STRATEGY FOR NATIONAL URBAN SYSTEM

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This is to certify that this thesis entitled STRATEGY FOR NATIONAL URBAN SYSTEM submitted by SURESH PRAKASH ACHARYA has been examined and it has been declared successful for the fulfillment of the academic requirement towards the completion of the Master of Science Course in Urban Planning.

Dean

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Thesis Advisor
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Date:- 1 March 2000

DECLARATION

I declare that this dissertation has not been previously accepted in substance for any degree and is not being concurrently submitted in candidature for any degree. I state that this dissertation is the result of my own independent work/investigation, except where otherwise stated. I hereby give consent for my dissertation, if accepted, to be available for photocopying and understand that any reference to or quotation from my thesis will receive an acknowledgement.

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(Suresh Prakash Acharya)

Date:.....15th March 2000

ACKNOWLEDGEMENT

I would like to express my profound thanks to Prof. Dr. Jibraj Pokharel (Dean, I.O.E.) for inspiring me to join this academic course of M. Sc. Urban Planning and also providing guidance during my studies at Institute of Engineering, Pulchok. My heartiest thanks with gratitude goes to Dr. Jibgar Joshi (MHPP) who has guided me for completion of this thesis and stimulated me for learning new ideas. I would like to convey my sincere thanks to Prof. Dr. S. R. Tiwari (I.O.E.), Prof. B. Mishra (S.P.A., N. Delhi) and Prof. P. Sharma (ICIMOD) for their contribution in conceptualizing and organizing my thesis work.

My thanks also goes to all the faculty staff members of M. Sc. Urban Planning Program at IOE, Pulchok for providing me all the necessary help during my studies. Similarly, I would like to show my thanks to my wife Rajni and my daughters Suchita, Suprita and Sushmita for being very much co – operative to me during the busiest hours of my studies.

ABSTARCT

Prepared By

Suresh P. Acharya

In the context of spatial planning, the infrastructures and other community facilities are called functions which are used not only by the people living in that particular area where the facility is located but also by the people of adjoining areas. Since all the facilities cannot be located in the same urban center, thus there is a functional interlinkage between the urban centers as well as between the urban center and a large area of rural hinterland. Such linkage and nodes form an urban system.

The subject of inter-linkage between various urban centers in Nepal itself is potentially vast and very much complicated. Lack of database related to functions of urban and rural settlements has made the task rather more difficult. The present thesis tries to focus the importance of this linkage and articulation of ***national urban system*** on the basis of this linkage. The scope of this study has been confined under

- Functional linkage of selected urban centers in Central Development Region on the basis of certain specified activities
- Spatial hierarchies of urban centers and relevancy of Central Place Theory
- Identification of the factors influencing urban system
- Define roles and functions of different urban centers.
- Recommendations of policies, strategies and programs.

This study examines the basic concepts behind urban system and studies the various factors influencing the urban system and the interlinkage system in the study area i.e. in Central Development Region of Nepal. The study has been made with respect to some selected urban/market centers in Mountain, Hill and Terai eco –regions of CDR. This thesis expects to clarify the emerging concept of ***National Urban System*** and its importance in rationalizing investment pattern in spatial context. Finally, it can be said that the basis of urban strategy lies in articulation of well integrated ***National Urban System*** by proper interlinkage of the roles and functions of the urban/market centers, physical and socio – economic infrastructures and investment pattern.

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ABBREVIATIONS

CBS – Central Bureau of Statistics

CDR – Central Development Region

DHUD – Department of Housing and Urban Development

DDC – District Development Committee

EDR – Eastern Development Region

FWDR – Far Western Development Region

GTZ – German Technical Co-operation

INGO – International Non Government Organizations

MHPP – Ministry of Housing and Physical Planning

MLD – Ministry of Local Development

MWDR – Mid Western Development Region

NGO – Non government Organizations

NPC – National Planning Commission

Udle – Urban Development Through Local Efforts

VDC – Village Development Committee

WDR – Western Development Region

The thrust from 'realism' to 'technique' in the history of development thought has given birth to the general use of the technical concept of planning.

Seligman, Ben B. in Main Current in Modern Economics: Economic thought since 1890

Chapter I : Introduction

The main objective of this chapter is to present the urbanization scenario and trend in Nepal and objective, need and scope of the study. Urban centers evolve and develop because people from surrounding areas agglomerate there to fulfil their commercial, social and political needs. Thus it is rather appropriate to say that cities do not grow up of themselves; countryside set them up to do the tasks. This chapter also deals with the hypothesis, methodology and the limitations of the study. Since this thesis is based on secondary source of information, therefore, the methodology flow chart is rather simple without any complexity in methodology adopted for the study. The study is made with the reference of Central Development Region of Nepal.

1.1 Background and Context :

Urbanization commonly refers to the concentration of formerly dispersed population that are primarily engaged in farming in a small number of settlements whose principal economic activities are in the services, trades and manufactures. A second meaning refers to urban modes of production, living and thinking originating in these centers and spreading from these to outlying towns and rural population. (Friedmann & Wulff, pp-4)

Urbanization is a recent phenomenon in Nepal. In 1971, about 4.1% of the population of Nepal lived in 16 municipal areas, in 1981, it grew to 6.3% in 23 areas, in 1991, it became 9.1% in 33 areas and by 1997., Nepal's urban population grew to 14% in 58 municipalities due to natural increase in population, rural urban migration as well as due to designation of new areas as urban areas. (See table no.1)

Table No. 1 : Indication of Urbanization

Item / year	1941	1951	1961	1971	1981	1991	1997
No. Of Towns	3	10	16	16	23	33	58
a. Hills	3	5	8	8	9	14	29
b. Terai	-	5	8	8	14	19	29
Urban Population in '000	156	228	336	462	958	1693	2932
Urban Pop. As % of Nation	2.4	2.8	3.57	4.1	6.3	9.11	14
Urban Pop. Growth rate	-	-	-	3.32	7.55	5.89	4.23
National Pop. Growth rate	-	-	-	-	2.7	2.1	2.44

Source: Course materials in Planning Theory by Dr. S. R. Tiwari, pp-7 ; Nepal District Profile 1997

The rate of urbanization is very rapid i.e. 4.23% per anum but the growth is not uniform throughout the country because of geographical diversities and differences in resource

endowments in various parts of the country. The spatial distribution of urban centers may be written as shown in the table no. 2. (See Figure 1)

Table No. 2 : Spatial Distribution of Urban Centers 1997

Development Region	Municipalities In various Region				Total
	Mountain	Valley	Hill	Terai	
Eastern Region	1	-	3	10	14
Central Region	1	5	6	8	20
Western Region	-	1	7	4	12
Mid Western Region	-	-	2	4	6
Far Western Region	-	-	3	3	6
Total	2	6	21	29	58

Increase in population living in the Terai has the most visible impact on the growth of the municipalities both in terms of numbers and size. Apart from the 58 municipalities, Nepal's urban scene is also characterized by small towns like district headquarters (administration centered) and market towns (spurred by transportation nodes). These small towns are expected to play important role in urbanization process in coming years.(Tiwari, 1998)

The average annual growth rate for all urban centers between 1971 and 1981 was 7.55% and between 1981 and 1991 was 5.89% which is well over twice the national population growth rate of 2.1% per anum (1981- 1991). But towns have not been able to manage this growth in terms of proper layout of expansion, provision of essential infrastructure services, more efficient mobilization of resources to finance such improvements and expansion,

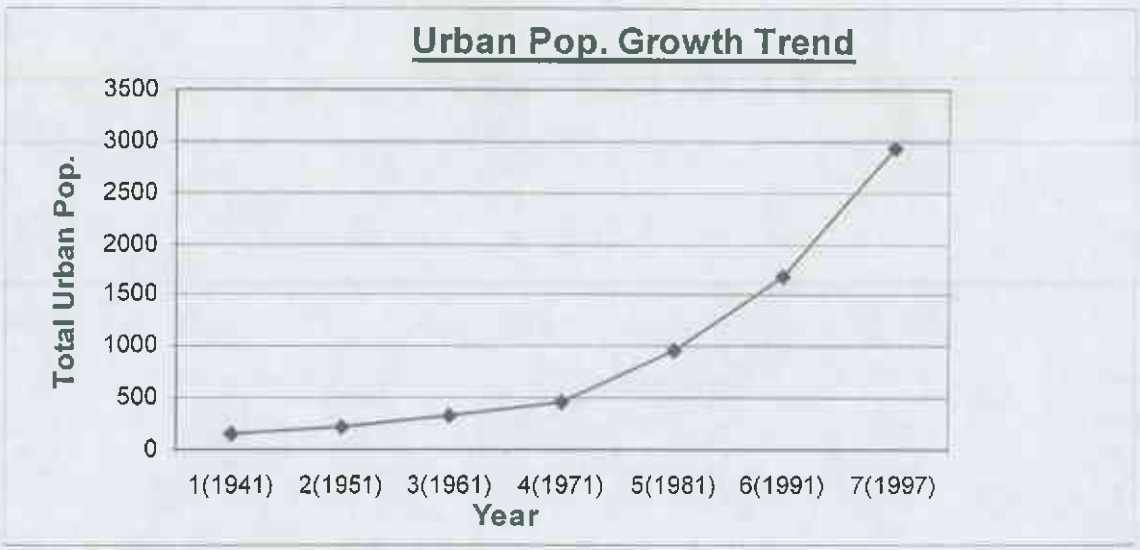


Figure : 3

adequate land use control and overall management. (Chhetri, 1998)

Urbanization in Nepal is not just a result of pull from urban areas but the dominating factor is resulting from push factor which is caused by Shortage of agriculture land, diminishing employment opportunities in the hill areas and subsistence economy in the rural areas. In addition, the difficulty to provide social, health and education facilities to rural people is also contributing to increased rural-urban migration.

The increasing trend of rural urban migration needs to be properly analyzed to understand the economic forces, which are the most powerful factors in shaping the physical nature as well as spatial pattern of towns/urban centers. The present urbanization trend is creating several urban problems such as congestion and several other ecological problems, due to rapid rate of population growth in urban areas.

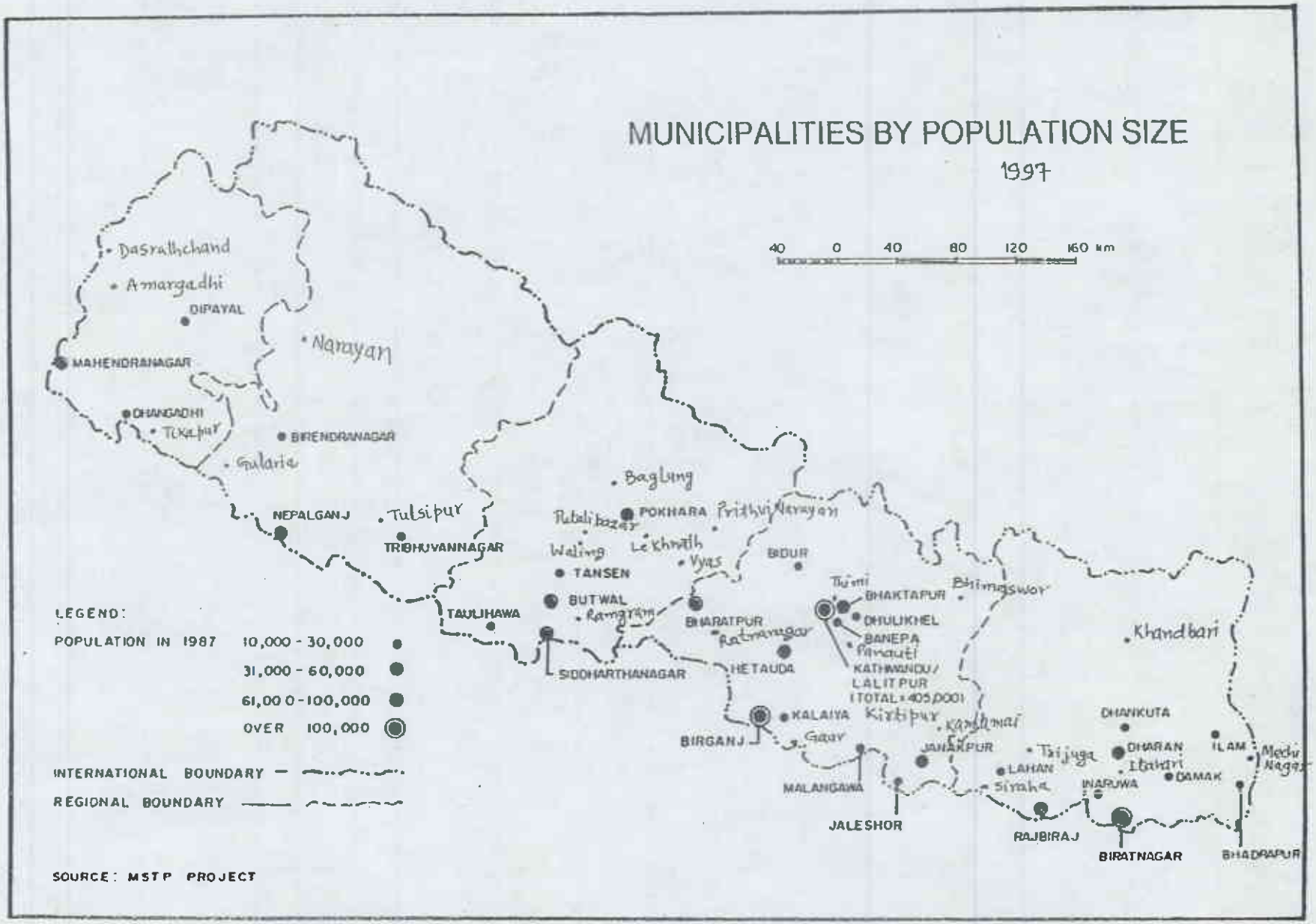
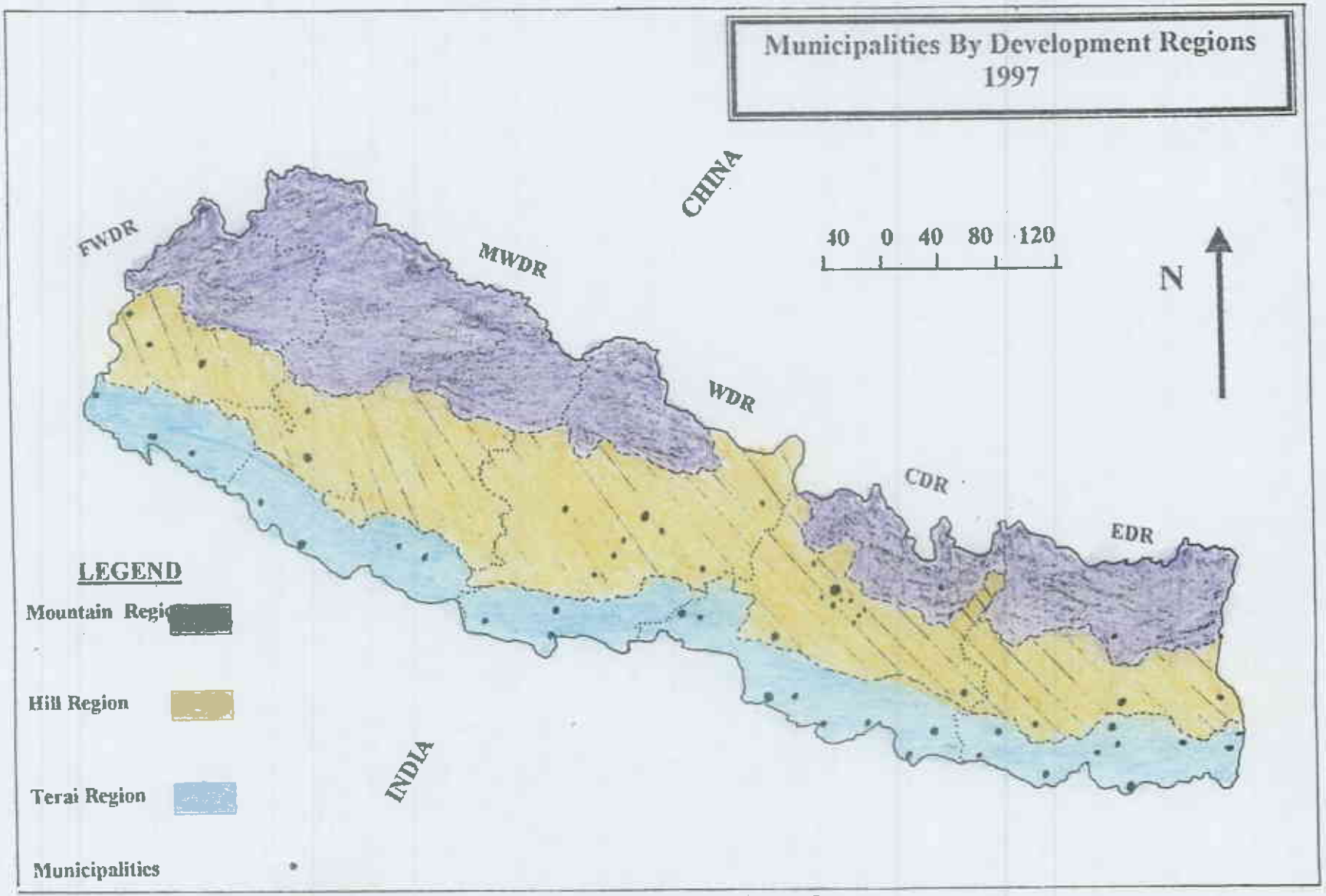

MUNICIPALITIES BY POPULATION SIZE
1997
40 0 40 80 120 160 km
Dasrathchand
Amargadhi
DIPAYAL
Narayan
MAHENDRANAGAR
DHANGADHI
Tikapur
BIRENDRANAGAR
Gularia
NEPALGANJ
Tulsipur
TRIBHUVANNAGAR
Baglung
Pokhara
Prithvi Narayan
Waling
Lekhnath
Vyas
BIDUR
TANSEN
BUTWAL
Ramgram
TAULIHAWA
BHARATPUR
Ratnanagar
SIDDHARTHANAGAR
HETAUDA
Tumi
BHAKTAPUR
Bhimeswor
DHULIKHEL
BANEPA
Panauti
KATHMANDU/
LALITPUR
(TOTAL=405,000)
Khandbari
KALAIYA
Kirtipur
Kamalmai
BIRGANJ
Gaur
JANAKPUR
Tajpur
DHANKUTA
DHARAN
Itahari
ILAM
Mechi Nagar
LAHAN
Siraha
DAMAK
INARUWA
MALANGAWA
JALESHOR
RAJBIRAJ
BIRATNAGAR
BHADRAPUR
LEGEND:
POPULATION IN 1987
10,000 - 30,000
31,000 - 60,000
61,000 - 100,000
OVER 100,000
INTERNATIONAL BOUNDARY
REGIONAL BOUNDARY
SOURCE: MSTP PROJECT

Figure 4



Source : Human Development Report, 1998 Figure 5

Urbanization Trend

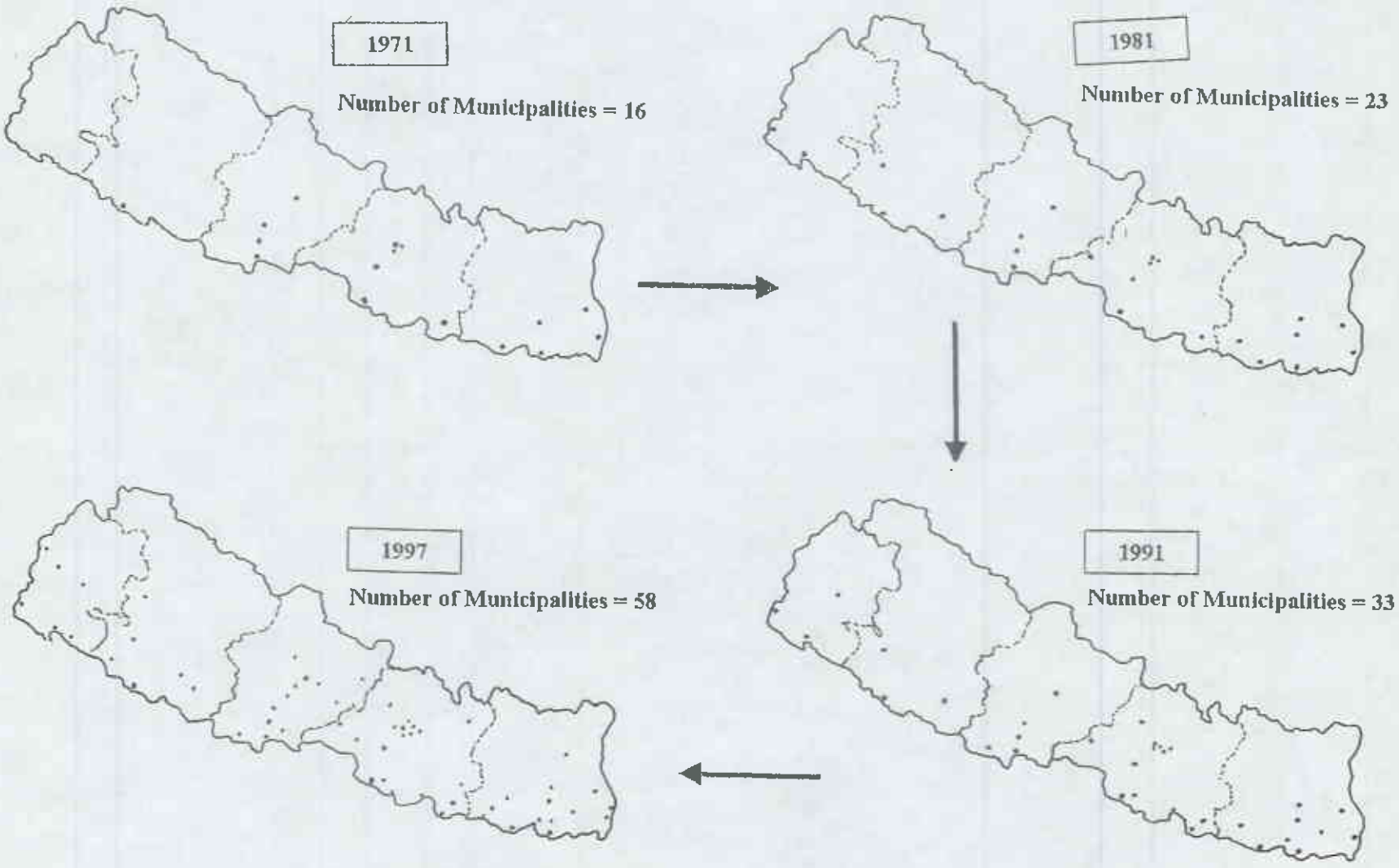


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Figure 6

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1.2 Need of the study :

Urban growth is a market driven process, which the government must support with appropriate policies if the Nepalese economy is to improve, poverty is to be reduced and the disadvantages of accelerated urbanization are to be avoided. A key concern is the role of the settlement system in national development efforts. (Recommended Policies, MSUD, 1991)

Urban growth takes place because of increasing demand for the goods and services made in urban areas and the hinterland rural areas. This growth can be adversely affected if the processes of change are not anticipated in good time and efficient mechanisms not established for the expansion of facilities as the population grows. The needed investment amount for urban services seems to be far more than what is being contributed by HMG as development expenditures in the urban areas. Thus the national investment has not been able to support development opportunities already taking place in growing urban areas despite their positive contribution to GDP. Urban centers don't grow by themselves but they have very strong interlinkage system with other urban centers as well as rural hinterlands. The better is this linkage, better is the diffusion of urban economies. Without an articulated and integrated urban system, the impulses from the urban centers cannot spread.

It has been found that the size distribution of human settlements and the market centers/central places in developing countries are not conductive to fostering development or for distributing economic benefits in a more equitable way. A closely interlinked hierarchy of central places without leaving spatial gaps in urban functions has been regarded as a necessary pre-requisite for economic development and equitable distribution of economic benefits and services. (Shrestha et al, 1994)

Without improvements in urban policy, planning, and management, growth in urban productivity and economic development will be constrained, resources will not be adequately mobilized and managed, infrastructure deficit will widen and maintenance will suffer. Worse still the poor will bear the burden of insufficient action resulting to more and more increase of poverty throughout the nation. Thus an urgent need of pragmatic urban strategy is advocated to integrate the economies of the differentiated urban centers into the main stream of national economy and thus at present it becomes the most needed policy for overall development of Nepal. Comprehension of overall national urban system is essential to

understand properly the backward and forward linkages, which enhances the integration of local economies into national stream.

There is an urgent need to look at the whole range of functional settlements and market activities at the lower end of the rural urban continuum from periodic markets to market centers and small towns, and also to promote development of a graduated hierarchy of settlements that facilitate and strengthen highland- lowland and urban-rural linkages. (Sharma, 1998)

Articulation of development impulses through the urban hierarchy being the ultimate pre-requisite for development....Through the urban hierarchy, establishment of functional linkages among different planning regions should be aimed at. (Joshi, 1985)

Nepal cannot meet its development objectives focussing solely on sectoral issues ignoring the issues regarding urban-rural linkages. The fact that urban centers are agents for economic development can only be utilized in achieving national goal by establishment of functional linkages between inter-urban and intra-urban areas. Thus an urban hierarchic system at national and regional level and their functional inter-linkages system are of utmost importance to rationalize the investment policy.

A well-articulated and integrated system of growth centers of different sizes and functional characteristics can play an important role in facilitating more wide spread regional development. It is envisaged that a well-articulated and spatially integrated hierarchy of urban centers promotes agricultural development in rural areas and links the economies of cities and their hinterland (Rondinelli and Evans, 1983). Neither the goals of increased productivity and income expansion nor those of greater equity in income distribution can be attained without increasing inter action among villages, market towns, intermediate cities and metropolitan areas in developing nations, without integrating urban and rural functions into a national spatial system. (Rondinelli,1976)

Good strategies become vital to cope with adverse effects or to use the prospect and/ or opportunities and to get the things being done successfully. A strategy in fact is a detailed plan for achieving success in situations such as war, politics, business industry or sport or the skill of planning for such situations. (Dhakal, 1998) In this way, a national strategy describes the policies and plans for taking the society or nation to where it is intended to reach from where it is now. The ***strategy for National Urban System*** is intended for balanced

development of rural as well as urban area so that maximum number of people have easy access to urban services as well as opportunities for economic generation. The strategy for national urban system describes the following aspects:

- ✓ Defining National Urban System
- ✓ Defining roles and functions of urban centers
- ✓ Defining interlinkage system between urban to urban and rural centers
- ✓ Policies and plans for taking the existing urban system to balanced development

Therefore, rationales of the study of ***National Urban System*** may be summarized as follows:

- The formulation of national urban strategy should not be limited to solving the problems of population and economic concentration in the urban areas but should accommodate rural development objectives. This fact highlights how investment pattern could be rationalized by articulating National Urban System.

- More emphasis has been made on physical linkages rather than economic and functional linkages between urban centers. Through a well-defined national urban system, economic and functional linkages are explored to establish a hierarchy of functions and services providing better accessibility of services and economic activity to a large group of population.

- Strategy for National Urban System should be able to focus on how to reduce the gap between higher rate of growth in larger cities and lower rate of growth in rural areas. The larger is the city, more are the economic opportunities therefore more and more investments are attracted in those areas at the cost of the lagging rural areas. Thus the strategy is needed to attain equitable growth.

- A well-articulated urban system enables the planner to understand the urbanization trend and implications of investment at one center over the other centers and ultimately the entire region as well.

- A hierarchical system of centers avoids duplication and wastage. It is relatively an efficient way of administering and allocating resources within a region, facilitating the realization of social benefits accruing from economies of scale. (Glasson, pp-140)

1.3 Scope Of the Study:

The unregulated expansions of urban areas at foothills, at the crossroads and at the transport corridors are in urgent need of planning intervention. Thus a comprehensive and pragmatic urban policy for Nepal is inevitable. The present thesis work is an humble attempt to discuss how proper articulation and integration of National Urban System facilitates in formulation of development plans, programs and strategies for the same.

The inclusion of all urban centers, irrespective of the size and extent of central functions or any other variables is neither conceptually sound nor practically feasible. Thus the coverage of the proposed study has been made on the basis of well-defined status of urban centers in Central Development Region. Some non – municipal areas of the mountain eco – region have been included in the study so as to cover the overall eco – regions of CDR.

The subject of inter-linkage between various urban centers in Nepal itself is potentially vast and very much complicated. Lack of database related to functions of urban and rural settlements has made the task rather more difficult. The present thesis tries to focus the importance of this linkage and articulation of ***national urban system*** on the basis of this linkage. The scope of this study has been confined under

- Functional linkage of selected urban centers of Central Development Region on the basis of certain specified activities
- Spatial hierarchies of urban centers and relevancy of Central Place Theory
- Identification of the factors influencing urban system
- Define roles and functions of different urban centers.
- Recommendations of policies, strategies and programs.

The study of interlinkage between urban centers of mountain, hills and Terai in CDR will be helpful to understand the nature of interlinkage between urban centers of CDR with other development regions and thus the national system. The central Development Region of Nepal is rather more urbanized as compared to other development regions. There are altogether 20 urban centers out of which 8 are in the Terai, 6 in the hills and 5 in the Kathmandu Valley and one in the mountain eco-region. The urban centers in the valley have rather influential role as compared to other centers. The rationale for choosing CDR as study area may be written as follows:

- CDR being a more urbanized region in Nepal presents a well developed urban system, a better region for academic study
- Interlinkages among the urban centers in CDR are comparatively better.
- CDR having all types of urban centers ranging from remote urban centers in the mountain area like Bhimeshwor to extremely dynamic commercial town like Birganj and Bharatpur and even primate city like Kathmandu.
- CDR has been a region of great concern for policy makers and investors and the activity in this region is able to influence the whole nation; thus there is more need to be studied and analyzed.

1.4 Problem Statement:

Analysis of Nepal's urbanization is beset with conceptual problems. The criteria for providing urban status to localities has remained mainly political and universally recognized attributes such as the density of population, the occupational structure of economically active population and contiguity of settlements have been consistently ignored. (Sharma, 1993)

The recent trend of rapid urbanization is bringing forth-new types of problems and issues while the country remained predominantly rural. Because of geographical diversities, there are great differences in resource endowments in various parts of the country. National allocation of resources could not be rationalized due to the lack of comprehensive

urban policy and it became difficult to link urban investments with rural, regional, and national development. (Joshi, 1997)

The development problems common to all the urban centers of Nepal are related to lack of land use controls, lack of basic urban services such as drinking water, drainage, sewerage, road networks, environmental problems, loss of cultural heritage and congestion etc. The planning problems related to ***national urban system*** can be listed as follows:

i) Inadequate definition of urban area:-

'Urbanization' is not merely an index of the population strength. In fact, it brings in its wake profound changes in the socio-economic structure of the society. Moreover the urban areas have the tendency to expand and spread continuously beyond its statutory limits into rural areas with urban traits.(Urban Development Through Nagar Panchayat, 1984, pp-6) Under such a complex situation Municipality area cannot be delimited solely on the basis of population strength as is being done arbitrarily under Local Self Governanace Act 1999. The criteria for delineating an urban area as mentioned in Local Self Governance Act 1999 now and previously in Municipality Act 1991 do not specify the functional criteria in the designation of urban areas i.e. municipalities.

