling and is covered with deep alluvium which lends admirably to probuctive farming. Annual rainfall averages about 79--89 centimeters (30--35 inches) occuring mostly during the summer mounths. "Some summers bring excessive rains with resulting floods to be followed in the succeeding year by a severe drought".[4] As such, there is a need for sound water management practices for more reliable agricultural production.

Until recently this area was covered by dense forests, much of it containing valuable stands of *sal* (shorea robusta). Because of its unhealthy malarial climate, This area was not

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4 Pradumna P. Karan, *Nepal: A Cultural and Physical Geography* (Lexington, Ky.: University Kentucky Press, 1960), p. 94.

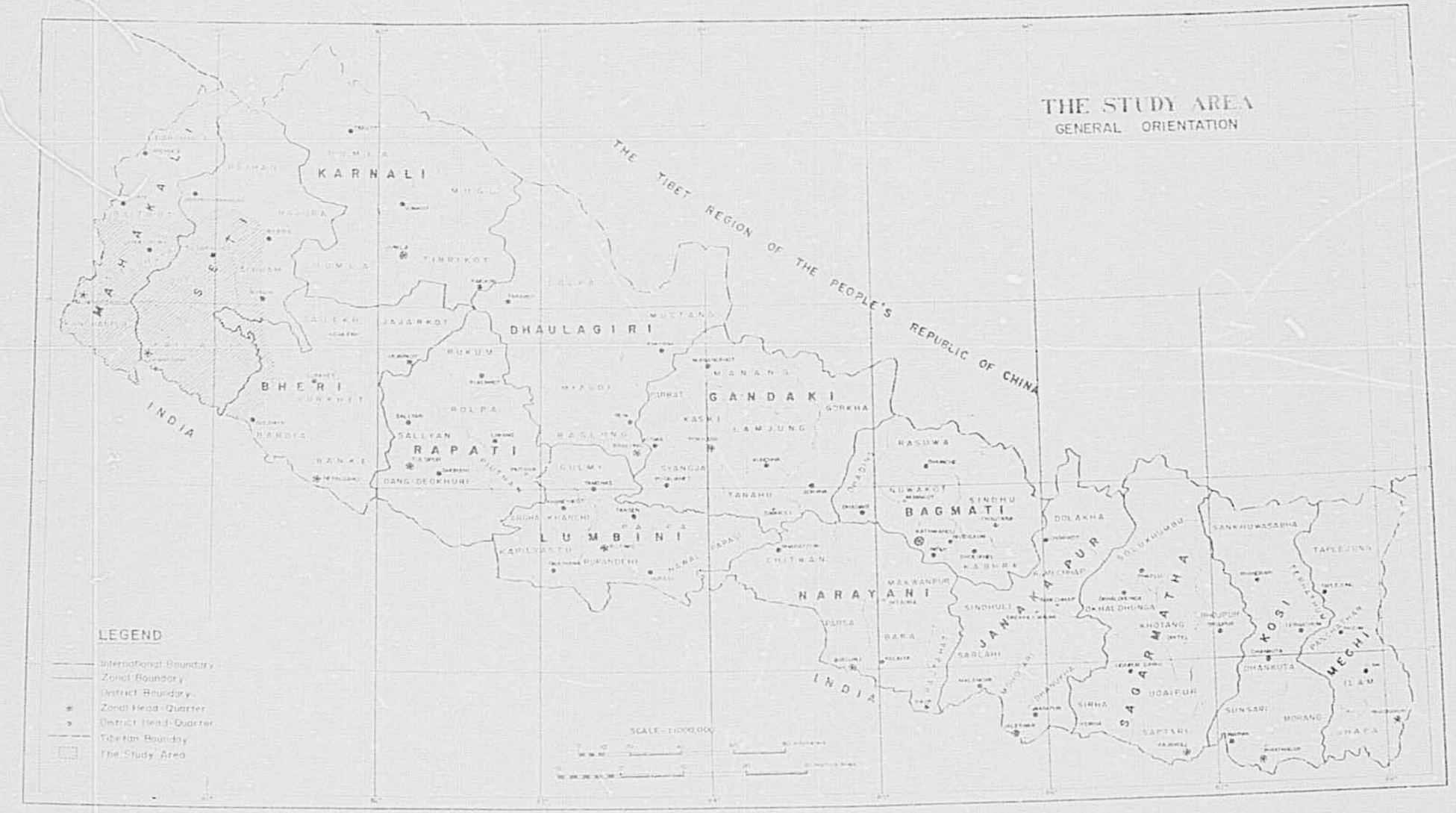

Figure 1 The Study Area

favourable for human occupancy. Only Tharus, who were native to this region, lived here permanently in smaller numbers in river valleys and forest clearings. Nevertheless, some hill families who acquired land in this area normally stayed here for a few months during the winter, returning to the hills at the onset of the hot weather when malaria was rife. Because of the successful campaign of the malaria eradication program during the past few years, malaaia has now been largely controlled over much of this region. Consequently, the area is attracting settlers from the surrounding hill districts where economic conditions have been steadily deteriorating. These settlers have been abandoning their ancestral home in the hills and resettling in this region in increasing numbers, clearing forests to bring new land under cultivation. Thus, aided by the operation of both the "push" and "pull" factors simultaneously, this region has been an area of accelerated colonization and a greatly increased influx of settlers from the hills in the near future is almost inevitable.

While limited absorption of the hill people is feasible in this region, it would be unrealistic to regard this as a solution to the population problem of the hill districts, for the best lands have long since been settled (of course in terms of available technology). Most of the areas available for settlement are marginal forest lands. Furthermore, the most important source of cash earning for the hill people—the production of ghee—is dependent upon the forest of the region for winter pasturage. Thus, the cutting of forests for resettlement purposes on any large scale without considering alternatives for the winter pasturage of the hill livestock in these areas endangers the ghee industry and might affect the economic ecology of the entire region. Indiscriminate destruction of forests in this region will not only harm the ghee industry in the hills but will also deprive the nation of valuable revenue accruing from lumber production.

Despite recent colonization, this region still has a low population as well as a favorable balance between its population and resources. It has the most arable land per capita and also produces the highest cereal grain surpluses in spite of lower agricultural yields in comparison to the central and eastern Tarai. This region offers a good potential for producing agricultural surpluses and absorbing some increase in population by intensifying the existing agricultural activities rather than extending them over larger areas.

DHANAGADI-DANDELDHURA ROAD PROJECT

The Dhanagadi-Dandeldhura Road forms the first section of the Mahakali-Seti Zones network which will ultimately link with the East-West Highway system. This road is planned for completion in 2029 (1973) with other feeder roads in the network to be constructed in the 2035--2041 (1979-1985) period. Extending for 145 kilometers (91 miles), this road traverses across three districts--Kailali in the Tarai and Doti and Dandeldhura in the hills— and is expected to cost Rs. 72,500,000,[5] seventy-five percent of which will be borne by U. S. AID although direct administrative responsibility for the construction and maintenan

[5] At the official exchange rate, US $ 1.00 is worth Rs. 10. 10.

of the road remains with the Roads Department, Ministry of Public Works, Transportation and Communication of His Majesty's Government of Nepal. The estimated cost of maintenance after completion of the road is Rs. 6200 per kilometer (roughly Rs. 9977 per mile) or Rs. 900,000 annually.[6] After this road is completed, transport volumes generated in the area are estimated as 25 ton/km (40 ton/mile) of freight per head per year and 53 passenger/km (96 passenger/mile) per head pear year.[7]

Project History

A motorable road from the western zone into the hills has probably been under discussion since at least the beginning of the 1950's. Although reference can be found to various proposed roads, Mahendranagar to Dandeldhura, Mahendranagar to Doti, Dhanagadi to Dandeldhura, and Dhanagadi to Doti, actual construction on such a road was begun under the Regional Transportation Organization (RTO).[8] Following essentially the same alignment as that of the present project, a reconnaissance survey was conducted on the entire alignment. In addition, a two feet track was made up to kilometer 48(mile 30) and some earthwork and culverts were completed up to kilometer 19 (mile 12) in the Tarai before the dissolution of the Regional Transportation Organization in February 1952.

A sum of Rs. 1,600,000 was budgeted in 1966-67 for surveying and construction work on the alignment by the Roads Department of His Majesty's Goveranment. This was later revised to Rs. 900,000 of which no funds were spent. A reconnaissance was made of the alternative alignments from Mahendranagar and Dhanagadi to Dandeldhura with the decision made in favor of the latter alignment.

Again in 1967-68 Rs. 1,800,000 were sanctioned for work on the Dhanagadhi-Dandeldhura Road, primarily for surveys in the hill portion, and some work in the Tarai. Discussions were held between His Majesry's Government of Nepal and U. S. AID officials concerning the possibility of U. S. AID participation in the project, particularly aimed at involving local panchayats in working on the road and on complementary projects in the area of the road.

U. S. AID became involved in the project in the fiscal year of 1968/69.[9] The total

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[6] Ministry of Economic Planning, His Majesty's Government of Nepal, *United States Developmental Assistance to Nepal : The Current Emphasis and Proposals for the Future* (mimeograph, March 1968), p. 13

[7] ——— *Dhanagadi-Dandeldhura Road Project Formulation and Evaluation* (mimeograph, December 1967), p. 1.

[8] Formed in 1959, the RTO was a joint undertaking by Nepal, India and the United States for the purpose of constructing roads in Nepal (primarily from the Tarai into the hills). Survey and construction were begun on many of these roads.

[9] In general, the fiscal year represents the period from July of one year to June of the following year.

budget agreed to was Rs. 12,200,000 of which Rs. 9,300,000 (76 percent) was borne by U.S AID, the rest having been provided by His Majesty's Government of Nepal. During this period, Rs. 9,300,000 was appropriated for the project but only Rs. 7,966,000 (86 percent) were actually spent [10] By the end of the last working season, that is the beginning of the rains in 1969, some new earthworks were completed in the Tarai up to kilometer 23 (mile 14). Cutting and rough grading were undertaken in the hills up to kilometer 42 (mile 26) at Buritola and the road was opened for project use up to kilometer 32 (mile 20). Survey work was completed up to kilometer 70 (mile 44).

In the 1969/70 fiscal year Rs. 12,700,000 was initially allocated for the road project. This was later revised to Rs. 14,700,000 increasing the initial appropriation by Rs. 2,000,000. Of this total budget Rs. 11,025,000 (75 percent) was contributed by the U.S.AID, the rest having been borne by His Majesty's Government of Nepal. All of this amount was expended during the 1969/70 fiscal year of which approximately Rs. 635,700 (4 percent) were spent for salaries and allowances, Rs. 2,243,800 (15 percent) for equipment, including spare parts, picks, shovels and crowbars that were rented to contractors, and Rs. 10,876,200 (74 percent) on actual construction, that is on labor and construction materials. Most of the equipment and machinery arriving at the time of the field study were ordered last year. Until recently, most of the supplies which were inadequate had also been dependent upon last year's planning.

Almost all of the work at the time of the field study were being drawn on a contract basis in contrast to the " piece-work " system utilized previously. The contracts given usually involved a large sum of money, thus eliminating small contractors who were often Nepalese. Furthermore, the contractors were required to deposit approximately 10 percent of the contract amount as security although this could be done in installments. The implication of this change was that the employment opportunity for the local laborers and Nepali contractors with small amount of capital as is often the case was considerably curtailed. It was observed during the course of the field study that most laborers hired by the contractors were from outside the area among whom quite an appreciable number of laborers were Indian. The primary reason why the contractors preferred te hire laborers outside the area was that they did not have any previous contact in hiring laborers locally. More importantly perhaps, the outside laborers whom the contractors had brought to work on the road have had prior experience working for these contractors which simplified their operational organization to a great extent. This certainly would not be the case if the contractors hired local laborers. The decision of the government in favor of contract basis in contrast to the " piece-work "

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[10] Of the total amount appropriated in the 1968/69 fiscal year, the contributions of His Majesty's Government of Nepal and the U.S.AID were respectively Rs. 2,210,610 (24 percent) and Rs. 7,089,390 (76 percent) . As regards to the funds spent during the same period, the share of His Majesty's Government of Nepal was Rs. 1,893,518 (24 percent) while that of the U.S AID was Rs. 6,072,482 (76 percent).

system, which we were told came from Kathmandu, obviously eliminated the need for low and middle level overseers to supervise the cumbersome task of works performed by the unexperienced local laborers in every phase of road construction. Thus, the present approach to the organizational aspects of the labor for the road project had, as noted above, seriousiy limited the number of Far Westeern Hill people employed. In utilizing contractors instead of hiring on a piece-work basis, the project had reduced employment opportunity for the local people. However, in view of the chronic unemployment in the area it is difficult to praise this decision. Even if local laborers could not be employed for high quality construction purposes, there appeared to be enough room for hiring them for ordinary earthwork. In any case, the system of hirinng laborers demands a thorough re-examination.

The overall project office is located at Dhanagadi. There are currently five sub-division offices active in the road project covering up to kilometer 70 (mile 44): (a) Dhanagadi sub-division from kilometer 0 to 22 (mile 0 - 14), (b) Godavari sub-division from kilometer 22 to 32 (mile 14 - 20), (c) Buritola from kilometer 32 to 48 (mile 20-30), (d) Khandanda from kilometer 48 to 58 (mile 30 - 36) and (e) Sahejpur from kilometer 58 to 70 (mile 30 - 44). The Dhanagadi sub-division is divided into two sectors, the first of which is from the main road to Dhanagadi Bazaar which is approximately 2 and one-half kilometer long (1½ mile). This section is under an engineer and has one main bridge between the project headquarters and the bazaar. The road in this section will be gravel paved over earth eambankment with an overall width of roughly 10 meters (32 feet) of which about 4 meters (12 feet) will be paved. Its second section consists of the stretch of the road from the Indian border to kilometer 22 (mile 14). With a staff of one engineer and four overseers, this section has two major bridges (over rivers Manahara and Geta) and fifty-three culverts. The earthwork of this section involving the embankment beyond previous standards and proper compacting with the rollers is complete. Culvert construction was being done by two contractors at the time of the field study which involved widening of culverts previously constructed as well as constructing new ones which were planned for completion in 1970. Work on the two major bridges, although scheduled for completion before the onset of monsoon in 1970, may not be totally finished.

The Godavari sub-division had one engineer and three overseers. There were one major bridge (over Godavari River) and fifty culverts to be constructed. Work on the bridge, the original site of which was later relocated, was expected to begin in January 1970. This will be the largest bridge on the project with a total length of 107 meters (350 feet) made up of one 60 meters (200 feet) and another with 46 meters (150 feet) steel truss span. Most of the earthwork in this sub-division involved grading and improvements on curves. The construction of central workshop for the project was planned at the Godavari Camp in 1970. This will involve constructing six residential quarters and one 8-room office block. There were over 1000 laborers in this sub-division at the time of field study who were almost entirely from the Tarai and India. It was expected that peak employment would soon rise to 2000 before the beginning of the rainy season' 1970.

The Burhitola sub-division had one assistant engineer and three overseers with 47 culverts to be constructed in addition to hill cutting. This sud-division was partially opened in 1968 when the construction of the camp was begun. Earthwork (primarily hill cutting) was completed up to kilometer 40 (mile 25) and improvement work was well underway in the rest of section. There were four fairly large contractors among whom three were Nepali and one Indian who had been working in Nepal for the past ten years. There were altogether 1500 to 2000 laborers employed in this sub-division and some work were being done on a piece-meal basis.

With one engineer and there overseers, the Khandanda sub-division was opened this season and the construction of the camp was initiated in November 1969. This section consists almost entirely of rock-cutting through probably the most difficult terrain along the alignment. There were 15 small and 5 large contractors working in this sub-division with between 3000–4000 laborers employed during the peak period.

Of all the sub-divisions, Shahejpur is the newest and was opened in 1969 with one engineer and three overseers supervising the construction. At the time of field study, the camp was still under construction and major contracts undecided. As much of the work in this sub-division involved earthwork and some curve improvement, no major problem was expected in this section where roughly 2000 laborers being employed.

Surveying up to kilometer 85 (mile 53) was planned in 1969 with some possibility of going beyond there with at least preliminary work. Resurveying of the center line was being done from kilometer 22–40 (mile 14–25) at the time of field work and survey for culverts and main bridges were also in progress. It was estimated that the road could be opened for seasonal project use up to approximately kilometer 70 (mile 44) before the onset of the monsoon season of 1970 if progress was good. It was planned to open two more sub-divisions next season (1970–71) at Rupaskhana about kilometer 85 (mile 55) and at Garhi about kilometer 104 (mile 65). The work in these sections is mixed earth and rock-cutting and should progress more easily than the work being done previously. It is estimated that work by next year should proceed close to the Ruwa Khola area and reach near Dandeldhura by the end of the following season (1971–72). However, the road will not probably open officially until 1973, although it may be passable for project vehicles. Of course, this will be dependent on the efficient and timely supply of materials, in addition to budgetting constraints and negotiations with contractors. There was some concern that the opening of work on the British financed secton of the East-West Hightway this year (1969) might affect the Dhangadi–Dandeldhura Road project adversely, for contracts and working conditions have attracted some contractors already working on this project as well as raising the bids on contracts.

Some Comments on Road Alignment

Criticisms were heard in many areas visited about the present alignment of the road (Fig. 2). These criticisms were generally based on two points: firstly, that the road does not

pass through populated areas and secondly, that the primary destination of the road in the hills should have been Silgadi-Doti instead of Dandeldhura. The first criticism is largely true as the alignment of the road from kilometer 23 (mile 14), where it enters the foothills until approximately kilometer 118 (mile 74) where it reaches the Ruwa Khola valley, goes through areas of little human habitation. Again, after the Ruwa Khola valley until shortly before Dandeldhura proper–the Ghatal or Gairi Doti valley–the area is sparsely populated. Alternative approaches to Dandeldhura do not, however, offer much possibilities for accessing heavily populated regions. This point when voiced in and around Silgadi–Doti was specifically related to the idea of either entirely deviating the road to Silgadi-Doti, or to the expressed need for a branch route to connect it from the present alignment.

The most commoly noticed alignment was to come from near Garhi, approximately kilometer 70 (mile 44), through the Jorayal area and then over the Mahabharat Lekh to Silgadi-Doti. Another possible alternative mentioned was to construct a road from near Ghanteswar on the Mahabharat Lekh along the crest and then down and across the Seti River to Silgadi-Doti. The Jorayal valley route was supported by the argument that this would pass through populated areas with good potential for development, both in Jorayal and south of Silgadi-Doti on the northern side of the Mahabarat Lekh. Jorayal valley is quite populated but not extremely dense. As the possible alignment of a road from Joryal to Silgadi-Doti is somewhat uncertain, it is difficult to estimate how much population this route would serve. The suggested aligment from Gnanteswar along the Mahabharat Lekh to Silgadi–Doti would again cut through largely unpopulated areas until it decends from the Lekh south of Silgadi-Doti.

With regard to serving populated areas enroute to Dandeldhura, the most that can be achived in the immediate future would be in the vicinity accessing the Ruwa Khola area and the valley south of the road and southeast of Dandeldhura. The Jorayal valley should be accessed in the future. This should not, however, be contingent upon the extension of this road to Silgadi–Doti. The alignment of this possible route from the Jorayal valley to the Mahabarat Lekh south of Silgadi-Doti would again possibly not serve any significant settled areas. Despite this, Silgadi-Doti should be accessed by a road, for it is already an established market centre of fair size with certain amount of economic dynamism serving a much larger segment of far western hills than any central place in the area. Thus, a road to or near Silgadi-Doti would serve a much greater area of the hills than the road to Dandeldhura can hope to for some years to come, perhaps even under near optimal develomental conditions. It does not, however, appear justifiable that a seperate branch road from the lower hills be constructed immediately to connect Silgadi-Doti. General agricultural conditions and population densities would indicate that an extension of the present road from below Dandeldhhra proper to Silgadi-Doti would benefit a greater number of villages with good development potential than either of the routes alluded to previously.

DHANAGADI – DANDELDHURA ROAD ALIGNMENT

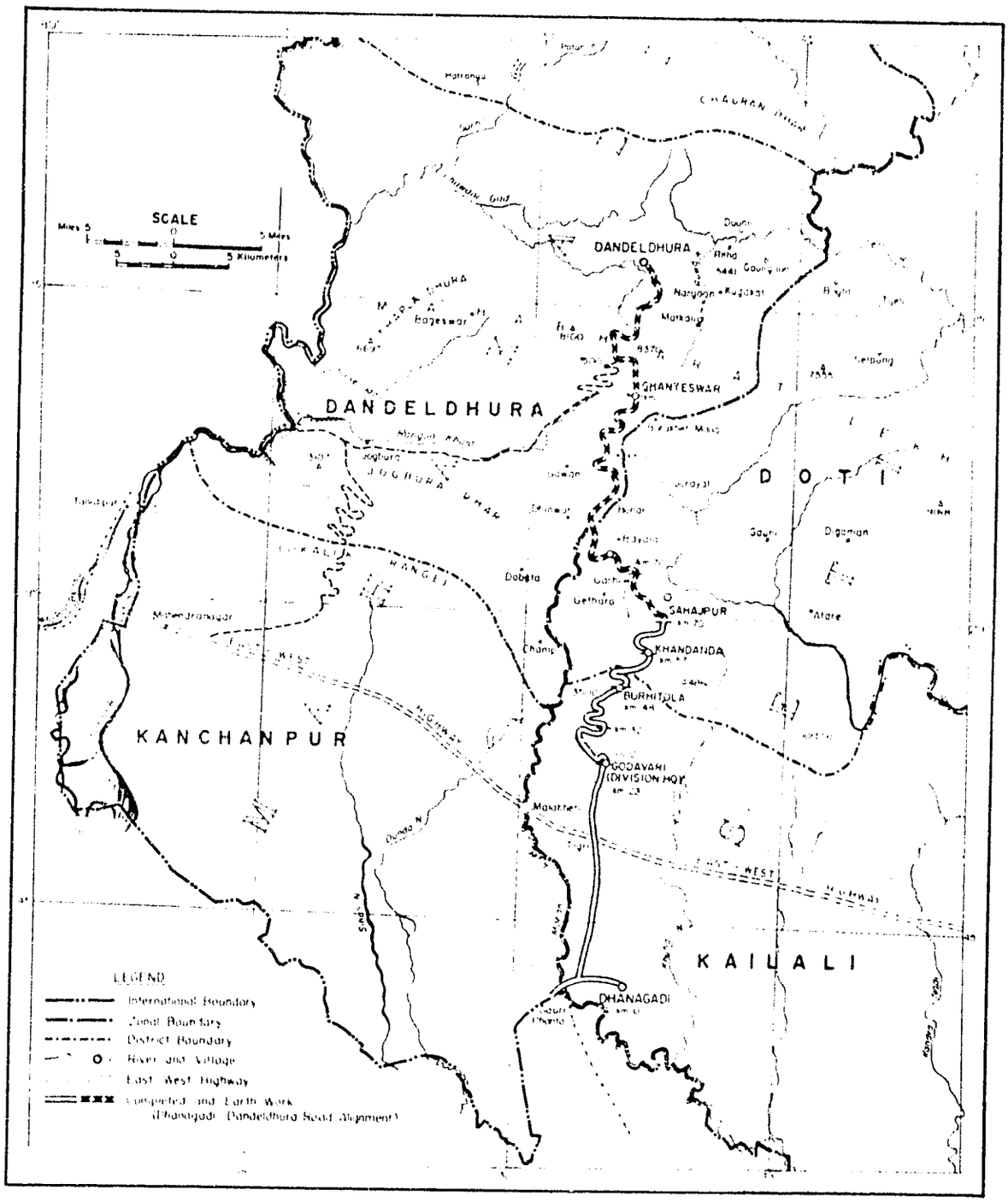

Fig 2. Dhanagdi - Dandeldhurua Road Alignment

DESIGN OF THE STUDY

Objectives

The objective of this study is not to provide a justification, economic or otherwise, for the Dhanagadi-Dandeldhura Road Project. Nor is it intended to provide a regional plan for the area. Rather, its main objective is to compile basic information directed towards formulating guidelines for incremental investments within the region that will complement the on-going invesment on constructing the Dhanagadi-Dandeldhura Road so that patterns of increased production and exchange might be generated between the Hills and Tarai, deriving the maximum long-range benefit from the road. Specifically, the main purposes of this study are (1) to make an assessment of the area within the influence of the road, (2) to compile basic information on the economic structure and developmental activities of the region and (3) to indicate possible areas for incremental investments by economic activity (sector), its location and broad organizational set up.

Data and Methodology

This study is based upon available data collected from the Central Bureau of Statistics, the National Planning Commission secretariat and other governmental organizations such as the Economic Analysis and Planning Division as well as in the area itself. In addition, a six-week eld study from November 15 to December 26, 1969 was also carried out during which information were obtained by using questionnaires and inquiring many informants at various levels of local government and in the public sphere. The places visited and the governmental offices and agencies interviewed are given in the Appendix.

During the course of the work in Kathmandu and the areas studied, many types of data were sought which were only fragmentarily and unevenly collected. This was in some ficases due to oversight on the part of the author but was more generally due to the erratic efficiency, organization and co-operation of the agencies collecting or holding various types of data. This was found to be particularly true in offices contacted in the study area and generally true with data in units smaller than the district Panchayats.

Some data have been excluded because of uneven or partial collection when it was felt that it was not possible to accurately interpret it within the time limit of this project. In other cases, information has been presented which was not available for the entire study area. In these cases, it was felt that it was important enough to be offered as such and has been noted and analysed with respect to inconsistencies within it.

As this study touches upon so many aspects of regional economy and area development activities, it is very difficult to single out any specific mothodology. Thus, our analysis has relied heavily upon an observational and subjective-intuitive approach rather than specific techniques derived from various social science desciplines although insights from these, we hope, have been applied to add perspective upon our judgements in investigating the problem under consideration. In general, our normative judgements are based upon some conceptual frame-

work of locational analysis the essense of which is that given area's volume of economic activities is primarily related to two factors: (1) its access at competitive costs to the inputs of production and (2) its access at competitive costs to markets for outputs of this production. Nevertheless, we have been unable to apply this framework in any rigorous manner because of several constraints, primarily time, which are noted subsequently.

Scope and Limitations

Within the overall planning and implementation of this study, the main constraint was the time allowed (four months). Although the completion of this report was extended by about a month beyond the date originally decided upon, its results were intended to be utilized as quickly as possible. As such, certain areas of analysis had to be rather partially and superficially dealt with, particularly those that would require time consuming and not necessarily productive manipulation. Hopefully, these have been identified as such, and at least an outlining of further possible work has been indicated. While the study was intended to provede a basis for planning, with recommendations and evaluations based on the information presented, it was not intended to be a 'plan' for the area dealt with. Correspondingly, while questions of regional definition, relative potentials and levels of activities and possible directions for development are discussed the study in no way purports to be a regional plan for the area.

CHAPTER III

ASSESSING THE PROBABLE AREA OF INFLUENCE OF THE DHANAGADI-DANDELDHURA ROAD

PRELIMINARY REMARKS

Before approaching an assessment of the area within the influence of the Dhanagadi-Dandeldhura Road, it is worthwhile to consider briefly how numerous forces interact to influence the flow of goods and people from place to place and, conversely, how transportation affects this flow. In general, six factors must be operative if economic transportation is to occur between any two regoins. This may be illustrated by considering the hill and Tarai districts conceptually

as examples rather than a matter of fact, though there may be certain truths involved in this exemplification. First, there must be a surplus product, such as foodgrains in the Tarai districts. Second, the hill districts must desire this surplus product which depends upon the tasle of hill consumers and the insufficiency of their own foodgrains production. In other words, there must exist a complementary relationship between the hill and Tarai districts. Third, the Tarai districts must have a competitive advantage in the production of her surplus (foodgrains) which is a result of a more favorable physical environment or a more favorable cultural endowment, or both. Fourth, the hill districts must have the ability to pay for the foodgrains from the Tarai districts either by cash payment or a surplus of some other commodity desired by the Tarai districts. Again, such a surplus and a competitive advantage in its production depend upon the physical environment or cultural endowment, or both within the hill districts. Fifth, there must be an absence of intervening opportunity between the hill and Tarai districts. For complementarity alone does not bring about trade between two areas; it can take place only when there is no nearer complementary source between the hill and Tarai districts. Finally, both ability to pay and absence of intervening opportunity are in turn affected by transferability: the cost of transportation measured by money, or its equivalent in credit, and the time required for the journey between the hill and Tarai districts.

The foregoing factors are the main pre-requisities as regards to economic transportation which may operate through complex linkages. However, when a new road it built connecting economically and physically diverse areas like the hill and Tarai districts, it is bound to influence the areas traversed by it. Generally, the extent of the area influenced by a road may be viewed in terms of the change that a road might induce in the space economy around it. A road may impart different kinds of influences in the area it serves. It may transform the area around it by generating more social and economic benefits and integrate areas having diverse activity patterns by facilitating movements of goods, people and ideas. On the other hand, it may initiate very little or no change at all, or might even disrupt the existing trade and service patterns in the area which is often the case when there is no prior dynamism and easily exploitable natural resources in the region traversed by the road. [1] What is important to note is that transportation improvements in subsistence agricultural areas may also become negative income generators. Given that there generally exists a previous equilibruim of production capacity in subsistence agricultural areas as is often assumed, an improvement in transportation can cause redundencies in the use of production factors such that a new equilibruim cannot be interpreted to mean that transportation improvements necessarily bring about a rise in local income. [2] However, rigorous investigation of the impact of the Dhanagadi-

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[1] The Brokings Institutions, *Highway Investment in Developing Countries* (Brokings Research Report No, 48, Washington D. C. 1969), p. 8.

[2] For an elabortion of this point, see Shalom Reichman, *A Note on Transportation Impact in Subsistence Agricultural Areas* (Evanston, Ill. : Northwestern University, Department of Geography, Research Report No. 49, 1969).

Dandeldhura Road in the local income is clearly beyond the scope of this study as this would first necessitate the defining of the nature of existing production functions. Thus, what we are primarily interested in is discovering or assessing up to what distance people will come from to use the Dhanagadi-Dandeldhura Road and its general patterns of influence in the region under consideration.

The extent of the service area of a road largely depends upon the existing trade and service patterns in the area, distance, time and money inputs needed in reaching the road, population densities, levels of economic activity and the competition offered by other modes of transportation. In the studies of large numbers of people as well as volumes of goods transported, a significant relationship between distance, frequency of trips and volume of goods shipped has been observed. In both cases, the nature of the relationship has been distance decay or an inverse-distance. Based upon these empirical regularities, demographic and economic models of spatial interaction have been formulated in terms of mathematical representation. We could have probably used a combination of these models, such as "gravity", "market potential", "population distance" and "population potential" models to assess the extent of area influenced by the road, both stocastically and deterministically.[3] However, apart from the inadequacy of these models in real life situations, such a model could not be applied due to the constraints mentioned previously as well as due to a paucity of computational facilities. Nevertheless, approaching the problem in an intuitive-subjective manner, it can be said that the influence of the Dhanagadi-Dandeldura Road in the movement of people and goods can be expected to decrease progressively away from the road in either direction although its precise spatial rate cannot be estimated at this point. Studies made by various authors indicate significant differences in the extent of area influenced by a road. For instance, according to one analysis a surfaced road can be expected to influence the surrounding area to a depth of at least 1.6 kilometers (1 mile) from the roadway.[4] On the other hand, another study has found that the influence of the road extended about 8 kilo meters (5 miles) from the road at a decreasing rate.[5]

AREA OF INFLUENCE

In assessing the probable area of influence of the Dhanagadi-Dandheldhura Road, a number of factors are felt to be significant taken in light of information collected during the study and the field work done in the area itself. The road does not link up in the south

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[3] For a discussion of these models, see Walter Isard et al., *Methods of Regional Analysis—An Introduction to Regional Science.* (New York : John Wiley and Sons, 1960) pp. 493-566.

[4] Wilfred Owen, "Transport and Food" in Edwin T. Haefele, ed., *Transport and National Goals* (Washington, D. C. : The Brookings Institution, 1969), p. 96.

[5] R. S. P. Booney, "Road Building and Economic Development in Sabah", *Development Digest*, Vol. IV, No. 2 (July 1966), p. 29.

with any existing market center or population concentration on the Indian side of the border. In view of the large area of "reserved forest" south of Dhanagadi, it is not likely that this area will develop in the near future even though there have been some some sort of assurances from the Indian Government that an improved road will be linked to the Dhanagadi—Dandeldura Road on the Indian side.

Dhanagadi itself, while not the larget market in the area, is an important market and a center of local administrative and central government activities. It is already undergoing a period of rapid growth which can be expected to continue. Its long-term growth beyond the completion of the road will in large part depend on the initiative taken in the area itself to make the development that takes place as sound as possible. At present Dhanagadi enjoys a lower level of prices which could, if not controlled, fall victim in an atmosphere of misguided entrepreneurship.

In Kailali and Kanchanpur districts the largest concentrations of population and some of the fastest growing areas lie at the far western border, around and south of Mahendranagar and in the eastern areas of Kailali District. Aside from the natural competition that can be expected from Mahendranagar, Dhanagadi is largely cut off from the eastern areas of its own district (Kailali). These areas are two days distance for the average householder, most easily reached through India and almost inaccessible from Dhanagadi during the rainy season. The greatest factor in the development of the far western Tarai, in terms of transport and movements, will be the construction of the East-West Highway. The alignment of this highway runs from Mahendranagar along the northern part of Kanchanpur, intersects the Dhanagadi-Dandeldhura Road at Tigri near Malakheti and continues across Kailali in the north until it crosses the Karnali River. This will then link the bracketing population concentrations on either side of Dhanagadi and quite likely bypass Dhanagadi completely in terms of the major east-west movements that will take place.