While the adhoc nature of designating municipalities is quite evident, we know nothing of the extent to which existing urban areas have been over bounded and extent to which the areas which could be considered urban relative to existing municipalities have been excluded from urban status. Unless a better statistical base is created to designate urban areas, reclassification as well as annexation is likely to contribute to apparent urban growth and urbanization in future. (Sharma, 1989, pp-120) Thus projecting the actual urbanization trend in Nepal is beset with pitfalls and planners often face problems in formulating efficient urban policies.

ii) Unregulated demographic shift from Hill/Mountain region to Terai and municipalities:-

The number of interregional lifetime migrants has more than doubled between 1961-71 and 1071-81. The continuing Hill-Terai migration has created rapid growth of rural settlements in the Terai and inner Terai. This has resulted more pressure on the existing

state of infrastructure services in municipalities especially in Kathmandu valley and Terai towns. This trend has also left the potentials of the hill and mountain unexploited and remains unused for national development

iii) Ineffective inter-urban and rural urban linkage :-

The development policies and guidelines have not been able to specify the proper spatial linkage between rural to urban centers as well as urban to urban centers. Thus the potentiality of various settlements has not been properly utilized in the national development process. "Due to lack of a well developed and integrated hierarchy of central places, opportunities of development are lost in larger areas, and a large number of people are deprived of services and facilities." (Identification and Development of Small Towns and Market centers in Nepal, 1996, pp-1) Thus it is necessary to identify functional linkage and locate centers with high growth potentials for investment.

Since many urban centers and trading centers of the country are based on "pocket economies", such "Pocket economies" represented by small urban settlements are urgently required to integrate with national economy. Some form of grouping of centers on the basis of population as well as function must be accomplished and the distribution of these centers must be examined. Also the viability of spread effects of these centers must be evaluated in a regional context. These examinations should take into account not only the regularities of centers in space but also their distribution in a possible hierarchical network.

1.5 Objective of the study:

The growth and development of urban network system is essentially a process of integration of regional, socio-economic system. The construction of a number of highways and roads has recently led to an increase in the number of small market centers throughout the country. In order to make the role of urban centers effective in the national development, such centers should expand their urban functions along with the increase of number of small urban centers in such a way as to cover the whole rural area.

"The general approach to settlement system analysis seeks to provide a spatial and locational dimensions to regional planning by I) identifying settlements that can most

effectively act as service, production and trade centers for their own population and those of surrounding areas ii) determining the strength of linkages among these settlements and between them and their rural hinterlands and iii) delineating those areas in which people have little or no access to town based services and facilities." (Rondinelli, 1985, pp-2)

The main objective is to assess the role of urban centers in national development process, and to explore strategy for articulating an efficient and integrated ***national urban system***. The specific objectives of the study have been broadly divided into two parts

A) To study existing urban system in CDR in the following aspects

- factors influencing urban system
- Urban interlinkage system

B) Recommendations towards a effective urban system for Nepal in terms of

- Policy measures
- Suggested program framework

1.6 Methodology :

Conceptually this study derives some of the basic notions of central place theory. In Nepal, some towns serve a populous hinterland, whereas some do not have external support, some are experiencing population boom effecting other nearby settlements whereas others with declining population. Such variations largely depend upon geo-political location and accessibility pattern of that particular center. Not all towns can or should be developed as central places, nor should they all have a full range of services, facilities and infrastructure. An articulated and integrated settlement system provides access to a wide range of functions without each settlement having to provide them all.

The study also implies conceptual notions inherent in the growth center strategy. Regional development policies must be focussed on increasing agricultural production and the marketing of agricultural goods, supporting small scale agro-processing industries and diversifying the economic base of market centers. It would require not only the increasing

availability of agricultural inputs but also a far more developed economic, social and physical infrastructure than what now exists. The development of such infrastructure requires the development of a national urban system in the form of growth centers with sufficient linkages for the movement of goods, people and technology. Thus regional development requires careful planning to ensure that essential services and facilities are provided in strategically located settlements and that these places are linked to their rural hinterlands.

This study is based exclusively on secondary data based on various studies of the past and by Central Bureau of Statistics. Route linkages of each urban center in CDR were identified on the basis of field visits and the functional and economic bases and the characteristics of the urban centers in Central Development Region were identified from secondary information sources and Government offices.

The nature of present study is both descriptive as well as developmental research. Descriptive research is a process of accumulating the facts and the developmental research is conducted for the purpose of predicting future trends. The various steps in conducting the study may be written as follows:

i) Define the problem and state the objective.

ii) Review the literature to establish a baseline of existing information.

iii) Data Collection from various secondary sources

iv) Analysis of data to study factors affecting urban system and functional interlinkage system

v) Compilation of the result and formulation of strategy and program framework

Methodology flow chart

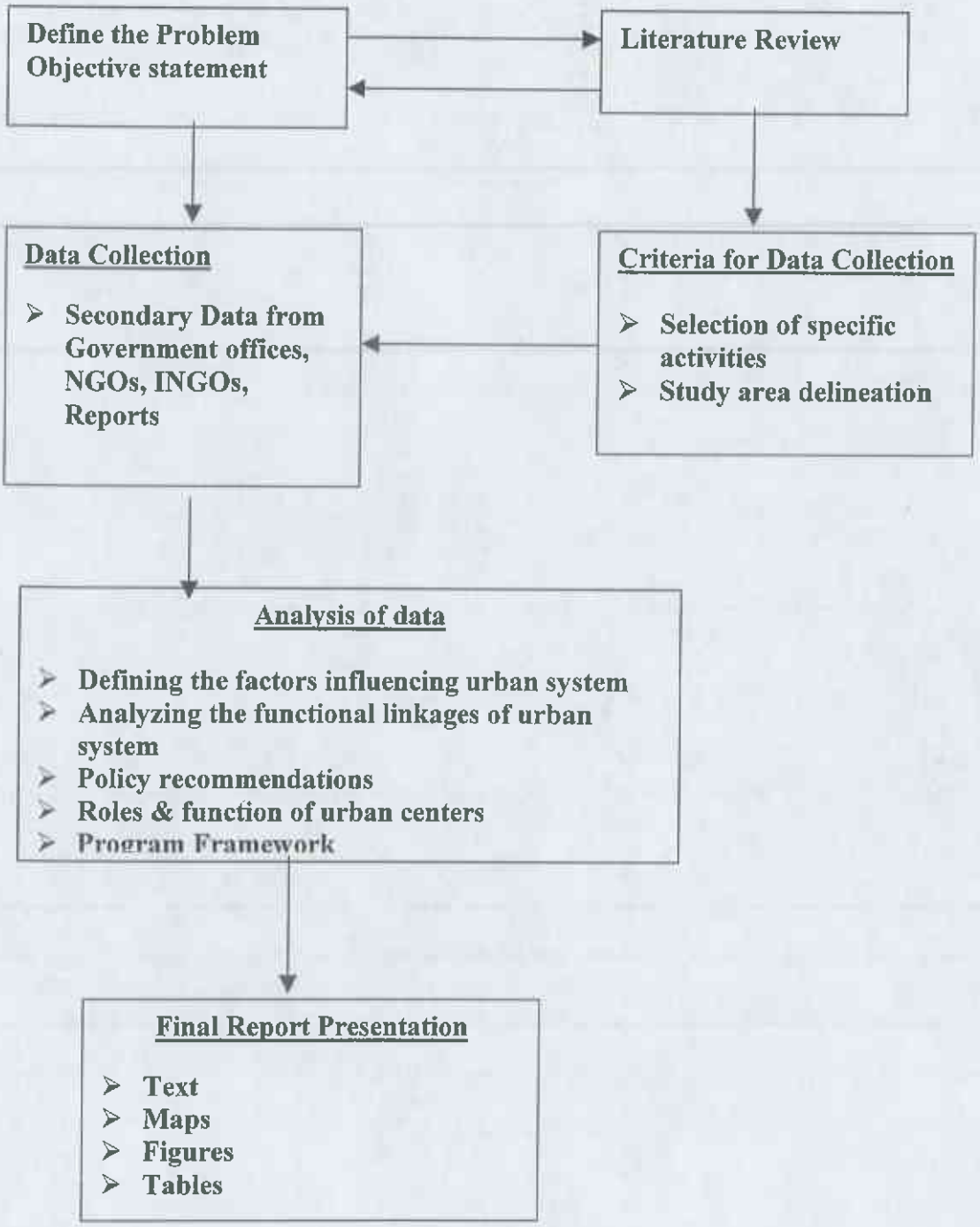


Figure: 7

1.7 Hypothesis:

- Establishment of functional linkages among different eco – regions can be made by properly articulating and integrating National Urban System
- Urban hierarchy system avoids duplication and wastage of investment
- National urban system help to check the unregulated demographic shift from hill/mountain region to the Terai and municipalities of the Kathmandu valley
- A well-articulated national urban system helps to strengthen rural – urban and urban – urban linkage reducing imbalance between rural and urban as well as developed and backward region.

1.8 Limitations :

The study is limited to Central Development Region in terms of selected activities and functional linkages of the urban system. The study has number of limitations as listed hereunder:

- Functional linkage is addressed with the help of only limited activities
- Only limited factors influencing urban system are studied
- Spatial hierarchy has been studied on the basis of Central Place Theory
- Several data has been extracted from various reports from several organizations

1.9 Organization Of the Thesis :

The spatial layout of urban system is closely related to the role and functions of the urban centers as well as the inter-relationship between them. These urban centers (within a region or in a country) form an urban system connected by flow of goods, people and information. This system is constantly evolving and reflects well the stage of economic development and economic integration of a country. The organization of the thesis has been

made keeping in view the inadequacies in defining urban areas in Nepal, the factors affecting the urban system, functional interlinkage between the urban centers and their rural hinterland and national effort through several Five Year Plans.

The write-ups of the thesis have been logically divided into six chapters. The introductory chapter includes the background and general urbanization trend. The second chapter includes the basic concepts behind the idea of urban system and literature review. Chapter three includes the national five-year plans, which explicitly influence the national urban system. Chapter Four is focussed on the important interlinkage system between urban centers in the study area i.e. CDR. Chapter Five deals with the various factors influencing the urban system in the study area and describes the urban population distribution and growth of urban centers, occupational distribution as well as urban primacy. Chapter six is the concluding part of the thesis and explains the importance of urban hierarchy system, investment strategy, program framework and strategic recommendations for National Urban System.

The first step of knowledge is to know that you are ignorant.

- Cecil

CHAPTER II: Literature Review

This chapter describes the basic concepts related to urban system and its strategic importance. Central Place Theory is the fundamental concept, which clarifies the significance of spatial considerations of urban centers as well as the interdependency linkages between the urban centers as well as the surrounding rural hinterlands. The Growth Pole/Growth Center concept shows its importance in understanding the role of urban centers, which are economically potential, in regional space. Similarly, views of various scholars about urban system and its hierarchical order have been described in this chapter. Basic ideas about generative and parasitic cities, ecological footprints, growth axis etc. have also been dealt with. In this way, this chapter deals with the philosophy of urban system in brief.

2.1 Central Place Theory:

As a social system, the city suggests intensive interaction and interdependency among its residents and institutions. As a spatial system, it suggests that these patterns of interaction are spatially bounded. As a space organizing sub-system, it suggests that it also functions as a **Central Place** (within a hierarchy of central places) to organize surrounding and sometimes distant territories into economic, social and cultural spaces. Cities are no longer seen as independent entities, but as a space organizing systems. (Friedmann & Wulff, pp-6-7) The **space** may be defined as those dependent areas where surplus of production will be redistributed and also service functions such as markets and transport will be provided from hierarchically ordered centers of control. In other words, the space includes those areas of hinterland which are dependent upon the urban center for several services and industrial production and the urban center is also dependent upon the space for agricultural production and the labor force.

There is a hierarchy of service activities ranging from "low order" services found in every Center City, town or village to "high order" services found only in the major centers. Such distribution of settlements is though uneven but not dis-orderly. Central Place Theory hypothesizes this orderly pattern of distribution of settlements and W. Christaller demonstrated its validity with reference to macro regions of Southern Germany in the 1930s. In 1933, Christaller proposed that settlements with lowest order of specialization would be equally spaced and surrounded by hexagonal shaped service areas or hinterlands. For every six of these lowest order settlements, he suggested that there would be larger and more specialized settlements which in turn would be situated at an equal distance from other settlements of the same order and also surrounded by a hexagonal service areas. Thus one of the important aspect of theoretical formulations of Central Place Concept is the regularity of distribution and hierarchical arrangement of Central Place in a region.

Christaller intended a broader interpretation of Central Goods and Services. The theory was created to describe and explain the territorial arrangement at the intercity scale of not only retail and service trades but of transportation and communication activities, wholesaling, public and cultural institutions, some financial activities and certain types of market oriented industries and thereby to contribute to a solution for the general problem of explaining the size, number and distribution of urban places. (Preston, 1986, pp-17-42)

Christaller postulated also an isotropic space – a homogeneous plain territory with an evenly distributed rural population, a uniform distribution of purchasing power and feasibility of transportation links. The fundamental meanings used in Christaller's Central Place Theory (1933,1966) are written as follows:

- **Central places** are urban settlements that provide central goods and services not only for their own residents but for consumers living in their complementary regions . The term central place is used because to perform such a function efficiently, a settlement should be located at the center of minimum aggregate travel distance from the settlements surrounding it. Central places are categorized into different hierarchical groups on the basis of number and types of functions performed and the size of population served by them.

- Importance of **centrality** is related to concepts that identify respectively the aggregate and relative importance of settlements as central places. **Nodality** represents the aggregate importance of a place as a provider of central goods and services both for its own residents and for other consumers. Thus surplus goods and attractiveness for goods and services are the measures of centrality but they are not static and thus centrality is not static. Consequently centrality can increase or decrease. "An ideal location is one where geographic center and the functional center coincides." (Rao,1983, pp-114-116)

- **Central goods and services** are those " produced and offered" at a few necessary central points in order to be consumed at many scattered points. "Such services may be rudimentary but essential such as general store or sophisticated and specialized such as a university. These examples may be referred to as low-order or high order services respectively. Between these extremes is a wide range or hierarchy of intermediate functions. it will be apparent that the population required to support different functions tend to increase as one go up to hierarchy." (Knowled et al, 1996, pp-221)

- **Economic distance and range of goods**: Economic distance represents not just linear distance but embraces cost of freight, insurance and storage, time and loss of weight in transit.

- A **central place hierarchy** is an idealized stair step like distribution of central places in which each level or order is distinguished from other orders by a distinctive group or order of central goods and services not offered by lower order places.

The central place studies determine the extent of the peripheral area required to support a town, specify optimal spacing of settlements and try to organize space suitable to the activities of man.(Joshi, 1985, pp-98) However in explaining the process of hierarchical development of market centers, the two theorists – Christaller and Losch, have pursued different approaches. Christaller started from the top down to develop a central place hierarchy, wherein high order centers containing higher order goods are first established and later followed by successive lower order centers containing lower order goods. Whereas Losch began from the bottom up wherein small centers which provide basic necessities are first established and larger ones are created as the demand intensifies.(Berry 1967; Smith 1976)

In short, the theory seems to provide two potential roles

- as a framework for understanding the regional spatial structure
- as a model for future planning

Along with its several benefits of having the basic philosophy to understand the spatial structure of urban places, there are several **limitations of Central Place Theory** that can be listed as following:

i) An assumption of the isotropic surface is never fulfilled in real world.

ii) In economically advanced regions, the hierarchy as explained by the model is distorted by the domination of large centers.

iii) The theory relates only to the service elements but in real world, the settlement may develop due to localization of natural resources (e.g. tourist centers).

iv) The uniform distribution of population is very much unlikely to occur in practice.

v) The theory assumes that consumer will act rationally and patronize the nearest center for relevant service activity, giving rise to mutually exclusive hexagonal hinterlands. Several other human factors (such as preference) are not considered.

Most of the studies (with reference to urban centers of Sudan, Iran, China, South Asia and Tanzania) show: for most developing countries where rural population forms the majority of the total population, a hierarchical pattern of towns and rural centers closely related

to the findings of **Central Place Theory** should be the most promising and basic solution for economic planning and resource allocation; technological diffusion and economic development can trickle down through various levels of administrative hierarchy formulating a pattern of diffusion. But this hierarchical diffusion has not been triggered because of the lack of articulation and integration between larger towns and small urban centers. (Role of Small Urban Centers,1984, pp-17-18)

2.2 Concept of Growth Pole and Growth Center:

The **Growth Pole** concept of spatial development suggests that by investing heavily in capital intensive industries in the largest urban centers, government in developing countries can stimulate economic growth that will spread outward to generate regional development. It is assumed that the goods produced in the growth pole would be exported to the country's metropolitan centers and abroad, that other manufactured goods would come from the metropolitan center to the growth pole and that the free operation of market forces would create "ripple" or "trickle down" effects that would stimulate economic growth throughout the region. (Rondinelli, 1985,pp-3)

This concept developed by Francois Perroux in 1955 , is based on urban – industrial development strategy and on typically large scale and heavy industries. Economic growth cannot take place evenly in geographic space and growth is highly localized at certain **'epicenters"** with different degrees of intensities, spreading differentially in different directions. The concept of development pole developed by Friedrich Buttler assumes that an enforced development of the pole will induce development in its zone of influence. The practical consequences of this approach is a tendency to concentrate (public and if possible private) investment in a few poles instead of furthering more even distribution of the available resources.

There are several types of effects of the **growth poles** on the lagging peripheral regions; some are favorable whereas some are adverse. "The favorable effects have been termed as trickling down effects by Hirchmann and Spread effects by Gunmar Myrdal, whereas the adverse effects are respectively termed as polarization effects and back wash effects. The

prospects of development in the lagging regions may be encouraged or discouraged by the development of a pole."(Joshi,1985, pp-76).

Growth pole in economic space as field of forces is an aspatial economic concept (without any specific geographical dimensions), while the growth center concept is spatial and has location in geographical space. The **growth pole** when translated to the geographical space becomes **growth center**. (VLS Prakasha Rao – Urbanization in India, page 117-126). This concept of **growth center** developed by William Alonso realized the fact that certain centers grow faster than the others because of their own characteristics. The different categories of growth centers may be written as rural service centers, agro-towns, market towns. "The approach of development center is based on improvement of the situation of less developed regions by creating a new or by strengthening their existing regional centers." (Gurung, 1969) The objective of developing **growth centers** can be said as it is for the creation of polyfunctional settlements to cater the diverse needs of their hinterlands. Through the process of multiplier effects, the areas in organic link with the growth center will gain from the concentrated set of economic activities. In other words, the **Growth Centers** are supposed to have the highest order functions with some urban characteristics and are capable of generating employment opportunities through non-farm activities. Thus the **Growth Centers** are highest order central places, the next lower ones are the service centers and the lowest ones may be termed as small market towns.

Investment in industry at the growth pole would be the "engine of development" for agriculture and commercial activities but without an articulated and integrated system of growth centers, as opposed to one or few growth poles the impulses of concentrated investment could not spread and economic incentives for widespread productivity could not be created. (Rondinelli, 1985, pp-3) The major difference between Growth Pole Policy and Growth Center Policy is that the Pole Policy necessitates the development of a selected industrial focus composed of propulsive firms from leading industries whereas the Center Policy rather entails the concentration of investment in a chosen location of those facilities which will create urbanization economies that are attractive to industry. Thus the concepts of **Growth Pole** and Growth Center Policy rather explain why central place spatial structure tends to be distorted in real world.

In the settlement hierarchic system, the identified growth centers are expected to bridge the functional gap between higher category of settlement and individual village with

2.3 Concept of Urban Systems:

Systems are made up of sets of components that work together for the overall objective of the whole. An urban system exists in an environment, which contains urban and rural areas with which the city interacts strongly. "A careful analysis of the structure of a city demonstrate that it is not possible to study any of its parts in isolation, because they are strongly related to other elements of the city structure. For example, it is not possible to study the location of a shopping center without analyzing transportation facilities and the number of potential consumers." (Reif, 1973, pp-26-38) Similarly in regional space, location of an urban center or service center largely depends upon a number of socio-economic factors, transportation facilities and infrastructure services. In the context of spatial planning, the infrastructures and other community facilities are called functions which are used not only by the people living in that particular area where the facility is located but also by the people of adjoining areas. Since all the facilities cannot be located in the same urban center, thus one urban center become dependent on the other. Thus there is an inter dependence (functional interdependence) between the urban centers. The sets of complex relationships are functional linkages – physical, economic, social, administrative and political and these functional linkages are reciprocal linkages. The linkages between urban centers bind them into an ***Urban System***.

Characteristics of an urban system may be listed as follows:

- ***Interrelationship***: - The various factors which indicate the interrelationship between the elements of an urban system may be written as population distribution, patterns of migration, occupational distribution, accessibility pattern, role of urban center, infrastructure development etc.
- ***Vertical Structure***:- An Urban system cannot grow indefinitely and there is a maximum size of a system which corresponds to an optimum structure, deviation from which may threaten the system's integrity. The urban system may be National, Regional, Sub-regional or Local depending upon how it is dealt with.
- ***Horizontal Structure***:- An urban system must also have an optimum horizontal structure; i.e. a correct ratio must be maintained between all dissimilar elements of the systems. If the correct proportion is not maintained, the system may become an integrated set of parts that will behave in random manner compromising the correct functioning of the system. (Reif, 1973; pp-1-24) The system consists of not only the urban centers but also a number of rural centers as well provided they are functionally linked with the other centers within the system.

- ***Order***:- Order can be defined as the influence of the whole over the parts. In order to ensure that each part of the system behaves in a way, which benefits the activities of the system as a whole, there is a need to impose certain regulations and investment programs. Thus order is necessary for an efficient system.

- ***Identification of the urban system***:- An urban system consists of nodes and links. The nodes represent the various urban centers and the links represent the interlinkage. Since each urban center has its own system of central functions, the volume of such central functions creates different hierarchies of urban centers. Such hierarchies lead to backward and forward linkage system; linkages with lower order centers are backward and those with higher order centers are forward linkages. Transportation and communication are effective means of linkages.

The following Fig shows some of the subsystems within an urban area forming the urban system and their inter relationship:

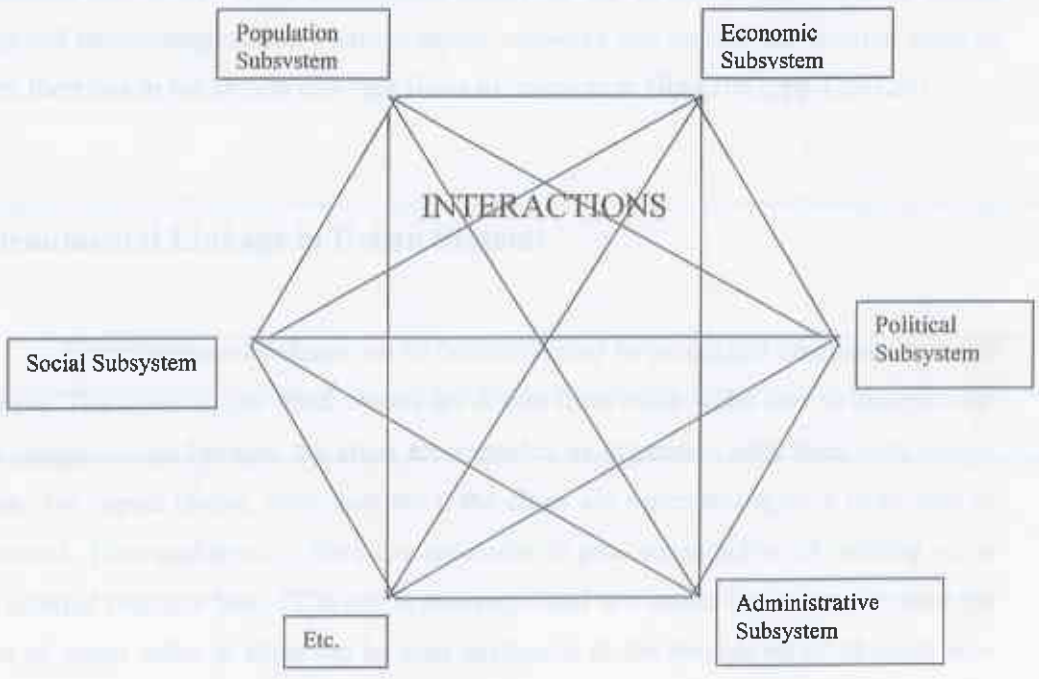


Fig: 8 Showing urban subsystems

community support and self-help mechanism in the other) to assimilate the stress." (Bjoness et al, 1997, pp-9)

According to Lyle A. Walker and William E. Rees(1997), **Ecological Footprints** of a given population is the total area of productive land and water required on a continuous basis to produce all the resources consumed and to assimilate all the wastage produced by that population, wherever on earth that land is located. Thus the total area of land required to sustain an urban region is typically at least of an order of magnitude greater than that contained within municipal boundaries. It confirms the inter relation of an urban center with a larger area of hinterland and other urban centers thus explaining and understanding the mechanism of change and inter dependencies between neighborhoods, cities and their region.

It is possible to visualize towns and cities as playing simultaneous generative functions in certain activities and parasitic roles in other activities. It is important to understand the people and their activities in the towns and cities to have a better understanding of generative and parasitic functions. Towns can play an important role in the distribution of daily essential goods and consumer items and a place for earning money by selling dairy products and vegetables and food grains for rural areas. The availability of agricultural inputs to increase agricultural production as well as easy access to credit facility can also be attributed as generative function of small towns. The towns has also been playing parasitic role in their absorption of food grains and making rural areas dependent on cheap industrial products from outside thus hampering the indigenous industries.

Thus it is clear that interdependencies as described above explain the role of urban centers such as providing market supporting services and industrial production whereas the rural areas supply agricultural production, labor force and several other resources. Therefore rural and urban development should not be seen in isolation from each other and they have strong social, financial, demographic, economic and environmental linkages that can be optimally utilized to strengthen local economic and spatial circuits. The urban economics have potentials for high growth if they can perform the role of producers for goods and services required for rural economics and the rural production system develop to meet the growing demand of urban areas. The rural farmers for increasing their purchasing power and poverty alleviation could better utilize the high market potentials in urban area if proper interlinkage system is developed.

2.5 Urban Hierarchy System:

'Urban' is an attribute of space, 'Urbanism' the way of life and 'Urbanization' the process of becoming urbanized, which are rather explained by dynamic field of forces of socio-economic character. Thus '**Urbanization**' as a space bound phenomenon refers to a 'form', a 'system' or a 'settlement pattern' (Friedman, 1966). The **space** represents a settlement pattern – an ordered and discrete hierarchy down from villages and country side to towns and cities – often measured in terms of their location, size density, forms, etc. giving rise to the complex planning problems of dynamic urban and regional systems. (Wishwakarma, 1981, pp-48)

The main task of articulating ***National Urban System*** to prepare and understand spatial planning for identifying the requirements of support infrastructures which could improve the quality of life as well as promote economic activities. Another important task of spatial planning is to identify and correct imbalances in availability of infrastructure facilities in a region as a whole or in any part of it. Such infrastructural facilities may be point bound i.e. school, hospitals etc. or connective i.e. road, telephones, electricity etc. These facilities are also termed as central functions because these are used not only by the particular place where it is located but also by the adjoining area. In this way there is interdependence (functional interdependence) between settlements. Since all types of functions cannot be located in each settlement because any service or facility would need a minimum number of consumers (threshold population) to support it, we can observe a kind of hierarchy between different settlements on the basis of these central functions.

The minimum number of users required to support a given function (service or facility) is termed as **population threshold** and the maximum distance which the users of a particular function are prepared to travel to avail it is termed as **distance threshold.** Population and distance threshold provides guidance for optimally locating a function in the existing settlement of an area. The graded structure of functions from the apex to the base shows the functional hierarchy of settlements. Therefore a functional network of central places is necessary to provide an efficient delivery system of production and systematic dispersal of socio-economic facilities and services. Such delivery and dispersal system should be so balanced that all groups and section of the society can share their benefits. Thus the technique of ***urban system*** is based on concept of central places that are dispersed in space and through which the whole process of development is conceived and generated. This process involves

selective "decentralized concentration" of socio-economic activities, which utilizes optimally the potential of an area thus safeguarding against any wastage of resources. The functions to be located at each central place are recommended on the basis of resource potentials of its hinterland and its own functional specialization. This selective approach is made to serve the region most efficiently and effectively in respect of infrastructure and social facilities. Unnecessary duplication and overlapping in the development of services may thus be avoided to some extent.

The position of an urban center in the urban and regional setting provides its level of fundamental specialization and associated hierarchic orders. The hierarchic structure is such that in the lower order of urban regional hierarchic system, city – regional reciprocal relationships are more dominant while in higher orders inter-urban and inter-regional relationship are more dominant. A hierarchy may not exist in all types of regions. In regions with subsistence economies, limited development potential and with intra-regional transport inaccessibility, independent local centers develop without hierarchic structure. (e.g. market centers in remote Himalayan Region).

Rondinelli argues that if economic development is to be achieved with greater social and geographical equity, investments must be made in a pattern of "decentralized concentration". This "decentralized concentration" can be achieved most efficiently and effectively through an articulated and integrated system of settlements. A hierarchical or diffused settlement system can provide not only the critical mass of services and facilities needed in rural areas to increase agricultural productivity and income but also provide the trade, transportation, administrative and social linkages that integrate a region into self sustaining economy. In a region with well articulated and integrated system of central places, people living in or near small towns have easy access to basic goods and services in local markets as well as to higher order functions that must be located in cities with a larger threshold population. An articulated and integrated hierarchy of settlements provides potential access for people living throughout the country to markets of different sizes and to a wide variety of urban amenities. For successful spatial balance, cities have to be designed as service centers to its hinterland and there should be ordered network of transportation and communication network linkage. Thus the study of spatial interpretation of inter-urban as well as intra-urban areas becomes quite useful to understand the level of spatial balance.

The development strategy requires the identification of rural service centers as basic nodes to articulate the rural economy and to link it with the national hierarchy of settlements. (Pradhan, et al,1992, pp-5-6) The rural service centers in other words are the

market centers, which have symbiotic relationship with the rural hinterlands. The development of market centers depends upon the resource potentials of its hinterlands as well as the availability of service and facilities. Most of the urban centers in Nepal are function as the market centers for their rural hinterland. By creating a functional interlinkage between these centers by articulation of national urban system, the function of market centers is rather appreciated and rural economy is interlinked with the national stream. In this way under proper condition, small towns and cities can be positive forces for developing their hinterlands for transforming subsistence rural societies into commercial agricultural areas. "The weak demonstration of agricultural development in the rural regions was generally attributed to the lack of a well articulated system of urban centers, inadequate distribution of services and facilities and poor linkage among settlements."(Bromley 1984; Mollet 1984; Rondinelli 1984)

Urbanization can be managed and shaped to contribute to the achievement of the goals of poverty alleviation and regional development. "In order to integrate local economies into national economies, networks of an intermediate cities and small towns need to be developed into self reliant, sustainable enterprises not dependent on the imported resources but capable of establishing functional linkages with other economies. With the right interventions, linkages can be made to work in favor of rural areas." (Joshi, 1998) The community in the rural hinterland needs to be strengthened and empowered to make the linkages favorable for economic development. The purpose of empowerment is to facilitate the local and indigenous inhabitants in taking authority in terms of deciding the future of their area and also to take initiative to upgrade the area.

The cities in any region may be ranked from largest to smallest according to their population size. The **Rank Size Rule**, proposed by G. K. Zipff in 1949, states that " if all the urban settlements in an area are ranked in descending order of population, the population of the nth town will be $1/n^{th}$ that of the largest town."

$$P_n = P_1/n$$

where P_n the population of town in rank n in descending order

P_1 is the population of the largest city

There are different ideas of different scholars about the central functions. Christaller (1931) in Germany took the number of telephones as a basis, Dickinson (1932) in

USA considered the provision of goods of service centers and service to their tributary areas, while Smailes (1944) considers the essential functions of the towns and institutions which discharge the functions, Carter (1955) considered selected data with an emphasis on commercial functions, Kolb (1933) uses social, commercial and religious services, Brush (1953) and Philbrick (1957) categorized on the basis of size and economic activities whereas Green (1950), Ullman (1960) and Taaffe (1962) considered centrality by capacity as transport centers. (Soni, 1986 pp-267-275)

Functional magnitude provides a common basis for the assessment of market centers. It is an effective measure considering the agglomeration economy of market centers on the basis of functional magnitude, the local market centers have been grouped into four classes: (Shrestha et al, 1994, pp-30-31)

- ✓ Centers with more than 200 functional units
- ✓ From 100 to 199 units
- ✓ From 50 to 99 units
- ✓ From 20 to 49 units

To assume that all functions are of an equal level of significance is not realistic. However it is apparently a valid measure of the relative importance of market centers in Nepal. Agglomeration of functions increases progressively with the increasing importance of market centers and provides a basis for **Urban Hierarchy System.**

The central purpose of the program is to raise production, employment, standard of living and general well being throughout the country, thus opening out to the people opportunities for a richer and more satisfying life.

First Five Year Plan 1956

Chapter III : National Planning and Urban System

The main objective of this chapter is to describe the urban and regional policies in National Planning in Nepal and *National Urban system* prevailing in the country. Regional Planning in Nepal is a new concept and has not been exercised much in National context. The policy and strategy in urban and regional planning in the various National Plans has been described in brief. The Urbanization Policy in the Ninth Plan has been described in two parts - policy for regional development and policy for Human Settlement and Urban Development. National Urban System describes the characteristics of urban centers of Nepal and the prevailing Urban System, which neither functionally nor hierarchically integrated nor articulated.

3.1 Regional Planning in Nepal:

The term region in a planning concept may be viewed in terms of its geographical features, climatic features, demographic features, administrative structures, settlement pattern, political dimension and development level. Some regions may be endowed with abundant natural resources, some with fertile soil, some with natural beauty, some with its own socio-cultural identity etc. Thus regional planning may be defined as basically the spatial development planning so that the fruits of economical as well as social development are equitably distributed among the regions. Another main purpose of regional planning is to bridge the gap between local level and national level of development planning.

Under the multilevel planning system for development, regional planning is defined as the ordering of human activities in supra urban space in relation to other spatial units of national territory with a view to attain social and economic integration in space and facilitate national development. The main aim of regional planning may be said as to explore the development potential alternatives of the regions which are usually bypassed under the sectoral plan and to give focus to promote development process of depressed region for attaining balanced development. (Joshi, 1985; pp-6)

"The objective of development efforts should not be directed towards accentuating inherent diversity but rather towards minimizing regional differentials. It is therefore, essential to appreciate the spatial reality in formulating development programs so that the varied resources of different regions contribute to the overall national development."(Gurung, Dr. Harka, 1969)

If economic development is to be achieved with greater social and geographical equity, investments must be made in a pattern of "decentralized concentration". This pattern of "decentralized concentration" can be achieved most efficiently and effectively through an articulated and integrated system of settlements. Hierarchical or diffuse settlement system can provide not only the critical mass of services and facilities needed in rural areas to increase agricultural productivity and income but also provide the trade, transportation , administrative and social linkages that integrate a region into self sustaining economy. (Rondinelli, 1985, pp-2)

In Nepal, the outline for the first development plan was made only in Oct 10, 1955 as the First Five Year Plan (1956-1961). Though an attempt was made to bring spatial dispersal and diversification of economic activities in the country in the second Three Year Plan (1962-

65), it was only in the fourth Five Year Plan (1970-75) when regional planning concept was first introduced in national development plan. The Seventh Plan (1985-90) deserves the credit for inclusion for the first time a separate policy component on urbanization and habitation, but the broader national policy framework was missing. Then National Shelter Policy was formulated during the period of the Eighth Plan (1990-95) and several issues related to urbanization started getting national attention. The main objectives and major policy component of national development plans are described in brief as follows: -

i) **First Five Year Plan (1956-61)** :- The first plan tried to orient the development programs to the potential possibilities (resources and limitations). The major objectives were to increase production, create employment and raise living standard of the people.

ii) **Second Three Year Plan (1962-65)** :- After a gap of one year, the second plan was a three year plan the objectives in this plan were made specific towards investment, employment and output. It was stated that the primary goal of the plan would be to create a base for development and the plan was labeled as "the preparatory plan" (Joshi, 1985, pp-24). For local development and spatial diversification, the country was divided into 3474 panchayats and 75 district panchayats areas and 14 zones with power and responsibilities necessary for undertaking development works. The three-year plan tried to raise problems and issues of regional development but detailed programs were lacking because a severe limitation of knowledge about the resources available in different areas and it was not possible to draw up a detailed program to this effect. (Amatya, 1987, pp-73) The programs and projects were however concentrated in the Terai and Kathmandu valley and a few hilly towns of Nepal.

iii) **The Third Plan (1965-70) :-** The third plan fixed the quantitative targets regarding the indices of economic development. It was aimed to increase the GDP by 19%, per capita income by 9% and food grain production by 15%. More concerns were shown in infrastructure development i.e. accessibility patterns. The third plan divided the country in various regions on the basis of Karnali, Gandaki and Koshi watershed areas in order to achieve balanced development through maximum utilization of resources. In this way, the spatial aspects of development was recognized.

iv) **The Fourth Plan (1970-75)** :- The primary objective of the fourth plan was to exert control on national development programs through proper regional control. The strategy of developing growth axes based on financial regionalisation principle was spelled out and major North South roads under the transport program were designated

as the spine of the growth axes. The concept of North South Growth Axes was developed in order to integrate various regions of Nepal. The major objective of the plan can be written as

a) to bring equality in the use of resources greatly in accordance with the social and political needs of the region and
b) To integrate hills, mountains and Terai through development of inter regional trade.

The development centers were also envisaged to act as marketing and service centers for the growth axis. In addition, the development centers were also expected to encourage the transformation of agriculture, the establishment of industries and promotion of trade and social service program. The Fourth Plan also aimed at comprehensive development of some selected development centers so as to act as "Demonstration centers" for formulating proper development programs in other similar places. Biratnagar, Birganj, Bhairhawa and Nepalganj were selected as "Demonstration Centers" in Terai whereas Palpa, Syangja and Dailekh for hills and Hedangna, Dhunche, Jomsom and Jumla for mountains. (See Fig. 9 and Fig. 10)

Table 3: Regional development Areas

Growth Axis	Macro Regions	Growth Centers
A.Biratnagar –Hedangna	Koshi or Eastern Sector	1. Biratnagar (Terai) 2. Dharan (Terai) 3. Dhankutta (Hill) 4. Hedangna (Mountain)
B. Bhairhawa – Jomsom	Gandaki or Central Sector	1. Bhairhawa (Terai) 2. Butwal (Terai) 3. Tansen (Hill) 4. Syangja (Hill) 5. Pokhara (Hill) 6. Tukche (Mountain)
C. Nepalganj – Jumla	Karnali or Western Sector	1. Nepalganj (Terai) 2. Surkhet (Inner Terai) 3. Dailekh (Hill) 4. Jumla (Mountain)
D. Birganj – Kathmandu	Metropolitan Sector	1. Birganj (Terai) 2. Hetauda (Inner Terai) 3. Kathmandu Valley (Metropolitan) 4. Barbise (Hill) 5. Dhunche (Mountain)

Terai – 6 , Inner Terai – 2 , Hill – 6 , Mountain – 4 , Metropolitan – 1 , Total – 19

Source : Gurung, Dr, Harka –1969 ; pp-17

Conceptual Diagram of Growth Axis System in the Fourth Plan (1970 – 75)

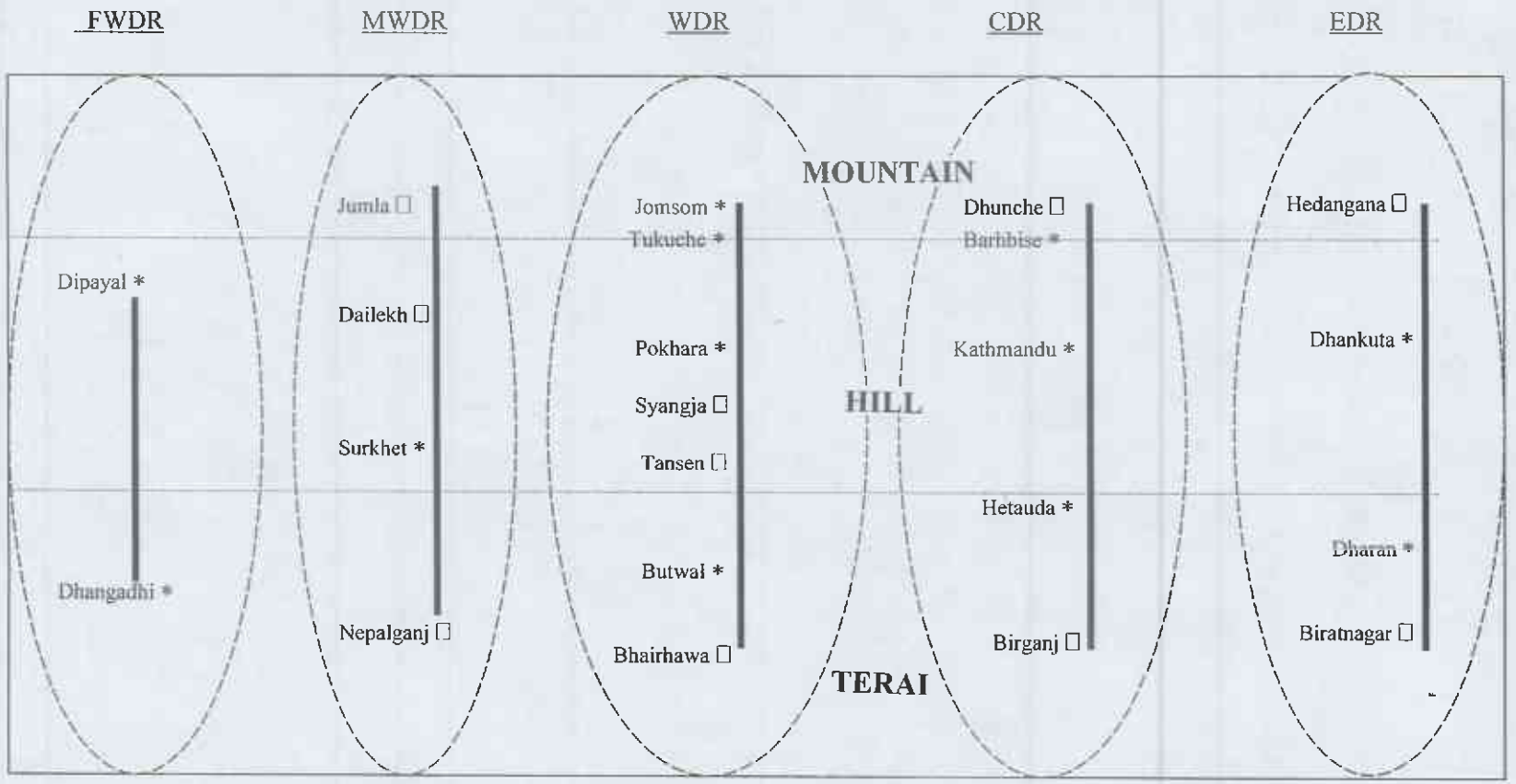
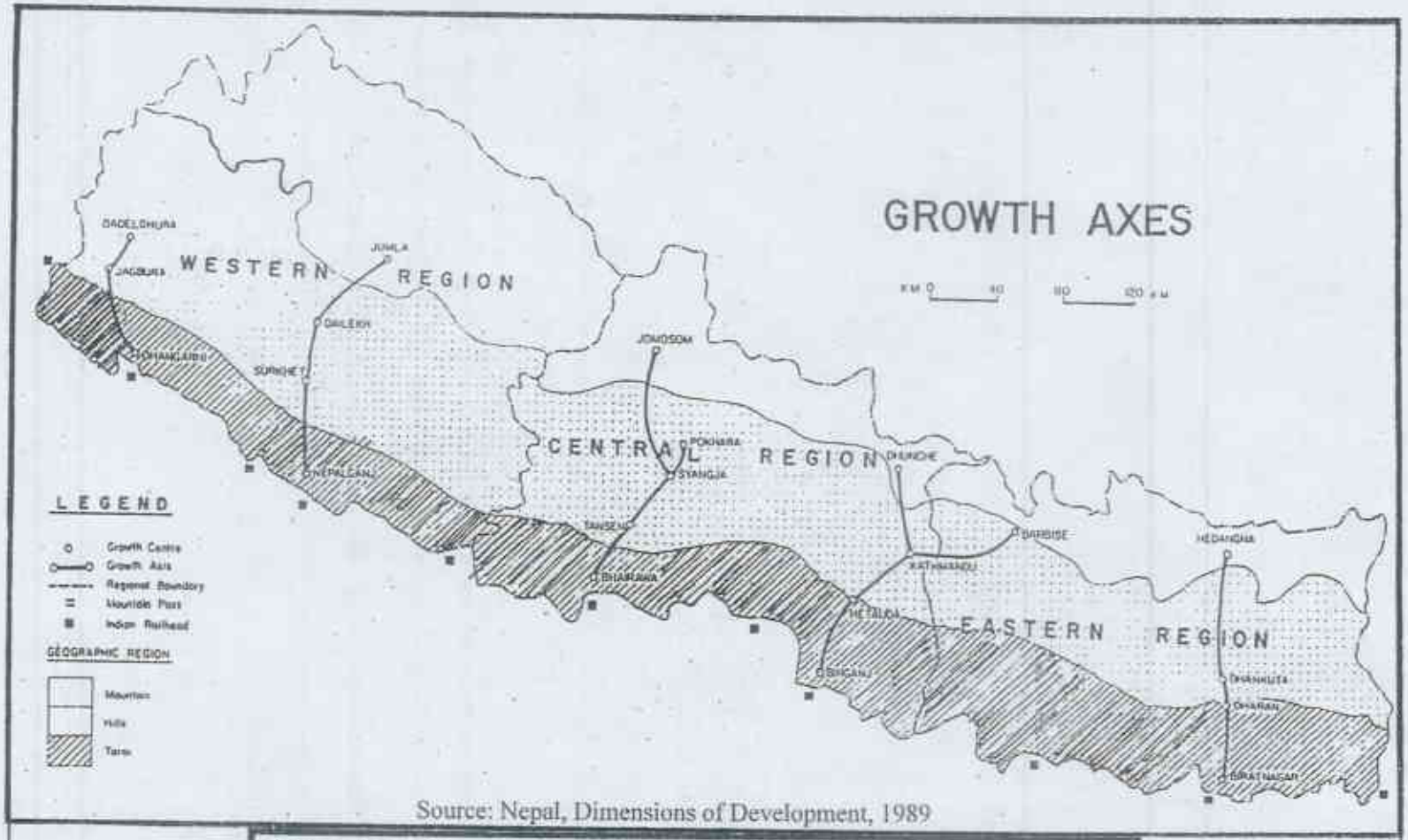


Figure: 9

Tribhuvan University INSTITUTE OF ENGINEERING Department of Architecture	Figure 9 Date: Dec. 1999	Prepared By Suresh Prakash Acharya Msc. Urban Planning



Source: Nepal, Dimensions of Development, 1989

Tribhuvan University INSTITUTE OF ENGINEERING Department of Architecture	Figure **10** Date: Dec. 1999	Prepared By Suresh Prakash Acharya Msc. Urban Planning

The Regional Development Strategy as mentioned above advocated a deliberate urbanization policy. The regional development centers, growth centers and growth points in each development region along North- South growth axis were envisaged to develop as polyfunctional urban centers of various levels. The strategy stressed the importance of road linkages in the process of deliberate urbanization.

The growth center/growth axis hypothesis appreciated the need to develop a graduated hierarchy of settlements that could articulate the potential of the hill settlement system in their relation to Terai economy and settlement system. The strategy visualized an eventual evolution of major East-West and North-South road network that could create an altogether novel location matrix in the country. The development of such a matrix with growth centers at the vertex, was based on the assumption that the "integration", "equity" and "efficiency" objectives of national development could best be met through the process of deliberate urbanization. (Sharma, 1989, pp-131)

But these spatial policies like Growth Axes proposition has not been able to induce fundamental change in spatial-economic structure. Due to lack of development of efficient linkage system in North-South and East-West road networks, the expected growth could not be materialized. Thus until now, those designated growth centers have not been able to create generative effect. The regional development centers have mere become administrative centers not as development centers.

"The designation of regional development center has merely meant the creation of another administrative level. Therefore the existing regional centers should be developed further with commercial and industrial activities to make them a viable growth center. The regional center should be in turn linked to district headquarter and other potential growth points in a network covering the development region." (Gurung, 1989, pp-295)

v) **The Fifth Plan (1975-80)** :- The plan aimed at comprehensive regional development approach, so as to integrate regional development through exploitation of comparative advantages of various regions. There was the concept of development corridor to be developed within the establishment of transport routes linking the hills with the Terai and expected to develop along the growth corridors are a hierarchy of growth centers and service centers, each with specified activity and service field. For spatial planning, four growth centers were introduced Dhankutta (Eastern Region), Kathmandu (Central region), Pokhara (Western Region) and Surkhet (Far Western

Region. far Western Region was further divided into Mid-western and Far-western Regions with Surkhet and Dipayal as their growth centers respectively.

The most functional characteristics of the growth centers are to work as nuclei of development for the out lying area as well as for the region; spread growth mechanism to the hinterlands; work as connecting center for North South and East West growth axis for trade traffic, exploitation of resources for development and organizing and co-ordinating institutions of development for implementation of plan programs work as communication center between capital and other parts of the country and thereby strengthen the circulation system of the nation. (Dr. Amatya,1987 pp-77).

The plan also attempted to identify the areas of specialization in which each geographical region will be capable of. Thus the North has been identified for having a capacity to specialize in livestock, Middle hills fruits and cereals in the southern plain of Terai. in this way regional balance and integration were adopted as principal objective of the Fifth Plan.

vi) **Sixth Plan (1980-85) :-** Regional development objectives and pollicies in this plan were not different than the Fifth Plan. The various projects relating to integrated rural development, establishment of market settlements, small farmers development programs etc. were included under regional investment programs but the IRDP Policy of the Sixth Plan has not been guided by regional development policy.

Under the Basic Needs Program, a number of urban development initiatives were proposed, which included:

- Development of rural centers
- Participation of the private sector in low income housing
- Application of cost recovery principle in the provision of infrastructure services
- Encouragement of private sector to be included in sites and services projects
- Execution of GLD programs

vii) **The Seventh plan (1985-90)** :- The seventh Plan included housing and physical planning as one of their sectoral programs, as one of the important component of basic needs program. The various objectives in this plan were directed towards

fulfillment of basic needs as the focus of the plan. The various objectives in urban development sector contained the following elements:

- ✸ to develop a well conceived and properly managed urban development plan for the country
- ✸ to create opportunities for future productive employment and increased income in parallel with urban growth
- ✸ to use urbanization to supplement rural development efforts

The policy framework included two main aspects:

- promoting non farm employment generation in urban places in response to rapid population and labor force growth
- strategic use of urban development programs to support rural development

The major strategy contained:

- ➢ The preparation of a typology of urban areas on the basis of their geographic situation, population sizes, functional characteristics, economic resources and development potential.
- ➢ Establishment of appropriate service standards in settlements as per their economic and financial resources.
- ➢ Special studies to evaluate the growth potential of settlement at the intersection of North/South regional corridors and the East West Highway.
- ➢ Gradual and planned development of regional development centers.

The Urban Task Force constituted by NPC for the Seventh Plan had suggested that an urban policy and investment unit be established with the planning commission. Such a unit in conjunction with other agencies will carry out studies to prepare a medium and long term urban policy and development strategy.

The ***hierarchical concept in urban development*** planning process has been officially introduced for the first time. The basic criteria adopted could be further refined for more elaborate refinement of urban classification system. (See Fig. 11)

Classification Of Urban Areas Of Nepal

Special Growth Centers: 1.Kathmandu 2. Pokhara 3. Surkhet 4. Dhankuta 5.Dipayal

First : 1. Hetauda 2. Biratnagar 3. Janakpur 4. Nepalganj 5. Butwal 6. Bharatpur 7. Dharan 8. Birganj 9. Bhairhawa 10. Dhangadhi 11.Tribhuvannagar 12.Lahan 13.Rajbiraj 14.Damak 15.Mahendranagar

Second: 1.Jaleswor 2.Malangwa 3.Kalaiya 4.Tansen 5.Bhadrapur 6.Taulihawa 7.Bidur 8.Inaruwa 9.Banepa 10.Dhulikhel 11.Ilam 12.Tulsipur 13.Damauli 14. Baglung 15.Itahari 16.Kohalpur 17.Gorkha 18.Syangja

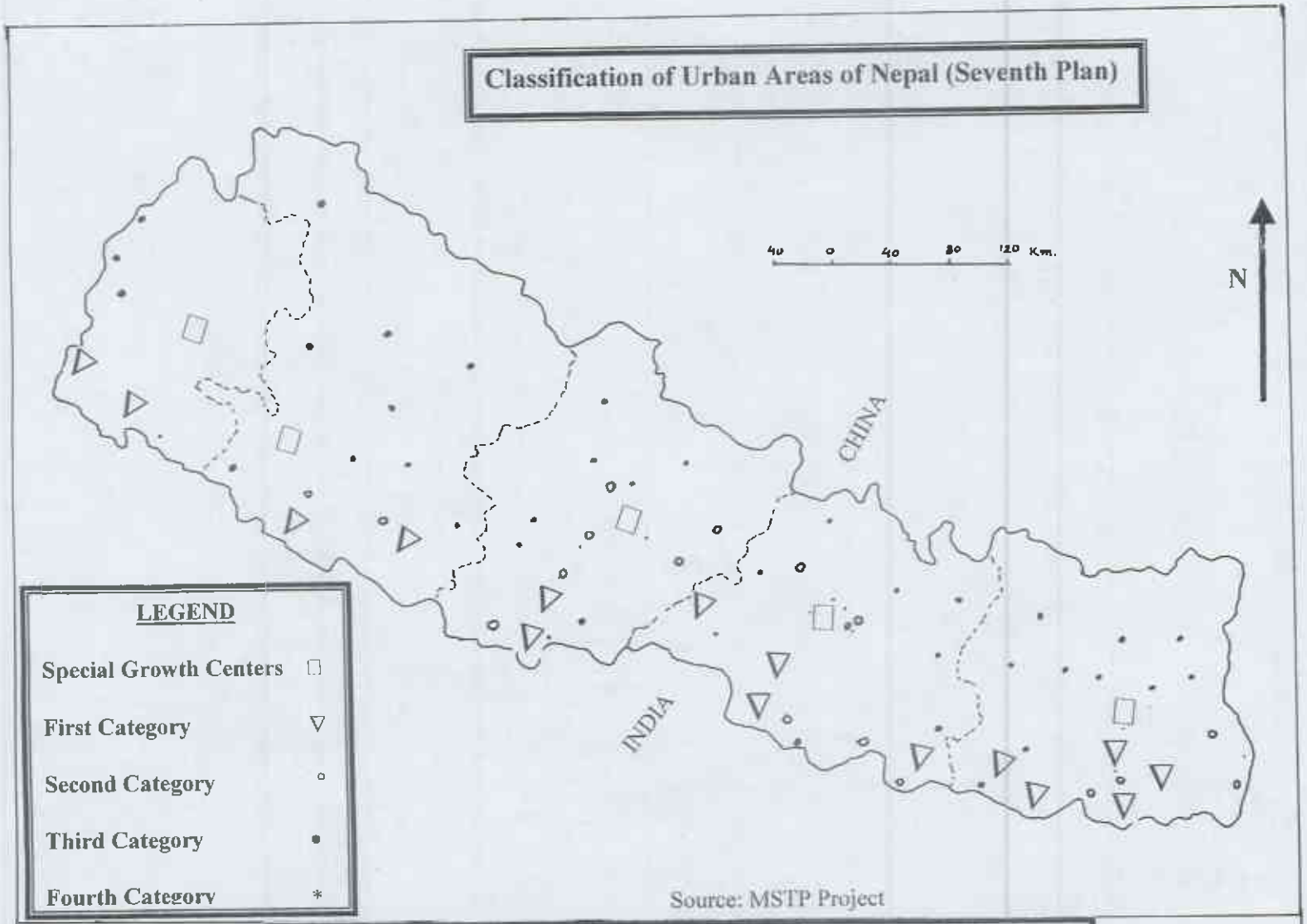
Third: District Headquarters and selected 66 important settlements

Fourth: Service centers and other market towns

The purpose of classification was to develop a system of financial and technical assistance for urban development to towns of different categories. But this classification could not remain functional in later years as the number of municipalities kept on growing and the criteria for delineation of urban areas i.e. municipalities remained mainly political rather functional.

In Nov. 1989, HMG approved a Regional Development Master Plan (1990-2000) which lays policy emphasis on the reduction of regional and sub-regional inequalities, mobilization of local resources for investment programming, efficient use of existing infrastructures and the development of functional relationships between regions and sub-regions and between rural and urban areas. The Master Plan provided a number of sectoral guidelines. However an explicit investment strategy for urban development was lacking and above mentioned master plan was not able to create substantial impact on sectoral policies.

A number of institutional changes were introduced to provide new impetus to urban development. These include the creation in 1988 of Ministry of housing and Physical Planning (MHPP) with Department of Housing and Urban Development, Nepal Water Supply Corporation and Department of Water Supply and Sewage under MHPP. In 1989, HMG created the Town Development Fund Board (TDFB) to provide financial and technical support to municipalities. TDFB's basic function is to make grants and loans to towns for infrastructure and revenue generating projects but small urban centers and market centers are



Tribhuvan University INSTITUTE OF ENGINEERING Department of Architecture	Figure 11 Date: Dec. 1999	Prepared By Suresh Prakash Acharya Msc. Urban Planning

not able to utilize this provision unless and until they are declared as the status of municipalities by HMG.

viii) **The Eighth Plan (1992-97):** - One of the most important objective of the eighth plan was reduction of regional imbalance and achieve sustainable economic development. The principle goals of urban policy were to promote urban economic development and improve urban infrastructure and services. Thus following major objectives were considered in urban development:

- Strengthening the urban planning and management framework at the central, district and town levels with an emphasis on economic development and service provision.
- Strengthening the linkage between urban and rural economic functions.
- providing for efficient, planned development of urban centers

"As resources are not available for solving all the problems, prioritization of programs will depend upon functional roles of the towns, avoidance of duplication between neighboring settlements, linkage between towns and regional resource base at inter-settlement levels. Programs will be elaborated across the entire ***"hierarchy" of urban settlements***" (Urban Development Policies and Programs for the Eighth Plan, NPC,1990; pp-16)

Following are some important program components, which will be taken into consideration:

- Identification of ***National Urban System***
- Urban and Regional Studies on Market Towns
- Well defined criteria for new towns

The strategies for spatial framework and settlement system are as follows;

- Urbanization will be encouraged through the development of small market settlements, functional interrelationships will also be developed among such centers
- On the basis of the ***hierarchical settlement system***, national settlement strategy will be addressed to integrate the national economy by development of hill-Terai and rural-urban areas as one complementing each other.

Thus during the Eighth Plan, many types of approaches, ideas and concepts in urban development sector have been introduced. For instance, **Kathmandu Valley Development**

Council was created on 2052/2/3 B.S. to co-ordinate the programs of different line agencies and municipalities for ensuring an integrated planning system within the valley.

3.2 Urbanization Policy in the Ninth Plan (1997 – 2002):

3.2.1 Policy for Regional Development :

In the Ninth Plan, a clear and concrete implementation strategy will be formulated for meeting the target of poverty alleviation and thereby improvement will be brought about in the living standard of the poor community. For reducing poverty effectively in the long run, poverty focused sectoral and targeted programs will be launched in a co-ordinated, integrated and effective way.

During the Ninth Plan, efforts will be made to make the process of proportional regional balance effective by removing differences noticed in the region specific development status, such as those existing between regions, within the regions and at the district level. In order to determine priorities at regional and sub-regional levels on the basis of needs and rationality, and also with a view of developing functional inter-relationships between various regions and sub-regions and also between rural and urban sectors, region specific programs will be conducted. To meet this purpose, arrangement will be made for ***National Urban System*** at different levels.

During the Ninth Plan period, appropriate programs will be conducted to support ***market oriented urban system*** in the course of regional development and in keeping with the requirements of settlement system, urban settlements will be physically improved in a planned way. By identifying backward areas in various regions and sub-regions and districts, poverty alleviation programs will be implemented in particular areas. Population management, infrastructure building and socio-economic development programs will be oriented towards balanced regional development.

The Ninth Plan has adopted an objective of launching **Special Area Development Program** covering some 25 districts in the backward region. Additional efforts will be made to give emphasis to the removal of economic and social inequality.