The first 80 kilometers (50 miles) of the Dhanagadi-Dandeldhura Road in the hills through the Churia range and up to and over the Mahabharat Lekh goes through an area that is presently quite low in population density. The only existing population concentrations in the area with some likelihood of developing agriculturally lie either under 16 trail kilometers (10 trail miles) to the east (Jorayal valley) or considerably further to the west (Jogbura valley). The other inhabited and habitable sites along this section are small valley or pockets of less rugged terrain. Although there is some migration into the Churia range, this area cannot be expected to support any large population agriculturally due to its extremely rugged and irregular topography. The only potential basis for development in this area appears to be the fairly good stands of pine, particularly in the areas south of the Mahabharat Lekh, between the road and Jorayal and towards Jogbura.

After the Mahabharat Lekh the road will closely bypass the Ruwa Khola valley but generally go through a relatively unpopulated area until reaching the Ghatal Doti

valley below the settlement of Dandeldhura proper. The Ruwa Khola valley is well-watered area with good land and is presently an area of good agricultural production. The Ghatal Doti area although relatively flat suffers from a lack of water to grow adequate crops.

The settlement of Dandeldhura proper itself is located along the top of a ridge about 300 meters (1000 feet) above the valley to its south. It is an adminstrative center of long standing but not a commercial center of great significance other than for the areas immediately around it. The number of shops is small with the largest shops at the foot of ridge a little less than an hour south-west of the main bazar which is called Ayat. There is little land to spare along the presently crowded ridge top which is the site of the town unless it were expanded linearly to the north-east along a single street. There is presently no water supply on the top of the ridge.

The surrounding areas are quite densely settled forming a western portion of the population concentration running along the Seti River to Doti and onto Achham in the east. With the exception of individual river valleys and areas along the Seti, this area does not generally produce adequate food due to the terrain, shortage of rainfall and lack of irrigated land.

As discussed in detail later, the area around Dandeldhura, together with most of the Far Western Hills, is characterized by normally marginal cereal grain production, very inadequate sources of cash income, a high degree of dependence on long-term and seasonal employment in the Tarai and India for cash income and a tendency to make most purchases in the Tarai or Indian market centers. In addition, the area has a history of recurrent droughts, which cause sharp drops in already marginal agricultural production and increase the numbers of individuals and households migrating out of the area permanently for long term and seasonal employment. Also, the droughts appear to have adversely affected both the limited growing of cash crops in the area and have weakened the organized trade structure that existed in the hills focused around Silgadi-Doti.

Based on these considerations, it is felt that the Dhanagadi-Dandeldhura Road, while facilitating solutions to existing problems, particularly in the hills, will not by its mere existence bring about solutions to any of them. In the Tarai it is expected that the influence of the road will initially not extend for more than several hours of walking distance on either side. This is particularly true to the west where the road is parallelled by the Mohara River at an approximate distance of two to six kilometers (about one and half to four miles). To the east in the northern portions of the road there are only intermittant cleared areas with the bulk of settlements in the south near Dhanagadi.

The only concentration of activity in the Tarai portion of the road could be expected near Tigri, in addition to area around Dhanagagadi, at the future intersections of the East-West Highway. The growth of Malakheti beyond increasing in importance as a local

bazar would be dependent on the persistent use of the trail which crosses the Dhangadi-Danadeldhura Road at approximately 70 kilometers (44 miles) above Bayala before continuing the distances of about one and one-half days walk to Malakheti.

Development at Godavari where the road enters the foothills will take place at least on a temporary basis around the site of the main workshops for the Dhanagadi-Dandeldhura Road project. The initiation of forest based activities could also be expected to stimulate at least limited development at Godavari.

Once in the hills, until reaching the Mahabharat Lekh, the road cannot be expected to have any significant influence on areas other than Jorayal, the areas immediately north to Jorayal and possibly the area of Gadsera, although the latter is approximately one and half days walk from the road. On the western side of the road there is little in way of settlement activity with the main area of potential, Jogbura, being more easily reached from Mahendranagar than from the road. The forests mentioned earlier between Jogbura and road will be partially accessible from the road, although the relative ease of accessibility from the alternatives cannot be firmly stated at this point.

Between the Mahabharat Lekh and Dandeldhura the road will immediately access areas to the east, primarily the Ruwa Khola valley. The main focal point of its influence, particularly in view of the low population densities along its alignment, will be its terminus at or near Dandeldhura.

Within the limiting considerations stated above, it follows that initially the road's value will primarily lie in what can be brought to the area rather than in what will be transported out. The only significant exports from the area at this time are labor and ghee. It is difficult to foresee a high rate of passenger traffic being generated from the area in view of the aforementioned lack of cash income and the average or lower than average economic condition of the majority of those who migrate south either on a seasonal or a long-term basis. The obvious result would be that until the situation in the hills improves, those that will use the road will most likely be limited to wealthier households in the area and government officials. One key factor in this aspect of utilizing the road will be the fares prevailing for passengers and the type of carriers plying the road. This in turn will be largely dependent upon the initiative taken by private carriers and guidance and control of government authorities. The "cost" of this journey, if done on foot, is rather difficult to determine in view of the fact that it is likely that the individual will not be sacrificing an alternative activity that would yield returns and that he may have to make the journey in any case to seek employment. Put differently, the opportunity cost involved in the travel time will be very low for the user of the road in the hills. The assumption of savings to seasonal migrants that might be realistic would be based on taking the wage that he could earn in Tarai or India as the amount that he would be sacrificing in the days taken to walk

from the hills and alternatively gaining if he utilizes the road. This sum minus the cost of passage on the road would indicate a savings to the individual hill dweller seeking employment. Thus, an assumed wage of Rs. 4/- day and a savings of 4 days from Dandeldhura to Dhanagadi, any fare under 16 rupees would result in a savings for the individual user. However, the logic of this argument in view of the time often spent finding work in the Tarai or India would probably not be too convincing to the average potential user of the road.

The extent to which ghee is exported through the road will be directly dependent on the prices offered in Dandeldhura and indirectly, but perhaps more importantly, on the extent to which necessary imported commodities will be available cheaply. Given the existing discernable patterns of ghee production and assuming that the prices offered at Dandeldhura were not significantly lower than those in other Tarai markets, perhaps one half of the present combined exports from Dhanagadi and Mahendranagar could be moved over the road. This is probably a maximum figure and is based on the conditions mentioned above – that relatively low cost goods are available at Dandeldhura. In this connection, it is not known what portion of the ghee that is produced from the animals of the hill households is produced and sold during their winter pasturing in the Tarai.

The greatest initial utilization of the road and the most important aspect of its long-term influence will be in moving the needed goods and supplies into the area. The groups of commodities which are perhaps most obvious and that were most widely discussed in the area were imported goods and cereal grains which cannot be said to have the greatest importance in terms of the overall economy of the area though this will help stabilize the great seasonal fluctuations in prices of several commodities such as rice, kerosene and salt.

The availability of necessary commodities in the hills at prices lower than those now prevailing will obviously represent a savings to those households who presently buy goods in the hills. The main savings to those who presently buy their goods in the Tarai, assuming that prices at the hill terminus of the road will be higher than at the Tarai markets, will be in convenience and, if productive activities are available in the hills, a savings in terms of the time saved. For those who must travel to the Tarai or India to seek employment, savings in convenience would be perhaps overweighed by the differentials in cost.

As discussed in a later section, it is not felt that in a "normal" year of production, any great quantity of cereal grains are brought into the hills. To the extent that grain is brought from the Tarai or India into the hills, it is definitely not as much as the deficits utilized in making several benefit-cost analyses conducted in connection with the Dhanagadi-Dandeldhura Road project formulation.[6]

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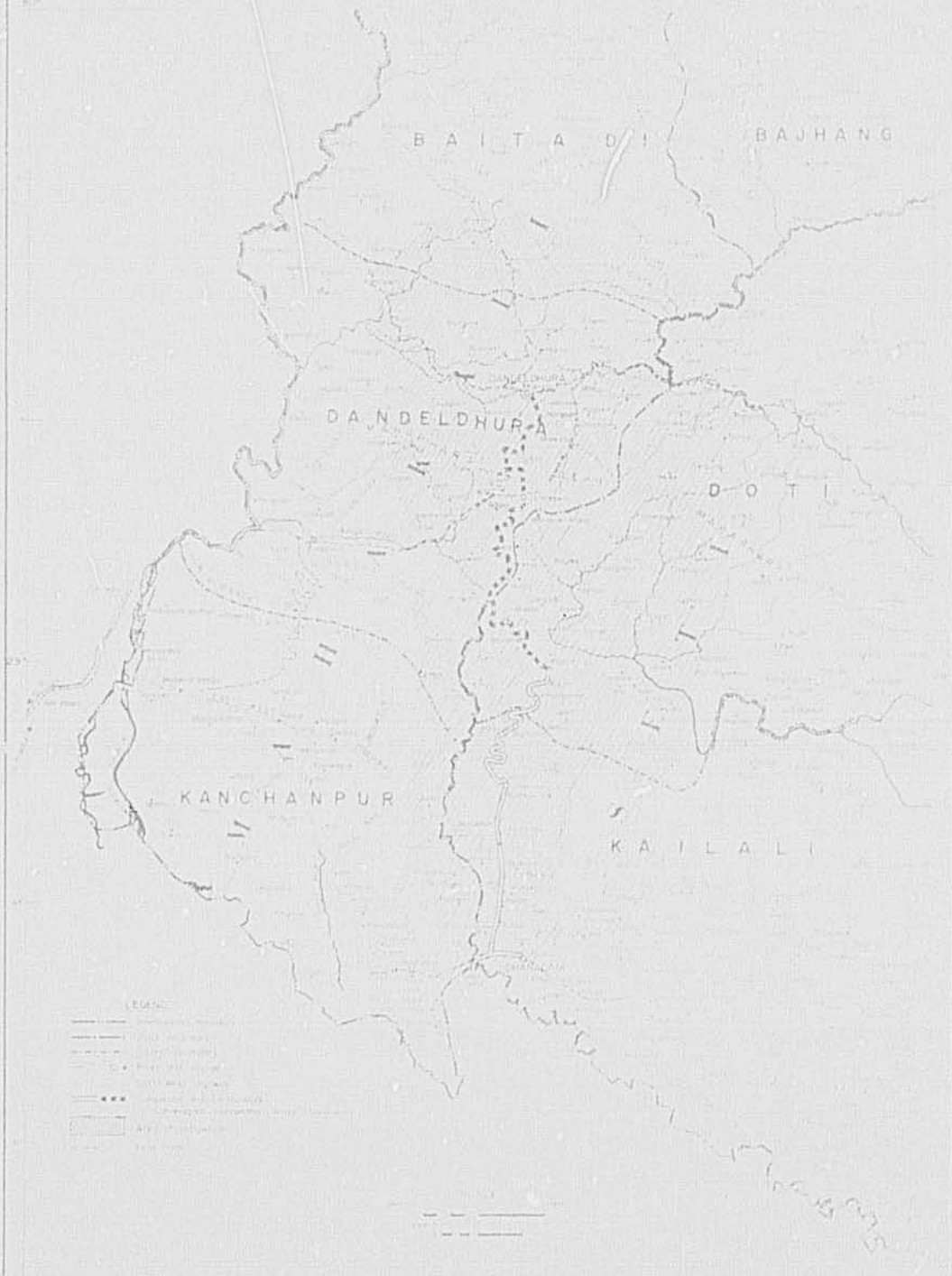
[6]One factor that reduces the amount of grain brought into the hills from the deficit between what is produced and what should be consumed is the large number of people absent during the winter months.

The main contribution that the road should make to the economy of the area will be in facilitating the availability of the basic imports required to increase agricultural yields, carry out irrigation projects and other developmental activities. These areas of activity will still not meet the problem of creating the basis for the generation of cash income. They are, however, for most areas of the hills the types of development that will create a basic sufficiency of food that will support the development of cash generating activities. In this aspect of influence the road should have an impact over a large area. It is also this form of influence that is most likely to generate a further spread of influence. One aspect of benefit to the hills that cannot be minimized is that even without achieving any of the above potential effects, the road should serve to lessen the impact of events such as have befallen the area in recent years.

The extent of the area of influence in terms of people coming to use the road is shown in the accompanying map (Fig. 3). This is based upon the interview conducted in the area regarding how far the residents were willing to travel to use the road as well as upon the topography of the area and the existing pattern of basic movements and spheres of trade influence exerted by adjacent market centres. The field study indicated that people were willing to travel up to one and a half day to use the road to go to Dhanagadi, depending upon whether they were located in the hills or Tarai. Generallly, people were willing to travel greater distances in the hills than in the Tarai to use the road. This is, of course, related to the distance or travel time taken to reach the roadway and Dhanagadi from the places where the trips would originate. Assuming that an average person in the hills travels between 7–8 hours a day covering roughly 3 kilometers (2 miles) an hour, which is true in most cases, and that the hill dwellers were willing to travel one day for using the road, then its area of influence may be approximately estimated to be 22 kilometers (14 miles) from the roadway in the hills. With the above assumptions, the area of influence of the road in the Tarai may be ascertained as half of that in the hills, if the people there were willing to travel only half day for using the road. It may be noted that these estimates are only crude approximations based upon generalized assumptions, for the distance travelled is dependent upon not only time but also upon the characteristics of the individual traveller, route, terrain, and the season when the journey is made which all contribute to the friction of distance.

AREA OF INFLUENCE OF THE DHANAGADI - DANDELDHURA ROAD



CHAPTER IV

ECONOMIC STRUCTURE OF THE REGION

This discussion covers the hill areas west of the Karnali in the area of the alignmen of the Dhanagadi-Dandeldhura Road and concentrates primarily on conditions in the Dandeldhura and Doti districts, although it is necessary in many cases to include the district of Baitadi, Bajhang, Bajura and Achham in explaining both the past and present conditions The basic factors affecting economic conditions in the hills are the limited amount of cultivabl land, the widespread lack of water for irrigation purposes and the increasing numbe

of people attempting to produce food. Conditions now are at best minimally sufficient, and only sufficient assuming a significant number of family members are employed in India and the Tarai with an unknown rate of permanent migration out of the area and a varying but widespread dependence on seasonal employment outside of the hills. While present trends in the economic patterns of the hills can be partially attributed to several recent occurances, it seems probable that the overall insufficiency of the hill economy has existed for at least some decades, and that the above external dependencies have existed to a varying degree for some generations. This is borne out by the history of periodic droughts in the area and by the general acceptance in many localities in the hills of people seeking both seasonal long-term employment outside the hills, primarily in India. It is not at all difficult to hear of family members who have been employed in India for the last 25 to 30 years and who are still contributing to their families in the hills. The past ten years has, however, seen a series of events that have reinforced and increased the dependence of the average family and the overall trade structure of the hills in India and the Nepal Tarai. In roughly chronological order these have been as follows :

(a) The cutting off of the northern border with the Tibetan region of China for trade purposes. This has been an erratic constraint with indications that some trade is still going on but one that has reduced the possibility of border trade for some imported necessities (particularly salt) and removed the basis of a fairly lucrative north-south trade pattern from which the merchants of the central hills (particularly Doti) derived some significant benefits.

(b) The opening of the road on the Indian side of the border with Nepal as far as Jhulaghat and beyond with a subsequent growth of Jhulaghat as a trade centre and "urban" attraction for the districts of Baitadi, Bajhang, Bajura and Dandeldhura's northwestern areas. While this has provided a source of lower priced goods at less or equal distance for the people of these northern areas, it has also reduced Silgadi's sphere of trade influence and channelled off all or a portion of some goods from the north (ghee, wool, charish, herbs) that previously moved south through the central hill areas. Costwise this has probably benifitted the people of the area, but it has increased the overwhelming direct dependence of the area on Indian merchants for purchasing and selling goods as well as for employment to obtain the cash to purchase the needed goods.

(c) The drought throughout the area from approximately 1965 through 1968 and the earthquake of 1966 in Bajhang and Baitadi districts. In addition to its direct effects of causing a severe food shortage and driving larger than normal numbers of people out of the hills to seek employment elsewhere, this period appears to have had several long-range effects, both on household economies and the trade structure within the area.

Due to the almost total lack of cereal grain production in many areas of the hills, particularly on low quality lands, poor families many already in debt, were forced to borrow in kind or cash from available sources to obtain food. Repayments on outstanding loans became extremely difficult as any income from employment in the Tarai or India generally went directly for food or to pay off newly assumed loans. It should be noted that this problem was generaly expressed by various sources, but not found to have been an extreme problem for any of the families from whom details were taken. It was also not indicated that exhorbitant rates of interest were involved but simply that the overall indebtedness of families was increased.

In certain localities and for individual families who had been growing limited amounts of cash crops such as tobacco, and to a limited extent cotton, the severe shortage of food forced them to abandon these crops in order to plant all available land with cereal grains. This was indicated to have taken place to some extent in the recent drought but more widely durin gprevious periods of drought. In most cases, cash crops were subsequently not replanted.

Many of the shops and individuals involved in trade and retailing in the area extend credit to local customers and in some cases (particularly in Doti) obtain varying proportions of their goods on credit. During the recent and past periods of food shortage, the demand for credit has increased and the ability of existing debtors to repay has rapidly decreased. Particularly for smaller stores with little capital or larger stores receiving goods on credit from India or the Tarai, this situation rapidly led to their closure, particularly in Silgadi-Doti. Although the recent period of drought affected the far western Tarai districts as well, the margin of safety for individual families tended on the whole to be much greater in the Tarai than in the hills. The increased number of people from the hills moving through the trade centres of Dhanagadi and Mahendranagar are becoming more dependent on them directly for yearly purchases and has, in fact, contributed to a growth in the trade volume and size of both towns. Mahendranagar, newly founded approximately six years ago, has experienced a long term growth although Dhanagadi, with the benefit of the road project, is now experiencing a period of rapid growth.

AGRICULTURE

Needless to say far western Nepal is predominantly agricultural where the overwhelming proportion of the total work force is engaged in rural economic activities and where a corresponding fraction of people live in small villages. For instance, approximately 97 and 84 percent of the total households is agricultural in Dandeldhura and Kailali districts, respectively. Hence, this region is beset with what may be called a rural problem where markets are small and where scale of operations in both agriculture and ancillary activities is inadequate and largely inefficient.

Despite the importance of agriculture in the economy of the region, the per capita income derived from each hectare of cultivated land is distressingly low, largely due to the pressure of population on land. The cultivated land per person in the hill district is as low as ·065 hectare increasing slightly in the Tarai district to ·567 hectare. Although this is comparatively higher than in Eastern Nepal not only is the available per capita cultivated land very low but what is more distressing is the composition of the cultivated land; the proportion of wet or irrigated fields (*khet*) being approximately 26·33 percent of the arable area in the hill districts as compared to 86.5 percent in the Tarai.[1]

The area of cultivation has reached a limit imposed by nature in the present state of technology in the hills while population has been increasing rapidly in both the Tarai and the hills. Agricultural technology remained stagnant and the quality of land steadily deteriorated due to soil exhaustion and erosion. Expansion of cultivated land which has been the primary source of increasing income, is no longer possible. Consequently, a large number of persons share the output from each acre of cultivated land, thereby giving low per capita income. This income has become so low aggravated by a long period of drought in recent years that the real problem for most people in the region, particularly those in the hill districts, has become one of survival. In order to appreciate the reality one has to actually see the poverty and want that the region has fallen into.

Cropping Patterns

The cropping pattern of the region is characterized by the predominance of food-grains cultivation. As much as 90 percent of the cropped area is under these crops, though there are appreciable regional differences with regard to cropping patterns. Among the commercial crops mustard is the most important, particularly in the Tarai. Details regarding regional cropping patterns are presented in Appendix 3.

In the Tarai, paddy is the master crop which was cultivated in approximately 62.50 percent of the total cropped area in Kailali and Kanchanpur districts.[2] Next to rice in importance is the cultivation of maize in the districts which occupied about 19.23 and 26.04 percent of the total cultivated area in Kailali and Kanchanpur districts repectively.[3]

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[1] The figure for the hill districts reprents the average for Baitadi (33 percent), Dandeldhura (13 percent) and Doti (33 percent) districts, and for the Tarai the average for Kailali (86 percent) and Kanchanpur (87 percent) disiricts.

[2] Central Bureau of Statistics, His Majesty's Government of Nepal, *Result of National Agricultural Census of 1962, Kailali and Kanchanpur District* (Kathmandu, 1966 -in Nepali).

[3] *Ibid.*

In the hill districts wheat cultivation which is quite negligible in the Tarai, assumes an important position covering approximately 30 percent of the total cropped area. After wheat the second and third ranking crops in the hill districts were respectively maize and paddy. As a single crop, however, paddy has the largest proportion of the total cropped area under its production in the region under consideration. It is cultivated in approximately 45 percent of the total cropped area within the region. At least one reason accounts for the wide popularity of paddy: taste factor aside, it produces more food per unit of land area than any other grain.

While paddy acreage was 62.5 percent in the Tarai, it was only about 25 percent of the total cultivated area in the hill districts, lowest being in Dandeldhura District (22.16 percent). Thus, rice cultivation is concentrated towards the southern portion of the region comprising of Kailali and Kanchanpur districts. The cultivation of paddy in the hill districts is mainly located in relatively low altitude river valleys and their immediate terraces. In general paddy cultivation declines with increasing altitude where both moisture (in terms of irrigation availability) and temperature, in addition to their soil, tend to diminish the profitability of its cultivation.

The next important crop from the viewpoint of area covered is maize with approximately 24 percent of the cropped area under it. The cultivation of maize is relatively spread out in the region as compared to paddy. In terms of acreage, Kailali, Kanchanpur and Doti districts are the most imporatant maize producers where about 19.26 and 30 percent of the total cropped area of these districts were under this crop, respectively. Of all districts, Kailali had the largest area under its cultivation (12,000 hectares). In terms of regional concentration, it is similar to rice, the bulk of its production having been located in the Tarai districts.

Wheat is another important crop in the region. It occupied about 17 percent of the total cropped area and is mainly concentrated in the hill districts among which Doti had the largest proportion of the cropped area under its production (4200 hectares). In the Tarai districts it occupies some prominence only in Kailali District where about 1800 hectares were devoted to its cultivation in 1968--69. During the same period, wheat was grown only in 800 hectares in Kanchanpur District. Like paddy, it is generally cultivated on flat lands and terraced slopes.

Other foodgrain crops of the region consist of barley and millet comprising of 1.32 and .81 percent of the cropped area, respectively. While barley is cultivated only in the hill districts, millet is extensively grown in both the hill and Tarai districts. Among the hill districts, Baitadi and Doti had the largest area under barley cultivation. As compared to other crops such as paddy and maize, millet cultivation is insignificant in the Tarai districts, although the hill districts devoted about 2 percent of their total cropped area

to its cultivation. In the hills, Doti District had the largest area under its cultivation in 1968-69 (250 hectares).

Of commerical importance, the cultivation of mustard is noteworthy. Some tobacco and sugarcane are also grown but these are mainly for household consumption, particularly in the hill districts. As a cash crop, mustard is important in the Tarai districts where a significant proportion of their total cropped area is devoted to its cultivation. In 1968-69, mustard was grown in 7,700 hectares in Kailali and in 1000 hactares in Kanchanpur District which represented 12.34 and 5.21 percent of the total cropped area districts, of these respectively. In the hill districts mustard is cultivated to any great extent only in Dandeldhura and Doti, though all districts cultivate some of it. Generally, its cultivaion follow the distribution pattern of paddy.

The predominance of foodgrain cultivation and their pattern of regional distribution may be attributed to the high pressure of population on land with the results of compulsion for food self-sufficiency, lack of opportunity for cash-oriented farming due to adsence of markets and the physical determinants of crop production such as soil and climatic conditions. It had been already noted that the per capita cultivable land is very low in the region. Economically, this situation spells low per capita income even if the return per unit of land area is high. Thus, pressure of population influences cropping patterns through demand for food.

The village economy of the region, being traditionally organized towards a self-sufficiency unit, lacks a market structure whereby specialized products of different villages could be traded. Thus, in the absence of such market structures as well as the difficulty imposed by physical barriers on trading, the emphasis has naturally been achieving self sufficiency in foodgrain.

Among the physical determinants of the present cropping pattern, altitude, soil and water availability seem to be the most important factors. Thus, concentration of paddy cultivation in the Tarai districts, river valleys and low terraces in the hills is associated with alluvial soil, sufficient insolation and a relatively high amount of rainfall. Another favorable factor for the location of paddy production in these areas is the existence of relatively good irrigation facilities. On the other hand, the areas which grow more wheat rae found to be those with moderate rainfall, but it is widely adaptable in terms of variation in moisture, temperature and soil conditions.

Production Trends

According to one analysis, approximately 103, 779 metric tons of cereal grains

were produced in Kailali, Kanchanpur, Doti and Dandeldhura districts in 1964-65.[4]

Although this figure would indicate a regional self-sufficiency in food-grain production the actual situation was far from being so because of regional imbalance between population and production. The regional patterns of the food situation in 1964-65 are presented in Appendix 4. As may be seen from this table the greatest bulk of foodgrains was produced in the Tarai districts with approximately 70 percent of the total regional output being produced here. The hill districts consumed almost 53 percent of the total foodgrains consumption in the region, approximately 47 percent over their own foodgrains production, while the Tarai districts produced foodgrains over three times as much as they consumed, the most important surplus producer being Kailali District. Production of foodgrains was 53.32 percent of the consumption in Doti as against 362.48 percent of the consumption in Kailali (see Appendix 4).

The main foodgrains production of the region consists of paddy, maize, millets, wheat and barley. However, there is great regional variations in the production of these crops which corresponds with the regional cropping pattern discussed previously. The regional production patterns of these crops for the year 1965-1969 are given in Appendix 5. In general the amount of production of these crops covaries with their area under cultivation (compare Appendixes 5 and 6).

It is observed from Appendix 5 that the Tarai districts are the larder of paddy production in the region. The district of Kailali is the largest paddy producer which produced 96,849 and 64,350 metric tons of paddy in 1965 and 1968-69, respectively.

Among the hill districts, Doti ranked highest in paddy production which amounted to 7091 and 10,023 metric tons during the corresponding periods. As regards to production trends, a decrease in the overall production of paddy was observed for the region, although production recorded an increase in all districts with the exception of Kailali where production decreased by 33.56 percent between 1965 and 1968-69. During the same period, the increase in paddy output was by 41.34 percent in Doti, 7.99 percent in Dandeldhura and 27.85 percent in Kanchanpur but it was the decrease in Kailali, the largest paddy producer in the region, which pulled down the overall regional production trend showing a decrease of 3.80 percent for the entire region. Associated with this decrease in paddy production was also the decrease in area under its cultivation which was not however proportionately related (compare Appenixes 5 and 6). For instance, the area devoted to the cultivation of paddy in Kailali District decreased from 58,820 hectares to 39,000 hectares between 1965

[4] Ministry of Economic Planning, His Majesty's Government of Nepal, *Cerial Grain Production, Consumption and Marketing Patterns, Nepal 1965*. (Kathmandu), *Passim*.

and 1968-69. During the corresponding period, the decrease in the production of paddy was from 96,847 to 64,350 metric tons in Kailali District. It is interesting to note that despite a decrease in area under paddy cultivation in Dandeldhura District, it recorded an increase in paddy production.

As regards to paddy yield per land area, the region presents a contrasting picture (see Appendix 7). The Tarai districts gained a significant increase between 1962 and 1965 which amounted to 10.82 and 44.23 percent in Kailali and Kanchanpur respectively. On the other hand, paddy yield declined by approximately the same amount in the hill districts between 1962 and 1965. During this period, paddy yield decreased by 53.35 percent in Doti. Thus, the gain in the paddy yield in the Tarai districts was not only cancelled out by the decline in the hill districts but also skewed the regional trend towards an overall decline by approximately 28 percent (see Appindix 7). Although this yield decline cannot be directly related to the decrease in paddy output for reasons of using different base year and also administrative boundry changes, the declining production trend of paddy appears to be a function of not only decrease in the area under its cultivation but also its yield.

With the exception of paddy and millet other foodgrains showed a considerable increase in their production trend for the entire region between 1965 and 1968. The production of maize, wheat and barley increased in all districts whereas the position of kodo (millet) showed some regional variation. The production of maize increased substantially in Doti District with a gain of 745 percent between 1965 and 1968. During this period the increase in maize production in Kailali District was minimal in relative terms although it produced the largest amount of maize of all districts in the region. As early as 1965, the production of wheat and barley appears to be insignificant in the Tarai districts. In view of this fact, the recent production trend of these crops in these districts is quite remarkable. For instance, Kailali produced 58 metric tons of wheat and barley in 1965 as compared to 2250 metric tons in 1968 (see Appendix 5). Among the hill districts, Achham recorded the highest increase in wheat production, the lowest being in Dandeldhura. Although the yield trend of these crops cannot be directly related to the production trend for reasons given previously, what is more significant is that despite a declining yield trend of these crops in the hill districts, the production of these crops increased between 1965 and 1968. The loss of output that might have resulted from this decline in yield seems to have been more than offset by an increase in the area under the cultivation of these crops (compare Appendixes 6 and 7). In summing up, it may be said that the production trends of foodgrains other than paddy increased considerably between 1965 and 1968 the main contributing factor being a change in the cropping patterns with areas previously under paddy cultivation being given to the production of other foodgrains. The switch from paddy cultivation to other foodgrains may be attributed to a general decline in the yield of paddy primarily due to drought

conditions which prevailed in this region during this period.

Organization of production

Although there are regional variation, the organization of productive activities can be generalized into some basic pattern for the region. On irrigated lands paddy and wheat often occupy the same field but during different seasons. Generally speaking, on non-irrigated land the summer crop is either paddy or millet; land under paddy is followed by wheat during winter whereas that under millet is fallowed during this season. In any given year, the non-irrigated land which was under paddy the previous year is normally put to millet cultivation and vice versa such that there is rotation of crops in alternate years. Maize is usually cultivated on lands which are dry for paddy but moist for the millets.

The peak period of agricultural activities is [illegible] to November, the period between the pre and post rainy seasons. The summer crops are planted at the beginning of the rains, weeded during the rains, and harvested in the early fall. The period from the middle of November until April, when wheat harvest begins, is the slack season. Annual rhythm of cultural practices of different crops for the region is presented in Appendix 8. A notable regional difference is found in regards to the cultural practices of paddy cultivation. The practice of transplanting and careful hand weeding of paddy seedlings so common in the hill districts are uncommon in the Tarai. Instead, rice is sown by broadcast method and weeding is done by a device drawn by bullocks.

The size of holding per household which is the primary unit of production shows a wide regional variations, varying from district to district. However, the greatest variation is observed between the Tarai districts and those in the hills. Average size of holding per household for the region as a whole amounts to about 3.14 hectares of arable land.[3] While the size of holding per household in the Tarai districts (Kailali and Kanchanpur) is 5.7 hectares on the average, it is only 0.52 hectares in the hill districts. The districts of Kanchanpur and Doti have the largest and smallest holding size in the region with 6.57 and 0.34 hectares per household, respectively (see Appendix 2).

When the size of holding is broken in terms of the quality of land- ***khet*** (wet) and ***pakho*** (dry) - it is observd that the proportion of ***khet*** to the total land holding is higher in the Tarai districts than in the hills. Average share of ***khet*** to total land holding is 86.5 percent in the Tarai districts whereas it is 23 percent in the hill districts. There tends to

[3] This represents the average for Kailali, Kanchanpur, Doti and Dandeldhura districts based upon the statistics presented in *Sample Census of Agriculture* (1962).

be a positive correlation between the size of holding and the amount of *khet* the holding has.

The manner in which other resources are mobilized, namely labor and capital, to exploit the land holding is primarily dependent upon a number of interrelated factors such as the size of holding, number of persons per household and the social structure of the region, a detailed discussion of which is beyond the scope of this report. In the hill districts where the size of holding is small, labor is generally supplied by the members of the household itself This is also true in the Tarai districts. However, at certain stages of crop production, the need for outside labour becomes most pressing which is secured either by paying wages in cash or kind, or on the basis of reciprocity. Those groups of people who are at the top of the social and economic ladder (Thakuris, Brahmins and Chhetris) can offer to pay the laborers in cash or kind, and they often do so. On the other hand, the poorer class, who does not have a viable holding unit, always relies upon the reciprocal labor arrangement. In the Tarai districts where the size of holding is relatively large, those landowners who have holdings too large for family operation generally employ contract tenants drawn from the class of the landless. Rich landowners fulfil their capital requirements from their own savings whereas cultivators from the other end of the social spectrum have to depend upon the village moneylenders, often mortgaging whatever little land they possess.

ANIMAL HUSBANDRY, FORESTS AND RESETTLEMENT

Although the role of animal husbandry is mainly limited to providing drought force and manure in the Tarai districts, its contribution to the economy of hill districts is quite significant. For, aside from the requirement of animals for plowing and manure, which is indispensible to sustain normal yields, livestock provide a major source of cash income for the hill people which they realize from the sale of ghee.

In general the quality of most of the animals is very poor which seems to be inversely correlated with the number of animals as well as the supply of fooder. The bullocks are small in size and the yield of milch cattle is quite low, the average annual yield per cow being about 135 kg (300 pounds) of milk. Milk product from cows are, however, used mainly for domestic consumption and does not enter into the ghee sale which comes primarily from the 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 (40 pounds) of ghee annually.

While recent figures for livestock population are not available, it appears that there is large number of working animals per hectare of cultivated land in the hill than in the Tarai districts. In 1962 the livestock population density averaged 12 per hectare of cultivated land

in Doti and Dandeldhura as compared to 2 per hectare in Kailali and Kanchanpur. As animal husbandry in an integral part of the peasantry, cultivators prefer to keep some animals regardless of their size of holding. Consequently, more animals per hectare of cultivated land are kept in hill districts where the average size of holding is relatively smaller as compared to the Tarai districts. It may be inferred from this judgment that bullocks are more under-utilized in the hill districts than in the Tarai districts.

The main problem of animal husbandry in the hill districts is the acute shortage of fodder and grazing, and wide fluctuations in their availability from year to year caused by uncertain and uneven rains. After the crops are harvested, the stalks of harvested grains provide one source of fodder but because of the number of animals this supply is soon exhausted. Formerly large herds of animals were grazed in the valleys and lower slopes of the ridges but with increasing pressure of population on land these grazing lands have all but vanished. At present twigs and leaves are cut from the forest and herdsmen have to devote an increasing amount of their time in foraging for the animals which often takes a half to full day's journey from the village. Pasturage is getting so difficult to find in the hill districts that many households take their animals to the lower foothills or the Tarai jungles for winter grazing. Due to inadequate fodder resources, the quality of the animal is further deteriorated. This state of affairs is not, however, solely due to pressure of population or of cattle on land. What is partially responsible for the decreasing supply of fodder is the grazing habits of people who do not practise rotation in grazing lands. Khas and Brahmin who predominate in these hill areas immigrated from the plain or low land areas and are not articulate in the proper utilization of forests and grazing lands as the natives in the hill areas (such as the Rais in eastern Nepal) who practise systematic forest use not only to allocate forest resources equitably among the villages and clans but also to provide for vegetation regeneration grazed in over areas. Consequently, the existing practice of grazing has a "predatory effect" on the land use.

The position of fodder supply is much better in the Tarai districts than the hills. Because of a relatively smaller number of animals per hectare of cultivated land, the supply of fodder that comes from the stalks of harvested grains is relatively substantial. Besides, the animals remain in the vicinity of the village throughout the year and are grazed in the abundant forest close to most villages. Due to this foreign trips of long duration in search of pasturage, which are so characteristic of the hills, are uncommon in the Tarai districts.

The location of different forest areas is the result of variation in rainfall, temperature, altitude, slope, exposure, soil and drainage patterns. While there are forested areas scattered througout the region being dealt with, concentration occurs mainly in the Tarai districts where forests cover over 50 percent of the total areas. Forestry in the Tarai districts was

recently studied by Browning and Clark (1969)[6] and an inventory of all Tarai forests was undertaken by the Forest Resources Survey in cooperation with US AID Nepal during 1963-66.[7] According to the latter, the total net sawlog volume of live trees by mercantibility was 252.27 million cubic feet in Kailali Division while that in Kanchanpur Division was 186.99 million cubic feet. In the hill districts forest covered approximately 55 percent of the total area in 1962 but their inventory is not yet available. For the most part, these hill forests are inaccessible and their utilization is purely for local purposes.

Much of what had Robbe[8] found on the forest resource problem in Nepal some 16 years ago is still valid as was pointed out by Browning and Clark. Although their conclusions were borne out by studies done mainly in the Tarai their generalizations were also found to be generally applicable in the case of the areas here under consideration.

The forests in the hills do not appear to contribute much beyond fulfilling at best the local needs for reasons of their inaccessibility and ungregarious nature of their locations. The Dhangadi-Dandeldhura Road will access some good stands of pine forest as was pointed out in Chapter 3, but their economic exploitation will primarily depend upon cost factors, for the value of standing timber drops considerably with any distance from the road, if the cost of truck logging is high, it does not enhance the value of the standing timber.

The Tarai 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; sissoo is also regarded as premium wood for furniture. Although these forests genarate substantial revenue at present, their potential has not been fully realized as yet. One of the reasons is the lack of transport inputs which the Dhangadi-Dandeldhura Road will furnish to some extent. However, it alone will not be sufficient for a fuller utilization of the forest resources unless their products are hauled in a form that will minimize the ratio of transport costs to the price of these products. Therefore, it is necessary to study market demands for various forest products and then establish necessary conversion industries.

Despite that the forests represent such a valuable resource, it has not been properly taken care of in both the hills and Tarai. At present, over-grazing, indiscriminate cutting of

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[6] A J. Browning and Wendell P. Clark, *Report to the Government of Nepal on Forest Management, Utilization and Marketing* (Kathmandu : Food and Agricuiture Organization of the United Nations, April 1969).

[7] Forest Resources Servey, *Forest Statistics for the Tarai and Adjoining Regions* (Kathmandu: Department of Forest, H. M. G., Nepal, 1967).

[8] Ernest Robbe, *Report to the Government of Nepal on Forestry, ETAP Report No. 209* (Rome: Food and Agriculture Organization, March, 1954).

trees, fire and an increased demand for fuel, construction purposes and demand for agricultural land owing to rapid population growth, have destroyed much of the forest cover in the hills. The steepness of the terraced slopes in the hill districts in hitherto forested areas bears dramatic witness to the heavy demand for land and deforestation.

In the Tarai also, not all of its forests are usable timber.[9] Forest areas adjacent to settlement have for years been exploited and too often the best trees have been selectively removed with the result that only inferior stands remain.[10] Regeneration is generally abundant in the Tarai forests. However, much of it is frequently destroyed by fire before the seedlings reach a size where they can withstand the fire. At present, as is pointed out by Browning and Clark, encroachment is the most serious forestry problem, though its extent is not well known. They point out that peasants in quest of tillable land continually encroach on already exploited or virgin forest areas which occur near frings of the forest belts or within the interior of virgin forests when transportation facilities into the area exist. This was partially borne out during the field study; squating nearby the Dhanagadi-Dandeldhura Road alignment had already caused some destruction of forests.

New settlers in forest land have become very destructive to the existing forests. Forest department officials may be inclined to disregard offences for they may not have the means to evict or punish these squatters in the face of threats or other forms of persuation.

Apart encroachment, there are other problems which result in the destruction of forest. Villagers have the priviledge of cutting wood on payment of nominal licence 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 that all the trees cut in this manner are used for the specified purposes. Additionally, villagers have also the privilege of removing dead wood as fuel which is subject to abuse. Young pine trees which had girdled or burnt, presumably for the purpose of killing them so that they could then be removed, were frequently observed during the field study. Prevalence of theft of trees were also commonly heard of which, if true, must cause a serious loss of revenue to the government. Efforts to discourage encroachment and destruction of forests have not been fully effective so far. Aside from a sound forest management policy for this purpose which has been fully outlined by Robbe, Browning and Clark, what seem to be most needed is a voluntary cooperation by the people—a change in their attitude towards pragmatic conservation.

As was pointed out previously, there exists a mounting imbalance between population

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[9] Browing and Clark, *op. cit.*, footnote 6, p. 13.

[10] Browning and Clark, *op. cit.*, footnote 6, p. 15.

and land resource in the districts. The limited amount of tillable land is virtually overworked and increasing population must move elsewhere in search of land and food. The unoccupied lands of the adjoining Tarai districts represent the most underdeveloped resource now left for this purpose. Consequently, agricultural resettlement is being pursued here in order to relieve pressure in adjoining hill districts. However, resettlement should not be pushed too far and the improved access to be provided by the Dhanagadi-Dandeldhura Road should not result in indiscriminate settlement and damage to the forests. For, from here must come future food supplies for the local, hill and urban population as well as a continuing supply of grain and timber for foreign trade. It is, however, by no means to suggest that resettlement in the Tarai should be stopped. While this development is necessary and warrants support, there is also a need for an integrated ecologic approach in planning for overall development effort of the region such that conflicts in land use can be resolved rationally and new opportunities for development brought to light.

During the past several years increasing numbers of people from the hills have resettled in the Tarai districts. Mounting economic pressure in the hills and widespread eradication of malaria in the Tarai have created conditions conducive to continuing resettlement which may be expected to increase greatly in the future. To a certain extent this will be beneficial, both stimulating the economic growth in the Tarai and relieving some of the population pressure in the hills. Initially, resettlement will bring about more land under cultivation with benefits to the regional economy. However, beyond a certain points, extension of cultivated areas will be at the expense of destroying the forest areas. If this is not the case, then further increments of population would result in having more and more people dependent upon the produce of a given area of cultivated land. Thus, unless production techniques are improved, it would merely mean more people realising less returns from the land than formerly. Furthermore as mentioned previously, a major factor in the econmy of the hill districts is the production of ghee which is dependent upon the winter pasturage of the hill animals in the Tarai forests. Thus, ceteris peribus, what happens in these forests will profoundly affect the patterns of ghee production in the hills. Doubtless the process of resettlement will continue for some time the result that some grazing lands will be lost. Given the conditions of overgrazing which already exist in the hill districts, this will adversely affect the ghee production and the degree af population pressure in the hills relieved by the resettlement will be partially cancelled out by a loss in this industry. Thus, a simultaneous increase in the production of fodder by utilizing the sub-marginal lands as well as reduction of existing herds with more selective breeding seem to be an obvious solution to this problem.

If resettlement is to benefit the regional economy in the long run, it must be controlled and channeled in a planned way — a point of view also expressed by McDougal [11]

[11] McDougal, *op. cit.*, footnote 2, Ch. 2, p.119

The first such attempt in Nepal was made in the Chitwan District as a part of the Rapti Valley Multipurpose Development Project. Since 1964 agricultural resettlement has been the responsibility of the Nepal Punarbas Company. This Company lays out the settlement according to a standard pattern: rectangular blocks girdled by access roads with homesteads sited along the access road approximately 50 meters (164 feet) apart.[12] The settlers are encouraged to form cooperative societies the number of which depends upon the size of the settlement and the number of "village" unit represented. At an early stage, the Company itself takes initiative in this matter and also settles loans for the settlers with the Agricultural Development Bank. Land that is agreed on for establishing resettlement is released by the Forest Department to the Company whose officers then select from applicants the appropriate number of settlers. A farm family of 3 to 7 members is to be alloted 2.6 hectares of land.

At present the Company has established resettlements near Nepalgunj and at Nawalpur. More resettlements are projeted in the Far Western Tarai. Although the proposed resettlement area in Kailali and Kanchanpur districts is 6075 and 12,960 hectares respectively, 4,860 hectares are estimated for distribution in the former and 10,530 hectares in the latter.[13] This will accommodate approximately 1880 families in Kailali and 4000 families in Kanchanpur District. Although the Company had planned to begin the actual resettling of the families in these districts in the fiscal year 1969-70, this has not been carried out so far. On the other hand, a larger number of families from the hills have already resettled as mentioned previously. In addition, 131 Burma-born Nepali families have at present settled in and around Mahendranager. One of the reasons for this seeming gap between plan formulation and implementation of the Company may be attributed to the unforeseen calamities on the hills when large numbers of persons abandoned their homes and sought relief in the Tarai as was the case during the droughts of early 1960's and the earthquake of 1966. In such circumstances, it is hardly possible to fully implement the planned programs either from an administrative or humanitarian standpoint. Thus, apart from the resettlement programs, part of the solution to out-migration from the hills lies in strengthening the regional economy of the neighboring hill districts.

POPULATION

One of the many problems of Far Western Nepal, and the most important of all, is too little land and too many people. While the available land is limited, the possibility of an increase in population is without doubt. As a result, the task of feeding the rapidly growing population from the ever shrinking cropland, even at the present level of mini-

[12] Gauri P. Sharma, *Resettlement Plan In Nepal* (Lalitpur, Nepal Resettlement Company, undated) pp. 11-13 (in Nepali).

[13] See *Agricultural Resettlement in Nepal* (mimeograph, no author, publisher or date), p. 2.

mum subsistence, has become the challange of the day.

The available population data for the far western hills and Terai is generally not adequate to accurately assess the magnitude or the precise characteristics of the changes taking place in the area. However, according to the published census information, Far Western Nepal had a total population of about 1,761,119 in 1954. By 1961, this number had reached 1,969, 634, increasing at an annual rate of 1.7 per cent[11]. In the four districts of Far Western Nepal–Doti, Dandeldhura, Kailali and Kanchanpur–with which this report is primarily concerned, there were 427,603 persons in 1954 which reached 491,271 in 1961. Of course, these figures relate to the census districts predating the present Development District. The correspondence between these varies from Kailali, which is largely the same as before, to Doti which consists of the area presently included in Doti, Bajura, Bajhang and areas of Achham and Kailali districts. Dandeldhura has remained approximately the same with Kailali gaining some area which was previously in Doti. Because of these discrepancies in areas covered and the problems involved in attempting to adjust the previous figures to agree with the current somewhat vaguely defined boundaries, they are presented here primarily for the general demographic characteristics they show and the differences between the general or approximate areas. However, with specific reference to the four districts of Dandeldhura, Doti, Kailali and Kanchanpur, these trends can be summarized as follows: (1) A rapid increase in the population of some areas of the Tarai, particularly in Kanchanpur District, focused near the border, around Mahendranagar, and along the foothills in Kailali. This is due to migration into the area from the hill districts to the north and from further east, including Tharus from Dang and Deokhuri areas, and from the resettlement of Burmese–Nepali refugees. (2) Observable but largely unquantifiable increase in the rates of permanent, long-term and seasonal migration out of the hills into the Tarai and India. (3) An overall increase in the hills with some changes in localized densities and new settlements established to a limited extent in the lower hills.

Distribution and Growth

Population is unevenly distributed throughout the region. While major population concentrations occur in the southern part of the Tarai districts near the Indian border, population is mainly concentrated below the 1500 meter (5000 feet) level along the river axis in the hill districts. In terms of population density, the Tarai districts are less densely populated than the hill districts. In the former districts–Kailali and Kanchanpur–the density of population per spuare kilometer was respectively 33 and 11 (86 and 29 persons/sq. mile) as compared to 35 (91 persons/sq. mile) in Doti and 47 (122 persons/sq. mile) in Dandeldhura in 1954. By 1961, Kanchanpur and Kailali had respectively 12 and 39 persons per square kilometer (31 and 101 persons/sq. mile) while Doti and Dandel-

[11] Central Bureau of Statistics, His Majasty's Government, *Results of National Population Census of 1961-62* (Kathmandu, 1966 [in Nepali]), *passim*.

dhura had 38 and 56 persons per square kilometer (99 and 146 persons/sq. mile), respectively. The overall density of population does not seem to suggest any serious population pressure in the hill districts but this is misleading as a very large portion of the hills consists of lands unsuitable for human habitation or for other economic purposes. Hence, the pressure of population can be better judged by relating population with the arable land area. Thus, the per capita arable land was .089 hectares in Doti, .076 hectares in Dandeldhura as against .77 hectares in Kailali and 1.8 hectares in Kanchanpur. From this point of view, the hill districts have a much greater pressure of population than the Tarai districts. Such a population pressure is not in itself necessarily a problem, but since agriculture is the occupation of most people and the lack of arable land distribution patterns cannot be offset by the availability of capital, these pronounced variations in the distribution of population and arable land have been the main source of inequalities in the general living conditions of the people in the Tarai and the hill districts.

Although accurate information could not be obtained, wide disparity in the participation rate of the active population-number of workers as per cent of the total population—can be discerned in the Tarai and hill districts. In general, the participation rate seemed higher in the latter districts than in the former. This is mainly due to the prevalence of social customs which permit women to work freely in the fields. The situation is reverse in the Tarai. The low participation rate in the Tarai districts was primarily due to the fact that the Tharu women did not participate in the agricultural operations following their social tradition.

In all the districts studied, agriculture is the single major activity giving employment to the largest number of workers, though there are slight variations in the degree of its importance from one district to another. In general the hill districts are highly dependent upon agriculture where more than 75 per cent of the total working population is engaged in it which reflects the lack of other economic activities. The Tarai districts have a sizable population of traders, office workers and others engaged in the operation of rice and oil mills as a result of which the dependence on agriculture is slightly less than in the hills. However, this difference is so little that employment in manufacturing and tertiary activities may be regarded as almost non-existent in the region.

Between 1954 and 1961 absolute population in the Dandeldhura and Doti districts numbered 15,338 and 33,930 persons which amounted to approximately 21.37 and 12.98 percent increase, respectively. During the corresponding period, absolute increase in the population of Kailali recorded 13,284 persons and that in Kanchanpur was 1119 persons. Alternately, population of Kanchanpur increased by 6.30 percent between 1954 and 1961 and that of Kailali by 17.33 percent.

In terms of annual increase between 1954 and 1961, the above figures ranged from an average of 1.5 percent in the Tarai districts to 1.6 percent in the hills. Among

the hill districts, Dandeldhura showed a higher rate of increase than Doti; population increased at a rate of 3.05 percent per annum in the former as compared to 1.85 percent per annum in the latter. On the other hand, with a per annum increase of 2.48 percent, Kailali recorded a higher population growth rate than Kanchanpur where it increased at a rate of only 0.90 percent per annum during the 1954-1961 period.

Although the above growth rates do not appear to be too alarming, recent trends as derived from the Nepal Malaria Eradication Organization data indicate that this is the case, particularly in the Kanchanpur District. Information obtained from the above source may not be precisely correct for the hill districts, for areas only 1200 meters (4000 feet) and below were considered. However, generalizing from the fact that areas of population concentrations are valley bottoms which are at low altitude, trends in population growth rates, if not the absolute increase in population, derived from this source can also be considered reasonably valid for the hill districts. According to this source, the population of Doti and Dandeldhura was respectively 40,537 and 19,534 persons in 1965. By 1969 Doti had 66,365 people and there were 37,535 persons in Dandeldhura which indicated an increase of 63.71 and 92.15 percent respectively between 1965 and 1969. Population increased at a rate of 15.93 percent per annum in Doti and at a rate of 23.93 percent per annum in Dandeldhura. Such an increase, however, must be accepted with caution. First, as was mentioned previously, the information used is limited to only areas 1200 meters and below in altitude. More importantly, however, is the fact that this demographic pattern cannot be supported by contemporary economic opportunities in these areas. Hence, what this suggests is the process of population descent to lower elevations. With malaria having been now largely controlled, population that had originally settled in higher elevations for fear of malaria as was generally the case moved to lower elevations, although some population increases cannot be discounted. Even then, any increase in population without a subsequent increase in productive activities assumes a critical dimension, for a considerable imbalance has already existed between population and the food producing capacities of these districts.

The information obtained from the Nepal Malaria Eradication Organization is reasonably accurate for the Tarai districts in terms of the area covered, for practically all of these districts are below 1200 meters. According to this source, the population increase in Kanchanpur District is more dramatic as compared to Kailali District. As early as 1965, the population of Kanchanpur and Kailali was respectively 29,486 and 93,860 persons. By 1969, population had more than doubled in Kanchanpur with 71,143 persons living in this district while Kailali had gained only 26, 437 persons, amounting to an increase of 141.28 and 28.17 percent respectively. In terms of annual increases, population had increased at a rate of 35.32 percent in Kanchanpur as compared to 7.04 percent in Kailali. One of the main reasons for these high rates of population growth is due to the people resettling here in large numbers from the hills. If such a trend continues, whatever possibility there is for resettlement in the Kailali and Kanchanpur districts will soon be eliminated. Thus, migration into the area, unless carefully planned and organized by resettlement authorities, will cause serious problem and

limit future alternatives for development. Details regarding population pattern and changes in the region are presented in Appendices 9-11.

Migration

Although the increase in populotion of the hill districts appears to be an outcome of a natural population growth, the rapid increase of population in the Tarai, particularly in Kanchanpur District, seems to be a result of, as noted earlier, a large scale immigration into the area. What is significant to note is that despite the increasing numbers of population absenteeism in the hill districts over the past two decades, the population seems to be growing as rapidly as ever. For example, there were 7123 persons absent for six months or more in Doti District in 1954 which increased to 12,730 persons in 1961. Likewise, persons similarly absent numbered 2151 in Dandeldhura in 1954 which increased to 4399 persons in 1961 (see Appendix 9). This indicates that more and more people are leaving the hills, though such a migration to a limited extent is believed to have existed for several generations. The matter for concern is that the scale of this migration has considerably increased in recent years, and is likely to continue, *ceteris paribus*, in the future.

In general, two types of migration may be distinguished. The seasonal migration commences from early November until March or April during the agricultural slack season after which migrants return to their original homes. Apart from temporary employment in the Tarai or India, the hill people migrating during this season use their journey for buying and selling of goods, and the people from southern Doti and Dandeldhura for winter pasturing of their animals in the Tarai. The long-term migration usually occurs during the winter season which results in most cases leaving the hills permanently, except for occasional visits at intervals of three to five years. Many people involed in this migration often went to the major urban centers of India (Bombay, Delhi and Madras) and worked there as watchmen or coolie laborers. These migrants who are always the young men of the viliage often moved in groups leaving behind the women, children and the old. Recently, resettlement in the Tarai districts has added a new dimension as regards to the permanent out-migration patterns from the hills. Many hill families have moved down to the Kailali and Kanchanpur districts, cleared the forests and settled down there permanently. In some cases, it appears that entire villages in the hills have relocated themselves in the Tarai districts. During the course of the field study, it was observed that resettlement by the hill people had penetrated deep into the forests, particularly in Kanchanpur District.

One of the compelling reasons why people are leaving the hills is because of the worsening economic conditions—too little arable land for too many people and no alternative source of employment. Structurally, as mentioned earlier, the economy of the hill districts is heavily dependent on agriculture where productivity is depressingly low under the present conditions of small holdings, lack of agricultural inputs and inefficient cultural practices. Because of the lack of economic opportunities locally, a large number of people have to go out to the Tarai or India to seek employment. The outflow of people from the hill

districts reasults in some inflow of cash income though its precise estimate is not possible at this juncture. This aspect will be discussed further under household economy.

PATTERNS OF REGIONAL TRADE

A number of factors determines the patterns of inter-regional trade and movement. Without going into any detail, it may be mentioned that within the limits imposed by transportation cost, political and cultural barriers, individual regions of a system can draw freely on the resources and products of other regions which however must be paid for either by export or the transfer of other assets. What affects most of the inter-regional trade and movement between the hill and Tarai districts is the type of commodities available in the respective areas, the linkage patterns of population concentrations in these districts and the location of the Indian border towns through which export to and imports from India are channelled.

The hill districts have very few exports. With the exception of ghee, other exports from the hills such as hides and skins, wool, livestock, locally produced paper and medicinal herbs are of much less importance. On the other hand, the hill districts import a host of commodities some in substantial quantity. These imports include foodgrains, cloth, salt, tobacco, sugar and *gur*, kerosene, metal and metalware, soap and a variety of other manufactured goods. Of these,cloth and salt are by far the most important items. With the exception of foodgrains, which are imported from the Nepal Tarai, and other items of less importance such as *bidi*, cigarettes and soap of Nepali manufacture, all other commodities are imported from India.

In general, all the exports from the hills, of which ghee forms the greatest bulk, are sold directly at Nepal Tarai or Indian border markets by individual hill people in their annual journey during the winter months. With the cash so realized, these people purchase cloth, salt, sugar, kerosene and a number of other goods which they require. Cash is used much less frequently to buy foodgrains in the same market. Usually, people from the hills tend to patronize the large border markets where they can realize as high a price as possible for the goods they sell while also obtaining the goods they buy at the lowest rates. Thus, this practice tends to reduce the role of middlemen in the hills, particularly so far as exports are concerned, but to a considerable extent in the case of imports as well.

There are four main centers at border points where much of the trade and movement between the hills and the Tarai take place. These centers are (a) Jhulaghat, (b) Mahendranagar, (c) Dhanagadi and (d) Rajapur. Each of these is linked with the adjacent Indian market towns through which exports from the hills to India as well imports to hills and Tarai from India are routed. Jhulaghat in Baitadi District is linked with Pithoragarh which is a fairly large town with a wide variety of goods and services. Mahendranagar in Kan-

chanpur District is located adjacent to the railhead and market center of Tanakpur which is the oldest railhead in the region, serving not only the adjacent portion of western Nepal with a large market but also eastern Kumaon. Dhanagadi, the headquarters of Kailali District as well as of the Seti zone, is linked with the railhead at Gauri Phanta. Although Dhanagadi is rapidly growing because of the Dhanagadi--Dandeldhura Road project, it is still a relatively small market. Gauri Phanta just across the border in India is at the head of a branch railway line and is located in areas of "reserved forests". As a result, Gauri Phanta is a much smaller market center as compared to Tanakpur and Pithoragarh. Indeed it is even smaller than Dhanagdi and has only a few shops. Rajapur in Bardia is linked with the railhead at Katarnia Ghat and is also close to Kauriala Ghat which are connected with Gorakhpur and Lucknow respectively by direct railway lines. Rajapur itself is a fair sized market town.

Among the above four market centers, it is only with Dhanagadi and Mahendranagar that we are mainly interested, for these centers are located in the Tarai adjacent to Doti and Dandeldhura districts in the area of the alignment of the Dhanagadi-Danbeldhura Road, though reference to the others are at times necessary for comparative purposes. As regards to exports from the hills as well as imports from India, Dhanagadi is the least important of the four not only because of its small size market but also of the smaller size of the adjacent market at Gauri Phanta as compared to other border markets. Since the other three border markets are considerably larger, the hill people generally realize more for their exports and at the same time are often able to purchase their requirements at lower rates. As noted before, ghee is the most important export as compared to other items mentioned earlier. Thus, the amount of ghee exported through the above four border points may be used as a rough index of their relative importance for exports which is presented below in Table 1.

TABLE 1

GHEE EXPORTS FROM VARIOUS BORDER POINTS

(in kilos)

	1963–64	1964–65	1965--66
Jhulaghat	285,525	251,475	333,648
Mahendranagar	89,912	108,300	99,718
Dhanagadi	57,225	43,762	68,258
Rajapur	264,075	267,037	278,175

SOURCE: CENTRAL BUREAU OF STATISTICS, H.M.G.

It is obvious from the above table that Dhanagadi is the least important of the four market centers. One of the reasons why Dhanagadi ranks lowest in the ghee export is due to the fact that the price of ghee is lower in Dhanagadi as compared to Mahendranagar

or Rajapur which may be attributed to the small market size of Dhanagadi and Gauri Phanta. Put differently, there appears to be less demand for ghee at Dhanagadi as compared to other places. Table 2 shows the price differences in ghee at these places.

TABLE 2

GHEE PRICE AT BORDER POINTS

(Rupees per kilo)

	1963-64	1964--65	1965--66
Jhulaghat	8.60	11.04	10.14
Mahendranagar	8.20	10.46	10.61
Dhanagadi	7.28	10.13	10.01
Rajapur	8.48	10.21	10.63

SOURCE : CENTRAL BUREAU OF STATISTICS, H.M.G.

Exports of other commodities also indicates that Dhanagadi is the least important of the four market centers in Far Western Nepal which is due to its weak linkage with the hinterland (see Appendices 12--15).

In general, with the exception of Mahendranagar, the Tarai market important for export also tend to be important for the imports of goods form India. Although Mahendranagar does not seem to be important in terms of ghee export, it is very important as a channel for Indian exports. This may be seen by comparing the import of cloth entering from the market centers in the region which is presented in Table 3. Similar importance of Mahendranagar may also be observed from import figures of other commodities (see Appendix 13).

TABLE 3

CLOTH IMPORTS FROM VARIOUS BORDER POINTS

(Values in Lakhs* of Rupees)

	1964-65	1965-66
Jhulaghat	54.71	26.10
Mahendranagar	58·68	43.17
Dhanagadi	14.21	16.38
Rajapur	51.08	34.65

* 1 Lakh= 100,000.

SOURCE : CENTRAL BUREAU OF STATISTICS, H.M.G.

The significant importance of Mahendranagar relative to Dhanagadi for both exports and imports is mainly due to the size and location of these places adjacent to the Indian

border towns.

It was already noted that people who have ghee or other products for sale usually use the proceeds of their sales to purchase the manufactured goods they require. However, even those households without having to sell, normally send members of the family to one of the border markets to purchase their repuirements at least once in a year, for the same items if purchased in Silgarhi Doti or Dandeldhra bazar would cost approximately twice as much. Persons who leave their homes in the hills to find temporary employment in the Tarai or India also purchase the goods they need at these border markets upon returning home. Additionally, shopkeepers in the hills import goods from India to stock their shops which are channeled through these border market centers. A large proportion of the goods are transported by mules from Tanakpur to their destination in the hills. The muleteers are Indians and they operate from their base at Tanakur. From here they transport goods to Dandeldhura, Silgarhi Doti and Achham via Silgarhi. The shopkeepers in these districts place orders for the goods they require through the muleteers. Often they also send their agents for purchasing goods. The cost of transporting goods varies according to the distance, mode of transport and the season. From Tanakpur to Silgarhi the muleteers charge Rs. 30 per maund (Rs. .80 / kg) during winter, and Rs. 50 per maund (Rs. 1.34/kg) during summer which is slightly lower than the porter rates carrying the same amount of weight. During the winter season a good deal of goods, chiefly rice and salt, is also carried by sheep into the hills. It is interesting to note that although Dnanagadi is closer to Mahendrangar, shopekeepers in Doti and Dandelhura obtain most of their goods from the latter because the adjacent border town of Tanakpur offers greater selection of goods as well as lower prices. Besides, one other advantage of Mahendranagar-Tanakpur over Dhanagadi-Gauri Phanta is the availability of the services rendered by the muleteers. Mule trains also operate between Dhanagadi and Silgarhi but they chiefly carry rice which they supply to the shopkeepers. No mule trains were found operating between Dhanagadi and Dandeldhura.

Basically, the same patterns of movements as discussed previously are found among the individual household members although it was discerned during the course of field investigation that individual household members, particularly from southern Doti District, tend to go to Dhanagadi rather than Mahendranagar. It is noteworthy that prices of most commodities are lower at Dhanagadi than at Mahendranagar. Despite the lower prices at Dhanagadi, which would indicate that most households would prefer to make their purchase there, with the exception of the households in southern Doti, most still go to Mahendranagar. The reason for this seeming anomaly appears to be rooted in a number of factors. First, it is the distance involved which operates in combination with the advantage of Mahendranagar being closer to Tanakpur. Secondly, the seasonal movement patterns of households greatly influence the shopping preference. Thus, households, even if equi-distantly located to Mahendranagar and Dhanagadi, would prefer to go to the former because of its close proximity to Tanakpur. As will be noted later, seasonal movements primarily originate for reasons of (a) buying and selling of goods, (b) temporary employment

and (c) pasturing of animals. It general all these factors operate in combination, particularly in southern Doti and Dandeldhura, in the origin of seasonal movement. For all of these, Mahendranagar has an advantage over Dhanagadi, if distance is not an overwhelming factor, as a result of which most people have a tendency to go to Mahendranagar than Dhanagadi. This pattern is likely to change after the completion of the Dhanagadi-Dandeldura Road but at the disadvantage of Mahendranagar, disrupting the traditional patterns of movement in the region. This will, of course, depend upon the cost of travel for the individual user of the road and the type of carriers used.

Although Dhanagadi is of less importance than Mahendranagar in terms of overall patterns of both exports and imports and direction of household movements as well, the picture is a different one when we consider imports, chiefly the foodgrains, to the hills from the Nepal Tarai. Most of the foodgrains imported into the hills comes from Kailali District which produces the largest surplus in that area. As a rice market and storage depot Dhanagadi is very important.[15] Much of the rice which finds its way north into the hills is channeled through Dhanagadi although a substantial amount goes directly from Malakheti which is about 19 kilometers (12 miles) north bypassing Dhanagadi. However, most of the rice reaching Dandeldhura comes from Kanchanpur. There are three ways by which rice and other foodgrains are imported into the hills; by the individual household members, the shopkeepers and other middlemen and through the government channel. However, less grain seems to be purchased directly by the individual household member than is true in the case of manufactured goods.

Another important commodity imported into the hills from Dhanagadi is salt. This is perhaps the only exception in which case Dhanagadi is as important as other Tarai market centers, or even more important than those discussed previously. In general a large proportion of the Indian salt comes in via Dhanagadi and is exported into the hills following the same routes as rice. During the winter season the sheepherders of Darchula, who are know as the ***Byansis***, bring their sheep to transport the salt from the Tarai markets to the hills. During the winter months, the ***Byansis*** make three to four shuttles between the Tarai and hill market centers carrying salt and also some foodgrains which they sell mainly to the shopkeepers. At the time of field investigation many ***Byansis*** with as many as 150 sheep were encountered carrying salt into the hills. Generally, most of them were enroute either from Dhanagadi to Doti, or from Mahendranagar to Dandeldhura. There may be other ***Byansis*** operating between Dhanagadi and Dandeldhura but even if there were, it appears that their number is not very significant.

It may be noted that unlike foodgrains, nearly every household buys some salt in the Tarai market. The main reason for this difference is that salt exhibits greatest difference in price when comparing the Tarai and hill markets. For example, salt in

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[15] See Bharat P. Dhital, *Dhanagadi Rice Market* (Kathmandu: Department of Agriculture, H. M. G, 1965 [in Nepali]) , p. 5-13.