To attain fast equitable development within the country by minimizing regional imbalance through provision of basic development requisites at the regional level has been the main objective of the regional development model in Nepal. Many districts in the

mountainous or hilly geographical territories is relatively highly under developed as compared to those in the Terai regions. High population growth rate and migratory reasons led to population pressure build in the Terai region. As a result of high population growth, villages in the Terai are getting converted into unplanned large settlements and small towns. Settlements and urban centers lack planned physical development and social and economic facilities and in some places haphazard growth has been observed. Despite development of appropriate concepts and policies to enact the regional development model right since the Fourth Plan period, efforts for regional development have not been found so effective and adequate policy framework for implementing district and local level programs have not been possible to be formulated due to deficiencies in enforcement of such concepts and policies. Because of these reasons, expected achievements could not be gained in reducing regional imbalance.

Box: 1

Existing Challenges in Regional Development

Formulation of policies and programs is not based on continuous monitoring and evolution of regional imbalance. Mountainous and hilly districts of the mid-western and far-western regions and mountain districts of the central and eastern regions is relatively underdeveloped. Focused programs, aimed at creating direct impact on such communities, encompasses very few communities as compared to the total population of the poor. As a result such programs have failed to create an impact.

Migration rate from hills to Terai and urban areas continues to remain high due to difficult living conditions prevailing in the hills. Increase in national income and productivity to support the national development process through mobilization of resources scattered in different regions and gradual reduction in regional imbalances has been minimal.

Source: The Ninth Plan- NPC; pp- 233-234

The regional development objectives of the Ninth Plan (pp-235) has been defined as follows:

- To minimize the existing regional imbalances
- To alleviate poverty

- To achieve national socio-economic integration by expediting the social and economic development through promotion of activities that contribute to employment and income generation
- To give emphasis to production enhancement through identification of local resources specific to the geographical regions

The major policies show the following ideas to be followed up during the implementation of the various programs of the Ninth Plan. Workable inter-relations between the regions and sub-regions and rural and urban areas will be developed with the objective of promoting regional development and national integration. ***Hierarchical systems of national urban areas*** will be developed to this effect. Development programs to be implemented at the regional, sub-regional and district levels will be based on hierarchical settlement systems and rural urban relationships. Appropriate programs will be implemented so that the market oriented urban development will support the regional development. Physical urban development will be planned and carried out according to the requirement of the settlements.

The main programs as mentioned in the Ninth Plan can be written as:

- Sustainable and production oriented ***local urban systems*** to be identified and developed for expansion and effectiveness of area specific development program
- Such settlement systems will be developed as a part of the ***National Urban System.*** Locally created regional settlement systems to be utilized for implementation of development programs
- Investments for promoting production and productivity through maximum utilization of present infrastructure, services and facilities available at different regional and sub-regional levels will receive priority and construction of new infrastructure will be integrated with production.
- Statistical database and skill will be developed and integrated development concept will be promoted

3.2.2 Policy For Human Settlement and Urban Development:

Since agriculture alone has been unable to support the growing rural population, internal migration is taking place and additional pressure has been put on the inadequate social, economic and physical infrastructures of the urban areas. Long term concept of Human Settlements and Urban Development in the Ninth Plan is to develop a ***balanced urban system*** by making Nepalese towns unpolluted, clean, well facilitated, productive and safe. The main objectives in this sector as written in the Ninth Plan can be listed as:

- Integrated physical and social infrastructures will be developed through physical planning system in order to develop urbanization process in an organized way, and to make urban living commodious, productive and healthy
- The role of urban area in national production will be made more efficient, sustainable and employment oriented and urban development will be taken as the supportive of rural development and poverty alleviation as per the urban development policy
- Emphasis will be given on the development of infrastructure and public utilities of municipalities and other cities in order to systematize the process of internal migration

Box: 2

Existing Problems in Urban Development

- The number of emerging towns, densely populated settlements and market centers in the country is increasing due to the growing pressure of population. But the efforts made for providing essential physical facilities with the help of limited available resources have remained ineffective
- Adequate facilities is not available in metropolitan, sub-metropolitan cities and other municipalities and other markets and towns as the catalyst of the overall development of rural areas, and to increase the linkage between urban and rural places.
- The organized development of urban system of the Kathmandu valley has not taken place not only because of the problems of growing pressure of population but also because of the lack of physical infrastructure, basic principal of urban system and effective management. Similarly, Kathmandu Valley Development Council has not become effective in the absence of institutionalized development.

Source : The Ninth Plan-NPC ; pp- 259-260

The main programs in this sector of Human Settlement and Urban Development has been mentioned as follows in the Ninth Plan:

i) ***Policy Formulation and Research***: - National urban development policy and implementation strategy will be formulated and implemented for regulating unplanned and disorganized urbanization taking place in different parts of the kingdom. Similarly, parameters will be formulated for the classification of new municipalities and urban centers

ii) ***Formulation of Act, Regulations and Standards*** :- Urban Planning and Development Act, Land Consolidation Act and Housing Occupation Act will be formulated and implemented

iii) ***Sub-regional Development Programs*** :- The functional role and future directions of the main cities of the kingdom will be specified and implementation of infrastructure in appropriate places will be developed with a view to achieving planned development of uncontrolled sub-regional market centers and settlement problems increasing along the North-South highways as well as the problems of escalating urbanization, migration, large hydropower projects construction and construction of highways and branch roads

iv) ***Kathmandu Valley Development Programs***:- By integrating al the metropolitan cities, municipalities and VDCs a physical planning system will be developed. A detailed land use policy in the valley metropolitan areas and local area plan in VDCs will be prepared and implemented.

v) ***Development Programs:-*** Several programs will be implemented for strengthening the linkages between urban and rural areas by making the development initiatives and all other services and facilities provided by the government reach the village in an integrated way, for creating more employment opportunities in non-agricultural sectors for making the management of market for agricultural products and for making gradual improvement in ***National Urban Settlement System.***

3.3 National Urban System :

The importance of individual urban centers serving the surrounding area, depends largely upon the magnitude and types of functions they contain. Larger centers with higher magnitude and array of urban functions tend to attract more people from larger area, as compared to smaller urban centers. In Nepal many urban centers are oriented to thorough fare trade and traffic of the highways, and they lack viable industrial economy. With the destruction of Terai forests and eradication of Malaria, the Terai became an attractive area for the hill people for migration and the growth of highways and roads further contributed to the increase in number of small urban centers. Several new small trading centers have developed along the highways such as Trishuli road, Arniko Rajmarg, Prithvi Rajmarg , Siddhartha Rajmarg and Several areas of East west Highway.

"Despite the development of transportation facility and the growth of population, most of the urban settlements in Nepal could not become large. Two plausible explanations of this trend are the low purchasing power of the people and low degree of commercialization and industrialization. Most of the towns are either low grade manufacturing centers or historical settlements." (Role of Small Urban Centers,1984, pp-29-30) But the larger urban centers grow faster creating a big gap between urban centers and rural areas. Even the policy measures are sometimes unable to fill this wide gap. Certain action-oriented strategies are required to fulfil this gap and attain a balanced development. By articulation of a national urban system, such unbalanced lopsided development can be checked and more equitable distribution of services is maintained.

Since either modern roads or traditional trade routes basically control the location of small urban centers, the number of urban centers is extremely limited in areas without modern road facility. Most of the urban centers are functionally either functionally administrative service centers or the focal points of traditional trade routes. Without the bases of urban functions urban agglomeration is not possible. In the Seventh Five-Year Plan (1985-90), urban areas of Nepal have been classified into five categories as special growth centers, first, second, third and fourth. But there have not been any remarkable efforts for the articulation of National Urban System. The policy and programs have not come up towards this aspect. Most of the urban settlements in Nepal are small bazaars and a large part of the country is not functionally integrated with urban centers.

" Moreover, regional disparity in the level of urbanization measured both in terms of urban population and the number of urban functions has been persisting in the country. Many small bazaars and trading of the country are based on pocket economies and still run on the basis of an archaic barter system. Such pocket economies represented by small urban settlements are required to integrate them with national economy." (Role of Small Urban Centers in National Development in Nepal, 1984, pp-8)

Urban centers function as the focal point for all human activities, new ideas and economic, social and political innovations, when then spread down to the rural areas. They also act as the integrator of regional economy and create an effective national economic system through ***National Urban System***. A reciprocal relationship exists between urban centers and surrounding region. The urbanization process relates to concentration of people engaged in non-agricultural occupations and concentration of non-agricultural land uses in a specialized area a place as a consequence of population occupational and land use shifts. Urbanization thus involves

- concentration of people at population densities higher than those associated with agriculture populations
- population shift (migration) from rural to urban areas
- occupational shift from agricultural to non-agricultural
- land use shift from agricultural to non-agricultural

An urban system is both behavioral and structural and may be defined as a set of urban centers of different hierarchic orders interlinked by sets of relationships within each hierarchic order and also between hierarchic orders. (Rao,1983, pp-13,106) The urban system may be defined in national level, regional level or local level. Functional roles of city as well as backward and forward linkages of the urban center characterize the system. Any urban center has its own system of linkages depending upon various factors such as its potential and also its needs. This system of backward and forward linkages when properly articulated and integrated creates a diffusion of economies; thus facilitating the integration of the national economy as well as making basic facilities and services available to the maximum number of population.

The basis of an Urban Strategy is the creation of a well-articulated national urban system comprising of national capital, major cities, intermediate towns, small towns and rural centers. National development should be seen in its spatial context as defined by ***National Urban System*** and its articulation through the functioning of urban centers of different hierarchies. (Joshi, 1999, pp-58)

The five major urban centers in the Kathmandu valley is growing towards becoming a metropolitan region where as the major terai towns and small market towns serve as linkage centers for providing services and generating economic activities. **Local governance Act 1999** has classified only three types of urban centers as follows:

- Metropolitan City (Minimum 300000 population, Rs. 40 crore revenue and necessary infrastructure services)
- Sub-metropolitan City (minimum 100000 population, Rs. 10 crore revenue and necessary infrastructure services)
- Municipality (Minimum 20000 population and Rs. 50 lacs revenue, for hilly areas minimum 100000 population and Rs.5 lacs revenue)

The criteria for providing urban status to certain localities remain inadequate and mainly political. To create new towns or growth poles (Regional Development Centers) under adverse natural conditions has become very expensive exercise for Nepal and those centers has not been able to act as engines of economic development. The emerging towns at foothills and crossroads are growing very fast and needs to strengthen economic linkages. In Nepal, it is through the system of urban centers that goods and services get distributed across the country thereby helping to integrate rural economy with the national economy. This realization is not reflected in our national plans.

If you can look into the seeds of time, And say which grains will grow and which will not, Speak then to me.....

Shakespeare

The past is gone. Nothing we do can change it. The future is before us and dynamic. Everything we do will affect it.

Charles F. Kettering

Chapter IV: Factors Influencing Urban System

This chapter describes the major factors, which influence the urban system in CDR. Population is the basic and fundamental aspect to be dealt with while understanding the characteristics of urban centers. Thus various aspects relating to population growth in CDR such as annual growth of urban population, patterns of urban migration and occupational distribution are described in this chapter. Agglomeration of huge population creates agglomeration of economies and it leads to primacy in urban development process. Primacy has been dealt in national context. Infrastructure development and process and growth of urban center help to understand the characteristics of urban system. These two contexts are also dealt in regional context i.e. with respect to activities in CDR.

4.1 Distribution and Growth of Urban Population:

4.1.1 Regional Trends:

In 1971, there were only 16 urban places in Nepal out of which 6 were in CDR, 5 in EDR, 4 in WDR, only one in MWDR and no urban places in FWDR. CDR contained 63% of the total urban population in Nepal. (See table 4 & 5).

Table 4: Growth of Urban Centers – Region wise

Region / Year	1971	1981	1991	1997
EDR	5	7	9	14
CDR	6	7	13	20
WDR	4	4	5	12
MWDR	1	3	3	6
FWDR	-	3	3	6
Total	16	23	33	58

Table 5: Regional Urbanization Level 1971- 1991

Region Year	1971		1981		1991		growth rate	
	Total Pop.	% Urban	Total Pop.	% Urban	Total Pop.	% Urban	1971-1981	1981-1991
EDR	88233	19.1	199279	20.6	344438	20.3	7.5	6.2
CDR	292950	63.4	504383	52.22	922520	54.4	5.5	6
WDR	57132	12.4	113469	11.7	209756	12.4	4	9
MWDR	23523	5.1	68482	7.1	99842	5.9	10.7	3.8
FWDR	-	-	80570	8.4	119163	7	-	5.2
Total	461938	100	966183	100	1695719	100		

Source: Towards national Urban Strategy,1997

The above tables 3 and 4 make it clear that CDR predominate the urban population scenario whereas EDR remains in the second position. But slowly decreasing trend of percentage of total urban population in CDR (from 63.4% in 1971 to 54.4% in 1991) shows that urbanization is slowly dispersing throughout the whole nation of course in a very slow pace. The urbanization level in MWDR and FWDR is very much insignificant as compared to other development regions. The trend of spatial growth of urban centers in

Nepal from 1971 to 1997 has been shown in Figure: 3 and Figure: 6 shows the spatial distribution of municipalities in CDR. The growth rate of urban population in CDR is quite high as compared to other region; the average annual growth rate of 5.5% in 1971-1981 has gone up to 6% in 1981-1991. The expansion of urban area as well as addition of new urban centers is also the major causes for the growth of urban population.

Exponential model of population growth has been used to calculate the rate of growth of population written as follows:

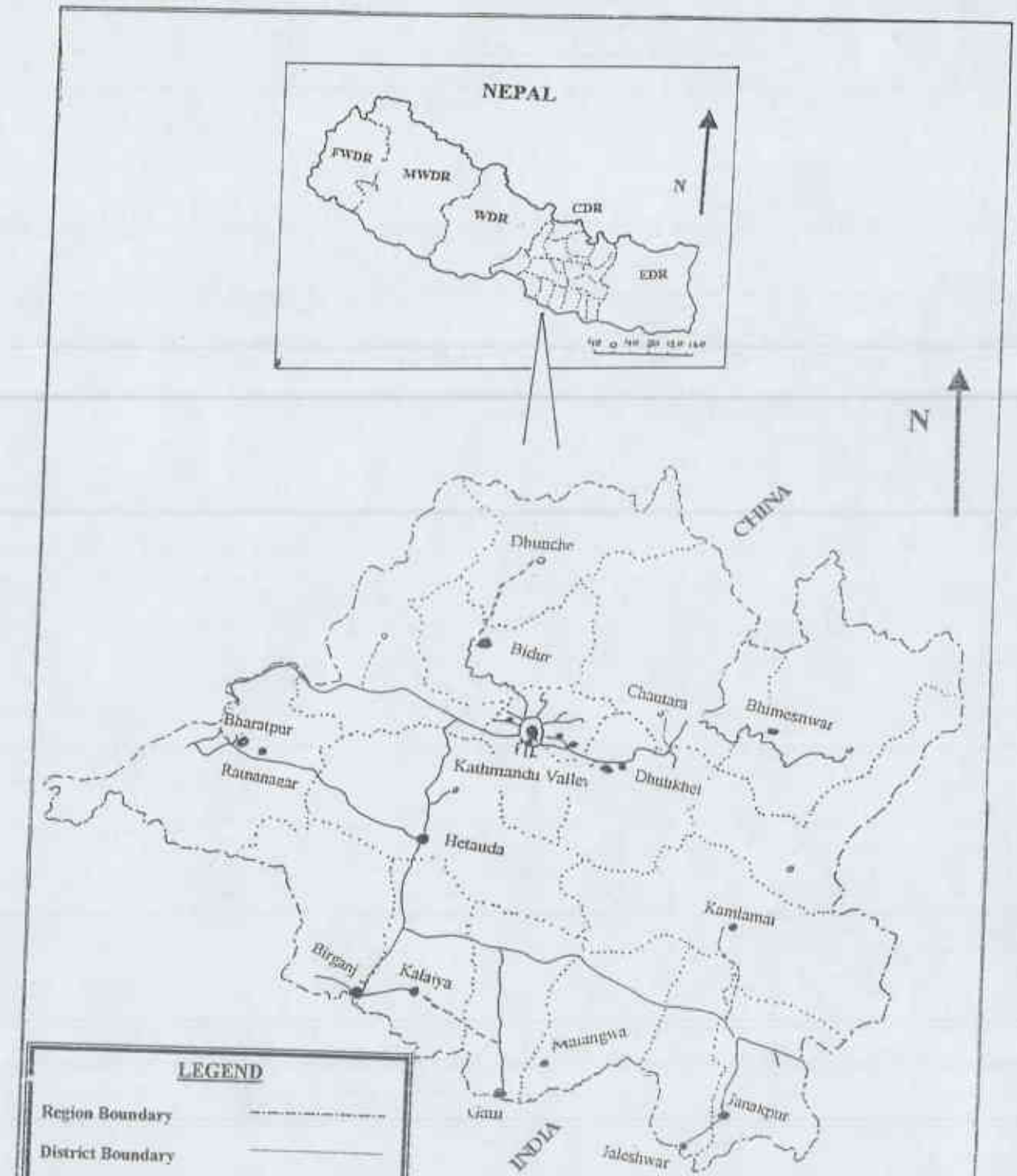
$$r = \frac{l_n P_n - l_n P_0}{n}$$

Where r is the rate of growth, n is number of years, P_n is the population in n^{th} year and P_0 is the population in base year.

The criteria for providing urban status to certain settlement has remained mainly political due to which the analysis of urban settlements may not produce the exact scenario what is happening in the real world. The designation of urban status has not been made on the basis of universally accepted attributes like population density, occupational structure of economically active population, interlinkage with hinterlands and role of the settlements.

Table 6: Growth of Urban Centers in Ecological Regions in CDR

Ecological Regions	1971		1981		1991		1997		Growth Rate	Growth Rate	Growth Rate
	Total Pop.	% Urban	Total Pop.	% Urban	Total Pop.	% Urban	Total pop.	% Urban	1971-81	1981-91	1991-97
Mountain	-	-	-	-	-	-	20937 (1)		-	-	-
Hills	16194 (1)	3.5	34792 (1)	3.6	94879 (4)	5.6	165784 (6)		7.6	10	5.5
Kath. Valley	249563 (3)	54	363507 (3)	37.6	598528 (3)	35.3	924932 (5)		3.8	5	4.3
Terai	27293 (2)	5.9	106084 (3)	11	229113 (6)	13.5	371905 (8)		13.5	7.7	4.8



Source: Nepal Road Statistics,1998

CENTRAL DEVELOPMENT REGION

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Figure 13

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The various municipalities in CDR are shown in Figure 13. Though the Kathmandu valley comprises of majority of urban population as compared to other ecological regions, but the rate of growth of urban population in Terai regions is quite high. These eco-regions need special attention in settlement planning to ease the over burden of urban population. (see table 5). During 1971-81, the growth of urban population in the Terai is quite high i.e. 13.5%. In 1971-81, the rate of growth in Terai was experienced quite high as compared to the valley, but in the next decade during 1981-91, the valley towns are again gaining quite a large bulk of population. (See Figure 12)

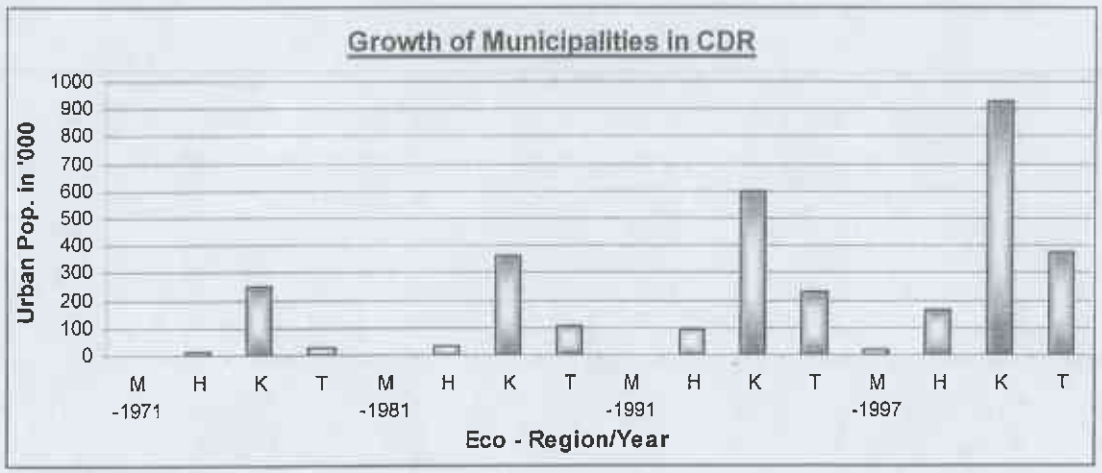


Figure: 12

Note: M: Mountain, H: Hill, K: Kathmandu Valley, T: Terai

4.1.2 Rank size of Urban Centers:

Demographic analysis usually use population size to determine the pattern of settlements that is the degree of hierarchy or diffuseness, the rank order and the degree of urbanity. These approaches provide an initial and easily determined profile of the settlement pattern that can be analyzed in more detail and cross-checked with functional analysis. (Rondinelli, 1985, PP-100)

The rank size as suggested by Zipff in 1949 is solely based on population size. In Nepal, Local Self Governance Act 1999 has classified three classes of urban centers based on population; Metropolitan City with 300000 and more population, Sub-metropolitan City

with 100000 and more population and municipality with 20000 and more population size. The functional characteristics have not been considered in delineation of urban centers. Recently some attention has been focussed on the role of small market towns, which are the service centers as well as bases for urbanization. Present study has considered those urban centers which have been designated the status of municipality by the government and also those centers in mountain eco –region which have not been categorized as municipalities.

Table 7: Ranking of Municipalities in CDR as per population

Municipality	1971 population	1981 population	1991 population	1997 population	% growth 1981-91	Rank 1997 pop.	Growth Rank
Kathmandu	150402	235160	421258	626339	6	1	2
Lalitpur	59049	79875	115865	151549	3.79	2	7
Birganj	12999	43642	69005	94854	4.69	3	4
Bhaktpur	40112	48472	61405	72247	2.39	7	12
Janakpur	14294	34840	54710	75355	4.62	5	5
Bharatpur	15108	27602	54670	88249	7.07	4	1
Hetauda	16194	34792	53836	73312	4.46	6	6
Bidur	10615	17000	18694	20098	.95	16	17
Kalaiya	9987	14047	18498	21365	2.79	13	11
Jalashwar	-	16000	18088	19759	1.23	17	16
Malangwa	8241	10500	14142	17007	3.02	18	9
Banepa	7636	10540	12537	14244	1.75	19	14
Dhulikhel	-	10000	9812	9581	-1.89	20	20
Gaur	-	-	20434	25131	3	12	10
Madhyapur^{+}	-	29551	31970	33516	0.79	9	18
Kirtipur^{+}	-	19797	31338	41281	4.7	8	3
Panauti^{+}	-	19393	20467	21139	0.54	14	19
Kamlamai^{+}	-	20029	24368	27410	1.98	11	13
Bhimeswar^{+}	-	16761	19261	20937	1.4	15	15
Ratnanagar^{+}	-	18492	25118	30185	3.11	10	8

Sources: 1. Towards National Urban Strategy 1997 – Udle/MHPP/DHUD Table 3.1
2. Sharma. 1989
3. CBS (1975) vol. 5 table 39
4. CBS (1984) vol. 3, table 9
5. Detailed Revenue and Expenditure Breakdown.... Udle/GTZ. 1999

Note: + Municipalities declared in 1997

Table 7 shows that Bharatpur ranks first in growth rank though in population rank Kathmandu, the capital city ranks the first. The Hill City like Dhulikhel is loosing its population and ranks the last in both populations' rank and growth rank. The Terai urban settlement of Birganj changed its rank from 6th in 1971 to 4th in 1981 and 3rd in 1991. The

gateway town likes Birganj, Janakpur, and Hetauda and Bharatpur show rapid growth rate mainly due to trade and transit facilitation with Indian border towards interior part of Nepal.

Generally, it is a common practice to determine the relative importance of urban centers in terms of population size. It is very often considered as a measure for ordering urban centers as shown in table 8. In actual practice the population sizes of urban centers are not a true measure of relative importance of the centers in a number of cases. Banepa and Dhulikhel through ranks bottom most rank population wise but functionally they have higher functional roles.

The changes in rank hierarchy of urban places in CDR can be written as shown in table 8.

Table 8: Changes in Rank Hierarchy of urban places in CDR

1971	*1981*	*1991*	*1997*
1. Kathmandu	1. Kathmandu	1. Kathmandu	1. Kathmandu
2. Lalitpur	2. Lalitpur	2. Lalitpur	2. Lalitpur
3. Bhaktpur	3. Bhaktpur	3. Bhaktpur	3. Birganj
4. Hetauda	4. Birganj	4. Birganj	4. Bharatpur
5. Janakpur	5. Janakpur	5. Janakpur	5. Janakpur
6. Birganj	6. Hetauda	6. Bharatpur	6. Hetauda
	7. Bharatpur	7. Hetauda	7. Bhaktpur
		8. Bidur	8. Kirtipur
		9. Kalaiya	9. Madhyapur
		10. Jaleshwar	10. Ratnanagar
		11. Malangwa	11. Kamlamai
		12. Banepa	12. Gaur
		13. Dhulikhel	13. Kalaiya
			14. Panauti
			15. Bhimeshwar
			16. Bidur
			17. Jaleswar
			18. Malangwa
			19. Banepa
			20. Dhulikhel

Above table shows the hilly towns like Bidur, Banepa, Dhulikhel are loosing their rank in 1997 ranking as compared to 1991 whereas new inner towns like Ratnanagar, Kamlamai, has emerged into new position. The Terai town which are not linked with main transportation corridor i.e. East West Highway and without any market potential like Kalaiya, Jaleshwor, Malangwa has gone down in rank hierarchy during 1971 to 1991. Similarly another possible reasons may be Banepa and Dhulikhel position has been overshadowed by primacy of Kathmandu, Kalaiya being over shadowed by Birganj and Jaleshwor by Janakpur. Gaur and Malangwa are being more affected by influential role of Birganj in the west and that of Janakpur in the east.

4.1.3 Density Distribution of Urban population:

Density is considered to be one of the important criteria of urban centers as there is agglomeration of population in urban areas due to abundance of economic opportunities there. In most of the Kathmandu valley towns, the density is more than 6000 people per square km of area whereas in the hilly towns, the density is less than even 500 people per square km of area.. (see Table 9) This disparity is clearly shown in fig 14, which suggest an immediate need of a pragmatic policy towards the criteria of density in urban areas. Low density generally shows inefficient and expensive infrastructural needs in those areas.

The table 9 shows following facts:

i) The density of urban population in the valley towns are very high as compared to other towns in the hills and Terai thus showing need of greater investment in the infrastructure services at those towns.

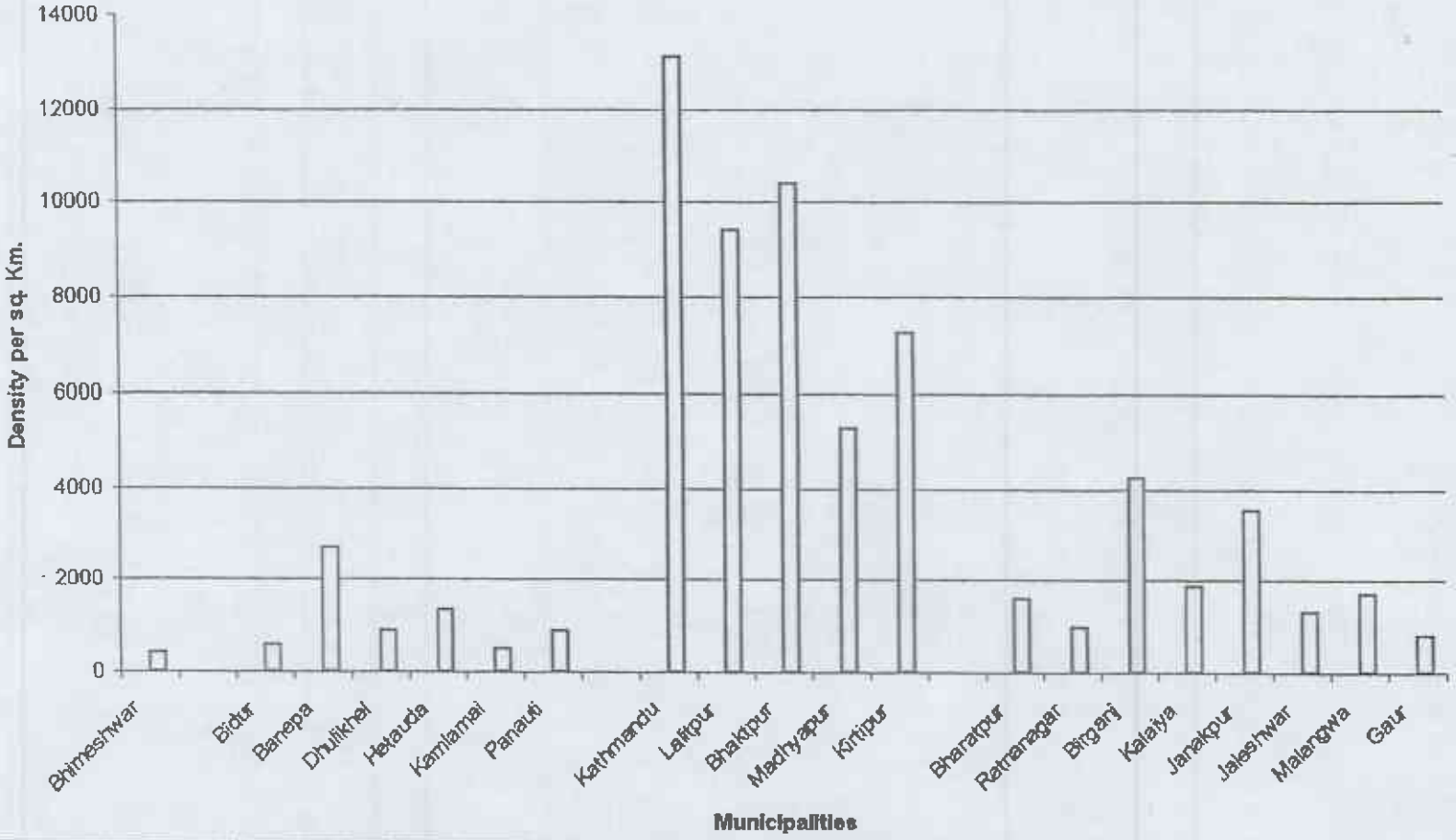
ii) The higher H/H average size indicates the acute housing shortage in most of the urban centers.

iii) The densities of urban population in mountain region i.e. Bhimeshwar as well as newly delineated municipality Kamalamai are very low. It shows larger area has been covered to meet the criteria for declaring the status of a municipality.

Table 9: Household Size and Population Density Distribution

Municipality	*Area KM^2*	*Number of H/H '91*	*'91 Pop. Density per Km^2*	*'97 Pop. Density per Km^2*	*Average H/H size '91*
Mountain Towns					
Bhimeshwar	54.3	4077	355	385	4.69
Hill Towns					
Bidur	34.92	3736	535	575	5.0
Banepa	5.31	1956	2361	2682	6.4
Dhulikhel	10.9	1624	900	879	6.0
Hetauda	55.48	10420	970	1321	5.2
Kamlamai	56.53	4469	431	485	5.5
Panauti	24.18	3742	846	874	5.5
Kathmandu Valley					
Kathmandu	47.69	81139	8833	13133	5.2
Lalitpur	16.10	20630	7196	9413	5.6
Bhaktpur	6.94	9187	8848	10410	6.7
Madhyapur	6.32	5133	5058	5303	6.2
Kirtipur	5.70	5672	5498	7242	5.5
Terai					
Bharatpur	55.22	10918	990	1598	5.0

POPULATION DENSITY DISTRIBUTION 1997



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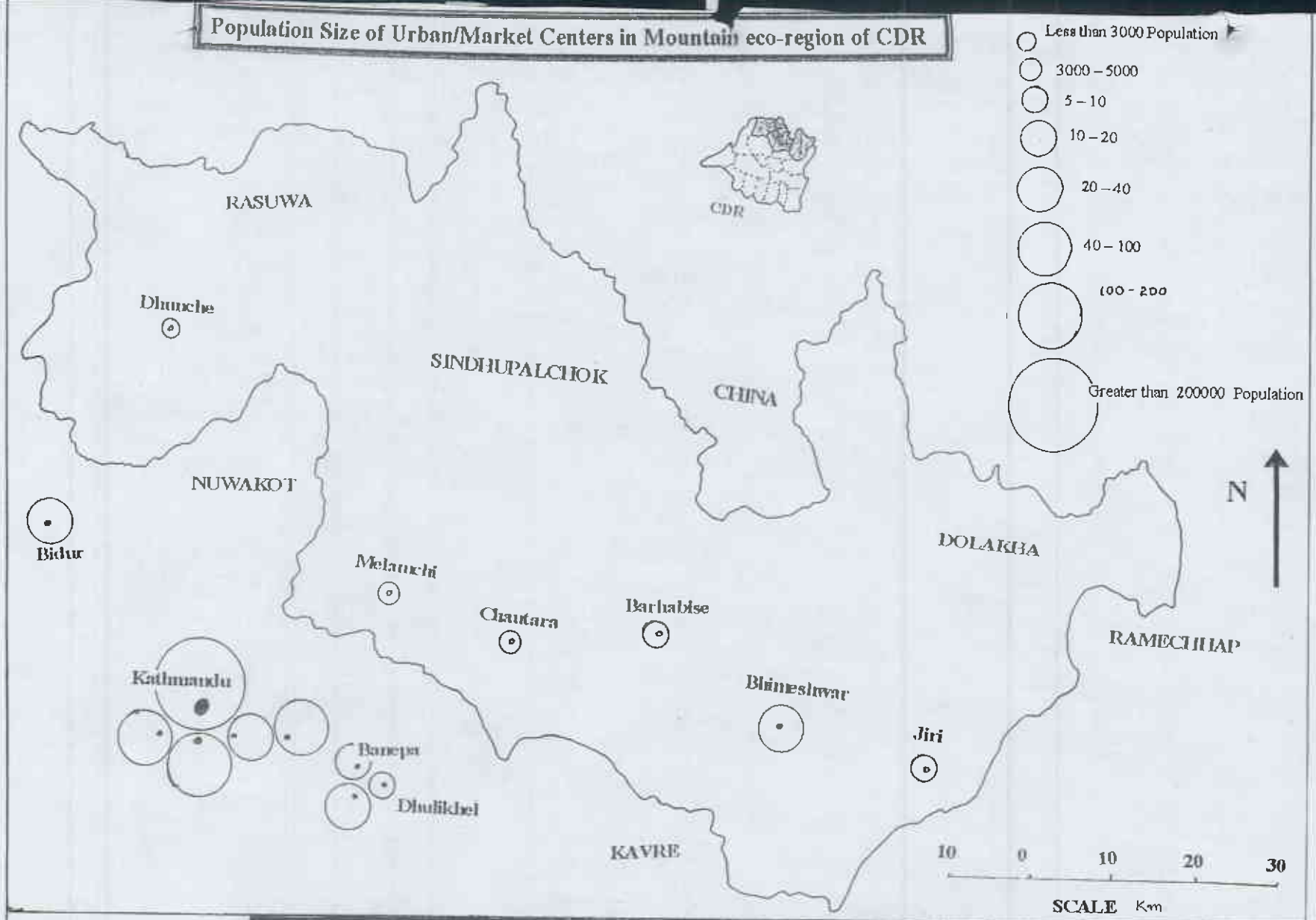
Population Size of Urban/Market Centers in Mountain eco-region of CDR



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Ratnanagar	31.52	4578	797	958	5.5
Birganj	22.31	11084	3093	4252	6.2
Kalaiya	11.37	3010	1627	1879	6.1
Janakpur	21.33	9668	2565	3533	5.7
Jaleshwar	15.11	2945	1197	1308	6.1
Malangwa	9.98	2403	1827	1704	5.9
Gaur	31.83	3498	642	789	5.8
Total		199889			5.48

Source: 1. Nepal- Economic Policies for Sustainable Development, 1992, ADB
2. Statistical year Book of Nepal, 1997- CBS
3. Detailed Revenue and expenditure Breakdown ... Udle, 1999

The population and household data for several important urban centers in the mountain area of CDR has been described in the Table: 10. Most of these centers are service centers, which provide basic services to the rural area of the mountainous region such as selling of urban goods, health facilities, education facilities and administrative services. Besides these services, they act as a place for forward linkage with the bigger urban areas by providing bus service as well as telecommunication facilities. Such urban centers of the mountain are place where new innovations are introduced to the rural areas by providing modern agricultural inputs and technology.

Table 10: Population and H/H distribution of major urban centers in Mountain eco-region of CDR

Major Urban Centers	*Number of H/H '91*	*Total Pop. '91*	*Average H/H Size '91*	*Number of H/H '98*	*Total Pop. '98*	*Characteristics*
Mountain Towns						
Bhimeshwar	4105	19261	4.69	4528	21244	Administrative Center, Market Center, Service Center
Jiri	1513	7040	4.65	1669	7765	Development Center, Dairy Product Center, Tourist Place
Barhabise	1163	5934	5.10	1261	6436	Commercial Center, Service center
Chautara	788	3710	4.71	855	4024	Administrative Center, Market Center, Service Center
Melamchi		3835			4156	Service Center, Market Center
Dhunche	505	2042	4.04	589	2380	Administrative Center, Market and Service center

Source: Nepal District Profile, 1998

4.2 Patterns of Migration :

Nepal has been experiencing an increasing volume of internal migration since the control of endemic malaria in the Terai and Inner Terai areas in the early 1950s. But the flow of migration is unidirectional i.e. from hill and mountain to the Terai. The migration in eighties has been more towards urban areas especially to the Kathmandu Valley.

Rural to urban migration comprises one of the most important sources of growth in the urban population. The 1971 census recorded for the first time data on urban migrants. Lifetime internal migrants to urban areas constituted 16.3% of the urban population in 1981 and 17.2% in 1991. Out of a total of 294438 inter-regional urban migrants, most went to Kathmandu Valley towns (33.9%) or Terai towns (56.8%). (K. C., pp-90-91)

Table 11: Number of Internal Migrants in Municipalities in CDR 1981-1991

Municipality	Internal Migrants						Ranking	
	1981	1	2	1991	1	2	1981	1991
1. Kathmandu	29127	41.0	12.4	82526	59.5	19.6	1	1
2. Lalitpur	6397	9.0	8	14628	10.6	12.6	4	3
3. Bhaktpur	1610	2.2	3.3	1389	1	2.3	7	7
4. Birganj	5544	7.8	12.7	4900	3.5	7.1	5	5
5. Janakpur	5528	7.8	15.9	4309	3.1	7.9	6	6
6. Bharatpur	14126	19.9	51.2	18903	13.6	34.6	2	2
7. Hetauda	8753	12.3	25.2	8481	6.1	15.8	3	4
8. Madhyapur	-	-	-	-	-	-	-	-
9. Kirtipur	-	-	-	-	-	-	-	-
10. Ratnanagar	-	-	-	-	-	-	-	-
11. Kamlamai	-	-	-	-	-	-	-	-
12. Panauti	-	-	-	-	-	-	-	-
13. Gaur	-	-	-	-	-	-	-	-
14. Bhimeswar	-	-	-	-	-	-	-	-
15. Bidur	-	-	-	1018	0.7	5.4	-	8
16. Kalaiya	-	-	-	714	0.5	3.9	-	9
17. Jaleswar	-	-	-	422	0.3	2.3	-	12
18. Malangwa	-	-	-	566	0.4	4.0	-	10
19. Banepa	-	-	-	379	0.3	3.0	-	13
20. Dhulikhel	-	-	-	443	0.4	4.5	-	11

Source : Bal Kumar K.C. – Trends, Patterns and Implications of Rural to Urban Migration in Nepal, pp 90-91

1. % of total number of migrants
2. % of municipal population

Table 11 shows the trend of internal migrants in CDR during 1981-1991 but the international migration has not been considered in Table 9, since it comprises of a very nominal volume. Looking at the trends of migration in 1981 and 1991, it can be concluded that internal migration is the major contributor of population growth in the Kathmandu valley, the Inner Terai (Hetauda and Bharatpur) and Terai (Birganj and Janakpur). Another attribute may be the addition of new towns and extension of old boundary of towns for the cause of population growth. It is note-worthy to see Kathmandu alone comprises of more than half (59.5%) of the total internal urban migrants in 1991 and this situation needs to be considered seriously by the policy makers and urban planners. Almost two third of the total urban migrants are rushing towards Kathmandu valley, thus it is unquestionable that the valley needs special attention while planning for infrastructure facilities or any other kinds of urban and environmental planning. The newly declared towns are not considered in the above analysis due to lack of available data on migration.

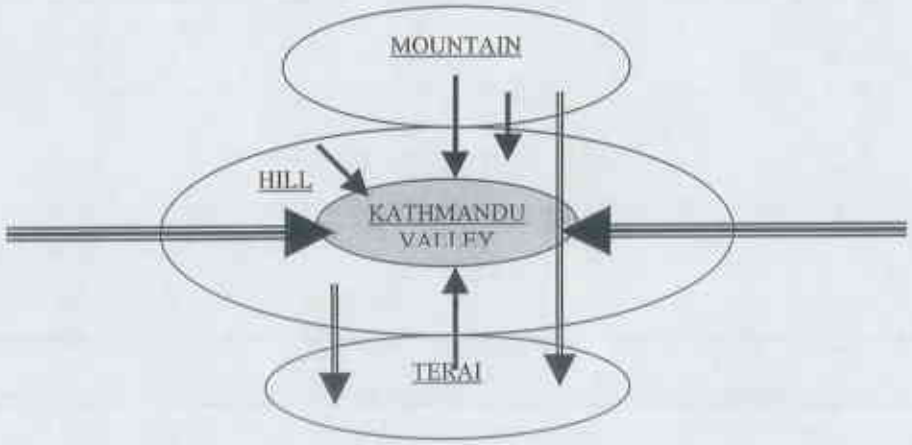


Figure: 16 General Migration Trend

The conclusions withdrawn from the data may be written as follows:

- Approximately 138678 people in migrated to municipalities in CDR alone during 1991
- More than half destined towards Kathmandu city alone and almost two third of those headed towards the valley itself as shown by 1991 data.(See Figure 17)
- Municipalities in Inner Terai also receive a significant amount of in-migrants like Bharatpur and Hetauda.
- Municipalities in the hills and interior part of Terai (not properly linked with highways) have very insignificant amount of in migration.

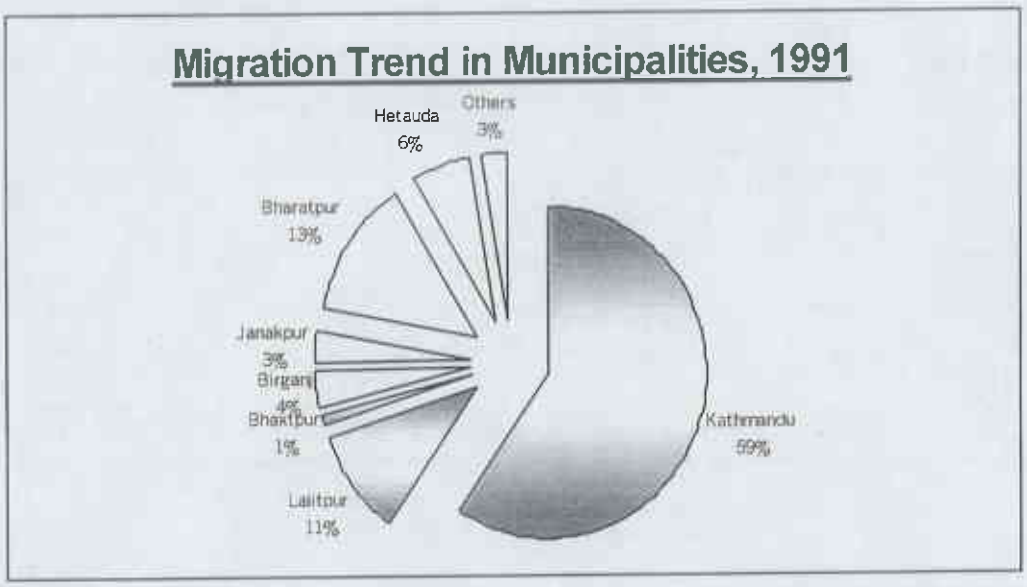


Figure: 17

The main reason of migration is associated with the availability of jobs in the urban areas as well as the decreasing employment opportunities in the rural areas of Nepal. "The creation of employment in the urban area triggers mobility and induces migration. There is also a secondary employment effect created by the growth of the population coming from migration, which raises further the demand for non traded goods and services in the city. Migration are generally demographic multiplier, because migrants are generally young, and move to cities during their most fertile years." (Renaud, 1981, pp-85)

4.3 Process and Growth of Urban Centers :

Historically the high Himalayas in the north and the malaria infected deep forest in the south were quite unsuitable for the growth of human settlement, thus much of the historical settlements have developed in the Kathmandu valley which has been very much ideal place for human settlement. Kathmandu valley had been a trade center since very old period since 750 B.C. Available evidence from the inscriptions indicates that were several settlement in Kathmandu valley and Banepa during Lichhavi period (300 A.D. – 879 A.D.) such as Drangas (business centers). The ancient Lichhavi dynasty had established the tradition of a well-established and well-organized local government institution then known as "Panchali".

The trade route of Banepa-Kuti (639 A.D.) was quite helpful in contributing the growth of the valley and several towns in the hills. Several commercial hamlets started growing at the crossroads in the hills. Urban growth in Nepal upto the 1940s was limited only in the Kathmandu valley. Historically, Lichhavi period show a very systematic order of urban settlements with well-defined policies for provision of services. The geo-political locational advantage of the valley promoted trade with Tibet and India.The Malla Period (1200 – 1769 A.D.) is considered to be a golden period for urban development inside the valley and also for non-agricultural economic opportunities as trade and craftsmanship. After unification of Nepal in 1769 A.D., the Gorkhali selected Kathmandu for the capital city. Since then the valley has been the focal point of the whole nation, thus leading to more population growth, economic development and urbanization.

Urban growth in the hills became apparent only after 1950 with the expansion of bureaucracy, overall increase in the volume of trade, and formation of infrastructure networks (Blaikie et al. 1980 : 130). But the rugged hilly terrain imposed several limits on the movement of both goods and people. Thus the settlement grew as a closed economic unit producing basic requirements of life within the settlement itself, promoting subsistence type of economies. The recent growth of urban population in the hills is also attributed mostly due to designation as urban area by the government and growth of service and administrative centers rather than urbanization in real sense. Lack of accessibility and infrastructure services remains the basic problems in all the hill towns.

The growth of settlement in the Terai started only after eradication of malaria and also development of trade link with India. The most important trade link to Kathmandu

was through Raxaul (India), Birganj (Terai), Hetauda (Inner Terai) and Bhimphedi (Hill). Similarly, the extension of Indian Railway network along the Nepal border such as Birganj – Amlekhganj and Jaynagar – Janakpur further increase the Nepal – India trade leading to the growth of urban centers at the transit points. A relatively large and growing agricultural potential of the Terai and easy access to Indian vast market area provided basis for commerce. Similarly, after eradication of malaria, a large-scale exodus of hill population to the productive agricultural and commercial frontier of Terai resulted growth of several settlements. The Terai and Inner Terai towns of CDR were the fastest growing urban centers because of their greater link with the capital city since the beginning. Until now, the trend is almost the same though the international trade through air transport has direct access to the international airport of Kathmandu. Birganj, Janakpur, Malangwa, Matihani, Gaur, Jaleshwor, and Kalaiya were the important trade centers of the Terai in the 1950s. Out of ten designated urban centers in Nepal in 1952/54, five were in the Kathmandu valley, which contained 82.6% of the then total urban population. Birganj, Janakpur and Malangwa were also designated as urban centers because of their location as important trade center. Market centers in the Inner Terai started growing in 1970s only after development of better transportation link, and is still growing faster than other eco-regions due to better agro-base and commercial potential.

In the history of urban development, it is evident that urbanization and urban characteristics do not grow overnight. A settlement begins to acquire urban dimensions even while it is fairly small (e.g. towns at foothills and crossroads). It is therefore important to recognize this evolutionary nature of urban places and start planning for their development at a very early stage – say from the large rural settlement stage. Once a settlement has succeeded in acting as a centripetal force and is of this size, it is necessary to introduce orderly process of development. If it is not done, it is likely that population will continue to grow but at the same time increases the hazards of poor urbanization – poverty, squatter, and over congestion. (Urban Development through Nagar Panchayat, 1984, pp-36)

In this way, CDR has been the region of greater extent of urbanization. The trade links can be attributed the single most effective reason of growth of urban centers. The development of various highways such as Tribhuvan Rajpath, Prithivi Rajmarg, Arniko Rajmarg, Trishuli rajmarg and East West highway have further contributed in the development of linkage system facilitating growth of a number of urban centers in the region. These highways greatly changed the spatial patterns of nodal points, which influenced the pattern and growth of urban centers in the region. These nodal points started performing new

additional functions such as health and education services, banking services, administrative services, and several professional and personal services. These nodal points developed closer commercial linkages with the nearby urban centers. The various such market centers developed along Tribhuvan Rajpath are Bhainse, Daman, Palung, Tistung, Naubise etc; along Prithivi Rajmarg are Mugling, Malekhu, Gajuri, Mahadevbensi etc.; along Arniko Rajmarg are Lamosangu, Lamidanda, Dolalghat, Barbise etc.; along Trishuli Road are Ranipauwa, Trishulibazar and along East West highway are Ratnanagar, Parsa, Lothar, Chandranigahapur, Nijgarh, Nawalpur, Bardibas, Dhalkebar and more.(See Figure 18 and 19)

Table 12: List of Important Highways in CDR

S.No	Road Sector	Total Length Km.	Date of Start	Date of Completion	Co-operation
1.	Thankot - Naubise	17	1953	1956	India
2.	Naubise - Bhainse	97	1953	1956	India
3.	Bhainse - Hetauda	10	1958	1962	USA
4.	Hetauda - Raxaul	57	1958	1967	USA
5.	Kathmandu - Trishuli	70	1957	1974	India
6.	Kathmandu - Kodari	113	1963		China
7.	Naubise - Mugling	84	1967	1974	China
8.	Pathlaiya - Dhalkebar	109	1967	1974	USSR
9.	Dhalkebar - Bhittamod	43	1967	1974	India
10.	Hetauda - Nrayanghat	77	1973	1982	USA
11.	Lamosangu - Jiri	110	1975	1985	Swiss
12.	Narayanghat - Mugling	36	1978	1982	China

Source : Nepal Road Statistics, NRS – 1998 – DOR, table:8, pp-191

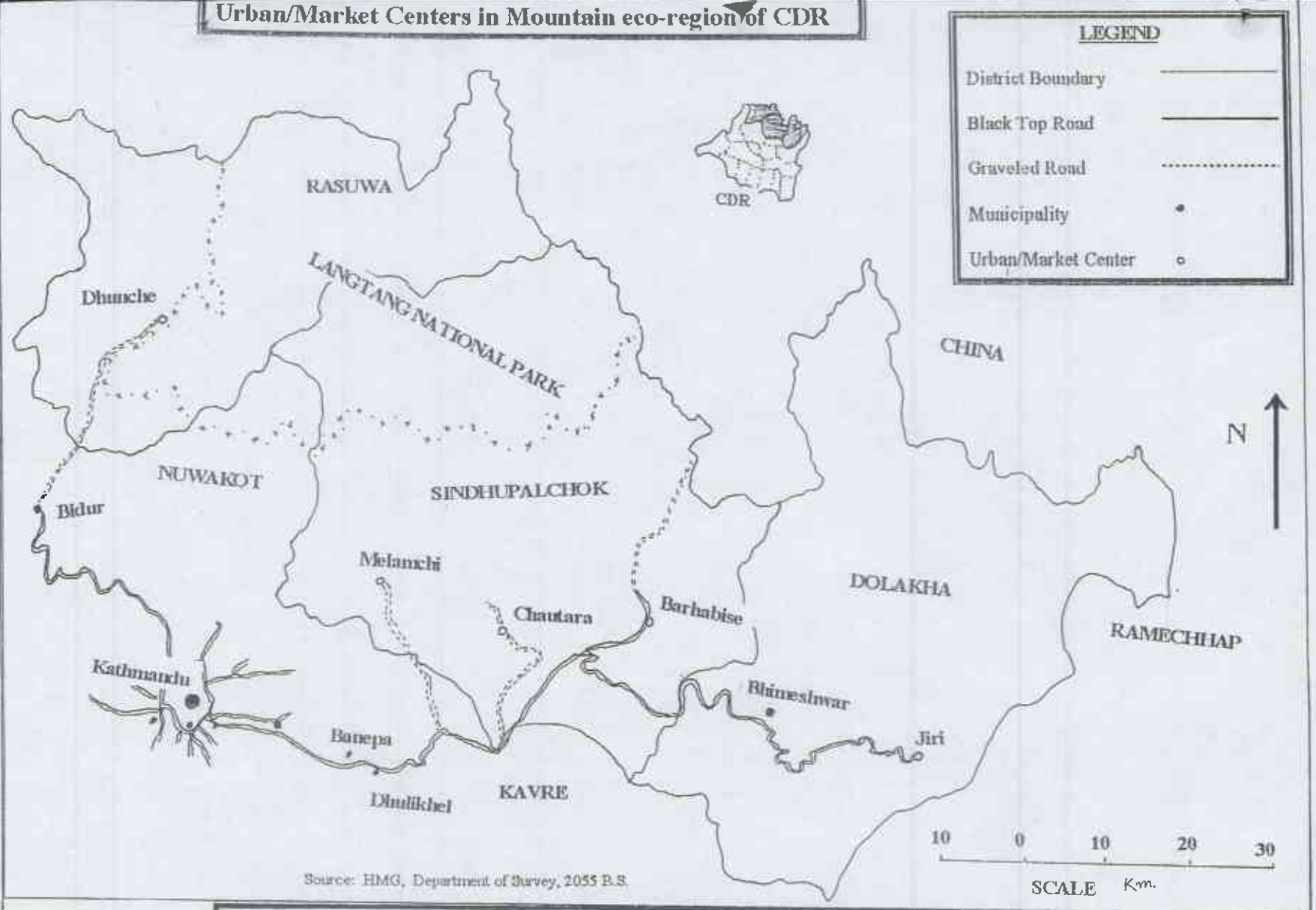
The trend of growth of urban population indicates that urbanization will go on increasing in Terai, Inner Terai and Kathmandu Valley. The valley as a whole will remain Nepal's major urbanized region. The urbanization in the Terai has been facilitated by

- easy access to trade and commercial contacts with India through major entry points of Terai
- enhanced agricultural production potential of the Terai
- creation of East West highway and major North-South Roads
- continuation of hill to Terai migration

Whereas the urban growth in the hills is likely to remain as it is because

- problems of accessibility and transport
- poor resource base in the hinterland

Urban/Market Centers in Mountain eco-region of CDR



Source: HMG, Department of Survey, 2055 B.S.

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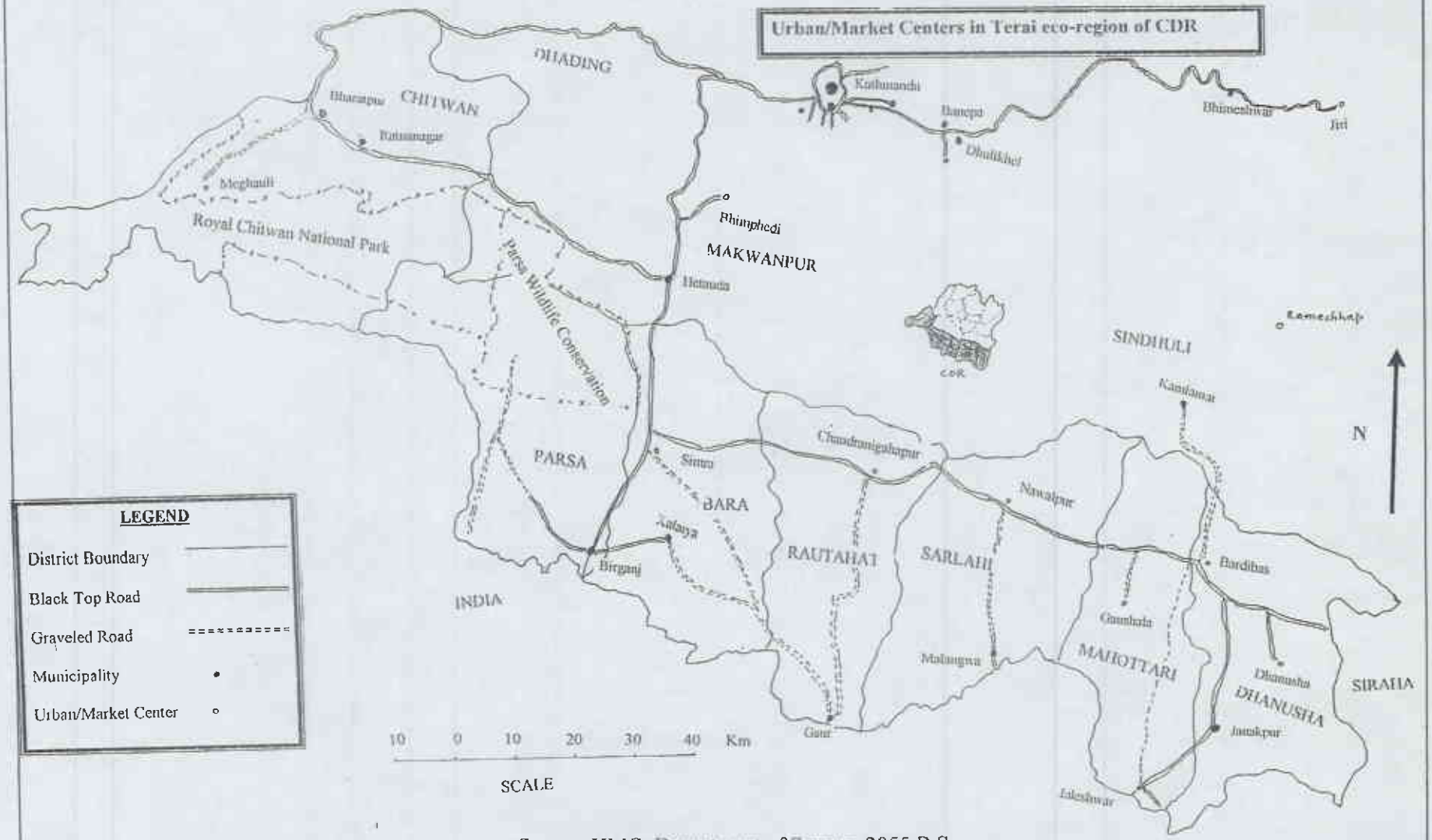

Source: HMG, Department of Survey, 2055 B.S.

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- limited potential for off farm employment generation

There are of course several opportunities in the hills, which if properly utilized may lead, to growth of urban centers in the transportation corridors. The opportunities of tourism, hydropower and horticulture need to be properly tapped and exploited.

4.4 Occupational Distribution and Employment :

One of the most vital features of urbanization is the concentration of persons engaged in non-agricultural activities. But agricultural occupation comprises of the major part of occupational structure in urban areas of Nepal because agriculture sector provides almost 80% of the Nepal's population its means of livelihood. The urban based occupation distribution consist of manufacturing, electricity, gas, water, construction, commerce, transport, communication, finance/business, personal services etc. Similarly rural based occupations comprise of agriculture, forestry, fishing, mining and quarrying.

The following table 9 shows the distribution of total economically active population and population which are in urban based occupation in various municipalities of CDR and centrality index based on this distribution of 1991 census data.

Table 13: Centrality Index of Municipalities based on urban occupation distribution

Municipalities	Economically Active pop. WP	Urban based Occupation TWP	% age distribution	Centrality Index C	Hierarchy Index H.I.	Ranking Ratio
1. Kathmandu	139967	131257	94	5.62	23	3.96
2. Lalitpur	39194	34296	88	1.47	11.34	1.95
3. Birganj	17210	15244	89	0.65	7.58	1.30
4. Hetauda	15269	11832	77	0.50	6.22	1.07
5. Janakpur	12755	10604	83	0.45	6.11	1.05
6. Bharatpur	17178	11479	67	0.49	5.72	0.98
7. Bhaktpur	23317	9472	41	0.40	4.03	0.69
8. Kalaiya	4645	2993	64	0.13	2.89	0.49
9. Malangwa	3756	2598	69	0.11	2.75	0.47
10. Bidur	6636	3099	47	0.14	2.55	0.44
11. Banepa	3561	2193	62	0.09	2.35	0.40
12. Jaleshwar	4245	2168	51	0.09	2.14	0.36
13. Dhulikhel	3388	1308	39	0.06	1.52	0.26
14. Panauti						
15. Bhimeshwar						

16. Madhyapur						
17. Kirtipur						
18. Ratnanagar						
19. Kamalamai						
20. Gaur						

Source: Statistical Year Book Of Nepal, 1997, CBS

Mean of Hierarchy Index = 6.01 Total Regional Population of Non agricultural Population , P

Standard Deviation of H.I. = 5.80 P = 2331767

Ranking Ratio = H.I. / S.D. of H.I.