Dandeldhura may sell for ten times as much as in Mahendranagar or Dhanagadi at times of scarcity. On an average, salt costs about Rs. 6 to Rs. 8 a maund (Rs. 16 to 21/kg.) at Mahendranagar and Dhanagadi. However, during the summer season the carrying charge itself is Rs. 50 per maund (Rs 1.34 kg) between Silgarhi Doti and Dhanagadi. Hence, it is no surprize that most individual household does its own purchasing of salt in the Tarai market. The price differential between the Tarai market centers and the hills is the least for cloth and metal and the highest for salt, kerosene and foodgrains (see Appendix 16). In general the high bulk low value goods have greater price differentials detween the Tarai and hill markets than the low bulk high value commodities.

From the above discussion it is apparent that the alignment of the Dhanagadi Dandeldhura Road does not coincide with any significant patterns of trade and movement presently in existence. However, the lack of correspondence is much less in the case of movement of rice and salt than in the case of exports to and imports from India.

HOUSEHOLD ECONOMIC PATTERNS

Reinforcing the importance of the family unit as the basis of agricultural production (particularly in the hills) is the fact that most of the area west of the Karnali River and particularly in the area of population concentration between and around Dandeldhura and Silgarhi–Doti, familes conduct most of their own trade and movement of goods. Although this was found to be somewhat less true in the areas around Silgarhi-Doti and to a lesser extent around Dandeldhura, it is still true of largest part of commodities brought into or exported out of the hills. However, it is the case throughout the hills of Nepal that family–oriented trade appears to be more prevalent in the area under consideration. In almost all of the villages visited during the study, it was indicated that most of the families purchased their own imported necessities in the Tarai or border market towns. In the cases where families had surpluses other than grains, they sold these themselves at the same or other market in the Tarai or India. The fact that this takes place is due both to the series of recent events outlined at the beginning of this chapter and to the functioning of the average household economy in the far western hills.

The study done by Charles McDougal in *Village and Household Economy in Far-Western Nepal* in 1967–68 dealt with Doti and Kailali districts as well as two districts (Sallyan and Dang-Deukhuri) further east. The present study has found that both his findings and most of his interpretations were borne out by our own more general overview of somewhat wider area around and adjacent to the villages which he had studied in the hills. The most important of McDougal's findings in connection with household economy in the Doti area generally applies to Dandeldhura District as well, with local variations in both districts which appear to follow generally definable patterns.

The overall primary weakness of the areas economy—the lack of adequate cash generating overall surplus of specific commodities- stems from and is true of most of the

individual household economies in the area. Agricultural production and other hills based activities simply do not meet the needs of the average hill family for cash or surplus income to exchange for needed imported goods and other purposes.

The widespread seasonal migration out of the hills to seek employment in the Nepal Tarai and in India is not primarily motivated by deficit in food production, (although this varies from family to family), but by the need to generate some cash income to exchange for imported goods. The average family even in years of good agricultural production tends to have expenditures exceeding its locally derived income, excluding long-term and seasonal employment outside of the hills. In some cases, even including outside employment, expenditures still exceed income.

In other to interpret these findings it is necessary to briefly present McDougal's basic conclusions regarding the breakuown of average cash income and expenditures for the sample of fifty households from which he gathered the detailed data which is presented in table below -

TABLE 4.

AVERAGE CASH INCOME FROM DIFFERENT SOURCES, DOTI DISTRICT

Income Source	Rupees	Percentage of Total Average Income
Sale of Crops	130	12.4
Animal Husbandry	34	3.3
Shopkeeping and Trade	7	0.7
Government Service	94	9.0
Local Employment	47	4.5
Employment in Tarai or India	716	68.9
Army Service and Pensions	12	1.2

SOURCE: MCDOUGAL, OP. CIT., FOOTNOTE 2, CH: 2. P. 46.

Of the fifty households included, only one reported selling cereal grains. This household accounted for most of the income reported under Sale of Crops. Other families sold some vegetables or potatoes. Very few households in either Dandeldhura or Doti indicated that they had a surplus of cereal grains to sell. This was true even in areas of relatively high production for the hills and with households that obviously had surpluses. Of the thirty-four villages in which interviews were conducted in Doti and Dandeldhura, only 3 villages indicated sufficient foodgrains. All of these were in river valleys and possessed relatively large holdings of *khet* lands. While some selling of other agricultural products was noted, this was on a very small scale and not a significant factor in any of the areas visited.

Although the holdings of livestock, particularly cows and buffaloes, are fairly large in this area, few households reported sizable sales of ghee or other livestock products. McDougal notes that his study was done at the end of the drought which was said to have reduced ghee production and following a period in which rinderpest had reduced the size of herds. He also notes that there appeared to be a tendency to underestimate returns from animal husbandry in general.[1]

During the course of the present study, much the same pattern was found to be true. In some areas, reasonable estimates of production and sales of animals and animal products were given but in general villagers seemed reluctant to estimate returns from either. While the estimates obtained during the present study are suspect, both as to numbers of animals and ghee production, they tend to support the trends noted by McDougal. Generally, holdings of animals, particularly milch buffaloes, were higher in areas close to good grazing areas, particularly in the main *lekh*. These were areas south of the Seti River in Doti on the northern slope of the Mahabharat Lekh and areas below Dandeldhura which tended to take their animals, particularly buffaloes, to the Tarai during the winter months. In some areas, particulary in villages on the northern slope of the Mahabharat Lekh, the buffaloes of a village would spend almost none of the year in the village, spending the winter in the Tarai foothills jungles and the summers on the *lekh* nearest to the villages. Export figures (Table 1) indicate that the volume of ghee production in the areas around Dandeldhura and Doti and south is not as high as the area to the north (exported through Jhulaghat) and to the east (exported through Rajapur and Nepalganj). This is probably due in part to the higher population densities in the central areas of Dandeldhura and Doti districts and the resulting pressure on grazing lands. It also may be due to the commitment in terms of manpower required to collect fodder materials if the animals are kept in the village or to stay with the animals if they are taken to pasture in the Tarai or in the summer to the higher pastures.

In general the number of individuals engaged in trade throughout the areas studied by McDougal and those covered in the course of this study was very low and confined largely to the two main centers of Dandeldhura and Silgarhi-Doti. Even in these centers, Dandeldhura being much less important, the number of people engaged in trade or shopkeeping was indicated to have gone down in recent years. Many of the shops encountered on the main trails were strictly seasonal, some operating for only a few months during the winter with the proprietors being primarily employed in agriculture

As McDougal notes, the proportion of households with members engaged in some form of government service is probably over represented on Table 4 showing average income.

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[1] McDougal *op. cit.*, footnote 2, Ch. 2, p. 17.

In his larger sample of 601 Doti households, only 4.5 precent have members in government service. Approximately half of those households were immediately adjacent to Silagarhi-Doti.

The low percentage of income from local employment reflects several factors. As noted previously, there is an unequal distribution of land, particularly better quality irrigated land, in the hills. In general however, the size of larger holdings does not reach the point where large numbers of people are employed on a wage basis for working the land. This also reflects the fact that even when local employment can be found, it is not often on a cash basis, but remuneration is made in kind. Since most of those seeking work would have to purchase some grain in any case, working for payment in kind achieves their purpose more directly.

The last source of cash income noted by McDougal, that of Army service and Pensions is, as confirmed by his findings, not a significant source of income in the area under consideration. Recruitment of men from both Doti and Dandeldhura has not been encouraged either in the Indian or British military forces.

The income received from employment in the Tarai or in India, amounting to 68.9 percent of the total average income in Doti, indicates heavy dependence of this area on outside sources of cash income. This figure again represents an average proportion of income from employment outside the hills. As indicated by McDougal, the average income figures from sale of Crops and Government services are both unrepresentatively high. The downward adjustment of these figures would result in an even higher percentage of average cash income due to outside employment.

The extent to which individual households and more importantly, particular areas, are dependent on outside employment as a source of cash income varies in relation to the amount and quality of land they own, the produce from this, and obviously on what other sources of income are available. During drought years, the overall dependence on outside employment tends to increase significantly. Even in view of all of these qualifications, the dependence on employment outside the hills is quite widespread. McDougal's larger sample in the same five villages indicated that 64.9 percent of the households were to some extent dependent on sources of income other than agriculture and at least 59.9 percent of the total were dependent on long-term or seasonal employment in the Tarai or India.

It is interesting to compare the percentage breakdown of the 269 persons McDougal indicates as being absent from their villages who are engaged in long-term, but temporary employment in the Tarai or India with the figures given in the 1961 Census Reports for persons absent for 6 months or more. Table 5 gives this comparison.

TABLE 5

LONG-TERM ABSENTEEISM PATTERN

Year	Total Population	Total Absent	Persons Absent per 1,000	In Tarai		In India	
				Total	Percent Absent	Total	Percent Absent
1961	295,367[A]	12,730	43[B]	709	5.6	12,021[C]	94.5
1967–1968	3303	269	81	30	10.8	239	89.2

[A] This is figure for Doti Census District which includes the present districts of Doti, Bajura Bajhang and parts of Achham.

[B] This includes people absent but in other areas of Nepal not only in the Tarai.

[C] This is the figure for person absent but outside Nepal. Of these, 11,912 were in India, 5 in other countries and 104 unstated.

SOURCE: Figures for 1961 were obtained from Central Bureau of Statistics, *Rashtriya Jana Ganana 2018 Ko Parinam* (The National Population Census of 2018). For 1967–1968 from McDougal, *op. cit.* footnote 2, ch. pp. 72–73.

Although the basis for comparing these figures is admittedly not precise, they do indicate a general increase in the proportion of the population seeking long-term employment outside of the hills that is supported by events after the 1961 Census and by the general estimates of officials in both Doti and Dandeldhura. The 1961 figures for the Doti Census District would, if anything, probably overestimate the proportion of persons absent from the area of present district of Doti as the portion of Achham, Bajhang and Bajura which were previously included in the former, probably have generally higher proportions of their population absent. These figures also indicate a higher proportion of people with employment in the Tarai than previously which is again borne out by the over all increase of activity and employment opportunities in Kailali and Kanchanpur districts. Although the employment opportunities in these Tarai districts should continue to increase, the increasing permanent migration into these areas may make it more difficult to obtain both long-term and particularly seasonal work in competition with the new permanent migrants.

In correlating the seeking of long-term employment with other factors, McDougal concludes that it appears to correlate most directly with larger household size. Thus, the mean size of household with members absent excluded, approximates the mean size of households without members absent. This finding again tends to support the proposition that

while related to low agricultural production, the seeking of employment is primarily motivated by a need to generate cash income. This would also indicate that this phenomenon is not a result of desperation but relatively rational reaction to a long standing economic imbalance.

The other main form of employment in the Tarai and India is seasonal and undertaken during the slack period of agricultural activity from approximately mid-November through April. Of McDougal's larger sample of 601 households in Doti District, 30.3 percent of them had one or more members who regularly sought seasonal employment in the Tarai or India. Of these, 59.3 percent went to the Tarai, primarily to Kailali and Kanchanpur, and 40.7 percent regularly went to India, usually to the nearby area of Uttar Pradesh. Of the total households having members leaving for seasonal work, 86.9 percent of them were entirely dependent on this seasonal labor.

Before discussing the pattern of seeking employment outside the hills in more detail, it is worthwhile to briefly discuss McDougal's findings regarding average cash expenditures and the distribution of these in comparision to average income given in Table 6.

TABLE 6

AVERAGE CASH EXPENDITURE FOR DIFFERENT PURPOSES IN DOTI DISTRICT

Items	Rupees	Percentage of Cash Expenditure
Purchase of Foodgrains	294	26.2
Purchase of imported commodities	553	49.3
Fulfilment of Social and obligation	104	9.3
Purchase of Meat	69	6.2
Agricultural inputs	102	9.0
All of above	1123	100.0

SOURCE : As in table 4, pp 44-45.

The level of expenditure for foodgrains in these figures may be higher than is the case during years of normal rainfall and relatively good crops. It was also noted during the present study that in many of the areas visited it was indicated that what cereal grains were purchased were often purchased locally from other households or from nearby productive areas. It is also likely, though data were not obtained to support this, that some grain is brought into the hills and sold there by households with land in the Tarai. On the whole, however, it did not appear that large amounts of cereal grains were brought into the areas visited from the Tarai during a relatively good year.

The last three categories of expenditures are to varying extent common to all hill households. It is important to note that they do tend to vary in amount considerably from household to household. Particularly in connection with Social and Ceremonial Obligatons, the amounts expended normally by poor households are very low. The cost of special ceremonies such as weddings, although occuring only occasionally, is a tremendous burden on the average household and often a leading factor in forcing households to borrow cash. In general, however, expenditures on all three of these items appear to increase proportionately with the prosperity of households.

The largest category of expenditures as indicated by this data is imported commodities. The items considered in this category—cloth, salt, metal, gur, sugar, kerosene and soap—are almost universally purchased by all hill households. Several other items excluded by McDougal, such as tobacco and mustard oil, are, at least partially, available or produced locally in the hills. The items considered are almost wholly Indian in origin and are generally purchased by individual households at Tarai or Indian markets. The price of these items in the hill markets is prohibitively high for the average hill household. Equally as important is the fact that even if these could be purchased more cheaply in the hills, the cash income required to purchase them, as discussed earlier, is largely derived from Tarai and India. For many households, the trip made to seek seasonal employment also serves as the occasion to spend a large part of this income on purchasing these needed commodities. The relationship between these will be discussed more fully in connection with the overall pattern of seasonal movements and trade in the hills.

It is worthwhile, before discussing more fully several aspects of the household economy already mentioned, to compare the distribution of cash income nd expenditures per household for the fifty households studied by McDougal. This is shown in Table 7.

TABLE 7

RANGE OF TOTAL CASH INCOME AND EXPENDITURE PER HOUSEHOLD IN DOTI DISTRICS

	Income	Expenditure
Less than Rs. 500	29	8
Rs. 500 - 999	3	24
Rs. 1,000-1,499	6	11
Rs. 1,500-1,999	5	2
Rs. 2,000-2,499	2	1
Rs. 2,500 or more	5	4

SOURCE As in table 4, p. 49-50.

This would indicate that there is more of a tendency for expenditures to exceed income in those households with lower incomes. Such a condition cannot, however, persist for long, but it is possible that these are groups of households which ultimately abandon the hills for long-term employment in the Tarai or India.

The existing agricultural pattern in the hills, while requiring high labor inputs from approximately May to November, creates a period of from four to six months, following the planting of the winter crop - generally wheat - in November, during which little agricultural labor is required. During this period, several patterns of movement take place fulfilling a number of purposes and involving almost all of the households in the hills. While a part of this movement is contained within the hills, involving trips to administrative centers and to some extent market centers, most of it is toward the Tarai and India. Because several purposes may be fulfilled by the same trip, these purposes will be presented in order of their relevancy to the greatest number of households.

Purchasing of imported commodities. Most hill households will make at least one trip annually to one of the main Tarai or Indian markets located near or along the border. In the border area under consideration, these include Nepalganj, Rajapur, Dhanagadi, Mahendranagar, Tanakpur, Pithoragarh and Jhulaghat. For the more limited area around Dandeldhura and Silgarhi-Doti extending to the south, the main markets are Tanakpur, Mahendranagar and Dhanagadi. In the immediate area of the new road, there is the smaller seasonal market of Malakheti near the foothills on the main trail from Silgarhi-Doti toward Dhanagadi and Mahendranagar.

Within the districts of Doti and Dandeldhura there appears to be roughly discernable divisions between areas that depend more heavily in Mahendranagar than on Dhanagadi, although this varies according to the type of goods being purchased, the main exception being cloth, which is often purchased in Tanakpur (in India) near Mahendranagar by people who normally go to Dhanagadi for other goods. Another exception to the pattern expected is that there appears to be a tendency for some people in areas closer to Mahendranagar to go to Dhanagadi for some basic goods. This is probably due to the slightly lower prices for these goods in Dhanagadi compared to Mahendranagar. In both Doti and Dandeldhura, many of the shops depended on the Mahendranagar-Tanakpur markets for most of their goods, although villages in Doti area seemed to be more prone to go to Dhanagadi for their own purchase of goods other than cloth. This tendency to go to two or three places for different goods implies a low opportunity cost for the time and efforts involved in travelling. As jobs are hard to find, even with a road people may prefer to walk rather than use the transport facilities. Also, it implies that the form of transportation be such in which loads as well as people should be carried; otherwise, there will be a low rate of utilization as in the Kodari Road.

In connection with these patterns, it is important to note that the main trails going south from Silgadi-Doti, the western area of Doti District and the more eastern parts of

Dandeldhura District, come togethe near Bayala and there is one main trail going through the Silwaliks. At the edge of the foothills (Kolmuda Chauki) there is own branch trail leading west to Mahendranagar with another a few hours south at Malakheti bazar. From these points it is about one-half day further to Mahendranagar than to Dhanagadi which lies a little more than a day south from there. The villages in the central areas of Dandeldhura District and in the south depend primarily on Mahendranagar and Tanakpur for their purchases with some exceptions in favor of Dhanagadi. The areas in northwestern Dandeldhura are probably split between Jhulaghat and Mahendranagar, although little information was obtained on this area.

Seeking of seasonal employment. It was mentioned previously that approximately 30 percent of households had one or more members who regularly left the hills during the winter to seek employment in the Tarai or India. The estimates obtained during the course of field work tended to include this group with a group that was also motivated by the need not only to earn cash, but to obtain a source of food for the winter months. This was particularly true in Dandeldhura District. These rough estimates tended to rank Achham as the area highest in seasonal migration with Dandeldhura next and Doti as generally lower. These estimates were usually in terms of the proportion of the total population that tended to leave the hills during the winter. In this sense, they are probably somewhat overestimated. The figures that were estimated however, were approximately 25-40 percent for Doti, 40-60 percent for Dandeldhura and 60-75 percent for Achham. As mentioned above, these estimates include not only members seeking employment, but other family members who also moved to the Tarai for the pasturing of animals and to obtain a source of food other than that grown in the hills for the winter moths.

It should also be pointed out that the sources of employment in the Tarai are such that usually women and older children can find work by helping in the harvesting of the rice crops in the beginning of the winter season and in the harvesting of the mustard crop towards the end of the winter. This does not appear to be the case in India where much of the employment is in construction and forestry. This, along with reasons that will be discussed later, may be one reason why working in the Tarai, or at least in agricultural sources of employment, may be generally preferred.

Pasturing of animals in the Tarai. As discussed earlier, many households or groups of households, particularly those in the central areas of Dandeldhura and Doti and areas closer to the Tarai, will take their buffalo and to a lesser extent cows to the lower foothills or jungles on the edge of the foothills for the winter months. The primary reason for this is the availability of ample grazing in these areas, particularly as compared to the insufficient possibilities in the hills. In many areas of the hills which were visited, the supply of grass from the summer was exhausted by mid or late November, and foraging by women and young girls was being done at considerable distances from their villages to obtain leaves and greens out of the reach of animals or grass on terrain too rugged for animals to be able to reach it.

In areas that had reserves of straw from the summer crops, this was being kept for use later in the season.

Households going for employment in the Tarai often found it convenient to bring their animals with them, leaving one member to look after them or arranging with other households to cooperatively pasture their animals. During this winter pasture, the ghee and milk produced is usually sold to nearby villages or markets for cash or barted for grains or kept until a journey to the main markets is made. This often depends on the prices offered locally and on the type of goods which the proceeds from this sale is intended to purchase.

Selling of agricultural produce and animals or animal produce. The amount of agricultural produce, either cereal grains or crops such as peppers, and other vegetables sold appeared to be ralatively small and usually limited to households with larger land holdings which were generally well off. It also appeared that most of the surplus cereal grains were sold or used as payment in kind in the hills. There were some indications, however, that certain grades of hill rice could marketed in limited quatinties in the Tarai or India, although only one individual was met who had done this.[17]

Herbs, which are reported to be widely found in the more northern areas of the Far-West, did not appear to be a significant factor in the areas around Dandeldhura and Silgarhi-Doti with the exception of the Jogbura valley. Jogbura, however, appeared to be more of a collection center for the herbs originating in Bajhang and Bajur districts rather than producing its own.

In general the main commodities being taken out to sell or barter by individual households were animals (usually buffalo) and ghee. Most of the animals were taken to Mahendranagar or Tanakpur where higher prices were obtained. Ghee seemed to be sold in a number of different markets, usually at Mahendranagar, Janakpur or Dhanagadi, but to some extent it was also sold at smaller markets such as Malakheti although the prices obtained were somewhat lower than those in Dhanagadi or Mahendranagar. The eastern areas of Doti District tended to sell some of their ghee at Rajapur, which also seemed and to be an important market place for Doti, eastern Kailali, Bajura, Achham and districts further east.

The important thing to note is that almost all of this ghee marketing was done by individual households, or by several households in cooperation usually with fairly small amounts running to 10-12 kilos (22-26.4lbs) per household. The determination of the market at which it was sold appeared to be a function of the distances involved, the price levels, the purposes for which the income was needed (e.g., if for cereal grains,

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[17] One owner of a sheep-train spoken with in Silgarhi-Doti claimed that he had taken approximately 15 maunds (1 maund = 37.32 kilos) of hill rice to Mahendranagar where he was able to make a profit on it.

it could be sold in smaller markets) and the other purposes for which the trip was being made.

Migration to the Tarai for food. In several areas, particularly around Dandeldhura, individuals indicated that some households or most of the members of them, went to the Tarai for winter with the intention of at least finding enough work to supply themselves with food for the time they stayed in the Tarai. It is difficult to separate this group from those who may go to the Tarai seeking employment and do not find sufficient employment to return with either goods or cash. One possible indication of this motivation would be those households who go almost entirely to the Tarai rather than sending one or two members. This need to supplement the basic cereal grain supply by seasonal migration seemed to be greater in Dandeldhura District and from observation of the large number of families leaving in groups from Achham the need would appear to be prevalent there also. This was also supported by general observations made by individuals in the area.

Individual or households going to Tarai to supervise or live on lands held there. McDougal's results indicated that only 0.71 percent of the households in the larger sample in Doti District owned lands in the Tarai. With little more than observations as a basis, it is felt that this figure may be somewhat lower than is actually the case for Doti District. The proportion of households with land in the Tarai has increased in recent years, primarily as a result of land reform. The total holdings of hill owners have probably not increased appreciably, but some of the large single or extended family holding in the Tarai (this was primarily observed in Kailali District) belonging to hill families have been broken into much smaller holdings and sold to other hill families. As observed in Kailali District, it was usually the case that the holdings were sold to other families from the initial owner's village or nearby villages in the hills. There also appears to be an increasing number of hill owners moving to their lands during the winter months and in some cases permanently, rather than having one or two numbers present only infrequently to supervise tenants or collect their shares of crops.

Certain generalizations, with relevance to the Dhanagadi-Dandeldhura Road can be drawn regarding the dependence of hill households on long-term employment outside the hill and seasonal employment and marketing in the same area. However, the interrelationships existing between the various forms of seasonal migration tend to make projections of the impact of the road somewhat complex. The increased facility to make the improved agricultural inputs widely available in the area will have a gradual tendency to increase the margin of economic stability for the hill households, although as often pointed out in the hills, this will first benefit those who have the cash to purchase them. If goods are offered at lower prices in the hill markets, particularly at or near Dandeldhura, this will definitely have an impact but an uncertain one in view of the more important needs of households to go to the Tarai for employment. The impact of hill markets on

the Tarai and India may not be greatly affected by the road. This is based on the assumption that these groups will still be most likely to migrate seasonally as entire or partial household units, in some cases with animals, and still make a large part of their purchases of imported goods at markets near the border.

Possible complementary development in the area, in view of the constraints posed by the economic conditions generally extant in the hills, will have to depend more than in other areas of Nepal on careful initial planning with regards to financing, execution and time lags involved and scope of impact. With a large proportion of households likely to remain dependent on the cash income generated during the agricultural slack season, the reception towards such approaches as voluntary labor and lower wages for public work projects than for other employment is not likely to be feasible. This was borne out by the complains heard among the hill people with reference to the wages being offered by contractors involved in the road project.

The present study has concentrated primarily on the economic situation in the hill districts given access by the road. This has been primarily motivated by the feeling that the marginal situation in the hills requires more immediate action than does the relatively better situation in the Tarai. Another factor relating to the Tarai is that it is not apparent that the present road will alter transportation and movements pattern in the Tarai to the extent that it can in the hills. Even to the extent that there will be improvement in the north-south corridor given access by the road, the lateral east-west influence of the road will probably not be great, particularly in view of the respective concentrations of population in both Kailali and Kanchanpur at the opposite sides of the districts from the road.

Although the overall economy of the Tarai is in relatively better condition than that in the hills, this is not intended to indicate that there are no problems, or that there are not inequalities existing within the overall picture. Without going into further details (again, McDougal's study presents this in a well founded discussion of household economics in Kailali), it is sufficient to note that the average Tarai housedold, including Tharus and hill people, produces a surplus in agricultural output, often both in cereal grains and in cash crops (generally mustard). In general the conditions of individuals not owning land is also relatively good. The one exception to this overall picture may be the newly arrived hill settlers who have, particularly in Kailali, little in the way of assistance in beginning cultivation.

The Tharu groups constitute a majority of the population, although their proportionate strength has been decreased by the migration of hill people into both districts, particularly into Kanchanpur. To an unknown extent, the settlement of hill people in these districts has been preceeded and to some extent balanced by a longer-term migration of Tharus, primarily from Dang and Deokhuri into the area. In contrast to the wide

ranging patterns of movement in hills, the Tharus suffered until recently from economic exploitation due to a lack of movement outside of their villages. This has followed a pattern of Indian merchants coming to their village before the harvest of crops and buying the surplus production at rates agreed by them. Cash or imported goods were advanced to the Tharus at this time by the merchants. The prices agreed upon for the sale of crops are usually much lower than their market value after harvest. Once this pattern has been established, the merchants attempt to keep the cultivators indebted to them and to continue purchasing crops in exchange for advances. To some extent, this has been alleviated by land reform through its debt interception aspect. In having the government intercede on behalf of the debtors in verifying the amount of debts and having payment made to these officials than to the creditors, much of the abuse of the cultivators has been discouraged. Although more Tharus are now marketing their own crops for higher prices outside their village and in turn buying necessary goods at lower prices, there is a noticeable tendency still for the Tharus to be exploited in this or similar ways.

CHAPTER V

DEVELOPMENTAL ACTIVITIES : PAST AND PRESENT

SOME GENERAL OBSERVATIONS

In approaching an assessment of the impact and nature of ongoing as well as some of the past developmental activities in the four districts primarily under consideration, it is first necessary to make several qualifications. As with most of the other areas of investigation covered in the field portion of this study, it was not generally possible to check first hand much of the information received in visiting and interviewing the personnel concerned with the developmental activities in the area. With regards to the "slack" operation of the offices and general attitude of the individuals contacted, it is perhaps easier to make misjudgements in the region under consideration than in other areas. It is also possible that preconceived attitudes

towards the general situation in the Far West tended to somewhat distort the interviews taken. It is hoped that the observations made will be accepted as honest attempts to constructively examine the efforts being made in the area, and to assist in overcoming problems faced in these efforts. Although no specific lines of solutions have been spelt out as such, these are implied which hopefully should suffice for our purpose.

In the four districts under consideration, the District Centers are the locations for most of the Government departments, offices, agencies and related institutions in the area. Two of these, Dhangadi and Mahendranagar are zonal headquarters of the Seti and Mahakali zones, respectively. Both Dandeldhura and Silgarhi-Doti are district headquarters of long-standing, the former is primarilly administrative but the latter is also an important market center in the Western Hills for an area several times larger than the present Doti district.

Before discussing some of the more important development related activities in these districts, several observations regarding implementing machinery or administrative capability should be made. This is important because without efficient implementing machinery, it is not possible to mobilize, allocate and combine the actions that are technically needed to achieve developmental objectives.

In the various offices or posts in which interviews were taken in the four districts, it was found that one of their technical needs, manpower for staffing, was generally unfulfilled. Put differently, almost all the offices were operating with staff below the authorized number which was due either to absenteeism of personnel or unfilled positions. Table 8 presents this situation in the four districts. Breakdown of the descrepancies between the actual and authorized personnel for individual offices, organization, agency, etc., in the four districts visited during the cource of field investigation are given in Appendixes 17-20.

TABLE 8

ACTUAL VERSUS AUTHORIZED PERSONNEL

District	Number of offices contacted	Authorized Staff	Actual Staff	Percentage of Actual to Authorized Staff
Dandeldhura	14	175	148	84.57
Doti	18	122	101	82.79
Kailali	13	188	170	90.42
Kanchanpur	12	170	140	82.35
Total	57	655	559	85.34

SOURCE : Field work.

As may be seen from the above table, actual personnel as a percentage of authorized personnel varied from a low of 82.35 percent in Kanchanpur District to a maximum of 90.42 percent in Kailali District, the average for all four districts being 85.34 percent. While this overall percentage is not extremely poor, it was found in many cases that one or two posts in offices that were not filled were those in the higher grades, in some cases the head officials of the offices themselves. For instance, the Chief District Officer, Panchayat Development Officer and Assistant Panchayat Development Officer in Dori District had been absent from their offices for months at the time of our visit. Likewise, the co-operative office was being run by only a *kharidar* (second ranking clerk) in Dandeldhura. In general, there was a tendency for high officials to be absent for a longer period in the hill districts than in the Tarai.

Far Western Nepal does present many difficulties for officials posted there, particularly in the hill districts. The distance of the entire area from Kathmandu and the difficulties encountered in communications and movement from one part of the area to another definitely merit consideration in making a judgement on the area. The absence of higher level officials or unfilled postings, however, seemed to have an extremely adverse effect on both the efficiency and moral of the offices and more importantly on the attitude of the public towards various offices and their work. When it is often the case that even the highest officials are reluctant to make decisions for themselves and take the responsibility of their outcomes, the function of the government departments, offices, agencies, etc. may be well imagined when there is no one at the top to enforce the decisions, whatever they may be. The construction of the new road into the hills (Dhanagadi-Dandeldhura Road) and development taking place in the Tarai should, if only allowing easier access to the area and easier movement within it, assist government officials in carrying out their roles in the further development of the area.

Apart from the problem of manpower for staffing, other problems encountered were generally related to finances for budgeting, arrangement for procuring and distributing supplies and transmitting instructions, or simply the logistics of supplies, distribution and information. For example, the Cottage Industry Center at Patan, Baitadi District, received only 42.67 percent of the funds requested for its annual budget. As regards to the allocation of funds for medical supplies, it seems that the amount sanctioned is about the same regardless of the number of patients attending the hospital. Not only were the funds provided for medical supplies insufficient, but the problems involved in procuring them is immense. As the medical supplies have to be obtained from India and the channels through which they are procured are time-consuming, much of the medicines distributed by the hospitals and health centers are often useless, aside from being inadequate in supply. Similarly, the cooperative societies can neither get adequate supplies for their requirements nor distribute them to their members for lack of adequate funds and staffing. Generally, it is not often the amount of money budgeted that hampers the functioning of the offices and agencies, but it is the bureaucracy involved in the timely remittance of money to them.

A case may be mentioned in this regard as an example. The Department of Minor Irrigation and Drinking Water in Silgarhi-Doti often receives its funds for its irrigation schemes in the month of *Baisak* (April-May) which it should have received in the month of *Sravan* (July-August) the previous year. In other words, the funds arrive eight months late and they are supposed to be utilized before the end of the fiscal year in the month of *Asadha* (June-July) after which the money is 'lapsed'. This leaves approximately two months for actual construction of irrigation projects. However, no laborers are available during this period (*Jestha-Asadha* [May-July]) as it happens to coincide with the hectic period of agricultural operation in the area. As a result, most minor irrigation projects are ended before the beginning, at best half completed. The personnel involved in construction of these projects remain idle waiting for the funds to arrive which they do again in *Baishakh* (April-May) as in the previous year, but when construction work is resumed on project started last year, little if any trace of work remains and the whole project has to be started all over again. It is quite difficult to comprehend the usefulness of carrying out a developmental project in such a manner, but this seems to go on and on. If the responsible authorities feel that the money and efforts spent in these and similar other projects will yield returns in future with interest, failure of developmetal efforts is beyond doubt with a net societal loss. It is ironic to invest such self-defeating developmental projects when some government offices do not even have a building of their own, let alone office furniture and supplies, and the staff of these offices have to pay rent for their offices on a mutual basis. A case in point here is the Boktan Range Office at Jorayal, Doti District.

SELECTED DEVELOPMENT ACTIVITIES

With these few words of introduction some of the important ongoing developmental activities in the region may briefly discussed. It is not, however, possible to present an elaborate analysis of these activities within the scope of this study. Thus, while we shall examine a few of these in some detail as case studies, others will be merely touched upon, bringing out their general operational situation.

Minor Irrigation Projects. The role of irrigation in increasing agricultural productivity and freeing farmers from rainfall mishaps needs hardly to be emphasized. Major irrigation projects are both costly and time consuming. Moreover, because of topographical constraints these projects are economically feasible only in the Tarai districts. Therefore, only minor irrigation projects are economically feasible in both the hill and Tarai districts considering the constraints imposed by local topography as well as the large amount of investment required both in time and money for major irrigation projects. However, during the course of field investigation in the four districts primarily under consdieration, it was discovered that despite a small number of minor irrigation projects so far undertaken, none had been fully executed. There are several reasons for this which may come to light from the following discussion of a minor irrigation project

undertaken in Doti District.