Centrality Index and Hierarchy Index have been calculated using the formula given below. The standard deviation has been calculated from the mean of the hierarchy index to find out ranks of urban centers. One urban center Kathmandu came out to be 3.74 times S.D. The urban centers reveal an order of hierarchy that expresses a direct relationship with centrality values.

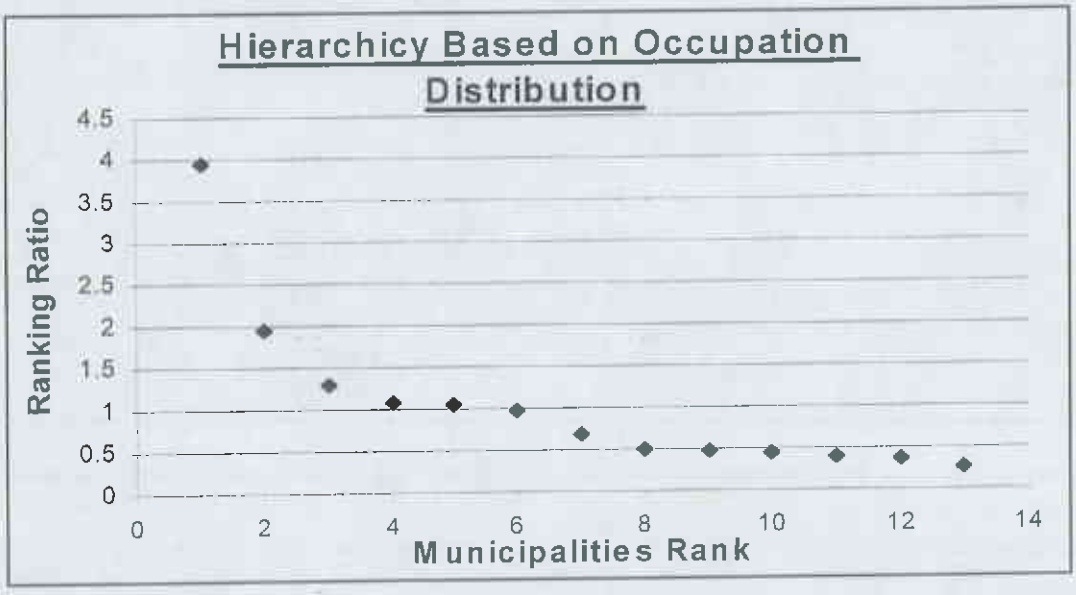


Figure: 20

In CDR, most of the municipalities seem to be rather more urbanized as the concentration of non-agricultural occupation is high enough except in four urban centers like Jaleshwor, Bidur, Bhaktpur and Dhulikhel. Though the agglomeration of non-agricultural population is quite high in Bhaktpur but the ratio as compared to the total economically

active population, it is quite low. Statistical calculation of centrality index and hierarchy index is based on total economically active population in the region and the table reveals clearly four category of urban population in CDR. Using the following formulas does the calculation:

$$C = \frac{T \times 100}{P}$$

Where C = Centrality Index

T = Number of persons dependent upon non-agricultural occupation

P = Total regional population of non-agricultural population

$$HI = \sqrt{\frac{C \times TWP \times 100}{WP}}$$

Where, C = Centrality

HI = Hierarchy Index

TWP = Tertiary Workers Population of a town

WP = Total working population of the town

Thus using economically active population data, four hierarchical classes have been identified as shown in Figure 20 and Table 13. Kathmandu and Lalitpur as discussed earlier dominate the urban hierarchy system not only in CDR but also in the whole country.

4.5 Urban Primacy:

A primate city may be defined as a city that is the largest in the country, state or the region and is several times larger than the second ranking city.(Jefferson). It is believed that once a city is larger than any other, this mere fact gives it an advantage over the other cities to grow rapidly in its size and to draw migrants from all others and hence it becomes a primate city but urban primacy is normally associated with several factors such as history of

the urban centers, rapid growth of population, high densities, low income and stagnant economy. " In the absence of a well ordered and well articulated system of lower order cities, there will be very little diffusion of the forces of urbanization and modernization downward to the masses, resulting in a sharp decline in the quality of life and level of living away from the primary settlements. It may not be possible to tally eliminate urban primacy." (Vagle, Exploding Cities)

Similarly El Shakhs in 1972 argued that primacy and economic development are related in a curvilinear way that is primacy increases with early advances in the level of development, reaches a peak during transitional period, and decreases with subsequent increases in development. (Sharma, 1989, pp-56).

Two-city primacy index is calculated by P_1/P_2 where P_1 is the population of the largest city and P_2 is the population of the second largest city. Four-city primacy index is calculated by

$$\frac{P_1}{P_2 + P_3 + P_4}$$

Primacy of Kathmandu , the capital city of Nepal is interlinked with all the cities of Nepal thus its Primacy cannot be confined within the CDR itself. Thus in Table 14, the primacy is calculated with respect to all the urban centers of Nepal.

Table 14: Measures of Primacy of Kathmandu in CDR

Index	*1971*	*1981*	*1991*	*1997*
Two City Index	2.54	2.51	3.25	4.13
Four City Index	1.04	1.06	1.23	1.52

Source: Calculated based on population data from Nepal District Profile

The rise of two city index to 4.13 in 1997 from 2.51 in 1981 is an indication that the primacy has been increased an a rather significant manner. Similar is the situation with four city index is also on the increase side. Thus Kathmandu remains as the most influential Primate City not only in CDR but in Nepal as a whole. Not only the national policies, but also establishment of SAARC Secretariat and rich cultural and tourism context

have very much encouraged the growth of Kathmandu and the towns in the valley. The favorable attribute of being the capital city from historical period has been one of the major reason why Kathmandu has followed a pattern of evolution very different from the rest of the urban centers of the nation. But the increasing problems of infrastructure and services in the valley has already indicated the need to consider the development of well articulated urban system of lower order cities to ease the overloaded burden of the valley. "Given the geo-political situation of Nepal and the Indian influence, a strong Kathmandu is a necessary condition not only for international connection and linkages but also for survival." (Joshi, 199, pp-60)

An important distinction must be made between the concentration of a large percentage of the total urban population in the largest city (primacy) and the existence of a very large urban center in a country. They should be distinguished on the basis of what is known about economic efficiency and city size. Economic efficiency for a city is the net result of the benefits of urban agglomeration (agglomeration economies), which lowers the average cost of production for many activities and the losses created by congestion and environmental deterioration. Most studies show that, at the lower end of the size range, economies of scale increases rapidly as a city expands, but beyond a certain size, the additional gains diminish rapidly.(Renaud, 1981, pp- 107)

4.6 Infrastructure Development:

Urban Services in Nepal can be grouped into two main categories; first, infrastructure services and second, social services which can be written as follows:

Infrastructure Services:

- Electricity (including street Lighting
- Water Supply
- Sanitation (Human Waste Disposal)
- Stormwater Drainage
- Roads (including bridges)
- Telecommunications (primary telephones)
- Solid Waste Disposal

Social Services:

- Education (school, campus and university)
- Health (hospitals and clinics)
- Police/Fire
- Miscellaneous – Public Markets, Bus and Truck Parks, Green Areas, Slaughter Houses, Crematoriums, Ponds and Public Transport

Responsibilities for these urban services in Nepal are divided between central line agencies (direct service providers for water supply, electricity, roads etc.) and local administrations (municipalities and VDCs). (Urban Infrastructure Service Delivery, 1990,pp-7)

Though it is a general assumption that urban areas enjoy better access to services and facilities, but it is a hard fact that most of the urban areas do not have adequate infrastructure services. All the urban areas show serious deficiencies in essential infrastructure and social services such as water supply, drainage, sewerage, solid waste management and urban road system. The situation in the hilly urban areas is even worse.

The pressure on the existing infrastructure is already high in most of the urban centers and is bound to increase as urban population grows. But impediments to proper infrastructure service delivery are getting more complex due to

- lack of agreed standards for infrastructure facilitation
- inability to control settlement pattern inside the city
- Lack of co-ordination between various line agencies responsible for implementation of infrastructure and social services

Table 15: Urban Road Length and Category

Municipality	Blacktop Road Length Km.	Graveled Road Length Km.	Earthen Road Length Km.	Total Road Length Km.
1. Kathmandu	332	67	32	431
2. Lalitpur	130	27	18	175
3. Bhaktpur	4	2	0	6
4. Birganj	13	1	6	20
5. Janakpur	14	12	14	40
6. Bharatpur	42	169	78	289
7. Hetauda	8	18	10	36
8. Madhyapur	16	2	45	63
9. Kirtipur	5	35	35	75
10. Ratnanagar	8	50	-	58
11. Kamlamai	1	1	30	32
12. Panauti	6	13	1	20
13. Gaur	4	2	2	8
14. Bhimeswar	31.5	2.5	2	36
15. Bidur	4	3	5	12
16. Kalaiya	6	1	8	15
17. Jaleswar	7	5	10	22
18. Malangwa	5	5	2	12
19. Banepa	6	0	0	6
20. Dhulikhel	3	0	0	3

Source : Nepal Road Statistics, NRS-1998 – DOR, pp:52-100
Detailed Revenue and Expenditure .. Udle

The Table: 15 clearly shows that The valley towns ranks on higher side in terms of road facility but the Terai towns like Bharatpur and Ratnanagar are also quite good as compared to other towns. The hill towns like Banepa and Dhulikhel, Terai towns like Gaur and Malangwa have very poor situation of road facility even in the town area.

The Table: 16 makes it very clear that the infrastructure services in the urban centers of the hills and mountains are relatively very poor as compared to Terai and Kathmandu valley. The hill city of Hetauda is the exception because of its strategic location in the main highway and strong economic linkages with the border town of Birganj as well as with the Kathmandu valley. Similarly the Terai town like Jaleshwar and Malangwa have

very poor situation of infrastructure services because of lower potential resource as well as poor linkage with other towns.

Table 16: Existing Infrastructure Facilities in Municipalities in CDR

Municipality	Street Light	Telephones	Drinking Water		Education			Medical Facility	
			Public	Private	Primary/ L.S.	Secondary	Campus	Hospital	Health Post
Mountain Towns									
Bhimeshwar	35	27	161	354	22+2	6	1	1	4
Hill Towns									
Bidur	527	500	155	630	19+3	4	2	1	1
Banepa	400	1708	50	1021	15	6	2	3	-
Dhulikhel	350	425	34	650	15	4	1	1	1
Hetauda	4850	2000	3000	4000	12	15	4	1	-
Kamlamai	153	141	50	520	31+2	2	3	1	1
Panauti	70	150		378	24+2	6	1	1	5
Kathmandu Valley									
Kathmandu									
Lalitpur									
Bhaktpur	91	4000	117	3399	48+10	18	5	1	-
Madhyapur	80	709	35	2094	25+4	13	-	1	5
Kirtipur	-	1800	139	950	5+5	9	1	1	10
Terai									
Bharatpur	5000	4200	100	3914	40+5	17	6	4	2
Ratnanagar	360	260	35	251	26+3	8	1	-	1
Birganj	4160	6500	45	6200	35+9	14	3	1	-
Kalaiya	1230	502	30	915	8+3	9	1	1	-
Janakpur	3376	3500	40	1722	27+6	14	8	4	-
Jaleshwar	500	250	360	54	8+1	2	1	1	-
Malangwa	-	500	10	506	10+1	5	1	1	-
Gaur	950	500	35	700	7+4	1	2	2	-

Source: Detailed Revenue and Expenditure... Udle, 1999

The basis of national wealth is the skill, dexterity and competence of individuals.

Adam Smith, 1776

Chapter V: Urban Interlinkage System

This chapter deals with the interlinkage system in the urban/market centers of the mountain eco-region of CDR. Linkage characteristics are one of the most important characteristics of the urban system because the urban system functions on the basis of linkages with the centers of lower order as well as the centers of higher order. The functional basis of an urban center is shown by the extent of distribution of economically active population. The functional basis also describes the per capita investment pattern in urban centers. Accessibility pattern is described on the basis of road density and frequency of bus/minibus service in the urban centers. The role of urban/market centers in the mountain eco-region of CDR has been described in two parts: role as service center and provider of off-farm employment. Pattern of interaction is dealt in two levels – linkage with rural hinterlands and urban center of lower order and linkage with centers of higher order.

5.1 Functional basis of Urban Centers:

The functional basis of urban centers has been described by the distribution of occupational population as shown in Table 17. The Nepalese towns are mostly Tertiary towns because there is no manufacturing base in any of the municipalities except agricultural production. The main economic activity lies in trade and services. Most of the economically active population in majority of the towns is dependent upon agricultural production system though the major share of economic activity lies in other tertiary activities. Though almost four fifth of the population are dependent upon agricultural profession but still ten out of nineteen districts in CDR are food deficient area as shown in Appendix: E. All the three districts in the valley are food deficit areas whereas two mountain, three hill and two Terai district also lies in food deficit areas. This situation is not going to effect much for the valley because the valley towns have plenty of non-farm activities and manufacturing as well as tertiary activities for supporting its population but the other hilly and mountain areas are in severe problem due to very limited economic opportunities in the urban centers of those areas.

There is no up to date data on the functional base of all the urban centers in the study area, some general observation based on 1991 census data can be made in the municipalities as given in the table: 17. The amount of bank deposits and credit flow per capita as shown in Appendix: D gives an indication of the potentiality of the particular district. The table in Appendix: D shows that the valley districts are in higher side in banking activities. The lowest bank deposit per capita is Sidhuli whereas the lowest per capita credit is in Rasuwa, both being the hill districts lagging very much behind in economic activities.

Table 17: Functional basis of municipalities in CDR

Municipality	Agriculture based Pop. %	Manufacturing based Pop. %	Personal and Commercial Services based Pop. %	Trade & Commerce based Pop. %	Others
Mountain Towns					
Bhimeshwar					
Hill Towns					
Bidur	53	3	20	13	11
Banepa	38	4	24	24	10
Dhulikhel	61	2	16	17	4
Hetauda	22	9	38	16	15
Kamlamai					
Panauti					
Kathmandu Valley					
Kathmandu	6	14	40	25	15
Lalitpur	12	18	39	15	16
Bhaktpur	59	8	15	11	7
Madhyapur					
Kirtipur					
Terai					
Bharatpur	33	4	32	21	10
Ratnanagar					
Birganj	11	6	38	26	19
Kalaiya	35	4	33	18	10
Janakpur	17	4	44	20	15
Jaleshwar	49	4	29	11	7
Malangwa	31	9	39	14	7
Gaur					

Source: Towards National Urban Strategy – Udle; 1997

From the above table: 17, following inferences can be withdrawn:

- There are only four municipalities which have less than 20% of economically active population depending on primary sector i.e. agriculture, e.g. Kathmandu, Lalitpur, Birganj and Janakpur. Majority of population in most of the urban centers is agriculture dependent. It shows that agriculture is still the most important economic activity even in the urban centers of Nepal.
- There are only two urban centers where more than 10% of economically active population are dependent upon secondary sector i.e. manufacturing, e.g. Kathmandu and Lalitpur. It shows manufacturing and production sector have very insignificant economic role in most of the urban centers.

- Personal and commercial services i.e. tertiary sector is rather dominating economic sector in most of the urban centers after the agriculture sector.

Several small urban centers (market centers) are erupting along the major roads and trade routes and almost all of these centers are expanding due to increase in personal and commercial services. The urban centers in the mountain areas have also agriculture the most dominating economic base but the commercial and personal service activity is quite influencing the economy of the whole urban areas.

The level of revenue, total expenditure and investment in various municipalities of CDR is given in the table: 18, which reveal several facts, listed as following:

- The gateway towns of Terai like Birganj, Gaur, Hetauda, Bharatpur have quite high per capita revenue whereas newly delineated municipality such as Kamlamai and Bhimeshwar have very low revenue base.
- The hill towns like Banepa and Dhulikhel have good revenue base as compared to other hill towns.
- Per capita capital investment of Primate City like Kathmandu is comparatively very low as compared to many other cities like Birganj and Dhulikhel. The capital investment in mountain town Bhimeshwar and hill town Kamlamai are too low as well. (See Figure 21)
- The Terai town like Janakpur has very low revenue base as well as minimum per capita capital investment; it shows this town needs special planning measures for its revitalization.

The figure: 21 clearly show the extreme disparity in capital investments in various municipalities of CDR. The high level of per capita capital investment in Birganj and Dhulikhel indicates these two towns a place of high investment because of high rate of capital return and they are in need of appropriate policy to improve the level of government services in infrastructure and related fields. The municipalities with lower level of investment such as Janakpur in Terai, Lalitpur in the valley, Kamlamai in the hills and Bhimeshwar in the mountain are in need of extra support from the government.

Table 18: Revenue, Expenditure and investment breakdown in municipalities of CDR

Municipality	Per Capita Revenue	Per Capita Expenditure	Per Capita Capital Investment
Mountain Towns			
Bhimeshwar	285.54	204.82	115.48
Hill Towns			
Bidur	784.65	639.15	418.65
Banepa	1313.02	1265.15	665.53
Dhulikhel	1928.60	1802.06	866.44
Hetauda	634.55	529.02	312.12
Kamlamai	182.81	142.93	118.39
Panauti	603.49	354.35	183.69
Kathmandu Valley			
Kathmandu	542.63	521.96	234.25
Lalitpur	394.61	396.64	84.73
Bhaktpur	1273.03	797.47	315.11
Madhyapur	586.05	417.38	293.33
Kirtipur	511.48	453.96	181.10
Terai			
Bharatpur	654.60	558.11	354.89
Ratnanagar	563.72	463.20	283.02
Birganj	1745.53	1687.88	920.53
Kalaiya	503.93	496.35	133.38
Janakpur	319.70	310.06	56.32
Jaleshwar	426.77	413.27	211.56
Malangwa	481.18	319.20	153.38
Gaur	984.25	729.47	524.01

Source: Detailed Revenue and Expenditure ...- Udle; 1999

The occupational structure of sample household survey in the urban/market centers of mountain eco-region was observed as follows:

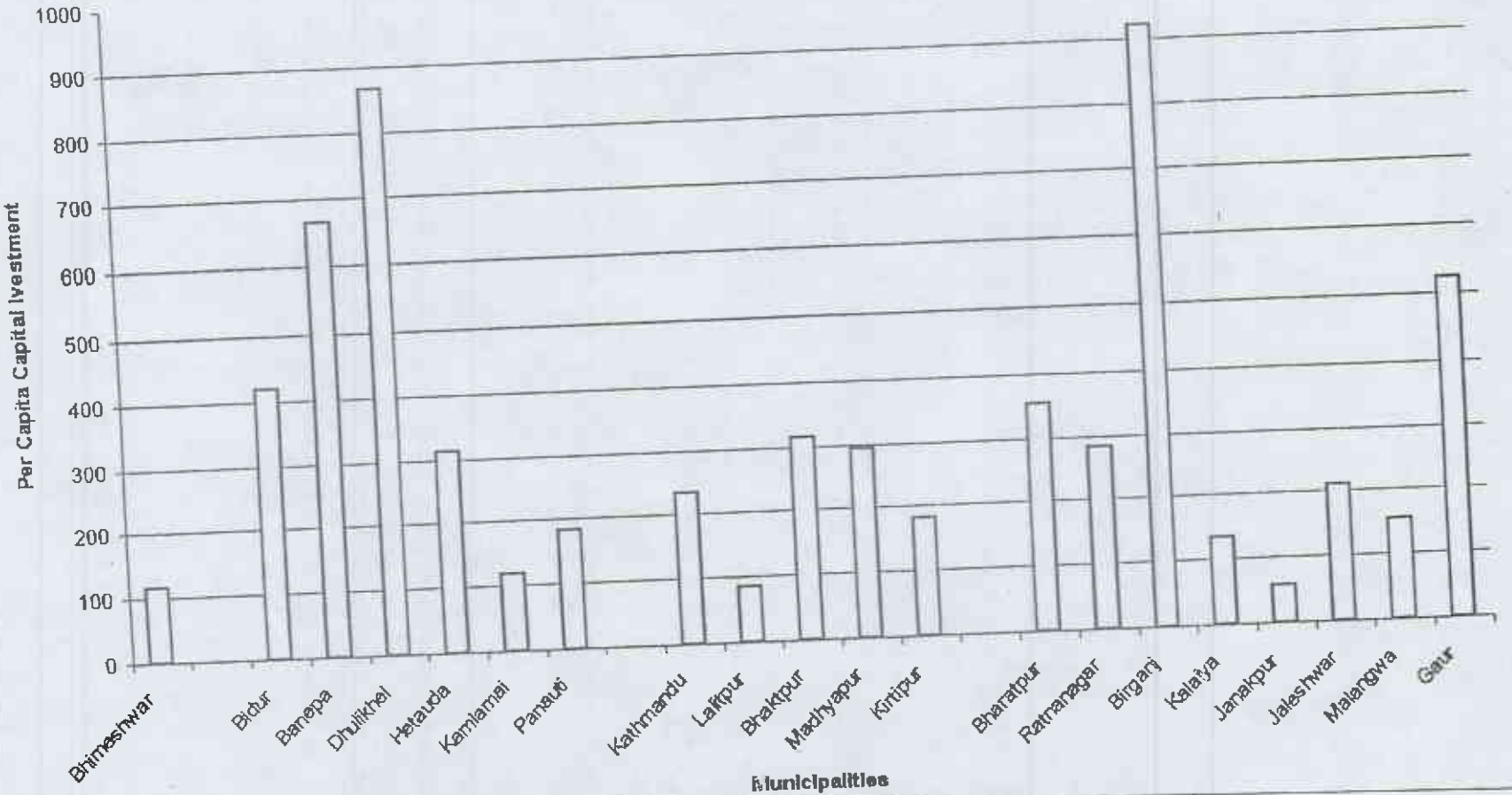
Table 19: Occupational Structure of urban/market centers in Mountain eco-region

Urban/Market Center	Date of Survey	Agriculture Based Pop. %	Manufacturing Based Pop. %	Personal & Commercial Service	Trade	Others (Wage Labor)
Dhunche*	1989	54.49	-	26	27	23
Bhimeshwar**	1996	37.6	1.7	29.4	30.1	1.2
Barhabise***	1977	48	-	52	-	-
Chautara***	1977	77	1	22	-	-

Source: * Basic Shelter Study – CEMAT Consultants, 1989; pp-38
** Identification of Small Towns – Central Deptt. Of Geography, T.U., 1996; pp-29
*** Settlement System, small Towns – Prof. C.B. Shrestha, ICIMOD, 1994; pp-29

The Table: 19 gives a glimpse about the occupational structure of urban/market centers in mountain eco – region of CDR but the importance of such urban/market centers in terms of central functions usually cannot be estimated on the basis of occupational structure. The relative

CAPITAL INVESTMENT IN MUNICIPALITIES OF CDR



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importance of urban/market centers is reflected in the magnitude of the array of central functions. The major groups of economically active population in various districts of CDr has been shown in Appendix A.

The various functions in the urban/market centers in the mountain eco-region of CDR can be written as follows:

Table 20: Central functions of urban/market centers of mountain eco-region

Urban/Market Centers	Functions
1. Bhimeshwar	Administrative/Commercial/Service Center
2. Jiri	Service/Market Center
3. Chautara	Administrative/Service Center
4. Barhabise	Commercial/Service Center
5. Melamchi	Market/Service Center
6. Dhunche	Administrative/Service Center

5.2 Accessibility Pattern:

Since historical periods, the route network in CDR has been influenced by strategic location of the Kathmandu Valey. All the highways and traditional routes converge towards the valley. The North-South trade link can be attributed for the development of accessibility pattern. The development of modernhighways such as East-West Highways, Tribhuvan Rajpath, Prithvi Highway, Trishuli Highway, Arniko Highway and Lamosangu-Jiri Highway has greatly transformed the old accessibility pattern of this region. But the traditional trails are still in very much use in the mountain part because the development of highways has been done only in limited routes such as Trishuli-Dhunche Road, Dolalghat-Chautara Road, Arniko Highway and Jiri Road. (See Figure 22)

Hill trails play an important role in linking rural settlement to the market center in the mountain area. The main trails mostly follow North-South trade routes because of the trade links with China Border for several industrial products and southern part for food grains and services. The East-West trails are more important for inter-regional long distance trade. The road density per 100 sq. km. Of area and per 10000 population has been calculated in Table: 21 as follows:

Public Bus/Mini Bus Frequency in Mountain eco-region of CDR

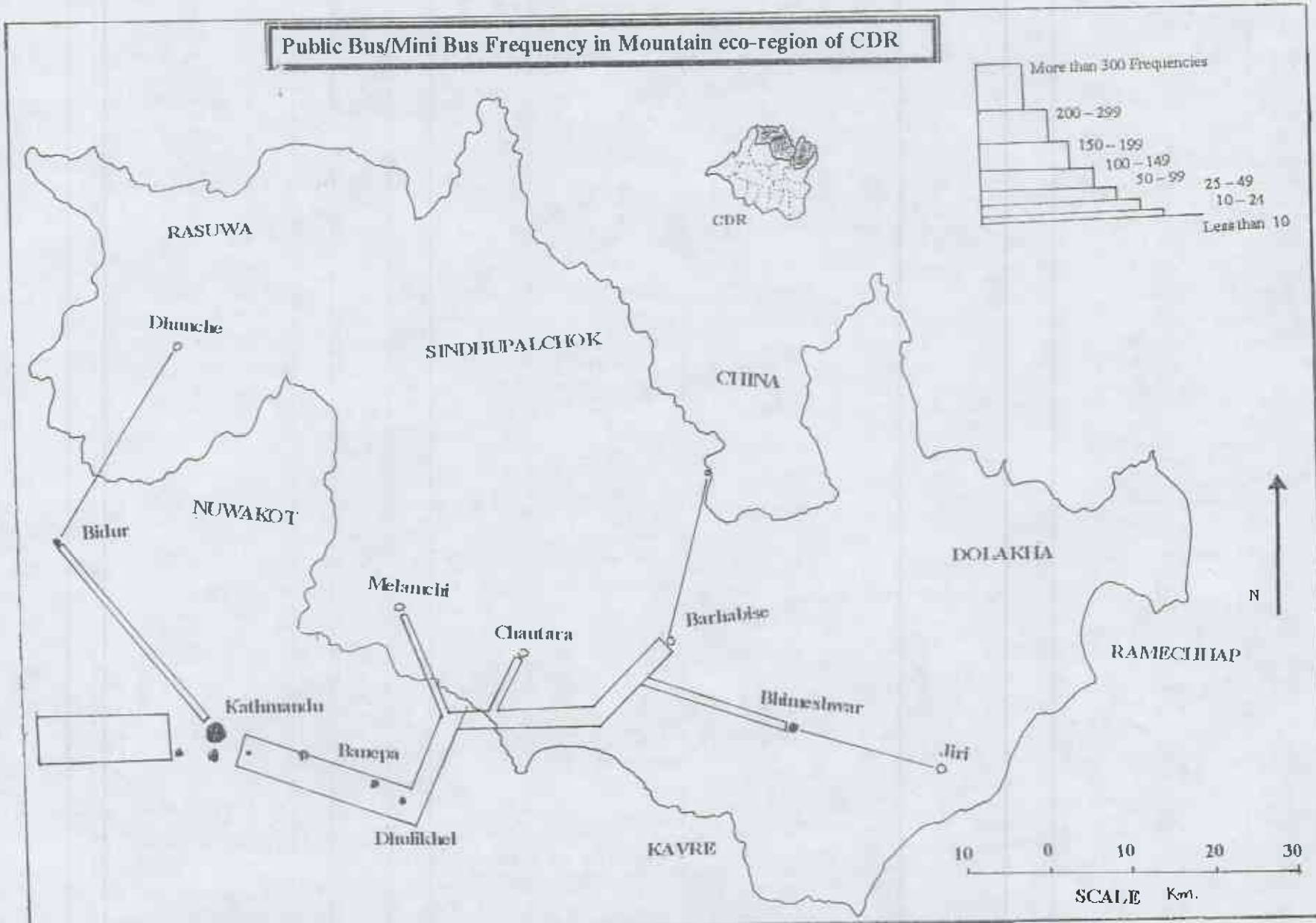

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Figure 22

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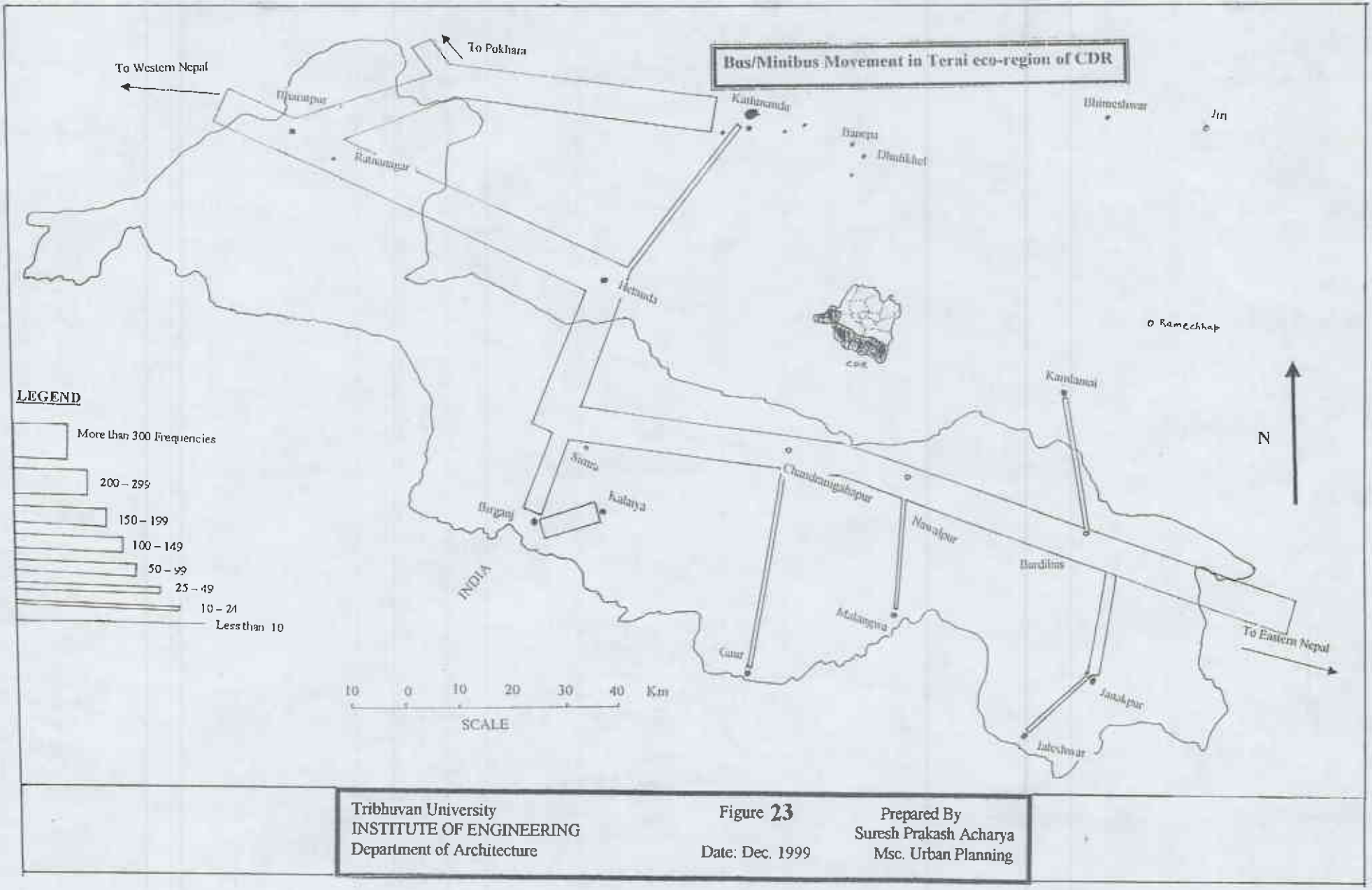

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Table 21: Road Density in Districts of CDR

Units	Road Length (All categories in Km.)	Road Density per 100 Sq. KM.	Road Density per 10000 Population
Nepal	7330	4.98	3.57
Mountain Districts			
Sindhupalchok	155	6.09	5.60
Rasuwa	98	6.34	24.25
Dolakha	111	5.06	5.97
Hill Districts			
Sindhuli	60	2.40	2.43
Ramechhap	Under Construction		
Makwanpur	339	13.97	9.49
Dhading			
Nuwakot	132	11.77	5.92
Kavre	159	11.38	4.77
Kathmandu Valley			
Kathmandu	525	132.91	6.17
Lalitpur	288	74.80	9.51
Bhaktpur	128	107.57	7.12
Terai Districts			
Dhanusha	229	19.40	3.76
Mahottari	207	20.65	4.26
Sarlahi	172	13.66	3.14
Rautahat	126	11.19	2.73
Bara	179	15.04	3.78
Parsa	92	6.79	2.16
Chitwan	445	20.06	10.77

Source: Nepal District Profile – NRA, 1996

The road density per 10000 population in Rasuwa is quite high due to low population. As compared to national average of 3.96, the road densities even in three mountain districts of CDR are relatively better though inadequate. As compared to road density per 100 sq. Km., the road density in Kathmandu district is quite high as compared to others. The road densities in three mountain districts are relatively higher than the national average. The road density in the Terai is relatively better when considered as the area of the region but is low as compared with per capita population. The road density is very much inadequate in Terai if compared to the higher density of population there.

The economy of any place is very much dependent upon the road access to that place and the standard as well as distance of that access. The table 22 shows an assessment of access to and from urban centers based on following factors:

- access to the hinterlands they serve
- access to other urban centers and
- access to trading countries, notably India and China

The west part of Kathmandu along Prithvi Highway is the most accessible part in CDR. Similarly, Bharatpur, Ratnanagar,and Hetauda ranks also very high in terms of accessibility as shown in fig. Similarly urban/market centers of mountain area such as Dhunche, Chautara, Barhabise, Bhimeshwar and Jiri are also easily accessible with all weather road but Melamchi is accessible only in dry season. The least accessible area in CDR is Ramechhap District, North Sindhuli and North Dhading and the Terai part is considered to be most accessible area of CDR due to geographical attribute. Figure: 22 and 23 shows the frequency distribution of Public Bus/Mini Bus in Mountain and Terai as well as Hill eco – region of CDR. The frequency towards west of the valley and in Kathmandu – Banepa route, the movement of bus is very high whereas towards the mountain urban centers such as Dhunche, Chautara, Bhimeshwar etc. is relatively less.

Table 22: Assessment of Access to and from Urban Centers

Municipality	Access to hinterland	Access to other Urban Centers	Access to Trading Countries	Overall Assessment
Mountain Towns				
Bhimeshwar	1	1	1	3
Hill Towns				
Bidur	2	2	1	5
Banepa	2	3	1	6
Dhulikhel	2	2	1	5
Hetauda	3	3	2	8
Kamlamai	2	2	1	5
Panauti	1	2	1	4
Kathmandu Valley				
Kathmandu	3	4	1	8
Lalitpur	3	3	1	7
Bhaktpur	3	4	1	8
Madhyapur	3	3	1	7
Kirtipur	2	3	1	6
Terai				
Bharatpur	3	4	1	8
Ratnanagar	1	2	1	4
Birganj	3	3	4	10
Kalaiya	3	2	1	6
Janakpur	2	2	2	6
Jaleshwar	2	2	4	8
Malangwa	2	2	2	6
Gaur	2	1	2	5

Source: Towards National Urban Strategy, Udle/MHPP/DHUD, 1997

The volume of goods movement from the various municipalities also gives an indication of accessibility pattern of that municipality.

5.3 Role Of Urban Centers:

The contribution of urban areas to the national economy is quite obvious from the fact that the share of agriculture sector in National GDP has been declining from 71% in 1975-76 to 44% in 1994-95 and most of the non-agriculture activity is essentially urban in character. In this context, the role of small market centers ids essentially very much important in economy generation in addition to the role of officially declared municipalities. The small market centers are the one, which are in direct contact with the rural areas.

When we look at the bigger urban centers of CDR, we observe that

- Kathmandu valley is becoming a big industrial area because Kathmandu valley alone provides about 69% of the industrial employment in the country(Prof. C.B. Shrestha,1994)
- Several pocket areas are fast industrializing such as Birganj-Hetauda, Bharatpur area and the whole region of Kathmandu Valley

Special care must be made for balanced growth in such areas through articulation and integration of urban system. In mountain area, the main role of urban/market centers is to provide commercial services and other types of social services such as health and education. The urban/market centers have also significant role in providing support to agricultural development, off-farm employment, social service delivery and also in social transformation and national integration. "The social transformation takes place through constant and intense social, cultural and economic interaction among the people living in cities. The small urban centers and market towns though not fully socially integrated can play a crucial role in social transformation."(Role of small urban centers in national development in Nepal, Geography Instruction Committee, T.U., 1984) This complex process can be evaluated by studying the nature and component of migration, volume of publications, and other communication facilities, demographic change in component of ethnic group, caste and religions.

Since Urban/market centers in the mountains are severely restricted in terms of physical infrastructure, commercial and social services, manufacturing and industrial enterprises and utilities, the prospects of investments in such centers are lesser as compared to bigger centers. The higher ordered centers are preferred for investment by private enterprise as the rate of return is

Rapid Urbanizing Area with High Economic Growth

LEGEND

- District Boundary
- Black Top Road
- Graveled Road
- Municipality
- Urban/Market Center
- Rapid Urbanizing Area

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higher. Thus the functional roles of such urban centers are limited. The most important role of such urban centers is in providing social services. The urban/market centers of the Hills have more pivotal role because of their strategic location between economically active Terai and undeveloped mountain region. The Hill towns are the main distribution centers of goods and services for the hilly rural hinterland as well as mountain urban/market centers of lower order. Most of the Hill towns are tertiary centers, which have strong commercial ties with border towns of Terai. The Terai urban centers are mostly trade and transit centers with high agriculture production base (see Appendix E). Manufacturing and industrial products is growing fast in certain areas such as Hetauda – Birganj Growth Corridor and Bharatpur area.(see Figure: 24)

5.3.1 Functional Role as Service Center:

The urban/market centers in the mountain area support services and facilities in order to meet basic human needs such as kerosene, salt, medicine, agriculture inputs and provide outlets for the sell of agricultural goods. And non-farm employment. They are the focal points providing services such as education, health, postal services and tele-communication services, banking services etc. "New employment opportunities in agro-processing, agriculture business, small scale manufacturing and cottage industries and alteration of the rural to urban migration pattern could also be given utmost importance in small urban centers.' (Role of small urban centers... 1984; pp-75)

The market centers provide important support services resulting in agricultural development. They have emerged as important centers in terms of the diffusion of technical innovations in the agricultural sector. They function as centers for extension services, providing technical know how, distributing inputs (improved seeds and fertilizers) imparting training and facilitating the marketing of agri-products. (Shrestha, 1994)

The urban/market centers also help in stimulating the development of rural areas by harnessing their potentials such as dairy, livestock, herbs and also other non-farm activities like indigenous crafts and tourism potentials. Jiri has been developed as a center of collection of milk from the surrounding area for the cheese factory. Similarly Dhunche has potential for herb collection and small scale herbal factory could help the rural area for economical upliftment. The hilly towns like Dhadingbesi, Ramechhap Manthali, Banepa, Bidur etc. serve as service centers for a large pocket of respective hinterlands. Similarly the Terai urban centers such as Jaleshwar, Malangwa, Gaur, Kalaiya, Janakpur etc. have the main role as service centers.

5.3.2 Functional Role as provider of Off Farm Employment:

Even in the bigger urban centers like several municipalities, the ratio of off farm employment is comparatively lesser i.e. more people are dependent on agriculture but still the urban/market centers could be good focal points where off farm employment could be generated. Dhunche could be a good tourist center (internal as well as foreign) as it lies in the route to Holy Gosaikund sand Langtang National Park. Melamchi could be a good center for non farm activities as the construction of big multipurpose Melamchi Water Supply Project is coming soon and the construction of Indrawari Hydal Project has already started its work there. Similarly Barhabise is developing as a good trade center for export import with China . It has been estimated that in 1996/97, 1 total of Rs. 620628000 worth goods have been exported and Rs.1101822000 worth goods have been imported through the Tatopani customs near Barhabise bazar.(Himal, Nepali – Aug. 1-15,1999 pp-24) Similarly Syabrubesi of Rasuwa could be a potential center of trade with Kerung (China) if properly linked with motorable road from Dhunche.

The urban/market centers such as Dhunche, Chautara and Bhimeshwor which are district headquarters as well provide more opportunity for government administrative services as well as several other wage labor employment opportunity, catering service opportunity etc. The other commercial and tourist centers such as Melamchi, Barhabise and Jiri provide ample amount of seasonal wage labor employment opportunities. It can be observed that generation of off farm employment depends to a great extent on the functional strength of market centers. Larger centers with relatively stronger functional bases generate more off farm employment than smaller centers with a small functional base.

The Hill towns like Hetauda, Dhulikhel and several other urban/market centers in highways serve as the provider of non – farm employment opportunities. Similarly, Kathmandu valley towns serve as the main source of non – farm activities due to high potential of Tourism and industrial base. Terai towns like Birganj, Bharatpur are main centers of non – farm activities because of strong industrial base and commercial activities.

5.4 Pattern of Interaction:

Interaction among urban/market centers takes place in two ways. First interaction with rural areas and market centers of lower order and second interaction with bigger urban centers of higher order. The former interaction occurs at rural-urban level and the latter at the inter-urban level. The rural urban interaction occurs because the surrounding rural areas rely upon urban centers for several types of urban services of higher order and also institutions and the urban centers also rely on the rural hinterland for agricultural products and labors. This interaction is rather conditioned by accessibility. " Similarly, the inter-urban interaction is rather understood by demand and supply in terms of trade, administration, social activity, technology etc." (Shrestha,1994)

5.4.1 Linkages with surrounding Rural Areas:

The linkages with rural areas are reflected in shopping and selling of farm products, administrative services, health and education services, persona; and professional; services and service industries. Most of the secondary schools, campuses, hospitals/health post, agriculture extension service offices are generally located in the market centers. Thus the residents of the surrounding rural areas have the most frequent and intimate relation with market centers not only for these services but also for shopping and selling farm products and buying kerosene, medicine and consumer industrial products.

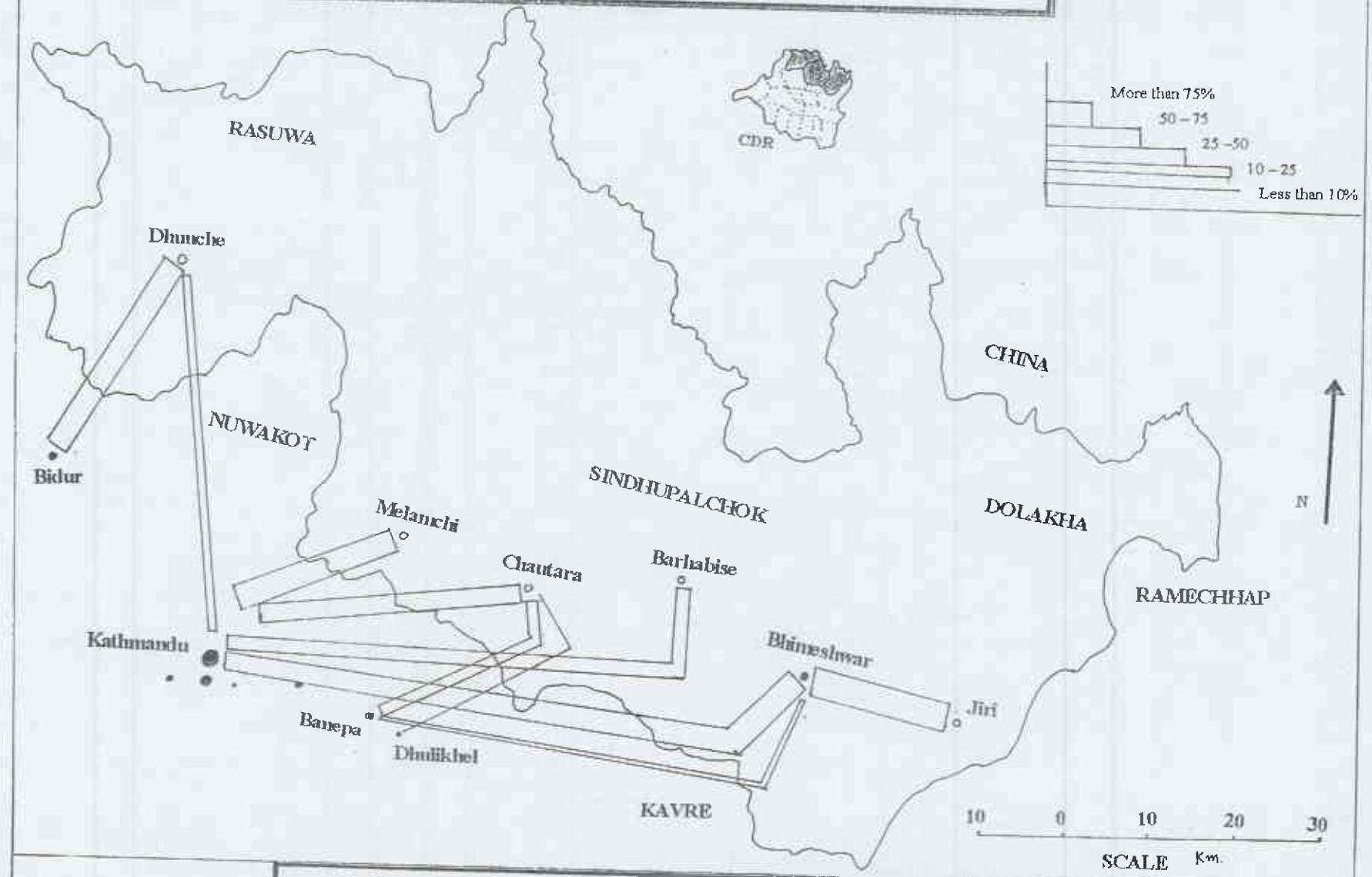
In the mountain urban centers like Dhunche, Chautara and Bhimeshwar, they are the focal point of route network with the advantages of road link and a point of confluence of trails. Thus they provide a range of services to the rural hinterland. The towns like Barhabise is a trade link with China, Jiri as a dairy link and service center and Melamchi as a market and service center to their respective hinterlands. The field survey in Chautara (Bhimeshwar) in 1996 revealed that most of customer visit the center for buying i.e. 57%, 39% visit for selling, 6% for buying and selling and 8% for other purpose. (Identification of Small Towns..,1996, pp-40)

In Rasuwa, Other settlements worthy to be called as a rural center do not exist, thus Dhunche is providing the administrative and other basic services like marketing, health and education to all the villages and settlements there. (Basic Shelter Study project, 1989)

Thus rural urban interrelationship can be summarized to exist in following ways:

- Trade and business
- Education and health services

Flow of Trading Goods in Urban/Market Centers in Mountain eco-region of CDR



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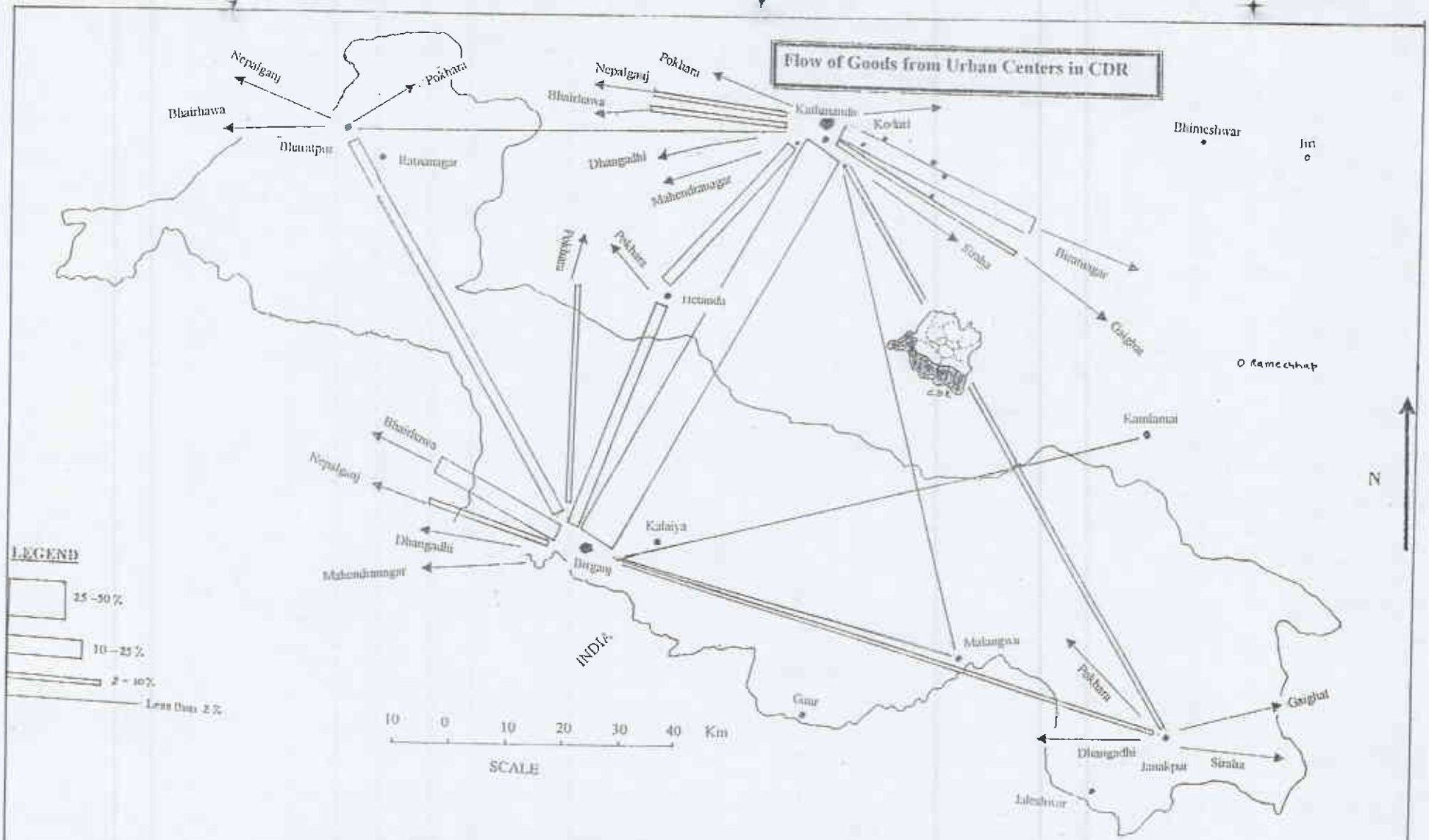

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- Administrative services and banking
- Agricultural; inputs and extension services

5.4.2 Inter-urban Linkages:

The interaction between urban centers depends mostly upon the supply and demand of goods. In addition to demand and supply, the interaction is also based on mutual needs, services of different orders and speciality of the center. Kathmandu appears to be dominant supplier of all types trading goods to all the urban/market centers of the mountain area. But the interaction between these centers among themselves is limited to very few amounts of consumer goods. Some market center like Barhabise has a very good linkage with other market centers like Bhimeshwar, Chautara and Jiri for supply of imported Chinese goods. The following table: 22 presents linkage pattern of urban/market centers with other urban centers in the form of flow of goods.

Table 23: Inter-urban Linkage through flow of goods in Mountain eco – region

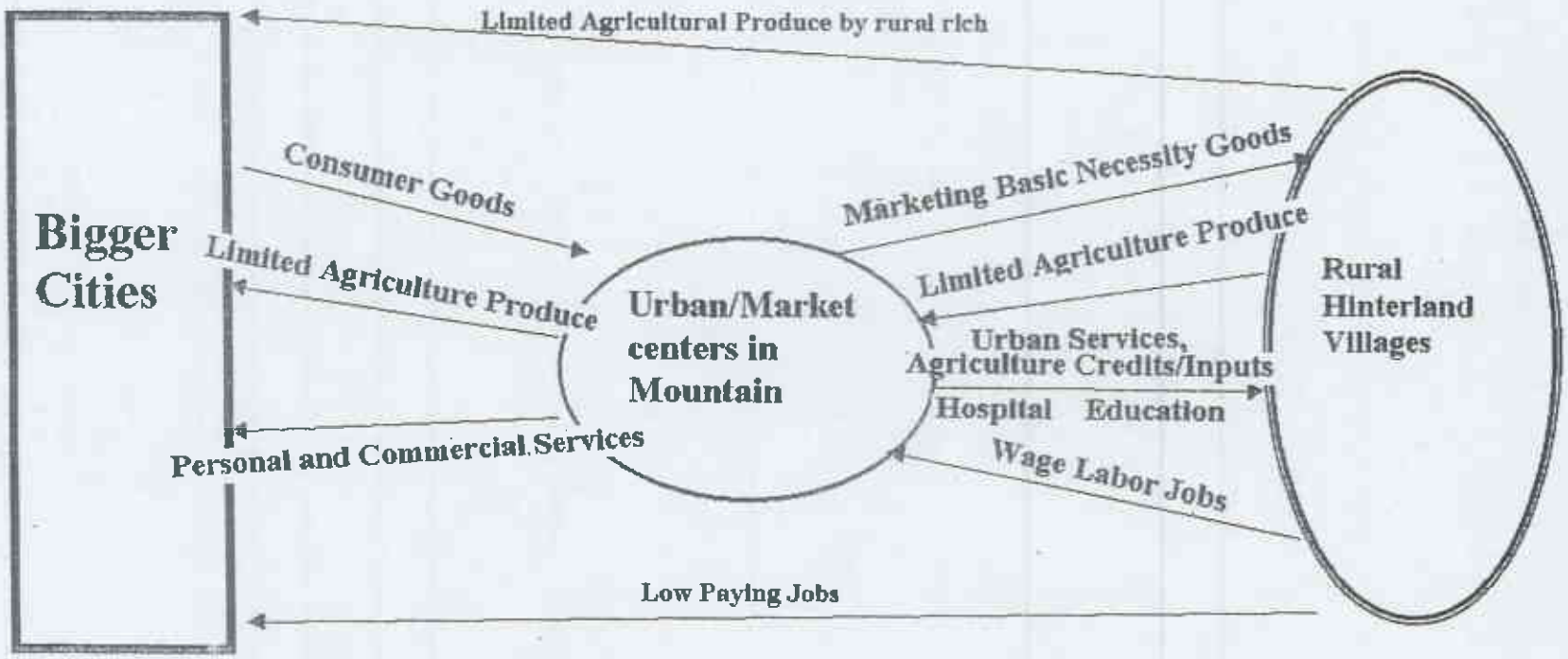
Urban/market Centers	Supply Sources		Of Trading Goods In Percent				
	Kathmandu	Banepa	Bidur	Birganj	Chautara	Dhulikhel	Foreign (China)	Local
Bhimeshwar*	80.25	9.18	-	0.56	-	-	6.88	3.13
Barhabise*	50	-	-	-	-	-	50	-
Chautara*	63	32	-	-	-	5	-	1
Jiri*								
Melamchi*								
Dhunche*	19	-	81	-	-	-	-	-

Source: ** Identification of Small Towns, Central Deptt. Of Geography, 1996
* Settlement System, small towns and..., Prof. C. B. Shrestha, 1994

The Figure:24 clearly indicates the higher amount of linkage pattern of urban centers of the mountain with Kathmandu city. The remote urban centers such as Dhunche has greater linkage with nearest murban center Bidur and Jiri has with Bhimeshwar but other centers are more linked with either Banepa or Kathmandu.

The Appendix: C and Figure: 25 show the annual goods movement from municipalities in CDR to other municipalities of Nepal and is based on Master Plan for Strategic Road Network and survey made by Priority Investment Plan Project In 1997. This data shows a clear indication that maximum flow of goods is from Kathmandu itself and the rest flow of goods are from

Linkage of Urban/Market Centers of Mountain with Rural Hinterland and Bigger Cities



Tribhuvan University INSTITUTE OF ENGINEERING Department of Architecture	Figure 27 Date: Dec. 1999	Prepared By Suresh Prakash Acharya Msc. Urban Planning

the Terai towns but non of the hill towns other than Hetauda has any significance amount of flow of goods to other municipalities. It shows very insignificant role of mountain and hill town in manufacturing and trade in national context and the linkages of Terai towns and other municipalities of Nepal with the mountain and hilly towns are very little, almost insignificant in national and regional context. The flow of goods from Kathmandu to Birganj is the highest, similarly that from Birganj to Bharatpur and Hetauda to Birganj are also very high as compared to linkages with other urban centers. The flow of goods in Birganj – Hetauda – Bharatpur route is very high as compared to other routes in CDR.

The state shall pursue a policy of raising the standard of living of the general public through the development of infrastructure such as education, health, housing and employment of all the people of all the regions, by equitably distributing investment of economic resources for balanced development in the various geographical regions of the country,

Constitution of the Kingdom of Nepal 1990

Chapter VI:

Conclusions/Recommendations

6.1 Urban Hierarchy and Interlinkage Systems:

The development of urban hierarchy system is based on Central Place Theory (see Chapter II) which describes central places as collection and distribution centers of goods and delivery point of essential services. There is an ascending order of services and goods along with the increasing size and rank of centers. Thus an articulated and integrated hierarchy of settlements provide potential access to market/service centers of different sizes for the people all around the rural hinterland as well as the people living in the settlement of different hierarchical orders.

Box:3 Urban System in CDR

i) **Large Border Towns:** - Large border towns are oriented by trade functions. Potentials for industrial growth are higher in these towns, upgrading the existing infrastructure remains the main urban development activity, e.g. Birganj

ii) **Potentially Large and Medium Towns located in foothills or at the cross roads:**- These towns display considerable potential for growth because these locations provide convenient points of interaction between the Hill and Terai economy. Road corridors from border towns to these towns are already experiencing industrial growth. Policies for encouraging orderly growth are needed, e.g. Hetauda, Bharatpur

iii) **Kathmandu Valley Towns**:- The unique geo-political attributes encourage the Kathmandu Valley Towns continue to play as the country's political, cultural and financial capital. The valley towns will remain the major locus of tertiary employment and thus have experienced major share of urban immigration. Comprehensive land use planning and large investments in infrastructural services are urgently required for balanced growth of valley towns. Tourism remains a field of major concern due to its major share of economic activities in the valley, e.g. Kathmandu, Lalitpur, Kirtipur, Bhaktpur and Madhyapur

iv) **Central Places and Major Market Centers**:- These towns have grown as a result of infrastructural expansion and administrative center. Prospects for secondary activities (manufacturing) remain limited in these towns but these towns serve critical roles in providing services at various levels and in the distribution of goods and supplies to the rural hinterlands. Planning for the growth of agro-processing and service related activities as well as enhancing the labor absorptive capacity should remain the major development concern of these towns. E.g. Janakpur, Jaleshwar, Malangwa, Gaur, Kalaiya, Bidur, Bhimeshwar, Banepa, Panauti

v) **Small Towns and Market Centers along highways and traditional Trails**:- Such centers often have attracted migrants from surrounding rural areas and provide seasonal off-farm employment. The employment potential needs to be enhanced in these areas through development of cottage crafts, small scale processing industries and provision of basic infrastructural facilities. E.g. Dhulikhel, Barhabise, Ratnanagar, Dhunche, Chautara, Kamlamai, Simra, Chandranigahapur

vi) **Service centers** - These are the lowest order centers in the settlement hierarchy but have more significance in distribution of services to the large areas of rural hinterland. A more viable and realistic approach would be to locate service centers at points that already show growth potential either as nodes in a major trail network or locations that command areas of population and productive potentials in agriculture, horticulture, livestock and similar activities. e.g. Melumchi, Jiri, Gajuri, Mugling, Bardibas, etc.

It has been observed that due to lack of dispersed urban centers of different hierarchical orders, opportunities for the economic development of the wider rural areas are limited. Therefore the development of urban hierarchy system is necessary for equitable development of larger rural hinterlands. Box: 3 shows Urban system in CDR as suggested in Economic Policies for Sustainable Development, 1992, but this system is equally applicable to all the development regions of Nepal. On the basis of this system, roles of municipalities in CDR have been identified as shown in Table: 24.