At the time when Silgarhi-Doti was visited during the course of field study, there were ten minor irrigation projects under consideration. Of these, according to the Engineer of the Minor Irrigation and Drinking Water Project, construction had begun on only one project, the rest had been only surveyed thus far. The Dang Project, in which construction had begun some time back and discontinued later on, is located a few miles southeast of Silgarhi-Doti. This project was estimated to cost Rs. 3 lakhs initially. However, as labor was to be supplied free, and other costs totalling 49 percent of this amount were to be borne by the villagers, the cost of this project was estimate downward at only Rs. 75,000. The major investment required was in the construction of a reservoir and a pipeline to bring water to the fields across a vast downward slope of a ridge which was the site of the proposed reservoir. If both the reservoir and the pipeline were to be constructed, it was estimated that this project would irrigate an area of about 102 hectares. Funds for the construction of this project were received in the month of *Baisakh* (April-May) and construction was begun in the first week of *Jestha*, 2026 (May-June 1969). Shortly afterwards, work on this project was postponed as there was a paucity of labor supply owing to the approach of the agricultural season. Finally, funds appropriated for the construction of this project were lapsed with the end of the fiscal year in *Asadh* (June-July), and until last December when we were in Silgarhi-Doti, no funds had been received under the current fiscal year to resume work on the project.

Cooperative Societies. These societies were organized in order to assist the farmers to help themselves through cooperation in buying, selling, processing, production credit and other related problems affecting their economic interest. At present however, the activities of most cooperative societies are centered on granting credit (in cash or kind) and supplying consumer goods. It seems that the cooperative movement has not had encouraging results thus far, particularly in the hill districts, mainly because membership is limited and as a result, deposits are low. Besides, the Agricultural Development Bank has given loans only to a few cooperative societies, but even so, a ceiling has been imposed beyond which loans are not permissible. Therefore, a number of these requirements were not fully met. Furthermore, the functioning of these societies has not been able to cope with the demands of a substantial proportion of the cooperative membership. These points may be exemplified by discussing the cooperative societies in Dandeldhura and Doti districts in some detail.

Ten Cooperative societies were established in Dandeldhura District in 2020 (1964) among which five were multipurpose, the rest being credit cooperatives. Of these, three have already been closed down and two more are in the process of being dissolved shortly. At present only the Sorar Multipurpose Cooperative Society seems promising, the Bhuwaneshwari Multipurpose Cooperative Society does also, but to a lesser extent. The Sorar Multipurpose Cooperative Society has so far provided loans worth Rs. 2422.10 to its members and also carried on transactions involving sales and purchases of goods.

During the six year period of its existence, it has sold goods worth Rs. 5503.10 which it had bought for Rs. 4290.55, thereby earning a profit of approximately Rs. 1212. On the other hand, the Bhuwaneshwari Multi-purpose Co-operative Society has provided loans to its membership amounting to Rs. 533. Although this figure appears negligible, it is of some significance relative to the performance of other co-operatives in the district which have done hardly anything so far. By and large, most co-operative societies have served very little practical purpose, if indeed any, at all and it appears that they exist just for the sake of existence rather than co-operative services as objectives. Appendix 21 serves as evidence in support of this observation. Aside from the reasons given previously, setbacks in the results of the co-operative movement in Dandeldhura seem to have been enhanced by the sheer inefficiency of the District Co-operative Office which is supposed to provide proper direction in the functioning of co-operative societies in the district. When this officewas visited for the purpose of information collection it was in such a state of disorganization that the officer-in-charge could not locate the office records until he had searched the drawers several times.

The story of the co-oprotive societies in Doti District is almost similar to that of Dandeldhura. There were seven such societies established during the Second Plan period (1962-1965). Of these, four were multi-purpose and the rest were credit cooperatives. However, three of these have been already closed down. The performance of these societies has been far from encouraging which may be seen from Appendix 22.

Agricultural Development Bank. Needless to say, one of the fundamental problems of our agrarian structure is a lack of adequate credit facilities for the financing of agricultural operations as well as capital investments for the improvement of the existing agricultural system. In order to help meet this need, the Cooperative Bank was set up in 1963 which was changed into the Agricultural Development Bank in 1968 for the purpose of broadening the scope of investment in the rural areas. Formerly, it provided loans to the farmers through various cooperative institutions. At present it provides banking services in the rural areas and grants loans to the farmers for the purchase of fertilizers, seeds, insecticides and other agricultural inputs as well as financing agro-based small scale industries. Up to now its sphere of operation has been limited to the Tarai districts presumably where the land reform program has been effectively implemented. The hill districts where credit needs of the farmers are seemingly no less than in the Tarai have been neglected. Dhangadi and Mahendranagar each have branch office of the Agricultural Development Bank. In these areas this bank seems to be playing an important role in providing credit to the farmers, though on a limited scale. For instance, it provided loans worth Rs. 10,600 for irrigation, Rs. 140,000 for mustard sales, Rs. 25,000 for paddy sales and an equal amount for mills in the 2025-26 (1968-69) fiscal year in Kailali District, amounting to a total sum of Rs. 2,000,600.[1] In view of

1 Agricultural Development Bank, Dhanagadi, Kailali District.

the fact that such a facility for credit was non-existent previously, however little these loans may be, their contribution is something to reckon with. Nevertheless, the operation of this bank has to go a long way in restructuring the pattern of the credit system in the area. It is not only that funds appear to be inadequate to meet credit needs, but a real problem involved is administering loans over a large segment of the rural population which live in a much wider area than the present administration is capable of coping with. This being the case, the services rendered by this bank benefit only those few individuals, often already well to do with relatively little needs for credit who are located close to the bank, thereby leaving the majority of the farmers in the hands of the various traditional moneylenders. At the time of field investigation, it was frequently heard that pre-planting borrowing from the *Turkas* Indian moneylenders) was still a common practice among most small cultivators. Should these cultivators who form the majority in the area still borrow money from the *Turkas* who force them to sell their products at a price of their asking, where does the Agricultural Development Bank stand at the moment ? Until these cultivators are freed from the grip of the *Turkas*, the work of the Agricultural Development Bank cannot be considered to have been effective in any measure.

Compulsory Savings Scheme. Another aspect of fulfilling the credit needs of the farmers is through the compulsory savings scheme which was established in 1967 under the Land Reform Program. It attempts to institutionalize rural credit by collecting from individual farmers savings which are used in setting up a revolving fund for the purpose of making credit available to the farmers at low interest rates. At present, the Ward Committee collects in each village under the supervision of the cooperative department compulsory savings at varying rates for the land owner and the tenants. In principle this scheme is an excellent approach to the extent that it curtails excessive social and ceremonial expenditure and develops a saving habit among individual farmers as well as mobilizes domestic resources for financing agricultural development programs. However, in the region under consideration, particularly in the hill districts, the savings collected by the Ward Committee appeared to have pinched some farmers greatly. It was indicated that they had taken loans from the village moneylenders at interest rates as high as 30-40 percent in order to pay the compulsory savings required by them. If the purpose of compulsory savings scheme is to provide to these subsistence farmers at low interest rates, what good is this scheme if it pushes them into taking more credit at rates much higher, thereby increasing their indebtness. Furthermore, it was indicated that most farmers were not aware of the fact that the amount collected by the Ward Committee was refundable with interest at a later date and that they would be able to take loans on account of this scheme. Thus, they regarded this scheme as another tax in disguise and resented it. Moreover, because of the reduction or liquidation of old debts under the Land Reform Program most farmers interviewed said that it has been much more difficult to obtain credit from traditional sources. However, compulsory savings from which the contributors can borrow grain or cash for short periods at 10 percent interest have not so far provided an adequate substitute for traditional

credit sources. Ward Committees cannot provide enough loans because of inadequate savings collected, while farmers can no longer obtain desired credit from village moneylenders. The moneylenders argue that it is uneconomical to make loans at the legal rate of interest (10 percent) and at the same time they are now afraid of charging higher interest rates. Thus, for many farmers compulsory savings appear to have been an added burden. Collecting savings from those who produce substantial surpluses is one thing but collecting "savings" from farmers who are at best, living at a bare subsitence level is quite another. One obvious drawback of the compulsory savings scheme is that savings are collected at a uniform rate per unit of land holding without any consideration as to the quality of the land and the size of the household.

Land Reform. Measures so far introduced under this program include abolition of the intermediary tenures, reform in the land revenue system, imposition of land holding and distribution, tenancy reform, reduction or liquidation of old debts and compulsory savings scheme. The abolition of the intermediary tenure and revenue collecting intermediaries were effectively implemented in most cases. In the hill districts, however, very few persons hold land in excess of the celling of 80 *Ropanies* (4 hectares) and there was very little surplus land to be redistributed under the provision of the Land Act of 1964. Thus, other than the guarantee of rights to tenants, the effects of land reform felt most in the hill districts were the provisions for the interception of loans to farmers and the compulsory savings scheme which was discussed above. Creditors and debtors were required to report their loans and debts which were verified by the Land Reform Officer. The amount of outstanding debt in which interest amounting to more than twice the principal had been already realized was liquidated and those cases in which interest at more than 10 percent per annum was realized by the creditors were intercepted by the government. Instead of paying the amount due to creditor, the debtor was required to pay that amount to the Ward Committee, the local organ of the land reform in the village, which in turn would reimburse the creditor. This sheme has produced the desired effect in the sense that former creditors are now reluctant to advance credit on the same scale as before though, as noted previously, it has not solved the problem of providing credit to the farmers, particularly in the hills where farmers are so dependent upon it for financing production.

In the Tarai districts, the impact of land reform is quite different with decidedly beneficial effects. Aside from the abolition of the intermediary tenures, revenue collecting intermediaries, and the redistribution of land as a result of the ceiling imposed upon land holding as a guarantee of rights to tenants, this program has helped a great deal in breaking the grip of the moneylenders over the Tharus, though the moneylenders, as noted before, still reap a major share of the profits in buying agricultural produce from the Tharus by virtue of their credit relations. The moneylenders are now much more reluctant to advance credit than before, but the Tharus still go to them because their real need for credit is less for the requirements of agricultural inputs, for they produce a sizable surplus, than for increased consumption of goods which was encouraged by the moneylenders. This suited the latter's

ends by keeping the Tharus indebted so that they could be pursuaded to sell their products at their creditor's price while on the other hand, it was also convenient for the Tharus who did not have to wait for cash until the crops were harvested. Therefore while the intereception of loans has served in freezing the traditional sources of credit in both the hill and Tarai districts, it has left a wider gap to be filled in the former where farmers can depend less upon their own resources to finance production than in the latter.

Agricultural Extention. It is a basic instrument through which modern yield-increasing techniques are imparted to the tradition-bound farmers. However, efforts to assist farmers through extension services in the region under consideration are mainly concentrated in the Tarai districts-Kailali and Kanchanpur which have District Agriculture Development Office. Recently a limited number of Junior Technical Assistants (JTA) have been assigned to the hill districts where they operate under the District Panchayat Office. The main functions of these JTA's are to assist the farmers to improve the level of agricultural technology they apply so that agricultural yields could be increased. There is also an Agricultural Farm at Dipayal, Doti District, and a Horticultural Farm in Baitadi, but their functions are primarily those of an experimental station. Thus, the extension services do not seem to have produced any significant results, particularly in the hill district. There are several reasons for the less successful outcome of the Agricultural Extention programes. Foremost is not only that the number of JTA's is few, but they are also inadequately trained with little relevant experience to extend to the farmers. For instance, there are now seven JTA's in Kanchanpur and three in the Doti District. In the hill district where travellig only fifteen miles a day proves to be an arduous task, efficient coverage of the whole district by a mere three or four extension staff seems nothing but absurd. The power of extention programs lies in demonstrating to the farmers that the new methods are superior to the old ones but it so often happens that the JTA's do more lecturing than demonstrating. This was borne out during the course of field investigation when we were informed that the usual methods of extension services was first to gather a larger number of farmers from different villages and to teach them everything about the modern methods of crop cultivation. Having attended a few of these lecture sessions by the JTA's farmers now seem not even to bother with this sort of extension services. Although this situation is quite lamentable, it seems rather difficult indeed to put the blame solely upon the JTA's, for how can actual demonstrations be possible when a JTA has to look after so many village. Furthermore, unless various factors of production such as improved seeds, fertilizers and insecticides are available, technical advice alone cannot produce any spectecular results. However, as with many developmental efforts, application of these inputs has so far been quite minimal. For example, improved rice seeds covered only 1.53 hectares in Doti and 7.18 hectare in Dandeldhura in 2025-26 (1968-69). What is needed in making the extention services more effective is not only to improve quality and sphere of technical advice as such, but also making the various quality inputs for production available at the right time and place.

Cottage Industry. At present, whatever little effort there has been towards development of cottage industry in the region appears to be rather frustrated. This judgement was borne out by our observation of cottage industry centers located at Patan, Baitadi, and Silgarhi-Doti which provided training in various crafts such as weaving, spinning, furniture-making, carpentry, etc. The training course spanned a period of approximately two years and the trainees were paid between Rs. 40/ to Rs. 60/ monthly, depending upon the year of their enrollment. The problem was not only that the goods produced in the course of training exercises could not be sold because of their high prices as most of the raw-materials had to be imported from India, but more importantly, there were no arrangements made whereby these trainees could utilize their newly gained skill. This being the case, all the the money spent the these cottage industry training centers appeared to have been completely wasted.

There are several prerequisites for the cottage industry to be able to contribute to the local economy and for its products to be able to be utilized for import substitution. Foremost is the requirement for market research and the creation of desire for the products either by invoking nationalism (as Gandhi did) or by adopting a pricing policy in favour of cottage industry products. Promoting cottage industries without considering these requirement, as has often been the case, is not likely to produce any significant results.

PANCHAYAT PROJECTS

Generally, *panchayat* projects cover a wide range of activities. These projects involve construction of *kulo* (irrigation ditch), bridges, culverts, and school and panchayat office buildings, footpaths, roads, ponds, wells, watertaps and a number of other structures which are of immediate need or interest to the villages and district *panchayats* concerned. Part of the funds for these projects is provided for by the central government and is channeled through the District Panchayat Office of each district which in turn distributes it to the village panchayats within its jurisdiction. The rest of the cost involved in these undertakings is made up of labor and cash contributions by the villagers.

Judging from past records, it appears that much of the funds allocated among various projects so far undertaken had been expended on *panchayat* office building, *kulo*, ponds, bridges and wells, though there were significant variations as regards to their priorities in each district. The districts of Doti and Kailali were on top of the list as far as their emphasis on panchayat office building project was concerned. In the fiscal year 2022–23 (1965–66) and 2024–25 (1967–68), these districts spent almost half of their total project expenditure in the construction of panchayat office buildings alone. During the corresponding period, bridges took a major portion of the total project allocation in Kanchanpur District (29.08 percent) and in Dandeldhura construction of ponds consumed a similar share of the total project expenditure, although almost the same amount was also allocated to the *kulo* construction. Apart from the first ranking projects in these districts mentioned above, projects related to providing irrigation invariably ranked second in all the districts under consideration with the exception of Kanchanpur where irrigation had the lowest priority with only 4.46

percent of the total funds allocated to it during the 2022-23 (1965-66) fiscal year period. Although no answer was found as regards to the lower priority of irrigation among the *panchayat* projects in this district, it might well be due to relative availability of water and the high man-land ratio as compared to the hills. It is interesting to note that while bridges were the third ranking projects in the hill districts, these were brick wells in Kailali and panchayat office buildings in Kanchanpur.

In terms of total funds made available for various *panchayat* projects during the above mentioned period, Doti had the highest amount (Rs. 667,514), followed by Dandeldhura (Rs. 337,922) and Kanchanpur (Rs. 97,135). This would indicate a substantial disparity amongst these districts as regards to absolute investments. However, in view of the numbers of different projects undertaken in each district, such a disparity is not shown. During the 2023--24 (1966--67) and 2024--25 (1967--68) fiscal year periods, there were 117 *panchayat* projects in Doti district, 64 in Dandeldhura, 32 in Kanchanpur and 18 in Kailali which would indicate an average of Rs. 5,270 and Rs. 5,705 for each project in Dandeldhura, Doti and Kailali districts and an average of Rs. 3,678 for Kanchanpur. A summary of various panchayat projects in these districts is shown on Tables 9 through 12.

Although development activities as reflected in the above mentioned tables seem to be significant in many respects, their results appear to have been less than encouraging. In addition to problems involved in the implementation of developmental projects, it appears that one of the main reasons for the discouraging results of most developmental projects is that they were not comprehensively worked out. One specific case may be cited in this regard. Construction of an airfield had been initiated in Dandeldhura in 2020-2021 (1963--64). However, after having invested approximately Rs. 20,000 in government funds and local labor worth Rs. 25,000 this project was abandoned for reasons of unfeasibility due to wind direction.

As regards to more general cases, examples may be drawn from the construction of irrigation channels which is one of the main projects undertaken in districts under consideration. Most of these irrigation channel projects are completed in a short period, usually during the dry season. However, as most of these projects are simply dug out without any consideration for the natural drainage system and without a concrete base to withstand the floods which frequently occur during the rainy season, they are often completely swept away in the first brust of a heavy monsoon. Thus, each year's efforts are nullified by another year's rain, or some other hazard with the result that the net effect is only a total loss. While the undertaking of many *panchayat* projects may be ragarded as a triumph of mobilizing local resources, because of a lack of a foresight in planning and management each such jump has ultimately become a setback. The main factors contributing to this are inefficiency of the officials in village and district panchayats and a lack of technical advice in formulating the projects.

TABLE

PANCHAYAT PROJECT ALLOCATION IN DANDELDHURA DISTRICT

[FY. 022-023, 024-025 (1965-66, 1967-68)]

(in Rupees)

Project Name	Number of Project	Contribution of Village Panchayat	Percentage Contribution of Village Panchayat to Total	Contribution of District Panchayat	Percentage Contribution of District Panchayat to total	Total Contribution	Percentage to total Contribution	Priority Ranking
Kulo	18	40,414.52	23.40	37,559.52	22.73	77,974.04	23.07	2
Brick Bridge	1	2000.00	1.16	2000.00	1.21	4000 00	1.18	13
Wooden Bridges	8	31,780.50	18.40	31,780.50	19.23	63,561.00	18.81	3
Suspension Bridge	2	10,222.00	5.92	10,222.00	6.19	20,444.00	6.05	4
Foot Path	1	2129.50	1.23	2129.50	1.29	4259.00	1.26	12
Well	5	5640.50	3.27	5640 50	3.42	11,281.00	3.34	8
Tube-well	1	5539.50	3.21	5539.50	3.35	11,079.00	3.28	9
Pond	15	40,058.50	23.20	38,421.50	22.25	78,480 00	23.22	1
Irrigation Pond	2	5025.00	2.91	5025.00	3.04	10,050.00	2 97	10

TABLE 9 -- *Continued*

Project Name	Number of Projects	Contribution of Village Panchayat	Percentage Contribution of Village Panchayat to Total	Contribution of District Panchayat	Percentage Contribution of District Panchayat to Total	Total Contributiona	Percenatge to Total Contribution	Prioritiy Ranking
Drinking Kulo	1	791.50	.46	791.50	.48	1583,00	.47	15
Middle School Building	1	8976.00	5 20	6000.00	3.63	14,976.00	4.43	6
Irrigation	1	1771.00	1.02	1771.00	1.07	3542.00	1.05	14
Reservoir	3	6487.50	3.76	6487.50	3.93	12,975.00	4.43	7
Primary School Building	2	9259.00	5 36	9259.00	5.61	18,518.00	5.49	5
Panchayat Office Building	3	2600.00	1.50	2600.00	1.57	5200.00	1.54	11
TOTAL	64	172,695,02	100.00	165,227.02	100.00	337,922.04	100.00	–

SOURCE : District Panchayat Office, Dandeldhura.

TABLE 10

PANCHAYAT PROJECT ALLOCATION IN DOTI DISTRICT

[FY. 022-023, 024-025 (1965-66, 1967-68)]

(in Rupees)

Project Name	Number of Projects	Contribution of Village Panchayat	Percentage Contribution of Village Panchayat to Total	Contribution of District Panchayat	Percentage Contribution of District Panchayat to Total	Total Contribution	Percenatge to Total Contribution	Priority Ranking
Sanskritik	4	1745.00	.47	1745.00	·60	3490.00	.52	9
Pond	9	22,149.00	5.92	14,738.00	5.03	36,887.00	5.53	4
Dhara	23	7074.95	1.89	6218.00	2.12	13,292.95	1.99	7
Panchayat office								
Building	44	162,064.24	43.28	146,337.18	49.93	308,401.42	46.20	1
Kulo	39	108,632.24	29.01	70,607.00	24.09	179,239.14	26.85	2
Well	29	19,609.32	5.24	14,602.50	4.98	34,211.82	5.13	5
Bridge	26	40,940.00	10.93	26,757.50	9.13	67,697.50	10.14	3
Public Hall	2	4027.40	1.06	3894.00	1.33	7921.40	1.19	8
Pipeline	1	8186.50	2.20	8186.50	2.79	16,373.00	2.45	6
TOTAL	177	374,428.55	100.00	2,93,085.68	100.00	167,514.23	100.00	—

SOURCE : District Panchayat Office, Doti.

TABLE 11

PANCHAYAT PROJECT ALLOCATION IN KAILALI DISTRICT

[FY. 022-023, 024-025 (1965-66, 1967-68)]

(in Rupees)

Project Name	Number of Project	Contribution of Village Panchayat	Percentage Contribution of Village Panchayat to Total	Contribution of District Panchayat	Percentage Contribution of District Panchayat to Total	Total Contribution	Percentage to total Contribution	Priority Ranking
Panchayat office Building	7	24,057.50	49.03	24,057.50	50.05	48,115.00	49.54	1
Pond	1	2000.00	4.08	2000.00	4.16	4000.00	4.12	5
Bridge	1	3000.00	6.11	2000.00	4.16	5000.00	5.13	4
Irrigation	1	12,000 00	24.44	12,000.00	24.96	24,000.00	24.70	2
Well-brick	6	6750.00	13.76	6750.00	14.05	13,500.00	13.91	3
Tube-well	2	1260.00	2.58	1260.00	2.62	2520.00	2.60	6
TOTAL	18	49,067.50	100.00	48,068.50	100.00	97,135.00	100.00	—

SOURCE : District Panchayat Office, Kailali.

TABLE 12

FANCHAYAT PROJECT ALLOCATION IN KANCHANPUR DISTRICT

(FY. 022-023, 024-025 [1965-1966, 1967-1969])

(in Rupees)

Project Name	Number of Projects	Contribution of Village Panchayat	Percentage Contribution of Village panchayat to Total	Contribution of District panchayat	Percentage Contribution of District panchayat to Total	Total Contribution	percentage To total Contribution	priority Ranking
Brick-well	11	16,853.00	27.28	14,327.00	25.58	31,180.00	26.47	2
Tube-well	9	9475.01	15.34	9475.01	16.92	18,950.02	16.09	4
Bridge	8	17,124.00	27.72	17,142.00	30.58	34,248.00	29.08	1
Kulo	1	4252.00	6.87	1000.00	1.79	5252.00	4.46	6
Panchayat Building	2	9640.82	15.61	9640.00	17.21	19,280.82	16.37	3
Foot path	1	4435.00	7.18	4435.00	7.92	8870.00	7.53	5
TOTAL	32	61,779.83	100.00	56,001.01	100.00	1,17,780.84	100.00	—

SOURCE : District Panchayat Office, Kanchanpur.

For instance, during the period of field investigation at Dhanagadi, there were only 19 out of 44 village panchayat members elected for the district assembly and they had not had any meeting in two years. Despite that knowledge of the Dhanagadi-Dandeldhura Road now under construction, officials in the Dandeldhura District Panchayat when interviewed had little awareness of any possible benefits from the road other than assessment of tax. Regarding town planning in Dandeldhura, discussions had been held in the district assembly in 2023 (1966), but no details were formulated.

Another problem is perhaps, for lack of a proper term, "the number-consciousness" of these officials. As a result of this, emphasis is often given to undertaking a large number of projects, probably with a motive to look good on records, which necessitates division of limited funds amongst too many project so that technical requirements are not fully met for successful implementation of the projects.

Despite the observations made above, local developmental efforts have taken place nonetheless, but how far these have been successful is a different matter, for an indication of the existence of development projects alone is not a measure of a success. What matters most is whether such projects have contributed to the total output of goods and services and increased the level of living in the region. With the information at hand, it is not possible to verify this matter quantitatively but from our observations during the course of field study and judging from the performance of various projects, it appears that actual gains have been minimal at best. This may be regarded as something better than nothing, but with the population growing rapidly and the quality of the main resource--agricultural land--steadily deteriorating from erosion and soil exhaustion, the task ahead is tremendous. Yet most people involved in developmental efforts seem to be inclined to be satisfied with just number accomplishments; the fact that a new hospital has been built, say in Silgarhi--Doti, can be regarded as a sign of an accomplishment but what if there were no doctors or medical supplies to treat the patients?[2] The main problem appears to be that the planners are most unwilling to admit their failures and try to find out where they went wrong. This is an immense problem and unless it is overcome first, it might be indeed difficult to devises ways and means to solve the country's developmental problems.

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[2] Actually, when we visited the Prithvi Chandra Hospital at Silgarhi-Doti, two doctors assigned to this post had taken a leave of absence for four months. The number of patients (inpatients and outpatients) registered last year were 25,207 but the total budget for the operation of the hospital was approximately Rs. 38,403 plus some contributions from voluntary sources. At least the situation of hospital here did not look as bad as in Baitadi where the hospital was recently converted into a health center.

CHAPTER VI

SOME GUIDELINES FOR DEVELOPMENT PROGRAMS

STRATEGY OF DEVELOPMENT

Although consideration of a detailed resource appraisal was essential for formulating guidelines for development programs, such an approach was not possible due to several constraints noted previously. However, it is hoped that the following discussion would have provided some broad guidelines upon which to formulate specific development programs for the region under consideration.

As indicated by available information, significant mineral deposits and, with the exception of a hydro-electric potential yet to be developed, energy resources are virtually non-existent. There are good stands of forests, particulary in the Tarai districts and in

more inaccessible areas in the hills. If properly exploited, this resource could considerably contribute to the economy of the region. However, a large scale development of this resource will have to await a development of transportation in the area. When the Dhanagadi-Dandeldhura Road is completed, it will provide access to *sal* forests in the Tarai as well as to some fairly good stands of pine forests in the areas south of the Mahabharat Lekh between the road and Jorayal in Doti and towards Jogbura in Dandeldhura as was noted in Chapter 3. Thus, apart from the potential for the exploitation of hitherto inaccessible *sal* forests in the Tarai, the above mentioned pine forest in the hills might be exploited for pulp wood, timber and resin. Use of this forest for timber will require proper seasoning of the wood. If resin is extracted improperly, it kills the tree itself as has been the case in Baitadi District where resin tapping has been promoted under contract. For this reason resin tapping should be allowed only under proper supervision. Thus, there exists a good potential for exploitation of the forests in the area, but prior to formulating a specific program for the development of this resource, these forests should be brought to a state of maximum production consistent with the needs for soil and water conservation which is a task for the forest experts.

There is a lack of industrial raw materials and infrastructure in the region as a result of which there is no possibiliiy of a large scale industrial development within the foreseeable future. However, since major development in the region will be mainly in the primary sector, which will be subsequently dealt with, some processing industries such as saw and rice milling units could be set up, primarily in the Tarai districts. In order to absorb the surplus labor in the region, cottage indastries should be developed which are employment intensive rather than output generative. As their effects on the total income may not be expected to be substantial, these industries should be regrded more in the nature of a supplementary activity rather then a basic one. Considering the accesssbility to be provided by the Dhanagadi-Dandeldhura Road, tourism appears to be another possibiiity which could be promoted to augment the income of the hill districts in the tertiary sector. However, in view of the fact that this region is located far away from Kathmandu and adjoining districts of Almora and Nainital in India have already somewhat developed tourist facilities, the development of a tourist industry does not appear to be feasible at this time.

Since agriculture is the most important activity in the region in terms of both income and employment, development programs will have to be primarily based upon a consideration of the available agricultural resources in the area. The most important agricultural resource we have is the land which has been put under extreme pressure to produce food in the hill districts by expanding cultivation onto steep slopes which for ecological reasons should be left under natural vegetation cover. Even the available land resources which are capable of yielding high income if used to grow commercial crops are used instead to grow the relatively low value crops like inferior foodgrains in order to meet the food requirements of the local population. Such an uneconomic utilization of land has been forced on this region primarily because the population and its requirements for foodgrain have

steadily increased over the past several decades. Secondly, the urgency for self-sufficiency in the production of foodgrains in the hill districts has been caused by the inadequacy of transportation facilities. At present, the sole means of transportation are either human being or pack animals which make transportation slow, uncertain and very expensive. It also makes marketing of farm outputs expensive and raises the cost of bringing inputs. The Dhanagadi-Dandeldhura Road will facilitate importation of foodgrains and other agricultural inputs within its service area in the hills, but it alone cannot generate substantial income to pay for these imports from the Tarai. Therefore, for a rapid economic development of the region under consideration emphasis will have to be mainly on ensuring a more efficient utilization of its existing land resource. Accordingly, two most prominent aspects of this strategy would be (a) to have a radical change in the land-use patterns along scientific and economically more remunerative lines and (b) to develope a well-knit market structure providing a transportation network so as to enable the economy of the region to derive maximum benefit from the first step. The former will involve substitution of land resource utilization from low value to high value crops, a rapid switch over from field crops to fruit crops in selected areas, primarily in the hills, and a large application of various inputs to raise agricultural productivity while the latter would enable the economy of the region to be more responsive to developments in output sectors.

Substitution Possibilities and Alternative Cropping Patterns

The changes in land-use patterns will involve the allocation of land for forests, pasture and agriculture with regard to the need and techno-economic possibilities for these purposes. Within agriculture, intensification rather than expansion of present agricultural use of the land is suggested for the Tarai districts. In the hill districts, in addition to use of yield-increasing techniques, restructuring of the present land-use patterns by means of a substitution of land from low value to high value crops and from field crop production to horticulture are recommended.

The cropping pattern suggested in the following discussion is only general and not exhaustive. A closer look at the farm and village levels is likely to reveal still larger possibilities. It may also be pointed out that a given set of cropping patterns is not always the best. Like many other things, it is also time related. With the passage of time, demand as well as supply conditions may alter and a new set of cropping patterns may then be profitable. Hence, an occasional review of the situation would be beneficial in determining whether a change in the cropping pattetrn is desirable.

In view of the fact that crop cultivation has been extended to marginal lands in the hill districts due to population pressure, the scope for bringing additional area under cultivation is extremely limited. This could be done in Tarai district to a limited extent, but if this is carried too far it will bring some unfortunate consequences; not only will it bring some ecolo-

gical imbalance, but will also cost the country some of her finest resource—the forests.[1] Recognizing that improper terracing causes soil erosion in the districts, it would be a most prudent policy to evolve a more efficient land-use pattern. At present the forest areas appear grossly indequate in the hill districts and this deficiency should be made up by a bold program of afforestation which should come mainly from the area classified as "temporary pasture" and "barren lands." Since the nature of the barren and cultivable westelands is not precisely known, it is necessary to undertake scientific land-use survey of these areas to determine how much of the land can be brought under agriculture, pastures and forests. It is suggested that higher slopes (lands with a slope of 35 or more) be permanently given to forest cover.

Pasturing lands in the hill districts are in bad condition as cattle are allowed to graze even before the grass grows fully, and as pointed out previously, the entire hilly region suffers from an acute shortage of fodder. The uncontrolled grazing of the existing pastures leads to soil erosion. Berseem and lucerne crops, which provide excellent feed for the cattle, appear to be unknown in the areas visited. Thus, given these crops are adaptable to the region, it is necessary to cultivate these or similar crops to improve the productivity of existing pasturage and grazing lands. What is needed is better pasture managemnt. Encouragement should be given to the growing of high-yielding and leguminous fodder grass. The pastures should be rejuveneted by re-seeding them with nutritious, fast growing and environmentally suited seeds. Overgrazing should not be permitted and pastures should be set apart for cattle and buffaloes, and sheeps and goats. The pastures should be controlled by introducing a rational grazing system in which a portion of the pasture is kept closed alternately for some period to prevent overgrazing and to let the grass grow fully. For carrying out the program of pasture development there will have to be close co-ordination between the agriculture and forest departments.

From the point of view of efficiency, the present cropping pattern results in a net loss of income. A substantial proportion of cultivated land is left fallow each year, especially during the winter season. Normally, land is kept fallow for the purpose of restoring the fertillty of the soil. However, if a proper rotation of cropping is adopted along with soil conservation techniques, the enrichment of the soil would be a natural process and a good portion of the land presenlty fallowed could be brought under cultivation. Also chemical fertilizer, compost and green manure can be used to restore the soil fertility. However, returns on these investments should first be analized within the context of the whole farming enterprize in the region. Unfortunatly, data for such a study is lacking. As increase in the net sown area will have to come mainly from the existing fallow lands, particularly in the hill districts, it is high time to take necessary measures to change the present fallowing

[1] This interpretation is based upon the persent demand for the Tarai Timber in India for making railway sleepers and other construction purposes. However, recent technological developments regarding substitution of various metals for these purposes may alter this demand for the Tarai timber.

system so that a maximum proportion of the land presently held as fallow could be utilized in agricultural production.

The most significant change in the cropping pattern should come from intensifying the cultivation of cereal grains in the Tarai districts. In the hills, such an intensive cultivation of foodgrains should be concentrated in the valley bottoms and the immediate slopes above them, substituting the upper terraces thus far used for food production to the cultivation of fruits and other cash crops. The main reason for the development of fruit cultivation is not only that the environmental conditions look eminently favorable, but also the output value per unit area from such a cultivation may be approximately 10 times as much, or even higher than from cereal grain cultivation. Another reason for horticultural development is, of course, due to the availability of transport facilities on account of the Dhanagadi-Dandeldhura Road. Regarding foodgrains, the area under maize and pulses should be stabilized while that under rice should be increased by reducing the acreage under millets and other food crops. The cultivation of wheat and barley during the winter season should also be increased. The increase in the output of foodgrains should, however, come mainly from the greater use of inputs and by improving the cultural techniques. Soyabean being rich in protein and oil content could be encouraged in the hill districts, provided that its cultivation is environmentally feasible. Efforts should be made to evolve a slightly earlier variety to fit the cropping pattern so that it could be intercropped with maize and pulses to recoup soil fertility. Chili pepper seems to represent a good potential for increased cultivation, for they have good yields and bring substantial cash return. There is also a good scope for extension of potato cultivation, particularly in high attitude areas. As three to four crops of potatoes can be harvested in a single year and it can be grown in a wide variaty of soils and climatic conditions, increase in the cultivation of potatoes should be given due consideration, primarily in the hill districts. If potatoes could be substituted as a staple diet, it could lessen the problem of food self-sufficiency in these districts. However, aside from other requirements, this would involve creating a taste for potatoes.

In order to develop horticulture in the hill districts, a detailed programming will have to be conducted based upon soil and climatic conditions within these districts. At this point it cannot be said how much land might be brought under horticulture and what would be the cost of this program. An important consideration to take note of is that the fruit grown in the hill districts may not be wholly absorbed in the local and Tarai markets and outlets will have to be found for marketing them in India

In view of the fact that horticultural development have already occurred in the Kumaon and Garwal districts, finding a market in India for our horticultural products will largely depend upon a favorable pricing policy and quality control. In any case, the potential for fruit culture in the hill districts looks promising and measures for exploiting it should be stepped up. Another possibility for changing the existing cropping pattern would

be additional vegetable growing. At present very few vegetables are grown beyond family consumption needs and in some of the areas visited vegetables, with the exception of potatoes, were not grown at all even for household consumption. One probable reason for not growing vegetables is that it competes directly with the production of foodgrains. Many of the vegetables sold in Tarai markets such as in Dhanagadi and Mahendranagar now comes from accross the border. Thus, vegetable growing both in the hills and Tarai districts should be encouraged. For not only does there seem to be a demand for vegetables, but the area is also well suited to growing them, particularly in the hill districts. One important reason for encouraging vegetable production is that, given the existence of a market, it will bring about higher returns per unit area of land than cultivation of any other foodgrains. Apart from producing vegetables for direct local consumption, there is also a good possibility of growing them for seed purposes because high altitude climate generally facilitates production of disease-free seeds. Furthermore, when the Dhanagdi-Dandeldhura Road is completed, vegetables from the hills can be exported to the Tarai plains and beyond at off-season because of the seasonal differences when they are grown at high and low altitudes.

For a proper program of horticultural development, it would be necessary to strengthen the existing government orzanization. Funds to this organization will have to be increased substantially. An important pre-requisite for this program is this adaquate availability of fruit plants of approved quality for plantation. At present there is only one horticultural station in Far Western Nepal which is located in the Baitadi District. This station certainly would not be adequate should the Government launch a full-fledged horticultural development program. Thus, more horticultural stations and orchard nurseries should be opened, their locations being carefully selected and backed by generous financial grants and technical aid.

The farmer's acceptance of fruit culture at the cost of foodgrains cultivation will not be easy to come by as was discovered through inquiries on the spot. The main reason is that farmers will have to wait for five to ten years for a return. With very small holdings which are not economically viable they cannot afford to switch over from crop cultivation to fruit cultivation. This could be overcome partly by growing inter-crops in the orchard for the initial period of four to five years. Alternatively, as indicated before, foodgrain production in the valley bottoms and lower terraces should be intensified so that land in the upper terraces, presently used for foodgrain production because increased population pressure, could be substituted for the growing of fruit trees. However, the government must provide long-term subsistence loans at nominal rates of interest. To offer inducement, a small part of this loan could be given as a subsidy. It is possible that small cultivators might be denied this loan because of inadequate holdings for security. It is suggested that the loans should be given to them also In order to prevent misuse of the loan, which might be the main argument against giving loans to them, it should be given in kind and on the security of the orchard planted. In addition, some interest-free loan on the basis of size of holding and family should be given to farmers for subsistance. The length of the loan period should depend upon the time

required for the particular type of orchard to bear fruit.

The suggested changes in the existing cropping pattern of the region are intimately linked with the provision of additional irrigation facilities and proper water management. Indeed, irrigation seems to be the most critical input required for any increase in the agricultural production of the region. This judgement was borne out by our observations in several areas of the region and also by the priority given to irrigation projects by the village and district panchayats which was discussed in the preceeding chapter.

At present, very little of the net sown area in the region is cropped more than once. Ordinarily, the reason for the low intensity of cropping is due to the lack of an ample water supply. Thus, increase in irrigation facilities and wide use of water conservation techniques have great possibilities for increasing the production of crops. For topographical reasons, rainfall in the hill districts usually drain from the fields as soon as it falls. Much of this could be checked, and very profitably, if bunding were taken up on a large scale. By increasing the moisture content of the soil, in many cases this would also help to substitute less remunerative crops (e. g., millet) by more remunerative ones (e. g., oilseeds). Returns on this type of invesment, allowing zero or minimal opportunity cost for labor, would be quite high.

In the hill districts irrigation potential exists mainly in the form of *kulo*, and to some extent probably ponds and "lift". Of these, *kulo* seems to have the maximum potential as it is the most common form of irrigation used in Far Western Nepal. The problem with *kulo* construction derives mainly from inadequate survey before undertaking the actual construction. Usually, sites selected for construction require considerable maintenance and repair costs. One of the main causes of high maintenance and repair costs is that practically *kulos* are merely dug-out channels for water flow without any concrete foundation, and a consideration of the drainage systems as was noted in the last chapter. At present, minor irrigation and *panchayat* irrigation projects do not seem to be making any headway in increasing irrigation facilities. It is suggested that a concentrated effort be made to provide more irrigation facilities in the region. This would be a step in the right direction which should be further strengthened by allocation of more funds and technical advice.

In the hill districts it is almost always difficult to irrigate fields in the upper terraces as most *kulos* run through the middle of the ridge on which terraced fields are carved out or on the valley bottoms. As a result, the fields above the *kulos* cannot be irrigated. Hence, in order to distribute water more widely it may be lifted from perennial streams by means of pumping sets or hydraulic rams and stored in reservoirs above the terraced fields. From these reservoirs water may be distributed to the surrounding cultivated area by constructing a network of canals. The costs for such a scheme would be quite high and their economic as well as technical feasibility will have to be properly evaluated. Possibilities of providing irrigation water through pipelines should also be investigated where construction of canals involves carrying water along steep hill slopes and crossing a large number of drainage areas.

Aside from irrigation facilities other inputs critically needed for intensifying agriculture, are manure, fertilizers, improved varieties of seeds, and control of disease as well as pests. Animal manures now extensively used mixed with leaves, straw, or sometimes ashes to form compost, are not sufficient to increase yields from the depleting soil. The soil in the hill districts appears to be deficient in calcium and phosphorous probably due to soil erosion. This deficiency should be recouped in order to increase agricultural yields by application of chemical fertilizers, but this added fertility cannot be maintained without first stopping the soil erosion. The soil also appears deficient in organic matter and nitrogen, especially in the hill districts. It would be useful to apply nitrogenous fertilizers to support greater intensity of cropping.

At presnt farmers are not in a position to resort to large scale application of fertilizer to increase agricultural productivity. The reason for this is quite obvious. Because of their low purchasing power farmers cannot afford to purchase fertilizer nor can they obtain it any other way as was pointed out before. The co-operative societies are no help in alleviating this problem. It is, therefore, suggested that every Village Panchayat, preferably each Ward Committee, should have a fertilizer depot and an arrangement whereby farmers can use this facility. Transportation difficulties in the area cause the fertilizers to be quite costly. Thus, this cost should be borne by the government as a subsidy.

Use of improved seeds is essential for improving existing yield rates. Growing of rust-resistant and high-yielding varities is necessary in order to increase agricultural production. Research to evolve resistant and high-yielding varieties of good quality seeds for the agro-climatic condition of the region under consideration and supply of the seeds from multiplying seeds farm is, therefore, a matter of great necessity. In recent years, improved varieties of seeds had been distributed by the government. However, their effect on increaing yield was very limited. With the exception of paddy, other seeds did not adapt to the area and farmers subsequently gave up planting them. Even paddy did not have much success. One of the reasons for such results was that pratically all the improved seeds distributed were developed outside the region and as they are effected by micro-environmental conditions, the seeds did not produce expected result. In view of this fact, improved varieties of seeds must be developed in the region itself and as the hill districts have a natural handicap with regard to transportation, it is suggested that a number of seed-multiplying farms be set up therein. Progressive farmers may also be encouraged and trained to produce better seeds on their farms in order to supply improved seeds to other farmers. In selecting the seed farms care should be taken in selecting locations representative of soil and climatic conditions of large areas within the region where overall transport costs are minimal.

It is also essential to control disease and pests because they cause considerable damage to field crops. Fungus diseases such as wheat rust, smut, food and late blight of potatoes are quite dommon and they spoil the quality and decrease the yield. It is therefore suggested that farmers should be taugh through demonstration to control diseases. Necessary

supplies of equipment and chemicals as well as know-how should be provided in each Village Panchayat. Particularly if horticulture is to be developed, it is necessary that ample technical advice be given to the cultivators along with provisions for pesticides and spraying equipment. This will necessitate creation of centers and sub-centers in the region for plant protection work.

In order to carry on intensive agriculture, it is also necessary that soil resources be properly conserved, particularly in the hills. Cultivation in the hill districts 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 surplus run-off and exhaustive crops (e. g., maize and wheat) that are grown year after year. All these factors, in addition to the destruction of the natural forest, burning and overgrazing, are aggravating the erosion problem.

Soil conservation in the hill districts requires a proper land use program combined with water management and cultural practices. Trees, preferably fruit trees, should be planted on hilltops and steep lands with more than forty percent slope. Moderately slopping lands should be cultivated only by means of bench terracing which consists of a series of platforms having suitable vertical slopes. Proper marginal bunding and backward sloping terraces, contour village, construction of grassed waterways, green manuring and growing of close cover crops such as grasses and legumes are some of the soil conservation measures which should be carried out in order to intensify agricultural programs although the cost involved in adopting these measures might be relatively higher in the hills than in the Tarai due to the ruggedness of the terrain.

An efficient cropping pattern which will maximize net return from the land is unlikely to evolve in this region without some external stimulus. Farmers who may want to follow such a pattern do not have the funds to invest nor do they possess the know-how that may be necessary for changing the cropping pattern. Another reason, probably a more important one, is that they are guided by traditions. In continuting the same cropping pattern as their ancestors followed they have a valid reason of generations of experience. On the other hand farmers are not foolish enough not to accept change whenever they are shown a better cropping pattern which will maximize their social and economic objectives. However, the stimulus will have to be provided by the government and will require, in addition to several other things to be dealt with later, arrangement for the education of the farmer in several technical fields and overcoming their resistance to a new cropping pattern to which they are unaccustomed and about which they are suspicious. The purpose of the existing Agricultural Extension Program is broadly in conformity with the above requirement. However, as was noted previously, the functioning of this program has as yet left much to be desired.

In translating the suggested guidelines into specific development programs for the region, much more sustained efforts will be needed. Technical knowledge will have to be disseminated regarding the proper use and dosage of different types of fertilizers, the timely

and efficient use of water, the cultivation of different varieties of fruits from the pre-sowing time to the stage of fruitation including intermediate cultural operations and regarding standardization and grading of the final produce to obtain fair prices. Hence, it is recommended that much more impetus be given to establishing more exension services in the areas where the scale of operations for each activity would justify such an impetus. Similarly, in view of the terrain and difficulties involved in travelling distances, the area of operation for each extension worker should be reduced. In addition, for imparting training to the farmers, courses on practical training should be arranged, emphasis being given to personal participation of the trainees in the field operations under conditions similar to those found in their own locality.

The success of the proposed program will by and large depend upon the availability of adequate credit on easy terms. There will be a need for credit for seeds fertilizers, implements, irrigation and so forth. For these overall requirements, credit should be made available at the local level through Ward Committees, Village Panchayats and cooperatives or other organized agencies, adequate provision for credit being properly linked with arrangements for the supply of inputs.

The major investment in the hill districts as well as in the Tarai should be for irrigation facilities. As pointed out earlier, detailed surveys of individual irrigation schemes are necessary before precise costs and benefits can be firmly estimated. Another major item would be setting up improved seed farms, nurseries for fruit plants and organizing a system for supplying fertilizers. Other programs should be soil conservation and rehabilitation of pastures and grazing lands.

Animal husbandary can also serve as an important source of supplementary income as it has been doing in the hill districts for many years. However, the strategy of development should be based upon the suitability of various animals and breeds for the spatial differences within the region under consideration. Thus, the use buffaloes for milk purposes can drastically reduce the number of cattle which compete with other animals in sharing the available scanty fodder resources. The main items of the program should be the improvement of the existing breeds, extensio of veterinary facilities and increasing the feed supply.

MARKET STRUCTURE AND TRANSPORTATION NETWORK

Without an organized market structure in the region, any attempt to help the cultivators to switch to cultivation of high value crops cannot have much success in the immediate future. The basic reason lies in the small scale operations of most village activities which could be remedied mainly by a widening of the whole market structure in the region. The main task is to create a number of market centers of reasonable size to which individual villages could be functionally related, thereby improving the effectiveness of production and

At present there is almost a total absence of local markets for the products that may result when the envisioned radical change in the existing cropping is effected. Additionally there is a lack of transportation facilities and marketing arrangements whereby commodities could be exchanged inter---regionally or intra—regionally. After the completion of the Dhanagadi-Dandeldhura Road, this will be possible for limited areas within the influence of the road, but as it now stands, the markets at Dhanagadhi and Gauri Phanta just accross the border are not large. Moreover, should a large scale horticulture development occur in the hill districts, the Tarai districts would not be able to absorb the hill products. conversely, the hill districts will obviously not be able to purchase the surplus agricultural products resulting from intensive development of agricultulture in the Tarai even if there were a considerable increase in the purchasing power of the hills accuring from substantial horticultural development. As a result, a long-range consideration should be capturing the India or even further-distant markets due to the ongoing "green revolution" in India for products that might be generated. The best strategy would be to tap the Chinese market in the north for our Tarai products and the Indian market for the hill products, thereby exploiting the geographical advantage of the country.

The efficiency of marketing as well as the ability to increase production is closely associated with an adequate transportation system. For example, Friendship Highway in Thailand has transformed partially used forests along its route into highly productive and prosperous farms.[2] Without adequate transportation facilities it is not possible to bring about an economic transformation of a region because the needed impetus for such a change cannot be effective without adequate transportation. For, lack of transportation means that costs are high, marketing possibilities are uncertain and incentives to produce are low.[3] This also means that governmental mechinery created to provide development stimuli becomes less powerful. For instance, the agricultural extension workers would not able to travel easily and the institution created to distribute agricultural inputs will be subject to infrequent deliveries and unreliable schedules. However, it would be a gross mistake to consider transportation a panacea, for a package of many ingredients will be necessary to transform the economy of the region under consideration. For instance, the Kathmadu-Kodari Road has faild to trigger much new production along its path and the history of transportation development in other countries present several such examples.[4] In addition to transportation

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[2] Wisit Kasiraksa, "Economic Effects of the Friendship Highway", *Development Digest*, Vol, IV (July, 1966), pp. 34-38.

[3] See Wilfred Owen, *Strategy for Mobility* (Washington, D. C.: The Brookings Institution, 1964), pp. 4-7.

[4] For Further information, see The Brookings Institution, *Highway Investment in Developing Countries, op. cit.*; George Wilson *et al*, "New Roads and Development : The Evidence from Case Studies" *Development Digest*, Vol. IV (July 1966), pp. 13-20.

a number of other things such as credit, seeds, fertlizer, irrigation and technical assistance are required to make the envisaged radical change in the present cropping patterns successful in the region. In other words, transportation should be viewed as one of the inputs in the whole package of requirements for transforming the regional economy.

In view of the above discussion, it is therefore necessary to formulate guidelines for market structure and transportation networks as part of the overall development program for the region being dealt with. Some persons might argue that widening the maket structure will be self-generating in response to increased mobility in that villages will progressively transfer more and more of their business transactions to the large market centers and thus make steady inroads into the fabric of the regional economy. This evolutionary process worked well in developed countries, particularly in the United States, before the beginning of present day economic planning.[5] Even then, in the United States her civic leaders had played substantial role in planning road systems that brought business to their town and put heavy pressure upon the local government to allocate public funds for other needed infrastructures.[6] This process of market widening is unlikely to occur in this region of Nepal for several reasons. First, there are very few market centers and their service is not only small, but they are also cut off from one another because of lack of transportation and communication. Second, the activities which support these centers are small scale as well as seasonal.[7] Finally, there is a lack of incentive in a large segment of the merchant community, particularly in the Tarai market centers, for any improvement.[8] The main compelling reason is that we cannot afford to wait for slow and uncertain local market forces to operate. Thus, for rapid development and transformation of the region, a systematic rationalization of the market and production structure of its rural economy must be programmed in consideration with guidelines here envisaged.

[5] With further regard to these points, see *Market Towns and Spatial Development in India* (New Delhi: National Council of Applied Economic Research, 1965), pp, 5-6.

[6] *Ibid.*

[7] It may be noted that *hats* (periodic markets) which are common in Eastern Nepal are quite uncommon in the region under consideration. The markets at Dhanagadi and Mahendranagar are very much oriented towards the hill people visiting these placesduring the winter season. The hill markets Dandeldhura and Silgarhi-Doti, though open for all months of the year, conduct most of their business at in seasons other than the winter.

[8] This judgement was borne out by the fact that most merchants at Dhanagadi and Mahendranagar were observed to be Indians who were presumably after quick money rather than building the town. These merchants established themselves during the winter months when people from the hills flock to these places. In summer, they pack and go to India only to return again the next season. Most merchants are permanently established at the hill market centers. Nevertheless, these places are also frequently visited by a few itinerant traders who are mainly from India (e.g., the *Byasis*).

For this purpose, the structure of the existing market centers will have to be changed and new markets will have to be created at convenient intervals of space and time. Emphasis will have to be given to integrating these centers with their rural hinterlands by locating facilities serving the immediate needs of the farmers in the former. In addition to marketing, these may include, selective basis of investment, providing of credit, agricultura extension work, cooperatives, school, health centers and simular other services needed. Such market centers as envisaged here will grow gradually in relation to the development of production, consumption, savings and enterpreniual ability in the area and expand their functions accordiagly. It may be noted, however, that such centers cannot be simply created by an out-right governmental fiat.[9] What is needad is sustained governmental efforts, at least at the initial stages of development, mainly in the form of providing nodality by means of transportation networks and other infrastructures.

In order to make these market centers the hub of social and economic activities, there must be an easy movement of men and materials within their service area. For this reason, market centers will have to be primarily transport-determined. As noted previously, the Dhanagadi-Dandeldhura Road now under construction will link not only relatively unimportant market centers in the region, but it also passes through relatively sparsely populated areas. Therefore,it alone cannot produce the new market centers that will be needed to activate the economy of the region. When the proposed East-West Highway is constructed, it will add some network connectivity which will be primarily in the Tarai districts. Hence, several access roads will be required in the area to integrate the hill districts into the overall regional economy. However, because of terrain difficulties and inter-village movements being limited, such roads will have to be constructed with discretion. Broadly speaking, the road system should consist of arterial routes and feeder approach roads, the former linking the district centers and the latter linking village clusters with regional market centers. The population distribution pattern, level of economic activity, regional topography and a number of other factors will influence the geometric and structural designs of the road system. A discussion of this is far beyond the scope of the present report. However, it may be emphasized that the importance of a road, or for that matter any transportation system, is derived from other goals it is designed to serve. Future construction of roads in the region should be based upon overall spatial planning with the purpose of unifying a sectoral program approach into a systems approach.[10]

In the foregoing discussion we suggested several guidelines for development programs. It may be added that such programs must necessarily involve some investment

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[9] Incidentally, it might be mentioned that some declared "development areas" in the past have so far remained under-developed, at best stagnant, as before. With initial developmental activities at the spur of that moment, these "development areas" seem to have been quite neglected afterwards. Patan Valley in Baitadi District is an example of this.

[10] Briefly, a system approach means consideration of a complex whole as opposed to

plan. Any such plan must postulate certain objectives for three investment dimensions: (a) the total investment volume, (b) the allocation of the total investment among various economic sectors and (c) distribution of the total investment within the district and village ***panchayats*** of the region under consideration. It is hoped that some guidelines for investment among the economic sectors were provided in the preceeding discussion. Some aspects of the spatial dimension of investment will be dealt with in the following chapter.

It may be mentioned in passing that cost-benefit analysis for investment plans can be especially useful for indicating priorities both among the sectoral and spatial investment alternatives. Although the traditional investment criterion — the profitability of a project—is always useful to achieve satisfactory returns on investment outlays, cost-benefit analysis, if properly conducted, can reach far beyond this test in evaluating not merely the expected monetary returns from an investment, but also indirect benefits not actually received by the investing agency. Briefly, this analysis involves a comparison of total costs with all foreseeable benefits and ordinarily no projects should be undertaken unless the ratio of benefits to costs exceed unity. If such cost-benefit analysis can be made, then it is easy to rank projects in terms of their potential contributions for sectoral and spatial investment programs. However, such comparisons are often easier said than done because there are many difficulties involved that constantly harass the cost-benefit calculators. For example, how shall one compare a low-cost, high-benefit project with a considerable amount of uncertainty with a lower benefit, high-cost project which involves less uncertainty, i. e. the slow-maturing versus the quick—ripening projects ? The problem involved is essentially one of measuring many intangible objects according to a monetary scale. Nevertheless, although perfect cost-benefit analysis may not be devised, it serves as a valuable tool for testing the wisdom of policy alternatives for development programs.

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mechanistic operataon of components of the subject. The procedures in a system approach are : (1) establishment of an information base and difinition of the system, (2) clarification of objectives, (3) application of appropriate mathematical methods to abstract the system and make it manipulable, (4) manipulation of the abstracted systems and evaluation of the observed changes under varying proposed alternations and (5) translation of the results into action. For information regarding its application, see Charles L. Leven, *Potential Application of System Analysis to Regional Economic Planning* (Pittsburgh : University of Pittsburgh, Center for Regional Economic Studies, Occasional Paper No. 1, March, 1964.

CHAPTER VII

GROWTH CENTER CONCEPT AND AREA DEVELOPMENT

CONCEPTUALIZATION AND THEORETICAL CONSIDERATION

In considering "growth center" in the region under consideration, it is first necessary to develop a conceptual framework within which attributes of such centers could be indentified. As an equalization of developmental efforts is constrained by a critical shortage of capital, markets, skilled labor supply and managerial and administrative personnel, there is an emerging awareness that investment allocations must be made on some selective basis in terms of the growth potential of areas as well as by sectors. This has led in turn to the concept of "growth centers" or "growth poles" for a region implying that developmental efforts should be concentrated on areas of promise wherever they will pay off best in terms of net

benefits.[1]

Although establishing investment priorities according to areas of promise is a sound argument as far as economic considerations are concerned, the argument for establishing priorities according to areas of need is also a powerful one. Clearly, then, the less promising areas cannot be neglected since this would be a social injustice and also politically unwise.[2] In view of these considerations, the question is how should the resources be apportioned spatially between areas of promise and areas of need, or in terms of the criteria of potential growth and economic distress among various areas within the nation. The answer to this question is just as difficult to search out as many other hard-to-find answers to contemporary development problems. Nevertheless, if our main objective is to achieve a rapid increase in national output, locational investment choices must be highly selective. Therefore, the selection of areas for development programs should be in terms of "growth poles" or "growth centers" with in systems of regions in the country. This is an approach which points to a process for generating investment profits and aggregating them over spatial subsystems of the economy.[3] Con traints imposed by limited resources and adminstrative and managerial capacity aside, another rational for a growth center approach to regional development is that economic improvements initiated at the growth poles will spill over to their relatively less developed hinterlands. At the heart of growth center concept is the notion of basic industries the development of which has an effect on the surrounding environment.[4] Hence, this approach of "seeding" developmental activities by focusing growth at these centers may also be regarded as the best way to help the less promising hinterlands in the long run, although how the effects of such concentrations are spread to the surrounding territory and the range and spread of the impact are not yet fully known, particularly in quantitave terms.[5] However, for such an approach the problem, of course, is how to identify the "growth centers".

In general, growth centers may be conceptualized as those spatial units within systems of regions whose growth trends measured in terms of "welfare" (improvement or decline in the average well being of the individual, i.e., relative levels of per capital income

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[1] For further infurmation on the growth center concept, see Albert O. Hirschman, *The Strategy of Economic Development* (New Haven, Conn.: Yale Uniiversity Press, 1948), Ch. 8; John Friedmann, *Regional at Developmen Policy: A Case Study of Venezuala* (Cambridge, Mass.: The M.I.T. Press, 1966), *bassim*; Edgar M. Hoover, *Some Old and New Issues in Regional Development* (Pittsburgh: University of Pittsburgh, Center for Regional Economic Study, Occasional Paper No. 5, 1967), pp. 7-13.

[2] Leo H. Klassen, *Area Economic and Social Redevelopment* (Paris : Organization for Economic Co-operation and Development, 1966), pp. 20-22.

[3] Friedmann, *op. cit.*, Footnote 1, p. 18.

[4] Philippe Bernard, *Growth Poles and Growth Centers in Regional Development*, Vol. III (Geneva: United Nations Research Institute for Social Development, 1970), pp. 15-16.

[5] Hoover, *op. cit.*, Footnote 1, p. 9.

and "volume" (increase or decrease in the magnitude of productive activities) relative to other such units measured from some common base are higher or likely to be so in a foreseable future. Alternatively, a growth center may be defined as an area that, at a given moment in time and in one respect or more, is economically at an advantage in comparison with other areas, or with the country as a whole. As suggested by historical evidence, such growth centers would be essentially urban areas since urbanization is basic to economic development.[6] As observed by Friedmann, "Economic growth tends to occur in the matrix of an urban region. It is through this matrix that the evolving space economy is organized."[7] A number of processes have been involved in the generation of urban areas for which explanations have been offered in various locational and regional economic theories, including the theory of central places and urban hierarchy.[8] Without going into these theories as they are not within the scope of the present report, the general characteristics of growth centers may be here identified not because they are immediately applicable in our context, but rather to sharpen our insights in conceptualizing the problem under consideration. Below is a list of characteristics by which an area experiencing dynamic economic growth can be identified.

(1) *Rapid urbanization.* As it is widely suggested, urbanization and economic development are intertwined. Areas in the process of growth will also experience rapid urbanization as modern productive activities are established. These urban areas, whether large or small, attract and hold a population when work in industry and in services replaces a dependence on agriculture.

(2) *Industrial activity related to the region's resources.* Although industries concentrated in urban areas are often resource-oriented in the beginning, their location here is primarily because of the availability of entrepreneurs, market, skilled labor force and other infrastructure. Generally the prosperity achieved by the first industries points the way for further enterprenership and agglomeration with the result that most industries later become

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[6] The role of the city or urban area in economic development is discussed in a series of essays contained in John Friedmann and William Alonso, eds., *Regional Development and Planning: A Reader* (Cambridge, Mass: The M. I. T. Press, 1964), part III, Section 2. See also Brian J. L. Berry, "City Size Distributions and Economic Development" in Friedmann and Alonso, *op. cit.*, pp. 138–152.

[7] Friedmann, *op. cit.*, Footnote 1, p. 28.

[8] There is substantial literature dealing with these theories. For reference, see Edgar M. Hoover, *The Location of Economic Activity* (New York: McGrow-Hill, 1948); August Losch, *Economics of Location* (New Haveb, Conn: Yale University Press, 1954); Walter Isard, *Location and Space Economy* (New York: John Wiley & Sons, 1956); L. Needleman, ed., *Regional Analysis* (Baltimore, Md: Penguin Books Ltd, 1968); Brian J.L. Berry and A Pred, *Central Place Studies: Bibliography of Theory and Applications* (Philadelphia; Regional Science Research Institute, 1961); Louis Lefeber, *Location and Regional Planning* (Athens: Center for planning and Economic Research, 1966) and B. Garner, "Models of Urban Geography and Settlement Location" in Richard J. Chorley and Peter Haggett, eds., *Socio—Economic Models in Geography* (London: Methuen & Co. Ltd., 1967), pp. 303–360.

foot .-loose However, in areas where such a development has not occured, initial development must be based upon exploitation of natural resource because this is perhaps the initial advantage these areas posses over the existing urban centers. For furthering growth at these places, government subsidies might be necessary to begin the cycle of resource exploitation during a shakedown period until markets for the resulting product are established.

(3) *Existence of external economies leading to formation of industrial complexes.* In an urban area where the growth process is dynamic, basic industry will serve to attract additional activities, thereby expanding the economy and the employment structure to its surrounding area. The existence of such an expanding economy is a sign that basic resource exploitation has led to further and more diversified rounds of investment with a regional multiplier effect in the area. This, however, could not occur in the absence of certain fundamental external economies such as sufficient capacities in systems of transport, power, water and other infrastructure.

(4) *Rising per capital income to support an increasing amount of service activity and employment.* An increase in per capita income may not come immediately within the growth center as relative low wage rates may be part of its initial advantage for industrial development. However, as agglomeration occurs, wages will steadily rise leading to service enterprises and aiding further diversification of the region's economy.

(5) *Transformation of agricultural activities from subsistence to cash crop farming.* Modernization in growth centers unleashes pressures to transform agricultural activities in their hinterlands. Industrial development furnishes the impetus for rural change by providing alternative employment for agricultural workers and forming a market for cash crops.

A relatively high level of educational services and a stock of related social overhead facilities (e. g., housing, urban utilities, etc.) sufficient to support continuing population and urban growth are other characteristics of growth centers. However, all of these are related to all the facters mentioned above either complementarily or as purveyors of industrial activities.

Finally, though it is not easily recognizable in quantitative terms, an atmosphere occurs which is conducive to further spurts of growth and change. Hirschmann talks of an "industrial atmosphere ... with its special receptivity to innovation and enterprise"[9] that prevails in such areas. Inhabitants of such areas evince great willingness to innovate and their aspiration levels are high as is their readiness to exert themselves in the achievement of aspirations.

The above discussion of the characteristics of a growth center indicates that its most important attribute is urbanization to a sufficient extent, agglomeration and the external

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[9] Hirschmann, *op. cit.*, Footnote 1, p. 183.

economies of urban concentration. This suggests a cumulative interaction of industrial growth and urban concentration as necessary to precipitate growth poles. If such is the case, then a strategy of directing further developmental programs at these locations which have sufficiently exhibited growth seems to commend itself. However, in areas such as those under consideration here, the problem of identifying growth centers cannot be based upon the attributes described above for the obvious reason that the economy we are dealing with is primarily rural, although those attributes are helpful for clarifying the concept of growth centers as such.

Criteria for Selecting Growth Center

In identifying the growth centers within the region under consideration, a logical approach would be an analysis of comparative growth rates among various sub-regions relative to the whole region itself over a specified period of time. Next the differential growth rates of these sub-regions could be clarified, measured, explained and predicated. Such an analysis would provide a method of discovering areas within the systems of the regions which had comparative advantages regarding specific economic activity or all activities combined. However, due to the constraints mentioned earlier in Chapter II, such an approach could not be followed.

As it is widely held that development tends to follow a prescribed sequence with growth initated by advances in primary activity, another criterion in considering growth centers would clearly be from the point of view of resource endowment. However, resource endowment is by no means the only determinant of growth centers, nor does it explain why such centers emerge, for the growth potential of an area is a function of many variables such as demand, production technology, economic organization and infra-structures. Moreover, in terms of resource endowment, there can be many differing types of growth potential, and subsequently growth centers. Since consideration of all these factors would lead us to a discussion far beyond our scope, it seems appropriate to settle for some simple operational criteria despite that such an approach would be bound to be less exacting. Thus, for our purpose we shall operationlly consider a growth center as a spatial unit which has a relative agronomic advantage over other such units within the region under consideration and where, with the access to be provided by the Dhanagadi-Dandeldhura Road now under construction, prospects for agricultural development are imminent given the needed push. This means that two criteria will be used for our purpose; first, the "input-output access" and second, relatively "good" agronomic conditions. It must be pointed out that application of these criteria is, however, simply a matter of subjective judgement based upon knowledge of conditions during the course of field investigation within the region, although we would have much preferred to apply these criteria with some rigour to rest our judgement on some quantitative security. Thus, when we speak of "good" and "poor" with reference to these criteria, they are only relative desigations and obviously do not represent discrete and separate types. The areas which fulfil these criteria also tend to be associated with relatively dense

population clusters in the region, a basic characteristic of a growth center, for this is how urbanization emerges. Furthermore, population is generally concentrated in areas where, aside from employment opportunities, a number of facilities such as a market, health facilities, schools and other infra-structures are available.

Briefly, "input-output access" refers to a netting out of the relative advantages and disadvantages of each region for the activities of any given industry or of all industries combined with respect to assembly of inputs and distribution of outputs.[10] Although a general index of access characteristics alone does not explain regional growth, such an index may be taken as a rough indication of a regional growth potential. In terms of "input-output" access characteristics, at least sixteen different types of regions may be identified which need not be reviewed here.[11] This is quite arbitrary as well as simplistic, but it still can provide some illustrative meaning in focussing attention on a wide range of prospects for growth in different region. Differences in access characteristics may also be expected to bring about different patterns of regional growth behavior.

It may not be incorrect to regard agricultural productivity as a function of site, soil, climate, seed, water, fertilizer and management factors. The agricultural output per unit area reflects a composite influence of all these factors but a precise measurement of the contribution of each of these variables is not only difficult, but posses many conceptual problems.[12] Nevertheless, in an area short of food, what matters is surely the actual amount of food produced which is indicated by the output per unit area. The fact that intrinsic characteristics of land highly influence the yield of crops cannot be refuted. Thus, even making some allowance for other factors, the quality of land or crop production per unit area may be regarded as a rough index of potential growth in agricultural development. By good quality land, we refer to the favorable physical and climatic conditions with respect to site, soil and water (actual or potential). In its application, however, we have relied mainly upon our observation and one indirect indicator. Whenever information on crop yields were unavailable, the availability of foodgrains for sale was used as a rough indicator of potential agricultural growth. Aside from the fact that other information was not available, we have relied upon this judgement on the basis of our observation of a positive correlation between the site, its physical appearance and the availablity of foodgrains in the villages. Generally, only those villages which looked physically prosperous with their neat looking slate-roofs and stone-walled houses with well-tended fields and located in well-watered

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[10] Harvey S. Perloff *et al.*, *Regions, Resources and Economic Growth* (Baltimore, Md. : The John Hopkins Press, 1960), pp. 87–93.

[11] For a detailed discussion of this as well as a schematic representation of various types of regions, see Perloff *et al.*, *op. cit.*. Footnote 10, pp. 87–93.

[12] J. S. Sharma, "Measurment of Agricultural Productivity-Concept, Definitions, Etc.", *Journal of the Indian Society of Agricultural Statistics*, Vol. 17 (1965), pp. 253—257.

valleys could offer any foodstuff for sale, especially rice.[13] Of course, this availability of foodgrains for sale could either be attributed to high yield per unit area of land or to a small population in these villages. However, it may be reasoned that the latter is most unlikely because these villages are densely populated in which case availability of foodgrains for sale would have to be attributed to good quality land.

PROBABLE GROWTH CENTERS

In view of the criteria discussed above, a number of areas appear to emerge as growth centers in the region, if not now, then in the future. These areas are briefly described below, but no attempt is made to delimit their spatial span, for this touches upon the problem of regionalization. The literature on this subject is extensive but no striking consensus appears to have emerged from the discussion so far.[14] However, it might be mentioned that regionalization should be purposive and a normative programming region may be devised with a purpose as furnishing the decision rule.[15]

From the point of view of access as well as being an administrative headquarters, Dhanagadi appears to be a potential growth center in the region. It is the zonal and district headquarters and the seat of all major governmental agencies within the region. As discussed earlier, Dhanagadi is a market center not only for nearby villages but also for the adjoining hill districts. Linked in some way with the adjacent Indian border railhead, it also performs a number of other service fuctions for the region. In terms of access characteristics, after the completion of the Dhanagadi-Dandeldhura Road, Dhanagadi will have at least one good access dimension. Although needed inputs may not be accessible within the region itself, the new road may not only offset this deficiency, but also add a good access dimension to markets in the home region as well as outside. The immediate tributary area of Dhanagadi as well as its own site are more or less level with good potential for irrigation and its soils and climate seem to be capable of supporting an intensive farming system. Thus, Dhanagadi may eventually become the large center of a productive agricultural region fulfilling the role of a trade and service center. It is already under-going a period of rapid growth which can be expected to continue. Its long-term growth beyond the completion of the Dhanagadi-Dandeldhura Road will, however, depend largely upon the initiative taken in the area itself to make the development that takes place as sound as possible.

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[13] This observation refers only to the hill districts under consideration. In the Tarai villages foodgrains were generally available for purchase irrespective of physical appearance of the villages. Even then, a prosperous looking Tarai village could be regarded as comparatively better endowed with good quality land.

[14] For a review of literature on this subject, see Chauncy D. Harris, "Method of Research in Economic Regionalization," *Geographic Polonica*, Vol. 4 (1964), pp. 59-86

[15] For an elaboration of this point, see J.R. Boudeville, *Problem of Regional Economic Planning* (Edinburgh: The University Press, 1966), *passim*; Friedmann, *op. cit.*, Footnote 1, p. 71.

In the Tarai districts being dealt with, some of the fastest growing areas lie at the far western border around Mahendranagar which is a relatively new settlement established approximately five or six years ago. Like Dhanagadi, it is also an important trading center in the region as well as a zonal and district headquarters harboring major governmental agencies. All the previous functions of Brahma Deo Mandi have now been siphoned to Mahendranagar and its prominence in the region is largely due to its proximity to Tanakpur. In addition, its location on a spacious plain has allowed rapid expansion to accomodate the resettlement of repatriates from Burma and other settlers from the hills. Brahma Deo Mandi on the other hand is squeezed between the Mahakali River in the west and the foothills in the east. Of course, malaria eradication has also been an important contributing factor in attracting the migrants. After the completion of the Dhanagadi-Dandeldhura Road, some of the traffic as well as the trade activities which accompany it will be diverted to Dhanagadi and its present burgeoning growth will be greatly reduced in favor of this town. However, with the completion of the East-West Highway, Mahendranagar may not only capture its lost traffic, but will also assume a more important role as a market center in the region, for it will have significant positive dimensions added to its access characteristics from the point of view of inputs as well as markets. Mahendranagar as a growth center has a good potential to successfully respond to upward thrusts in the development of forest and agro-based industries serving a productive agricultural hinterland.

Tigri near Malakheti is a small village in Kailali District located approximately 10 kilometers (6 miles) north of Dhanagadi. At present, its economy is mainly devoted to foodgrains production. The area around it seems to possesses good quality land, gently undulating with deep loamy soil and a good potential for irrigation. Its potential role as a growth center arises from the fact that the Dhanagadi-Dandeldhura Road and the East-West Highway will intersect at this location, thereby making Tigri the transshipment point in the region. Such a location will obviously attract service activities primarily oriented towards transportation giving rise to markets as well. However, continued growth of this area will depend to a large extend upon the initiative taken by the Government in locating supporting facilities.

In the hill districts, Dandeldhura proper and Silgarhi-Doti have some limited attributes of growth centers in the region to the extent that they are both market and administrative centers of long standing. The construction of the Dhanagadi-Dandeldhura Road will put Dandeldhura in a favorable position so far as an access dimension is concerned. On the other hand, despite this added advantage, it does not seem to reveal the potential to function as a viable, self-generating growth center. As already mentioned, Dandeldhura proper is located along the crest of a narrow ridge and the settlement itself is relatively small. There are only a few shops and it is not a commercial center of significance except for the immediate area around it. In fact, the largest shops are located at the foot of the ridge a little less than an hour's journey south-west of the main bazaar which is called Ayat. There is little land to spare along the site of its present location except for the possibility of a linear extension to the north-east. Adding to this problem is also the fact that there is presently no water supply at the top of the ridge; water must be fetched from the valley below

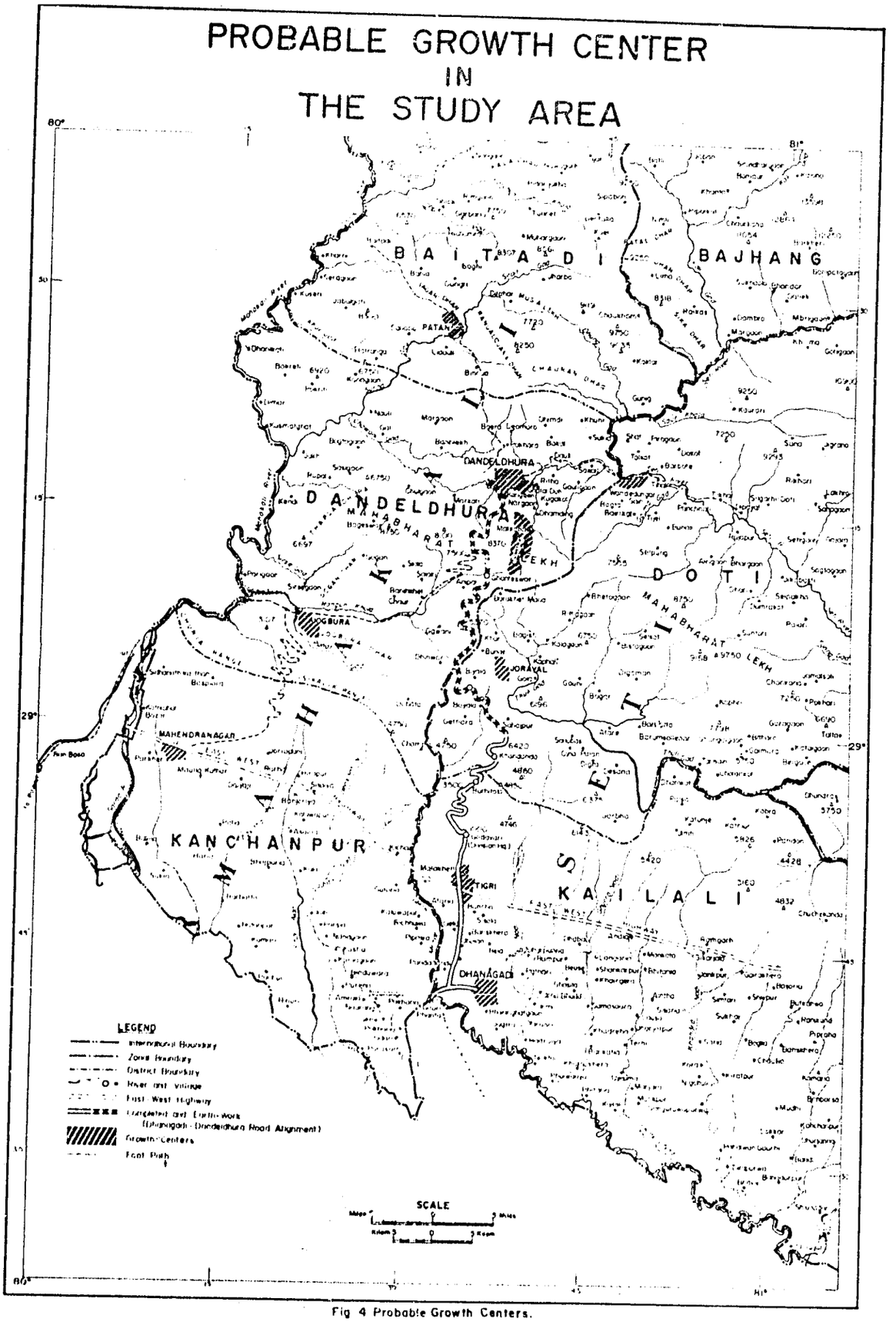

Fig 4 Probable Growth Centers.

which takes anywhere from half an hour to an hour's journey. Thus, in view of the future developments associated with the consturction of the Dhanagadi-Dandeldhura Road, it would be better to locate the supporting facilities for the road and vehicles at the base of the Dandeldhura ridge (Ghatal Doti area) rather than on top where the main activities of Dandeldhura proper are located. There also exists the possibility of developing Ayat, which is located along the main trail between Dandeldhura and Mahedranagar, as an alternative to Dandeldhura. However, this would involve the provision of an access road to Ayat either by diverting the present Dhanagadi-Dandeldhura Road or by constructing a link form this road to Ayat. In addition, since Ayat is only a commercial center, its development would also depend upon the relocation of government activities from Dandeldhura.

Although the role of Silgahri-Doti has lately been curtailed a great deal due to administrative boundary changes, it is still an established market center of fair size serving a large segment of the Far Western Hills. It has a certain amount of economic dynamism which may be channeled to enlarge its present functions and become a viable growth center. Judging from the attributes of a growth center which we discussed earlier, only Silgahri-Doti possesses the comparatve advantage of size and urbanization in the hill districts under consideration. However, its potential growth now seems to hinge upon its access requirement which the Dhanagadi-Dandeldhura Road is not going to fulfill. Therefore, as was indicated before, Silgarhi-Doti should be accessed by a road as soon as possible.

There are several areas whose potential for emerging as growth centers in the region appears fairly good. These areas indicate such a potentiality not from the point of view of their access characteristics (though some will come within easier access than others after the completion of the Dhangadi-Dandeldhura Road), but rather from the point of view of their physical endowment with respect to productive agriculture. These areas are: (1) Jorayal, (2) Ruwa Khola, (3) Ghatal Doti, (4) Wandedungar Sain, (5) Patan and (6) Jogbura. Jorayal Valley in Doti District lies approximately two day's walk north-east from Dhanagadi along the main trail between the latter and Silgarhi-Doti. Ruwa Khola and Ghatal Doti, both in Dandeldhura District, are situated between one and a little less than half a day's walk from Dandeldhura proper; the former lies along the main trail between Dhanagadi and Dandeldhura whereas the latter is off to the west of this trail shortly before approaching Dandeldhura proper from the south. Ghatal-Doti, also called Gairi-Doti, is actually the valley to the south at the base of the ridge along the crest of which Dandeldhura proper is located. Wandedungar Sain is located between Dandeldhura and Silgarhi-Doti along the bank of the southern bend of the Seti River and is about one and one and a half day's journey east of Dandeldhura proper. Lying along the main trail between Baitadi and Dandeldhura proper, is Patan Valley in Baitadi District which is about the same distance north and north-west of Dandeldhura proper. About two to two and a half day's journey from Dandeldhura proper heading south-west lies Jogbura in Dandeldhura District along the main trail between Dandeldhura and Mahendranagar. Approximate locations of these places are shown in Figure 4.

In terms of access to be provided by the Dhanagadi-Dandeldhura Road, the most favored of the above areas appears to be Ghatal Doti followed by Ruwa Khola and Jorayal; others are at a considerable distance from the present road alignment. After the road's completion, Ghatal Doti will be approachable within a journey of a couple of hours and Ruwa Khola and Jorayal will be reached in approximately five to eight hours from the road. Thus, from point of view of access only these areas are of potential growth, but all of them have some common characteristics indicative of a potential for good agricultural development. All these areas are situated on river valleys spreading from valley bottoms to immediate slopes above, the higher reaches being covered with good stands of pine trees. Jorayal is spread out in the valley of Karamnasa River, Ghatal Doti encompasses the valley of Doti Gad (river), Ruwa Khola, the name suggestive of its location, lies in the valley of Ruwa Khola (river), and so on. By virtue of being situated in river valleys, these areas are well endowed physically for increasing agricultural production. For in general, these valleys are fairly broad, well-watered and constitute gently undulating surface covered with deep alluvial soil with a few exceptions of gravelly outcrops in the upper slopes of the valleys. There are certain exceptions, however, particularly in Ghatal Doti and Wandadungar Sain which presently suffer from an inadequacy of water for growing sufficient crops. Nevertheless, nearby sources of water indicate enormous possibilities for expanding present irrigation facilities. Given a sufficient push, all these areas can be transformed into centers of productive agricultural operations It is in these areas that the guidelines outlined in the preceeding chapter should form a basis for formulating specific area development programs.

A logical approach would be to initiate multi-phased agricultural development programs in these areas concentrating first on increasing crop yields, then on diversification toward horticulture development on marginal land and on upper terraces, and then possibly encouraging livestock raising with fooder programs on or near adjacent ridges. In addition to strengthening the existing market towns referred to earlier, markets should also be created in these areas to respond to developments in agricultural productivity. The realization of development possibilities, however, shall mainly hinge upon three considerations : (1) the role of concerned authoritis to draw up individual prgrams for each area and work out the physical targets and financial outlays, (2) timely and effective implementation of the programs through an apparatus geared not to control or organize the existing adminstrative system, but toward innovation and development and (3) the extent to which the co-operation of the local people can be secured in the execution of various schemes.

As area development efforts become more effective when made on a selective basis, it is hoped that the areas suggested here will receive careful consideration for investment programs. Regional economic growth is externally induced and the creation of growth centers as conceived of generally in the region being considered will be a demanding task. Apart from mustering investment and energy, this will involve a sustained commitment on the part of the Government to guide the selected areas continually through the growth process.

CHAPTER VIII

CONCLUSIONS AND GENERAL RECOMMENDATIONS

The cultivable land in the hill districts has already reached a maximum level and the potential for increasing foodgrain production is limited. A rapid population increase over the past two generations has pushed cultivation into marginal lands. In this process, a great deal of natural vegetation has been destroyed. This has greatly increased soil erosion in the area. While top soil is steadily eroded away and more nutrients drawn from the land with successive cultivation, few nutrients are returned to it, for the level of agricultural technology has remained essentially unchanged with the result that there is a general decline in soil fertility. Thus, although the cultivated area has been expanded, its contribution in agricultural production has been minimal at best and increases in production have definitely lagged far behind

population growth. Due to climatic hazards and lack of irrigation facilities, agricultural production is barely enough for subsistence in the hill districts; in a bad year there is a deficit of major proportions. In short, the problem here is one of survival.

The main source of cash income is the production of ghee which is dependent upon winter pasturage in the Tarai jungles. Yet, cash income is necessary not only to purchase food in times of scarcity but also to meet other basic household needs. Such a situation has created a need for many hill people to seek employment in the Tarai or in India. Hence, a great many people go to these places at least once a year for employment as well as to sell ghee and to purchase goods upon their return in the hills. Many have also emigrated permanently or on a long term basis and have resettled in the Tarai district; some have gone to major Indian cities like Delhi and Bombay. Unless economic conditions are improved in the hill districts, increasing out-migration from these districts is inevitable, colonizing the areas of adjacent Tarai, or moving elsewhere in search of livelihood. There can be little doubt that such a migration will in due course profoundly alter the economy of both the hill and Tarai districts.

On the other hand, economic conditions in the Tarai districts are one of comparative abundance. Despite recent colonization, these districts still have a low population density as well as a favorable balance between their population and land resources. These districts have the most arable land per capita and despite their relatively low agricultural yield, they are able to produce a surplus agricultural output from which they realize substantial income. Because of evironmental conditions as well as the present population density, the potential for increasing agricultural production in the Tarai districts is enormous. This could be generally accomplished either by yield intensive or area extensive methods. The choice between these alternatives will involve consideration of different sets of economic parameters. While the attainment of maximum production from existing cultivated land will demand substantial doses of capital investment, meeting the same end by expanding cultivated area will cost the country its finest resources–the forests. The latter alternative will certainly lessen the population problem in the hills as well as the capital requirements, but this apparent advantage may, in the long run, turn around and become a major obstacle to further progress. In other words, extensive clearing of forests in the Tarai districts may have dysfunctional consequences, particularly in view of the dependency of hill livestock for winter pasturage on these forests. Of course, a limited absorption of hill people and extension of some cultivated areas are feasible in the Tarai districts, but uncontrolled resettlement and destructive clearings of forests in these districts would be dangerous.

In terms of resource endowment, there are very few easily exploitable resources in the hill districts. These districts have some scattered stands of good trees and rivers but their utilization in the immediate future may not be forthcoming. Thus, with too many people and too little cultivable land to support them, the hill districts are confronted with a problem of immense imbalance in the local economy. With fewer people and more land and forests,

the Tarai districts on the other hand, enjoy a relatively favorable balance between population and resources. In view of this consideration, the development of the hill districts relative to the Tarai will pose a tremendous task which, however, cannot be ignored, though sectoral cost-benefit analysis would favor concentrating efforts in the Tarai.

The region under consideration is one of the areas which appears to be relatively neglected in developmental undertakings. The construction of the Dhanagadi-Dhadeldhura Road is going to provide a much needed ingredient among the growth variables, but it may not be sufficient to induce economic growth. This is due to a combination of social, cultural, political and economic changes which may not be ascribed to transport alone.

The Dhanagadi-Dandeldhura Road will, of course, permit a more effective abridgement of distance in the region but, unfortunately, it does not coincide with the traditional movement of goods and people. Yet, the road will lead to a reduction in total resources required to produce and distribute a given volume of output per time period in the area accessed by it. How these "released resources" will be subsequently utilized will be a crucial factor in determining secondary effects that will ultimately induce growth in the area. Thus, the Dhanagadi-Dandeldhura Road will certainly facilitate development of the region being dealt with, particularly in the hills, but its mere existence will not bring about solutions to any of the existing problems. The greatest factor in the development of the Far Western Tarai in terms of transport and movement will, however, be the construction of the East-West Highway. In the hills, the main utility of the Dhanagadi-Dandeldhura Road will lie in what can be brough into the area rather than in what will be transported out. The main contribution that the road should make to the economy of the area will be in facilitating import of basic inputs needed to increase present agricultural yields. These areas of activity will still not meet the problem of creating the basis for the generation of cash income. They are, however, for most areas of the hill, the types of development that will create a basic sufficiency in food which will lay the foundation to support other developmental activities.

Past and on-going developmental efforts in the area appear to have had less than encouraging results. Dispersion of resources, lack of adequate funds, inefficiency of the implementing apparatus for want of sustained efforts in pursuing a planned program are some of the reasons for such results. In any case, the task ahead for development of the area is tremendous and there is no simple answer to it. A careful analysis of the problems and planning by means of a systems approach is needed for which this report is no substitute. Yet on the basis of some insights gained into the problems of the area, some general recommendations may be made in this regard which will have to be sharpened with further research. What is needed is an action-oriented research which has been neglected until now. The timing of such research is the first and perhaps the most important point to be considered in the whole development program. We are of the opinion that rapid economic development may not be achieved without continuous research efforts and properly utilizing their findings.

In terms of recommendations, foremost is, of course, the utilization of the

Dhanagadi-Dandeldhura Road in such a way that it will play a vital role in the development of the region. Since the road does not traverse an area of readily exploitable resources, physical or human, a basic prerequisite now is to create a combination of cricumstances which, in conjunction with the road will initiate growth in the area. How to create such circumstances is what we shall attempt to answer, although by no means in a comprehenive way.

In order to best utilize the Dhanagadi-Dandeldhura Road, the main task is to increase the productive capacity of the area such that the total net mobility is increased both in terms of freight tonnage and numbers of people. The increase in productive capacity will raise income which in turn will attract more people. An increase in output requires more labor whereby a demand for services will emerge, constituting a net growth for the economy. So long as markets remain favorable and the productive capacity undepleted, this process usually becomes reinforcing. The mechanism that will serve to stimulate this process is producing for markets rather than subsistence as transport facilities will extend the market.

As the Dhanagadi-Dandeldhura Road will certainly change the present service dimension of speed, cost, safety and dependability of transporting goods, it should be utilized in restructuring present production activities toward market-orientation and integrate the hill and Tarai districts. Each of these service features has a somewhat different implication upon mobility and growth stimulus much of which depends upon rates and service patterns. Generally, additional output, cultivation of new lands and more passenger travel are associated with a sharp decrease in freight and passenger charge as well as improved service.[1] After the completion of the Danagadi-Dandeldhura Road, an influx of entrepreneurial activity in transportation services will naturally come in response to the new opportunity. As is oftea the case in this kind of operation, high charges and an instability of service are likely to ensue. In addition, we discovered during field study that the local village panchayats are considering levying tolls on vehicles which will be passed on to the individual users of the road. If this comes about, transportation charges might be quite high and prohibit utilization of the road by most people in the area. It is hoped that transportation rates will be regulated by the government to prevent the road from falling into misguided enterprise. At the same time, it is also hoped that arrangements will be made for subsidizing selected commodities so as to promote interregional trade between the hills and the the Tarai.

As agriculture is the major activity in terms of both income and employment, the Dhanagadi-Dandeldhura Road should be utilized to increase the productive capacity of this sector as was suggested in Chapter 6. The main argument for this is the availability of transportation. In this regard, specific formulations of projects must be geared towards the spatial orientation of economic activities in terms of the selected areas indentified in the preceeding chapter for this purpose. Since everything proposed in the above mentioned chapters cannot

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[1] See George W. Wilson et al., *The Impact of Highway Investment on Development* (Washington, D. C.: The Brookings Institution, 1966). Ch. 7.

be done simultaneously, it is essential to establish appropriate priorities for actions to be taken in the area, at the same time synchronizing these to take care of time lags in various types of development schemes.

In view of the general conditions in the area being considered, a squence of priorities within the initial area of influence of the road may be given as follows. In the hill districts, primary utilization of the road should be as a means to provide inputs required to increase agricultural yields. This would be creating a provision for fertilizer and improved seeds with support and supervision from rgricultural extension workers for their proper utilization. In order to further the results from this, it is necessary to provide adaquate irrigation facilities with determination of priorities according to techno-economic feasibility, amount of land served by such projects and the accessibility of the project area from the Road.

The above recommendations for increasing agricultural output in the hills will create localized grain surpluses which will probably have low market value due to the price stabilizing effect of the Dhanagadi-Dandeldhura Road, particularly on seasonal fluctuations. This will also not create favorable circumstances for promoting trade between the hills and the Tarai, for grain production in the hills is not likely to have a competitive advantage over that of the Tarai. However, the point of initial thrust in increasing outputs in grain production is to provide a stable basis for specialization and diversification of activities in the primary sector: substitution of cash for subsistence crops, specialization in animal husbandry, primarily for ghee production, and ventures into horticulture. Without first strengthening the subsistence base of the area, any attempt to attack the problem of higher income generation would be shaky, for the present problem is not as much lifting the economic level up as it is preventing it from falling down. Thus, first proirity should be given to increasing agricultural output after which encouragement towards difersification and specialization should be stressed as a part of a broader or larger series of devlepment proirities.

Another factor demanding urgent consideration in the hill districts is widespread soil erosion. Deforestation and grazing as now practised inevitably spell soil crosion and consequently, a progressive lowering of productivity, often endangering the cropland itself. It is, therefore, contended that unless widespread soil erosion is contained, application of modern inputs to raise agricultural output will not produce any significant results, for whatever is added to the soil is simply going to be washed away soon. Thus, introduction of crop rotation to reduce exposure of the soil and other soil conservation techinques along with land and water management should be listed among top priorities in development programs. Reforestation is highly recommended not only to check soil erosion and prevent quick depletion of added nutrients in the soil, but also to produce additional forest products to meet the local demand arising from increasing population.

In implementing any of the projects thus formulated, land already relatively productive as mentioned in Chapter should be selected. Aside from the constraints of

limited resources to be spread over a wide area, such an approach would be required for relatively quick results on investements. As previously elaborated, the situation now is one of relative inequalities in an overall frameworks of regional economic imbalance and investments in selected areas will obviously only increase existing inequalities. However, to begin too soon to stress the removal of inequalities would be not only too difficult, but also invite failure to possibly sound developmental programs.

The economy of the Tarai is essentially based upon its farms and forests. Hence, the main role of the Tarai should be as a supplier of foodgrains for the hill and local population in addition to providing surplus grains and forest products for export to India and perhaps, beyond. At present the Tarai has been able to produce surpluses because of its low man-land ratio rather than through large total output per unit of resource input. With population increasing rapidly, both by natural process as well as by immigration, the existing favorable resource balance for producing surpluses may soon be exhausted. Thus, although agricultural output can be increased by area extension for some time to come, in the long run the productive capicity of this region must be based upon increasing the total output in terms of per unit of resource input. Hence, emphasis should be given to making modern inputs available to the farmers with similar priorities as in the hill districts towards achieving this goal. The differece here is that it should become a long-range goal to make the Tarai a grain supplier whereas in the hill districts this approach would create a foundation upon which other specialized activities could be initiated later.

Doubtless there exists a larger labor force than the present economy can fully absorb. Even with improvements in production methods, agriculture cannot be relied upon to absorb all the surplus labor, for even now where intensive cultivation is practised, the manpower available is belived to be more than adequate. In addition, the opening of the Dhanagadi-Dandelhura Road will presumably reduce manpower required for porterage and thereby leave a substantial group of hill people seasonally unemployed without a source of livlihood. There are practically no mineral resources, so far as is presently known,[2] in the exploitation of which surplus labor could be effectively utilized. Hence it is in the forestry sector that surplus labor should be utilized productively.

In the areas accessed by the Dhanagadi-Dandelhura Road, the value of standing timber will certainly be increased due to lower transportation costs. Many species in the forest that were not hitherto utilized because of the prohibitive shipment costs may now be marketable. Thus, establishment of a forest industry in the Tarai is recommended. This, however, must be based upon an analysis of the potential market for the resulting products. As a general observation, industries related to saw-milling, charcoal making, plywood manufacturing, wood pulping and resin tapping would appear to be economically viable.

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[2]See D N. Rimal, *A Guide to Mineral Resources in Nepal for Mineral Prospectors and Enterpreneurs* (Kathmandu: Bureau of Mines, Ministry of Industry and Commerce, 1967).

In order to absorb the surplus labor force in the region, another priority area of investment should be to develop a long-term public works program. This must be worked out carefully in terms of the needs of individual clusters of settlement areas. Generally, however,such programs should be directed towards developing road links, ponds, schools, bridges and a networkr of irrigation canals to provide water on a year-round basis for large areas. Programs such as these will, however, depend not only upon capital investment but also on sound plans and the availability of expert technical advice. The District Panchayat should serve as the central vehicle for formulating and implementing such programs, utilizing both local and central government resources. Presently, most District Panchayats do not have adequates technical personnel to conduct proper project planning. Hence, the District Panchayat can carry out these programs only in cooperation with the zonal and central governmental agencies. It must be added that the success of a program of this dimension must require local involvement. There must be a transfer of responsibility to the local people along with a transfer of the material means to do the job, with certain power circumscribed and supervised from the capital. Location of developmental decision-making must remain to some extenl within the area itself.

Since a comprehensive coordinated development plan for the region under consideration would cut through administrative boundaries, it would require the full cooperation of all elements of government in the area. Creation of a regional development authority would appear to be most effective for this purpose. It would be concerned not only with coordinating various developmental activities but also providing a sustained and concentrated effort in "total" resource exploitation - - agricultural, industrial, infrastructural as well as human development - - in the area. This would also imply planning and implementation responsibility within the same organization. Under this responsibility would fall preparation of the plans and action programs for the various sectors along with a captial expenditure budget for the region as a whole to be approved by the Ministry of Finance as a basis for fund allocation. The regional authority must also be charged with building and stimulating local institutions that are unlikely to arise without special efforts; it should also be given some responsibility for offering incentives, both of a financial and technical assistance nature to entrepreneurs. Difficult though it may be to amass a program of this nature, it is only through such action that economic growth in this area and returns on the Dhanagadi-Dandeldhura Road investment may be achieved. And the main instrument for this action should be government initiatives.

APPENDIXES

1. PLACES VISITED DURING FIELD STUDY

Districts	Village Panchayat	Village
Baitadi	Thaligada	Sukuti
"	Pallachaudali	Kumali
"	"	Pallachaudali
"	Ramki Barayal	Katmada
"	Patan	Patan
"	Patan	Maitad
"	Tadi Gaon	Gwani

Continued. . .

1 - - *Continued*

Districts	Village Panchayat	Village
"	Pallachaudali	Richpula
"	Tadi Gaon	Kurkutya
"	Barayal	Dholya
"	Tadi Gaon	Bansula
"	Patan	Lokha Gaon
"	Barayal	Swali
Bajhang	Khalwata	Tudikhad
"	Rayal	Jhota
"	Metala	Paringal
"	Chainpur	Chainpur
"	Jaipur	Pithlekh
Bardiya	Rajpur	Rajapur
Doti	Saraswatinagar	Kaphle
"	Dand	Bahna Ghangare
"	Bayala Garhi	Bayala
"	Pashnali	Pashnali
"	Saraswatinapur	Rautkatte
"	Katamadu	Tiltali
"	Malikasthan	Bokati
"	Banlekh	Bandogra Gaon
"	Gadshera	Dhami Gaon
"	Bhumi Raj	Phaledi

Continued. . .

1 - - *continued*

District	Village Panchayat	Village
,,	Kapalleki	Gotheuri
,,	Khirisen	Phulaud Khirisen
,,	Ghanteswar	Khar Gaon
,,	Bhumor	Urtola
,,	Silgrih	Sil Gaon
,,	Ghanteswar	Bada Ganwa
,,	Tikha	Tikha Gaon
,,	Saraswatinagar	Gola
,,	,,	Dhanrash
,,	Rayal Garhi	Sahajpur
Kanchanpur	Suda	Bhuda
Achham	Hitma	Phatawagar
,,	Jupu	Palakatne Gaon
,,	Mangalsen	Kuda Basti
,,	Dhandu	Dhandu Gaon
,,	Mangalsen	Mangalsen Gaon
Bajura	Kuldevmandu	Sayal
,,	Denlisen	Kharyakhet
Kailali	Malakheti	Rigri
,,	Gyata	Atariya
,,	Geta	Geta
,,	Malakheti	Malakheti
	,,	Baskota

Continued. . .

1 -- *Continued*

Ditrict	Village Panchayat	Village
"	Trinagar	Trinagar
"	Jehariya	Jauhi
"	Shivamandir	Bareha
Dandeldhura	Pokhara	Maligaon
"	Dewal Dibyapur	Ninali
"	"	Mattloa
"	Khalanga	Haradi
"	Doti Ghat	Karigaon
"	Ghatal	Josina
"	Dhod	Dawanli
"	Bain	Budali
"	Vsigram	Chira (Bain Gaon)
"	"	Darnding
"	"	Seti
"	"	Matkatte
"	Raukhola	Matela
"	Saingaon	Kiroda
"	"	Jogbura

2. SUMMARY STATISTICS FOR SELECTED DISTRICTS, FAR WESTERN NEPAL

Districts	Area in sq. Miles	Density per sq. Mile	Houses	Housing Units	Households	Population (Present)	Average Size of Household
Achham	585	260.7	23,231	30,866	30,926	1,52,220	5.0
Doti	2839	99.5	40,117	52,077	52,129	2,82,637	5.4
Baitadi	1414	112.4	23,260	24,284	24,554	1,58,962	6.5
Dandeldhura	566	146.1	12,103	15,556	15,575	82,709	5.3
Kailali	886	101.3	11,433	11,457	11,512	89,795	7.8
Kanchanpur	611	30.9	2400	2407	2384	18,877	7.9
Average	1150	113.8	18,757	22,775	22,847	1,30,867	5.7

SOURCE : The Result of the National Population Censuse of 2018 (1961), Central Bureau of Statistics.

3. AREA UNDER VARIOUS CROPS IN SELECTED DISTRICTS, FAR WESTERN NEPAL, 1967–1968

(in hectares)

District	Paddy	Maize	Wheat	Barley	Millet & Potato
Kailali	39,000 (62.51%)	12,090 (19.23%)	1800 (2.89%)	— —	175 (0.28%)
Kanchanpur	12,000 (62.48%)	5000 (26.04%)	800 (4.17%)	— —	75 (0.39%)
Doti	3900 (26.91%)	4400 (30.36%)	4200 (28.98%)	325 (2.24%)	250 (1.73%)
Dandeldhura	2900 (22.16%)	3100 (23.69%)	4500 (34.39%)	450 (3.44%)	150 (1.15%)
Bajhang	2500 (22.29%)	3600 (32.10%)	3900 (34.78%)	250 (2.57%)	175 (1.56%)
Achham	2700 (25.26%)	3050 (28.53%)	3700 (34.61%)	275 (2.57%)	150 (1.40%)
Baitadi	2825 (27.06%)	2700 (25.86%)	3275 (31.37%)	450 (4.31%)	175 (1.68%)
Bajura	2800 (28.90)	2800 (28.90%)	3100 (31.99%)	250 (2.58%)	75 (0.77%)
TOTAL	68,625 (45.38%)	36,650 (24.24%)	25,275 (16.72%)	2000 (1.32%)	1225 (0.81%)

Continued. . .

3 -- *Continued*

(in hectares)

District	Other Crops	Mustard	Tabacco	Sugarcane
Kailali	1540 (2.47%)	7700 (12.34%)	150 (0.24%)	25 (0.04%)
Kanchanpur	300 (1.56%)	1000 (5.21%)	20 (0.10%)	10 (0.05%)
Doti	1100 (7.57%)	300 (2.07%)	10 (0.07%)	10 (0.07%)
Dandeldhura	1650 (12.61%)	300 (229%)	20 (2.29%)	15 (0.12%)
Bajhang	550 (4.90%)	225 (2.01%)	10 (0.09%)	5 (0.04%)
Achham	575 (1.40%)	225 (5.38%)	10 (2.10%)	5 (0.10%)
Baitadi	725 (6.95%)	250 (2.39%)	15 (0.14%)	25 (0.24%)
Bajura	475 (4.90%)	175 (1.81%)	10 (0.10%)	5 (0.05%)
TOTAL	6915 (4.57%)	10,175 (6.73%)	245 (0.16%)	100 (0.07%)

NOTE : Percentage of each crop the total cropped area is shown within parenthesis. Dash indicates unavailability of data.

SOURCE : Economic Analysis and Planning Division, Ministry of Food and Agriculture.

4. PATTERNS OF CEREAL GRAINS PRODUCTION AND CONSUMPTION IN SELECTED DISTRICTS IN FAR WESTERN NEPAL, 1964-65

(in Metric Tons)

Districts	Consumption	Production	Surplus/Deficit (+) (—)	Production Percentage to Consumption
Baitadi	10,450	3031	- 7419	29
Dandeldhura	11,977	8289	- 3688	69.21
Doti	15,610	8323	- 7287	53.32
Achham	10,428	3818	- 6610	36.61
Bajura	4364	1479	- 2885	33.89
Bajhang	4745	2048	- 2697	43,16
Kailali	19,873	72,035	+52,162	362.48
Kanchanpur	3809	15,132	+11,323	397.26
TOTAL	81,256	114,155	32,899	140.48

SOURCE : Economic Analysis and Planning Division, Ministry of Food and Argiculture.

APPENDIX

5. PRODUCTION TRENDS OF MAJOR CROPS IN SELECTED DISTRICTS, FAR WESTERN NEPAL

1965-1968/1969

(in Metric Ton)

Districts	Wheat & Barley		Maize		Millet		Paddy	
	1965	1968-69	1965	1968-69	1965	1968-69	1965	1968-69
Kailali	58	2250	13,287	22,620	1081	1032	96,847	64,350
(% change)		(+3779.31)		(+70.24)		(-4.53)		(-33.56)
Doti	1264	7815	923	7800	1918	1375	7091	10,023
(% change)		(+518.28)		(+745.03)		(-28.31)		(+41.34)
Dandeldhura	2927	6808	1225	6160	614	1960	5923	6398
(% change)		(+132.52)		(+402.86)		(+217.59)		(+7.99)
Baitadi	1651	5596	n. a.	4463	n. a.	906	2320	6921
(% change)		(+238.95)						(+198.31)

Continued. . .

APPENDIX-

5 -- Continued

Disrticts	Wheat & Barley		Maize		Millet		Paddy	
	1965	1968–69	1965	1968–69	1965	1968–69	1965	1968–69
Kanchanpur	n. a.	1125	3128	10,440	n. a.	555	20,180	25,800
(% change)				(+233.75)				(+27.85
Achham	79	5602	1837	3460	146	832	2352	6548
(% change)		(+6991.13)		(+88.35)		(+469.86)		(+121.82)
Bajura	96	4554	122	1503	447	1120	1368	6944
(% change)		(+1643.84)		(+1131.97)		(+152.57)		(+407.60)
Bajhang	181	8320	117	2004	563	1094	1996	6425
(% change)		(+4491 71)		(+1612.82)		(+94.32)		(+221.89)
Total % change	6256	42,068	20,699	58,450	4769	8883	13,877	13,347
		(+572.44)		(+182 38)		(+86.27)		(- 3.80)

SOURCE : Data for the base year 1965 were obtained from *Cereal Grain Production, Consumption and Marketing Pattern in Nepal*, and for year 1968-69 from Economic Analysis and Planning Division, Ministry of Food & Agricultural.

6. AREA CHANGES FOR VARIOUS CROPS IN SELCTED DISTRICTS, FAR WESTERN NEPAL, 1962-1968

(Area in hectares)

DISTRICTS	Paddy			Maize		
	1962	1968	Increase or Decrease 1962–1968	1962	1968	Increase or Decrease 1962–1968
Kailali	39,137	39,000	–137	7772	12,000	+4228
% change			(–0.35%)			(+541.40%)
Kanchanpur	8146	12,000	+3854	1389	5000	+3611
% change			(+47.31%)			(+259.97%)
Doti	14,072	3900	–10,172	1651	4400	+2749
% change			(–72.29%)			(+166.51%)
Dandeldhura	4901	2900	–2001	1463	3100	+1637
% change			(–40.83%)			(+111.89%)
Baitadi	4429	2825	–1604	3991	2700	–1291
% change			(–36.22%)			(–32.35%)
Total	70,685	60,625	–10,060	16,266	27,200	+10,934
% change			(–14.23%)			(+67.22%)

Continued . . .

6--Continued

DISTRICTS	Wheat & Barley			Mustard		
	1962	1968	Increase or Decrease 1962–1968	1962	1968	Increase or Decrease 1962–1968
Kailali	1092	1800	+708	6824	7700	+876
% change			(+64.84%)			(+12.84%)
Kanchanpur	786	800	14	1143	1000	-143
% change			(+1.78%)			(-12.51%)
Doti	16,878	4525	-12,253	228	300	+72
% change			(-73.19%)			(+31.58%)
Dandeldhura	7459	4950	-2509	106	300	+194
% chage			(-33.64%)			(+183.02%)
Baitadi	7563	3725	-3725	32	250	+218
% change			(-50.75%)			(+681.25%)
Total	33,778	15,800	-17,978	8333	9550	+1217
% change			(53.22%)			(+14.60%)

NOTE : The figures within brackets show the percentage.

SOURCE : For figures for 1962, *The Result of the National Census of Agriculture*, 1962, Economic Planning Ministry, Central Bureau of Statistics. The figures for 1967-68 were obtained from the Economic Analysis and Planning Division, Ministry of Food and Agriculture.

7. YIELD TRENDS OF SELECTED CROPS IN SELECTED DISTRICTS OF FAR WESTERN NEPAL

1 —1964/65

(100 kg. per hectare)

Distircts	Paddy			Wheat		
	1962	1964/65	Change in the Yield	1962	1964/65	Change in the Yield
Kailali	10.96	16.53	5.57 (50.82%)	5.89	6.58	.69 (11.71%)
Kanchanpur	10.65	15.36	4.71 (44.23%)	5.30	—	a.
Doti	21.18	9.88	-11.30 (-53.35%)	12.58	10.95	1.63 (-12.95%)
Dandeldhura	25.96	14.27	-11.69 (-45.03%)	16.20	8.78	-7.42 (-45.80%)
Baitadi	22.60	9.87	-12.73 (-56.33%)	11.76	8.78	-2.98 (-25.60%)
Average	18.27	13.18	-5.09 (27.86)	10.35	8.77	-1.58 (-15.27%)

Continued. . .

7-- *Continued*

	Maize			Millet		
	1962	1964-65		1962	1964-65	
Kailali	6.06	13.17	7.11 (117.33%)	—	8.23	
Kanchanpur	7.80	17.01	9 21 (118.08%)	—	—	
Doti	24.53	5.48	-19.05 (-77.65%)	13.93	10.97	-2.96 (-21.25%)
Dandeldhura	27.63	15.91	-11.72 (-42.43%)	18.46	8.78	-9.68 (-52.45%)
Baitadi	16.71	—	—	11.58	—	—
Average	16.55	12.89	-3.66 (-22.11%)	14.66	9.33	-5.33 (-36.36%)

NOTE : Percentage change in yield is shown within brackets.

SOURCE : Economic Analysis and Planning Division, Ministry of Food and Agriculture.

8. CROP CALENDAR OF THE REGION

Districts	Paddy				Wheat Barley	
	Sowing	Planting	Weeding	Harvesting	Sowing	Harvesting
Achham	May/June	July	July/Aug Sept.	Oct./November	December	May
Baitadi	May/June July	August	July/Aug./Sept.	Oct./Nov./Dec.	Nov. Dec.	May/June
Bajhang	May	July	June/July August	October	December	May/June
Bajura	May	August	October	December	November	May/June
Dandeldhura	May/June	July	August	Oct./Nov.	Nov./Dec.	Apr./May/June
Doti	June	July/Aug.	Aug./Sept. October	Nov./Dec.	Nov./Dec.	Apr./May/June
Kailali	June to September	—	—	Nov./Dec.	Oct./Nov. December	Apr./May/June
Kanchanpur	July to September	—	—	Dec. to February	Nov./Dec.	March/April

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8 -- Continued

Districts	Maize			Millet		Mustard	
	Sowing	Weeding	Harvesting	Sowing	Harvesting	Sowing	Harvest
Achham	June	July	September	July	October	—	—
Baitadi	June July	July/Aug.	Sept./Oct	June	October	—	—
Bajhang	June	July	September	July	October/Nov.	—	—
Bajura	—	—	—	July	Oct. Nov.		
Dandeldhura	June	July	Sept./Oct.	May/June July	Oct. Nov.	November	June
Doti	June/July	Aug./Sept.	Sept. Oct. November	May June Jyly	Nov./Dec.	November	May
Kailali	June/July	—	Sept./Oct.	—	—	Oct./Nov.	Feb./Mar. April.
Kanchanpur	June to August	—	Sept. to November	Oct/Nov.	Feb./Mar.	—	—

SOURCE: Field Work

9. POPULATION PATTERNS FOR SELECTED DISTRICT, FAR WESTERN NEPAL

(Adjusted Census District Figures for 1954, 1961)

Districts	Total Population		Absolute Population increase	Percentage increase
	1954	1961	1954-61	1954-61
Doti	261,437	295,367	33,930	12.98%
Dandeldhura	71,770	87,108	15,338	21.37%
Kailali	76,626	89,910	13,284	17.33%
Kanchanpur	17,770	18,889	1119	6.30%
Baitadi	134,128	163,308	29.180	21.76%
Achham	141,793	165,699	23,906	16.86%

Continued. . .

9 - - *Gontinued*

Districts	Population Precent		Absolute increase in Population Present	Percen-tage increase of Population Present	Population Absent for six months	
	1954	1961	1954-61	1954-61	1954	1961
Doti	254,314	282,639	28,323	11,14%	7123	12,730
Dandeldhura	69,619	82,709	13,090	18.80%	2251	4399
Kailali	76,606	89,795	13,189	17.22%	20	115
Kanchanpur	17,745	18,877	1132	6.38%	25	12
Baitadi	132,148	158,296	26,814	20.29%	1980	4346
Achham	134,834	152,520	17,686	13.12%	6959	13,179

SOURCE : For area and 1954 population, *Census of Population, 1952/54*; for 1961 population, *The National population Gensus, 1961* (Kathmandu, Central Bureau of Statistics, Ministry of Economic Planning)

10. POPULATION CHANGE IN SELECTED DISTRICTS, FAR WESTERN NEPAL
1965 - 1969

District	Population of 1965[A]	Population of 1969[B]	Absolute change in Population	Per Cent Changed in Population	Rate of Change Per annum
Kailali	93,860	120,297	26,437	28.17	7.04%
Kanchanpur	29,486	71,143	41,657	141.28	35,32%
Dandeldhura	19,534	37,535	18,001	92.15	23.04%
Baitadi	30,883	56,719	25,836	83.66	20.92%
Doti	40,537	66,365	25,828	63.71	15.93%
Average	42,860	70,412	27,552	64.28	16.07%

SOURCE: Nepal Malaria Eradication Organization.

(A) This as well as population of 1969 represent population enumenation only in area below 1200 (4000 feet).

(B) Population, except in Kailali and Kanchanpur, districts, refers to the enumenation of December 1969.

11. POPULATION TRENDS IN DOTI, DANDELDHURA, KAILALI AND KANCHANPUR DISTRICTS
1954 — 1961

District	Total Population 1954	Total Population 1961	Absolute Increase 1954 - 1961	Percentage Increase in 1954 - 1961	Rate of Increase Per Annum
Doti	2,61,437	2,95,367	33,930	12.98%	1.85%
Dandeldhura	71,770	87,108	15,338	21.37%	3.05%
Kailali	76,726	89,910	13,184	17.18%	2.45%
Kanchanpur	17,770	18,889	1119	6.3%	.90%
Average of the four districts	4,27,703	4,91,274	63,571	14.86%	2.12%

SCURCE ; For 1954 Population, Population Census of Nepal, Sankhya Bibhag 1957. 1961 Population, The Result of the National Population Census of 2018, Economic Planning Ministry, Central Bureau of Statistics.

12. VOLUME OF EXPORTS AND IMPORTS, TRINAGAR (DHANAGADI)

Commodity	Unit	1963 - 64				1964 - 65			
		Import		Export		Import		Export	
		Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Paddy	md	251	6838	184343	4798448	12	240	41946	1096696
Rice	"	43	1311	9215	341946	2	160	532	25767
Wheat	"	34	1052	313	9344	9	465	1155	25559
Corn	"	42	993	24691	80012	14	554	16835	527518
Flour	"	686	28805	11	442	242	22594	48	3749
Ghee	"	13	4542	1526	469505	6	2379	1167	457853
Salt	"	—	—	—	—	31197	257086	109	872
Sugar	"	—	—	—	—	1554	128035	—	—
Hides	Number	—	—	—	—	—	910	1137	35426
Animals	"	3479	428474	430	55758	2105	336157	173	29429
Herbs	"	—	—	—	—	—	—	430	34340
Wood	"	—	—	—	—	--	2288	—	—
Cloth	Yard	—	—	—	—	556421	1421524	—	550
TOTAL			472315		14475655		2422360		2238902

Continued...

12 -- Continued

		1965 — 66			
		Import		Export	
Commodity	Unit	Quantity	Value	Quantity	Value.
Paddy	md	193.84	6173	25626.80	1140801
Rice	"	15.14	1154	5343.51	387120
Wheat	"	23.42	1189	917.06	48206
Corn	"	2.51	56	390.02	16619
Flour	"	659.14	45673	73 00	4551
Ghee	"	.13	45	1829.31	724831
Salt	"	103175.00	752666	—	—
Sugar	"	42.18	132553	—	49
Hides	Number	—		—	—
Animals	"	4961.00	573446	151.00	34792
Herbs	"	—	—	17430.00	64864
Wood	"	—	—		195373
Cloth	Yard	552166.	1638676	3507.00	9598
TOTAL			3860077		2628557

SOURCE: Central Bureau of Statistics.

13. VOLUME OF EXPORTS AND IMPORTS, MAHENDRANAGAR

Commodity	Unit	1963-64				1964-65			
		Import		Export		Import		Export	
		Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Paddy	md.	7	245	19146	550673	—	20	404	10925
Rice	"	244	10961	1473	51793	64	3683	13	650
Wheat	"	14	600	237	7502	12	569	—	—
Corn	"	—	—	9101	263190	—	—	8842	264504
Flour	"	877	38110	—	10	520	42677	41	4169
Ghee	"	61	6878	2211	603859	5	1950	2888	1097120
Salt	"	—	—	—	—	52357	135172	—	—
Gur	"	—	—	—	—	12604	931924	15	1200
Sugar	"	—	—	—	—	5343	441781	—	—
Hides	Number	—	—	—	—	—	96	288	5622
Animals	"	5690	290039	263	26516	6967	1128237	532	68252
Herbs	md.	—	—	—	—	—	—	84	8763
Wood	—	—	—	—	—	—	3429	—	—
Cloth	Yard	—	—	—	—	1514342	5476894	—	142
TOTAL			34833		16503543		8166132		1462626

Continued. . .

13 -- Continued

Commodity	Unit	1965 — 66			
		Import		Export	
		Quantity	Value	Quantity	Value
Paddy	md	---	---	696.53	29351
Rice	"	68.44	5687	215.76	17937
Wheat	"	19.40	1262	147.72	7333
Corn	"	—	---	538.14	13543
Flour	"	1953.69	150379	—	109
Ghee	"	4.93	2212	2674.05	998628
Salt	"	22945.00	179892	--	—
Gur	"	103951.92	561903	2.65	146
Sugar	"	4876.00	415690	—	—
Hides	Number	---	—	—	—
Animals	"	7105.00	1033444	583	157446
Herbs	"	—	—	266.47	24821
Wood	"	—	—	—	238076
Cloth	Yard	1557362.60	4317185	—	—
TOTAL			10408654		1489390

14. VOLUME OF EXPORTS AND IMPORTS, JHULAGHAT

Commodity	Unit	1963 - 64				1964 - 65			
		Import		Export		Import		Export	
		Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Paddy	Md	114	2942	26	570	45	1466	—	—
Rice	,,	477	18806	311	1183	128	6980	—	—
Wheat	,,	378	13060	326	10884	242	10485	—	—
Corn	,,	48	1689	411	11507	86	3024	—	—
Flour	,,	368	15044	41	1544	156	9452	—	—
Ghee	,,	163	52975	7614	245468	647	34189	6706	2777276
Salt	,,	—	—	—	—	14230	324459	2	16
Sugar	,,	—	—	—	—	3320	215652	26	2387
Gur	,,	—	—	—	—	2395	162681	492	30579
Herbs	,,	—	—	—	—	—	498	—	—
Animals	Number	7544	476657	4639	229860	6877	370352	1650	257245
Hides	—	—	—	—	—	—	—	—	—
Wood	—	—	—	—	—	—	2456	—	—
Cloth	Yard	—	—	—	—	1974885	5871312	—	—
TOTAL			581173		2710516		7013006		3067503

Continued...

14 -- *Continued*

		1965 — 66			
		Import		Export	
Commodity	Unit	Quantity	Value	Quantity	Value.
Paddy	Md.	—	—	—	—
Rice	"	—	—	—	—
Wheat	"	1.60	90	—	—
Corn	"	—	—	—	—
Flour	"	4039.00	7984	8941.76	3384397
Ghee	"	1.98	705	—	—
Salt	"	15193. 00	119768	30.00	2840
Sugar	"	4331. 00	395014	613.07	49
Gur	"	4976.49	254014	29.56	40812
Hides	—	29.74	2441	2058.71	2832
Animals	Number	12341.00	737152	—	181949
Herbs	Md.		—	—	—
Wood	—	—	—	—	—
Cloth	Yard	896031.69	2610244	—	—
TOTAL			4127469		3612930

SOURCE : Central Bureau of Statistics.

15. VOLUME OF EXPORTS AND IMPORTS, RAJAPUR

Commodity	Unit	1963-64				1964-65			
		Import		Export		Import		Export	
		Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Paddy	Md.	2	48	53268	1335139	34	1335	85737	2683832
Rice	"	612	27827	3445	120315	136	7888	13148	789543
Wheat	"	46	1729	120	3271	47	2192	443	19880
Corn	"	3	108	45396	1653734	2	65	40700	1739751
Flour	"	905	40103	14	504	449	33783	9	861
Ghee	"	8	2581	7042	2239564	—	—	7121	2727439
Salt	"	—	—	—	—	142395	384186	19	155
Gur	"	—	—	—	—	199	16971	—	—
Sugar	"	—	—	—	—	5264	329911	3	272
Hides	—	—	—	—	—	4	3028	2491	57894
Animals	Number	7421	690280	288	29739	12706	997056	1309	164955
Herbs	Md.	—	—	—	—	6	587	708	58615
Wood	—	—	—	—	—	—	—	3513	—
Cloth	Yard	—	—	—	—	1976667	5108146	4366	12993

Continued. . .

15 -- *Continued*

Commodity	Unit	1965 — 66			
		Import		Export	
		Quantity	Value	Quantity	Value
Paddy	Md.	—		20768.01	897287
Rice	"	34.03	2583	6715.22	433883
Wheat	"	100.04	23478	73.67	2882
Corn	"	—	—	72.25	2850
Flour	"	657.67	47327	2.14	136
Ghee	"	—	—	7455.09	2955199
Salt	"	19357.09	157455	—	—
Gur	"	240.00	20821	—	12
Sugar	"	4837.58	255712	1.07	75
Hides	—	—	—	—	—
Animals	Number	6913.00	736586	1634.00	383032
Herbs	md	—	—	11145.00	53249
Wood	—	35.00	—	1480.00	500802
Cloth	Yard	1471212.00	3465661	—	—

SOURCE : Central Bureau of Statistics.

16. SEASONAL PRICE DIFFERENCES BETWEEN KAILALI AND DOTI

(Figures in Rupees)

Year	Commodities	Unit	KAILALI			DOTI		
			Baisakh -Ashoj	Kartick-Chaitra	Percentage change	Baisakh -Ashoj	Kartick-Chaitra	Percentage change
	Rice	Per md.	40.00	46.67	+ 6.67	80.00	86.17	7.71
2022	Wheat flour	" seer	2.93	3.20	+ 9.21	—	—	—
1965/66)	Keroseneoil	" 4 gallo	19.61	21.10	+ 7.60	66.33	83.50	25.88
	Ghee	" seer	10.47	11.67	+ 11.46	8.00	8.70	+ 8.75
	Salt	" seer	.22	.20	— 9.10	1.62	1.98	+ 22.22
	Kalo Jin	" yard	1.60	1.60	No change	2.75	2.96	+ 7.66
	Rice	Per md.	55.50	60.00	+ 8.11	76.67	92.75	+ 20.97
2023	Wheat flour	" seer	—	2.38	No change	—	—	—
1966/67)	Keroseneoil	" 4 gallon	15.46	13.43	— 13.13	78.00	53.83	— 30.99
	Ghee	" seer	10.40	8.66	— 16.73	7.93	8.00	+ .88
	Salt	" seer	.18	.17	— 5.56	1.43	1.25	— 12.59
	Kalo Jin	" yard	1.31	1.25	— 4.58	2.33	2.08	— 10.73
	Rice	Per md.	67.63	70.26	+ 3.89	120.83	125.00	+ 3.45
2024	Wheat flour	" seer	3.25	—	No change	—	—	— —
(1967/68)	Keroseneoil	" 4 gallon	18.76	18.82	+ .32	49.38	49.00	— .77
	Ghee	" seer	8.81	9.79	+ 11.12	8.33	10.00	+ 20.04
	Salt	" seer	.17	.17	No change	1.83	1.35	— 26.23
	Kalo Jin	" yard	1.21	1.99	+ 64.46	2.54	2.00	— 21.26

SOURCE Nepal Rastra Bank, Central Office, Baluwatar.

NOTE : Summer is considered from Baisakh (April-May) to Ashoj (Sept.-Oct.) and winter from Kartick (Oct.-Nov.) to Chaitra (March-April).

17. GOVERNMENT AND RELATED INSTITUTIONS IN DANDELDHURA

Office Name	Location	Personnel		
		Authorised	Actual	% of Actual to Authorised
Khalanga Village Panchayat Office	Khalanga	1	1	100
Post Office	Khalanga (Dandeldhura)	48	48	100
North Dandeldhura Forest Division Office	"	12	10	83
District Co-operative Office	"	5	3	60
Class Organisation	"	2	2	100
Police Chauki	Pokhara	6	3	50
Army Headquarter	(Khalanga) Dandeldhura	11	11	100
Mal Adda	"	24	19	79
Land Reform Office	"	17	16	94
Ranger Office	Jogbuda	11	11	100
Police Post	"	6	6	100
Police Chauki	Jogpur (Dauli)	5	2	40
District Panchayat Office	Dandeldhura	13	7	54
C. E. O's. Office	"	14	9	64

SOURCE: Field Work.

18. GOVERNMENT OFFICES AND RELATED INSTITUTIONS IN DOTI

Office Name	Location	Personnel		
		Authorised	Actual	% of Actual to Authorised
District Panchayat	Silgarhi	25	16	64
Dist. Inspector of Pol. Off.	"	16	16	100
Chauki Police	Jorayel	7	6	86
Veterinary Hospital	Nachanthli	10	8	80
Health Dept.	Doti Silgarhi	13	10	77
Family Planning	Silgarhi	7	7	100
Chief Post Office	"	22	21	95
Agriculture Farm	Dipayal	15		
Land Tax Dist. Office	Silgarhi	17	11	65
Dist. Land Reform Office	"	31	22	71
NMEO W6 Doti	"	15	15	100
District Forest Office	"	12	11	92
Zonal Ed. Off. Seti Zone	"	12	11	92
District Co-op. Organisation	"	6	5	83
Cottage Industry	"	18	15	83
Nepal Rastra Bank Sub. Off.	"	11	11	100
Irr. & Drinking Water Supply	"	4	4	100
Boktan Range Office	Chankatte	13	7	54

SOURCE: Field Work

19 GOVERNMENT OFFICES AND RELATED INSTITUTIONS IN KANCHANPUR

Office Name	Location	Personnel		
		Authorised	Actual	Percentage of Actual to Authorised
District Cooperative Office	Mahendranagar	5	3	60
Agricultural Development Office	"	11	4	36
Land Administration Office	"	34	27	79
Agricultural Development Bank	"	3	3	100
Rastriya Banijya Bank	"	15	15	100
Costom Office	"	26	19	73
Irrigation Department	"	3	3	100
Forest Office	"	14	14	100
District Panchayat Office	"	27	27	100
Exchange Post Office	"	19	11	58
Wireless Office	"	5	5	100
Nepal Maleria Eradication Organisation	"	9	9	100

SOURCE: Field Work

20. GOVERNMENT OFFICES AND RELATED INSTITUTIONS IN KAILALI

Office Name	Location	Personnel		
		Authorised	Actual	Percentage of Actual to Authorised
Royal Nepal Airlines Corporation, Office	Trinagar	7	7	100
District Panchayat Office Kailali	"	22	20	91
Nepal Maleraia Eradication Organization, Dhanagadi	"	37	37	100
Forest Department, Kailali Division	"	24	n.a.	
His Majesty's Government, Land Reform Office Kailali	"	13	n.a.	
Cooperative Office	"	7	4	57
Post Office Exchange Head Office, Dhanagadi	"	22	16	73
S. P. Office	"	n.a.	n.a.	
Excise Duty Office, Dhanagadi	"	14	12	86
Agricultural Development Bank	"	6	4	67
National Trading Limited	Dhanaga	5	5	100
Tele Communication office	Trinagar	16	13	81
Nepal Rastra Bank	"	15	15	100

SOURCE : Field Work

n. a. = not availabl e

21. CO-OPERATIVE SOCIETIES IN DANDELDHURA

Name	Location	Date Established	No. of members	Share Price (in Rs.)	Share Capital (in Rs.
Bhuwaneshwari Multi-purpose Co-operative Society	Sansal	2020.4.1	29	16/–	464/–
Bhawanisthan Multi-Purpose Co-operative Society‡	Karagaon	2020.5.4	20	15/–	200/
Puyeelekh Multi-Purpose Co-operative Society*	Puyeelekh	2020 10.7	—	—	—
Sorar Multi-Purpose Co-operative Society	Solpala	2220.1.22	14	—	2400/–
Sahastra Multi-Purpose Co-operative Society	Rayee.	2021.4.30	23	10/–	430/–
Ganesthan Credit Society°	Baral	2020.4.15	—	—	—
Pilkot Credit Society	Letam	2020.4.7	—	—	—
Tali-Sorar Credit Society	Basedibhunw	2020.2.27	—	—	—
Lulan Credit Society	Laduwa	2020.2.10	—	—	—
Vishrampur Credit Society'	Haratola	2020.10.7	—	—	—

Continued...

21-- *Continued*

Name	Locatioe	Entrance Fee (in Rc.)	Loan Advanced (in Rs.)	Loan Paid Back (in Rs.)	Interest (in Rs.)
Bhuwaneswari Multi-Purpose Co-operative Society	Sansal	1/- (each)	533/-	300/-	15/-
Bhawanisthan Multi-Purpose Co-operative Society‡	Karagaon	1/- (each)	—	—	—
Puyeelek Multi-Purpose Co-operative Society*	Puyeelekh	—	—	—	—
Sorar Multi-Purpose Co-operative Society	Solpala	1/- (each)	2422/40	—	—
Sahastra Multi-Purpose Co-operative Society	Rayeen	1/- (each)	—	—	—
Geneshthan Credit Society`	Baral	—	—	—	—
Pilkot Credit Society	Letam	—	—	—	—
Tali-Sorar Credit Society*	Basedibhunwa	—	—	—	—
Lulan Credit Society	Laduwa	—	—	—	—
Vishrampur Credit Society`	Haratola	—	—	—	—

NOTE : ‡ Dissolved in 2026. 5 . 8, * Dissolved in 2026. 1. 17. ` To be dissolved shortly but date unknown.

SOURCE ; District Co-operative Office, Dandeldhura.

22. LIST CO-OPERATIVE SOCIETIES IN DOTI

Name	Location	Date Established	No. of members	No. of Share purchased	Share Capital (in Rs)	Loan given by Societies (in Rs)	Loan Paid Back (in Rs)	Interest
Akhil Khalanga Multi-Purpose Co-operative Society	Ransadal	2019.11.17	43	5	2671/-	10000/-	3165/56	—
Shaileswari Kutir Udyog Co-operative Society	Sarki Tol	2020.1.22	50	—	1600/-	7995/-	2614/15	—
Wadi Bhartoli Credit Co-operative Society	Bharati Village Panchayat	2020.3.23	11	6	600/-	—	—	—
Laxmi Credit Co-operative Society*	Thalara	2020.5.9	13	—	416/-	—	—	—
Sidhi Vinayak Multi-Purpose Co-operative Society*	Silgarhi	2020.10.21	17	10	3400/-	—	—	—
Gadsera Multi-Purpose Co-operative Society*	Gadsera	2021.1.22	11	4	1100/-	7000/-	7000/-	—
Mudegaon Multi-Purpose Co-operative Society	Mudegaon	2021.6.26	21	11	5500/-	—	—	—

SOURCE: District Co-operative office, Doti.

NOTE : * Dissolved, but date not known.

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