Table 24: Role of Municipalities in CDR

Municipality	Major Functions	Hierarchical System
Mountain Towns		
Bhimeshwar	Administrative/Commercial/Service Centers	Central Place And Major Market Center
Hill Towns		
Bidur	Administrative/Commercial/Service center	Central Place And Major Market Center
Banepa	Commercial/Service center	Central Place And Major Market Center
Dhulikhel	Administrative/Touristic/Service center	Small towns and Market centers along highways
Hetauda	Administrative/Commercial/Service/Industrial Center	Potentially Large and Medium Towns located in the foothills and at cross roads
Kamlamai	Administrative/Commercial/Service center	Small towns and Market centers along highways
Panauti	Commercial/Service center	Small towns and Market centers along highways
Kathmandu Valley	Administrative/Commercial/Service/Industrial Center	Kathmandu Valley Towns as National Capital Region
Kathmandu		
Lalitpur		
Bhaktpur		
Madhyapur		
Kirtipur		
Terai		
Bharatpur	Administrative/Commercial/Service/Industrial Center	Potentially Large and Medium Towns located in the foothills and at cross roads
Ratnanagar	Commercial/Service center	Small towns and Market centers along highways
Birganj	Administrative/Commercial/Service/Industrial Center	Large Border Towns
Kalaiya	Administrative/Commercial/Service center	Central Place And Major Market Center
Janakpur	Administrative/Commercial/Service center	Central Place And Major Market Center
Jaleshwar	Administrative/Commercial/Service center	Central Place And Major Market Center
Malangwa	Administrative/Commercial/Service center	Central Place And Major Market Center
Gaur	Administrative/Commercial/Service center	Central Place And Major Market Center

The strategy for urban hierarchy system helps to identify the role that each center plays in the national and regional settlement system. This strategy can guide sectoral policies for investment. The six categories of urban/market centers in CDR has been described in Box 3 and the roles of 20 urban centers has been briefly listed in Table: 24. Any urban center performs various service functions for its hinterland and is itself a part of the hinterland of a higher order settlement. In this sense, the city is not an island unto itself but a part of sectorially linked infrastructure system for sectoral service receipt and delivery. Its linkage pattern with other centers as well as its own need according to its hierarchical order in the regional space determines planning needs.

The graduated hierarchy of urban centers (Table: 24) can integrate the potential of the regional urban system in their respective resource framework, because the spatial distribution of socio-economic activities can not be dissociated and treated independently from the broader issues of national economic, social and political development. Urban Hierarchy System is also tied with policy objective of reducing interregional disparities in development (between mountain, Hill, Kathmandu Valley and Terai on one hand and between rural and urban area on the other). Another objective is to create integrated urban system, which are oriented inward rather than outward (toward leaky frontier with India). Thus it is suggestive to shift the locus of industrial growth from border towns to inward locations.

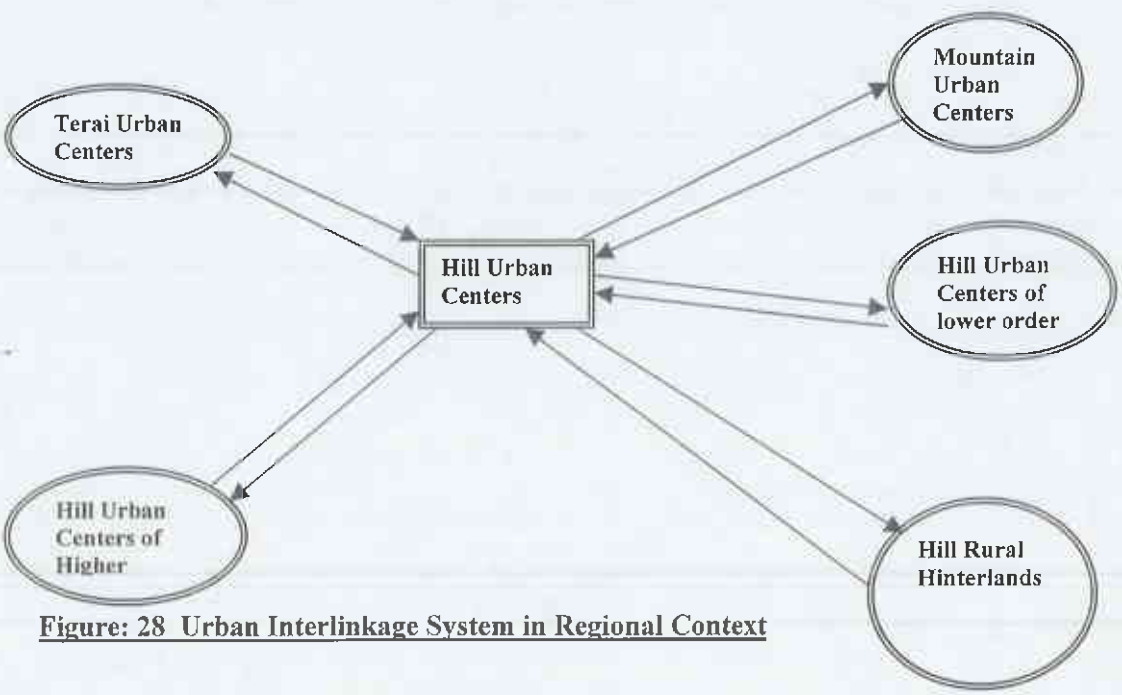
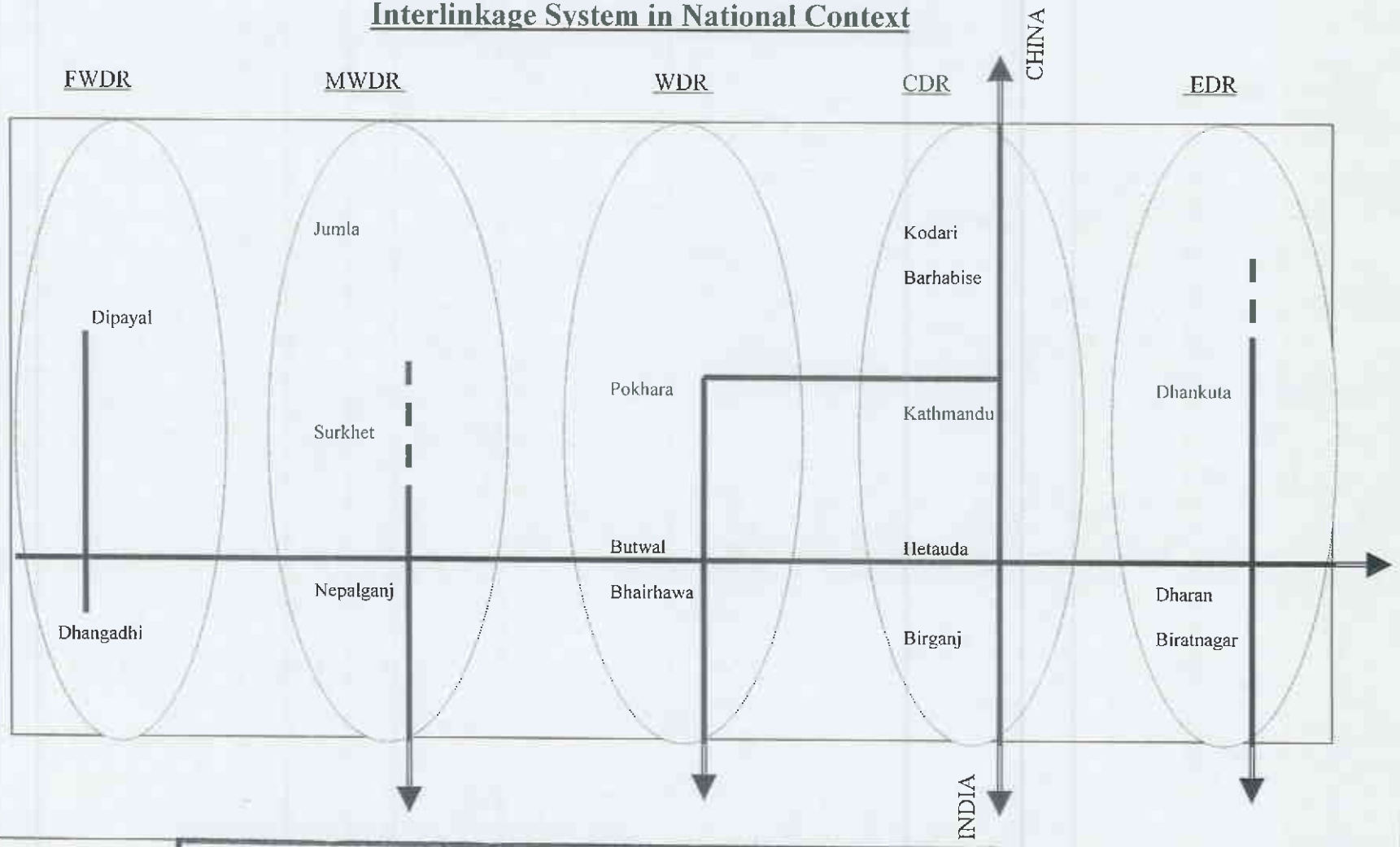


Figure: 28 Urban Interlinkage System in Regional Context

Interlinkage System in National Context



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The Figure: 28 clearly shows the crucial role of Hill Towns in integrating the regional urban system as is evident from the existing role of hill towns like Hetauda and Kamlamai. The Hill towns like Banepa, Dhulikhel, Panauti etc. do not have direct linkage system with the Terai towns therefore they have more linkage with other hill towns of higher order i.e. the Kathmandu Valley towns. The interlinkage system of the mountain towns has been shown in figure: 27. Similarly, interlinkage system in National context (figure: 29) shows better linkage of CDR and WDR to form a loop of Hill – Terai linkage both in the North (China through Arniko Highway) as well as in the South (India through Birganj). This potential has very well stimulated the growth of Kathmandu as well as Birganj and the periphery.

Terai is the most dynamic region of Nepal and it is here that the urban growth is very rapid (see Table: 6) due to extensive commercial and trade ties with India. Terai urban centers have become a main trade and transit center for the hills and mountains to get a wide spectrum of goods varying from edible cereals to industrial products domestic as well as imported ones. The expansion of road network has also reinforced the importance of Terai Urban centers. Hill urban centers (other than Kathmandu Valley) are functionally distribution centers of goods transported from Terai, to mountain urban centers and rural hinterlands of the hills. In regional context, the hill towns have the potential of reactivating the pivotal role capable of effecting economic transaction both with the Southern Terai and the large Northern area of hills and mountain region. The Kathmandu Valley towns have more roles and economic functions in national context being the capital city as well as the national center of administration and economic decisions.

The development of East-West and North-South road network in the Terai has provided enough potential to relocate the urban growth from border areas to locations along East – West highway (at the foothills) and North – South corridors. As a result, Hetauda - Birganj Corridor[1], and Bharatpur area have been identified as the most rapidly growing areas (see Figure 24) The Kathmandu Valley itself has also been observed as a region of rapid urban growth. In the Hills and Mountains, there is a need to provide essential lower order goods and services to the population on one hand and to induce the growth of small towns that can act as centers of off-farm employment and rural industrialization on the other. A policy of Urban

[1] Birganj Town Developemnt Committee proposed a planning concept of "Greater Birganj" in 1994. The sub – regional plan considered the industrial growth corridor area between Birganj and Simra and the preliminary survey report was prepared by DHUD. Birganj – Simra is the most rapidly growing part of Hetauda – Birganj Growth Corridor.

Hierarchy System has to be appreciated in the context of the resource potential of hills and linkage with Terai on one hand and resource potential of mountain and its linkage with hills on the other hand.

6.2 Role of Government:

Spreading the benefits of development to all over the country have drawn the attention of planners to spatial planning. The definition of spatial unit which meets policy needs and establishes relationship between the spatial levels for comprehensive planning are of prime concerns for planners. The process of urbanization both as a 'space' and 'culture bound' phenomena demand integration of urbanization to space and 'space' to 'sector'. The government plays the role of main actor in facilitating the network of existing urban centers to work more efficiently. Efficiency is characterized by optimization of development opportunities to increase national output.

Since urbanization is an integral part of the entire process of development, and includes the provision of basic facilities and services covering water supply, drainage and sewerage, housing activities, land development, transportation, road construction, supply of electricity, telephones etc, the municipality and local government at VDC level alone cannot bear the expenses of all these requirements; the central government has to play a crucial role.

The government can strengthen the existing network of urban/market centers in the following ways:

- Developing and improving highways as well as rural roads to increase accessibility in rural areas
- Locating basic services (health, education, postal and banking) at small market centers which also act as the central places for the surrounding hinterlands
- Improving and developing infrastructural facilities at urban/market centers
- Concentrating the field offices of government and line agencies (NGOs and INGOs) at small market centers to enhance their centrality
- Development of new market centers in the areas where there is structural deficit
- Adequate institutional development for infrastructural development and execution of government policy at spatial level

It is obvious that the state has decisive role in regulating migration and mitigating its adverse consequences in balanced development by harmonizing sectoral policies on industrialization, agriculture and social welfare. The uncontrolled and unbalanced migration trend (figure 17, table 11) the disparity in capital investment in municipalities (fig.21, table 18), the unbalanced distribution of budget allocation (appendix F) and the inaccessibility of majority of population of hilly and mountain area can only be addressed by adequate government roles and policies.

"Nepal is confronted with two challenges: to increase economic growth and to ensure that basic minimum life sustaining support is available to those living in poverty in both rural and urban areas. To achieve the first, success in i) directing investment in areas where infrastructure are already available and ii) encouraging private investments will be essential. To achieve the second, the concept of service delivery in terms of Spatial Network, public – private co-operation, administrative ability to execute and manage service programs and the availability of resources to finance the programs will need to be worked out." (Strategic Program for Human Settlement Sector, 1993)

The government has specific roles in formulating the following three major elements of urbanization strategy:

- The implicit Spatial Policies created when formulating National Economic Policies
- The appropriate Intra Urban Policies to deal with the problems of Municipalities and Urban centers
- The policies to reduce sharp Regional Disparities and increase Socio-economic Integration of the nation

Some of the direct roles of government policies and strategies in the articulation of ***National Urban System*** may be listed as follows:

- ✓ **Adequate Definition of Urban Area**:- The designation of urban area needs to be based on following criteria
  - Density of population

- Functional Linkages with urban centers of lower as well as higher orders and rural hinterland
- Stage of socio-economic development of the area and its scope for future development
- Occupational characteristics of the local people

✓ **Investments in national infrastructure to integrate settlements into national economy**:- This will result in higher mobility, access to wider range of services and increased production, It will help to reduce unemployment and under employment creating job in rural areas.

✓ **Proper delivery of basic services** such as health, education, communication, banking and postal services so that the role of urban/market centers will be enhanced.

✓ **Promotion of cottage/small industries** in small urban/market centers as well as tourism, trade and commercial activities in rural area

✓ **Review of acts, bylaws,** municipal functions and responsibilities such as land management, infrastructural services etc. must be made on regular basis from time to time

6.3 Investment Strategy:

Urban Areas serve as engines for economic growth, because they consists of higher levels of productivity as well as urban areas are sources of opportunity for higher economic activity. Higher per capita investment in urban area clarifies the extent of higher rate of return of investment. All the urban areas are not equally potential for investment, some grow faster others don't. Urban and rural developments are not alternative to each other but the first may be seen as a complementary and productive route to help achieve the second. Therefore, policy guidelines are necessary to guide the public investment so that investment pattern is optimized and distribution is made justifiable.

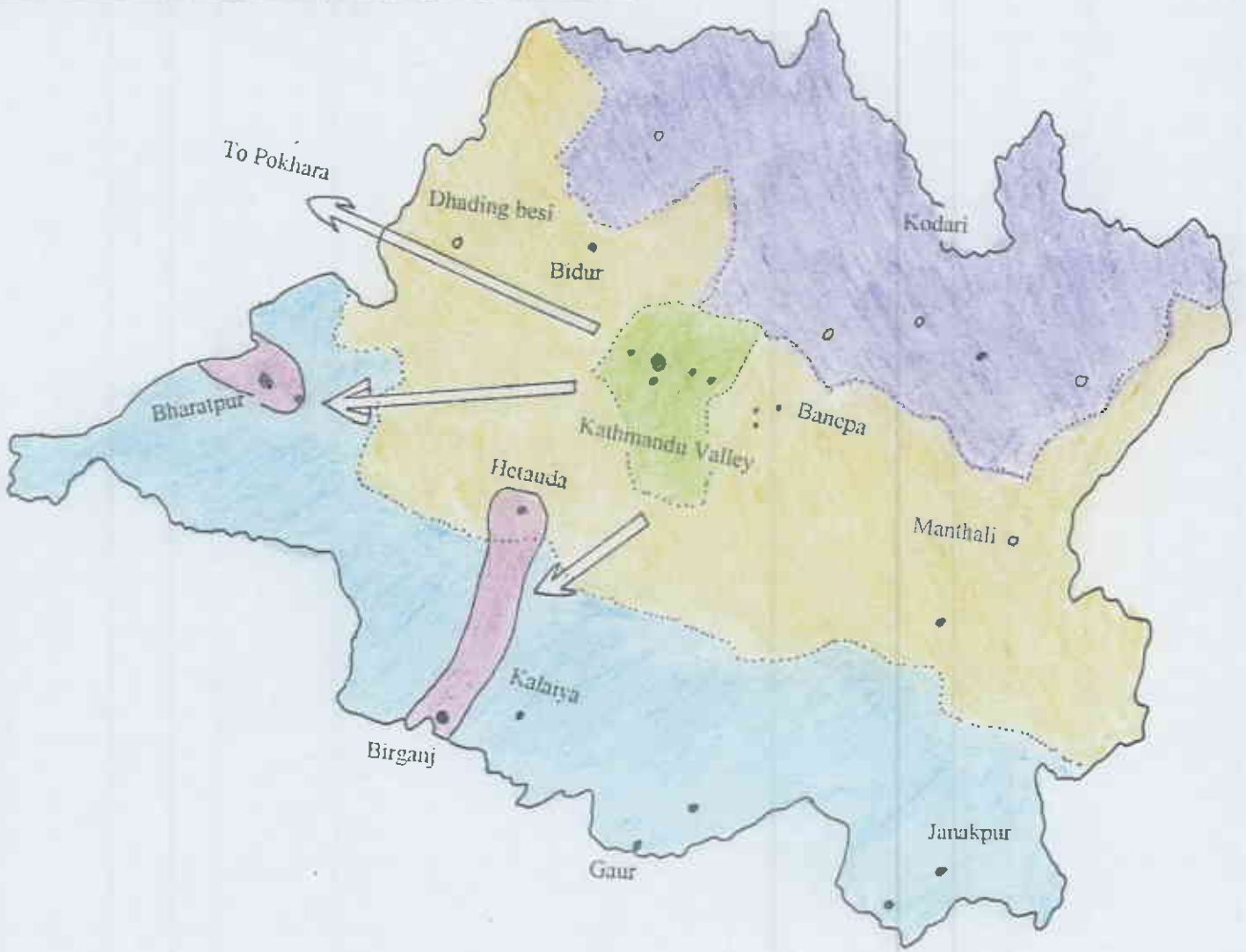
"Urban growth is a market driven process which the government must support with appropriate policies if the Nepalese economy is to improve, poverty is to be reduced and the disadvantages of accelerated urbanization are to be avoided." (Recommended Policies and Strategies for Urban Development, 1991, pp-6) National Urban System guides the investment pattern in the following ways:

- ✓ Articulation of ***National Urban System*** is followed by hierarchical system of urban/market centers (central places)(See Table 24). Higher order urban center need higher investment than the lower order centers due to greater economic activities and greater demand of services but the minimum level of services are required for the lower order centers also. By ordering hierarchic system of urban/market centers, investment in socio-economic infrastructures is guided rationally. In this way, articulation of Urban System rationalizes the investment plans.
- ✓ Articulation of ***National Urban System*** is supported by proper integration of urban centers of different hierarchic orders(See Figure 25 and 26). Integration means functional interlinkage system i.e. physical interlinkage as well as communication and socio-economic interlinkage system. Investment planning is strongly influenced by the level of requirement of physical and other interlinkage system in the planning space. Information about interlinkage system of urban centers with centers of higher order, lower order as well as rural hinterland provides a basis for investment pattern in that planning region.
- ✓ ***National Urban System*** also identifies the roles and functions of urban/market centers of different hierarchies. The roles and functions of urban centers are the basis for deciding the norms and standard of social infrastructure services and the norms and standards are the key factors in deciding the level of investments. The infrastructural needs of Metropolitan City like Kathmandu, Industrial City like Birganj and mountain town like Bhimeshwar vary a lot from each other and thus the investment pattern.

In this way, ***National Urban System*** rationalizes the equitable distribution of investment in regional/national space. By articulation of hierarchical system of centers, National Urban System avoids duplication and wastage of investment. Thus it is rather an efficient way of administering and allocating resources within a region thus distributing investment equitably. Investment Plan has been formulated in the form of Strategic

Urban/Market Centers	Potential	Suggested Program Framework
Melumchi	▪ Commercial/Service Center ▪ Good link with big project sites such as Indrawati Hydropower Project and Proposed Melumchi Water Supply Project	▪ Infrastructure Development at intra and inter settlement level ▪ Information and communication system development ▪ Education and health services development
Dhunche	▪ Administrative/Service center ▪ Tourist attraction places such as the holy Gosaikund, Langtang National Park ▪ Link with Kerung (China) via Syabrubesi	▪ Infrastructure development at intra and inter settlement level ▪ Information and Communication services development ▪ Proper link with Syabrubesi ▪ Infrastructure development for Hotels, Lodges and catering services
HILL ECO – REGION		
Banepa	▪ Commercial/Service Center ▪ Tourist Center	▪ Inter and intra settlement level infrastructure development ▪ Infrastructure development for hotels and lodges
Dhulikhel	▪ Administrative/Touristic/Service Center ▪ Good link with rural area for administrative, health and education services	▪ Inter and intra settlement level infrastructure development ▪ Infrastructure development for hotels and lodges
Panaauti	▪ Commercial/Service Center ▪ Tourist Center ▪ Link with rural areas for agriculture markets and services	▪ Inter and intra settlement level infrastructure development ▪ Agro – processing facilities ▪ Agro based market development ▪ Infrastructure development for hotels, lodges and catering services
Dhading besi	▪ Administrative/Commercial/Service Center ▪ Good Link with rural hinterland for administrative and several other types of services	▪ Infrastructure development at intra and inter settlement level ▪ Agro – processing facilities ▪ Infrastructures for developing as market center
Ramechhap Manthali	▪ Administrative/Commercial/Service Center ▪ Good Link with rural hinterland for administrative and several other types of services	▪ Infrastructure development at intra and inter settlement level ▪ Agro – processing facilities ▪ Infrastructures for developing as market center
Bidur	▪ Administrative/Commercial/Service Center ▪ Good Link with rural hinterland for administrative and several other types of services	▪ Infrastructure development at intra and inter settlement level ▪ Agro – processing facilities
Hetauda	▪ Administrative/Commercial/Service Center ▪ Good transportation linkage with Terai border towns as well as other part of Nepal ▪ Location at cross road ▪ Plenty of land available for expansion ▪ Good industrial base	▪ Infrastructure development for industrial growth as well as for the expansion of town ▪ Improve transport link with rural hilly area of hinterland ▪ Planning for Hetauda – Birganj Growth Corridor ▪ Planning for Counter magnet of Kathmandu through land development and providing better transport linkage such as proposed Tunnel highway

Strategic Program Framework: Sub – Regional Planning Area



LEGEND

- Proposed Counter Magnet Of Kath. Valley
- Dispersal of Heavy Industries And Services
- Proposed National Capital Rergion
- Mountain Eco – Region
- Hill Eco – Region
- Terai Eco - Region

20 0 20 40 60 Km

SCALE

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Figure 30

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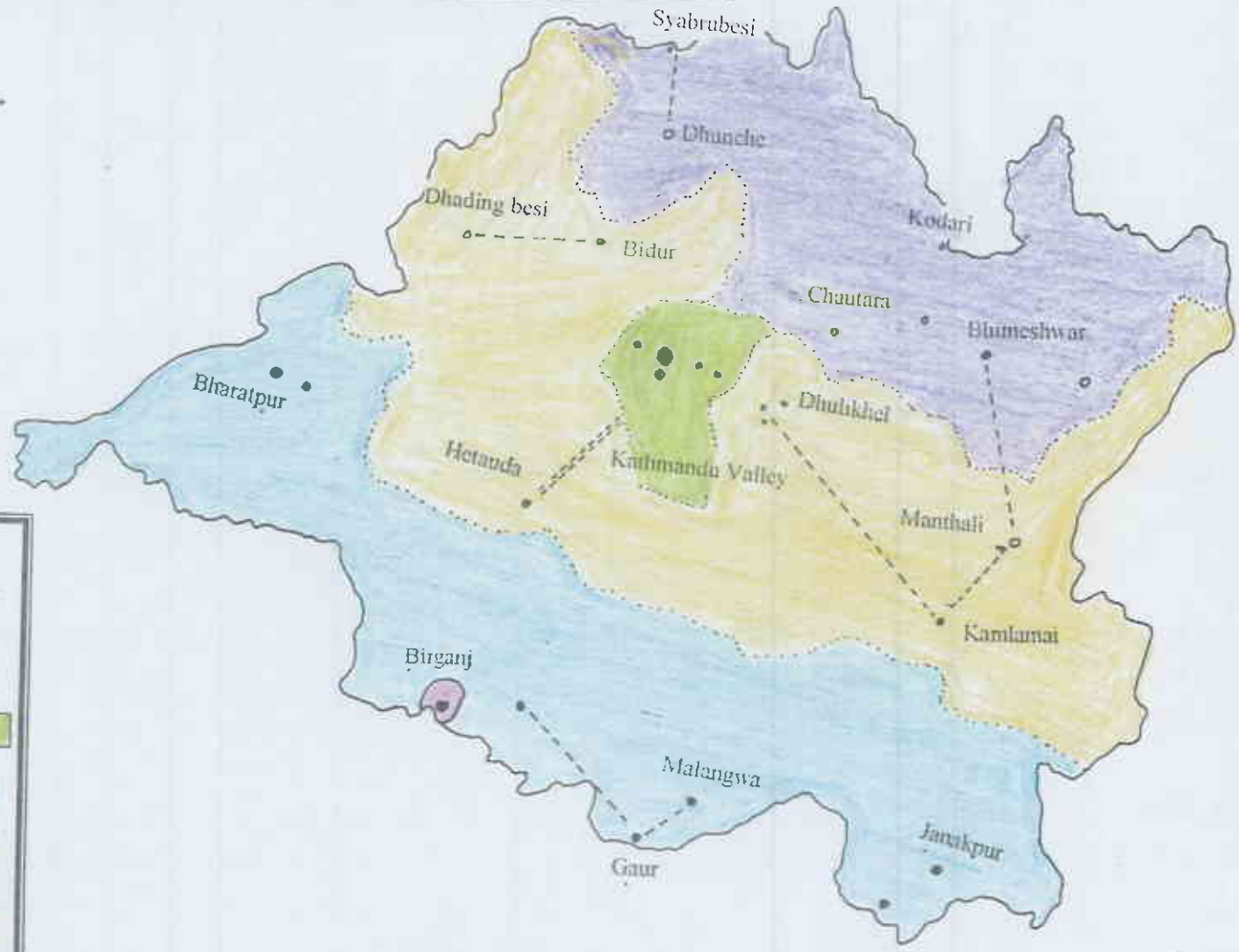
Strategic Program Framework: Proposed Linkage Development



LEGEND

- Proposed Road Linkage
- Proposed Tunnel Highway
- Special Conservation Program Area
- Export Processing Zone
- Mountain Eco – Region
- Hill Eco – Region
- Terai Eco - Region

20 0 20 40 60 Km

SCALE

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Figure 31

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Strategic Program Framework: Mountain Eco - Region

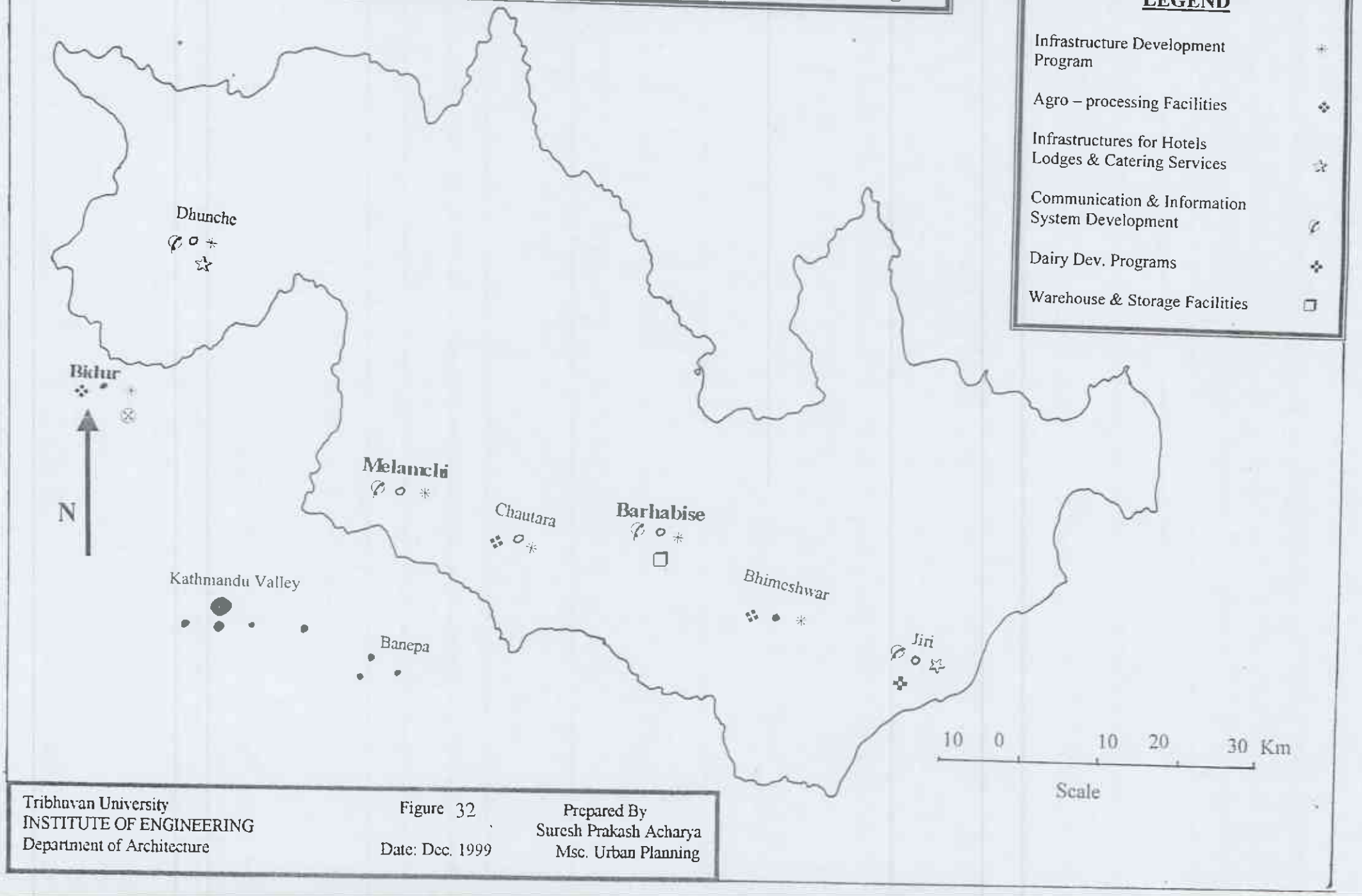

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Figure 32

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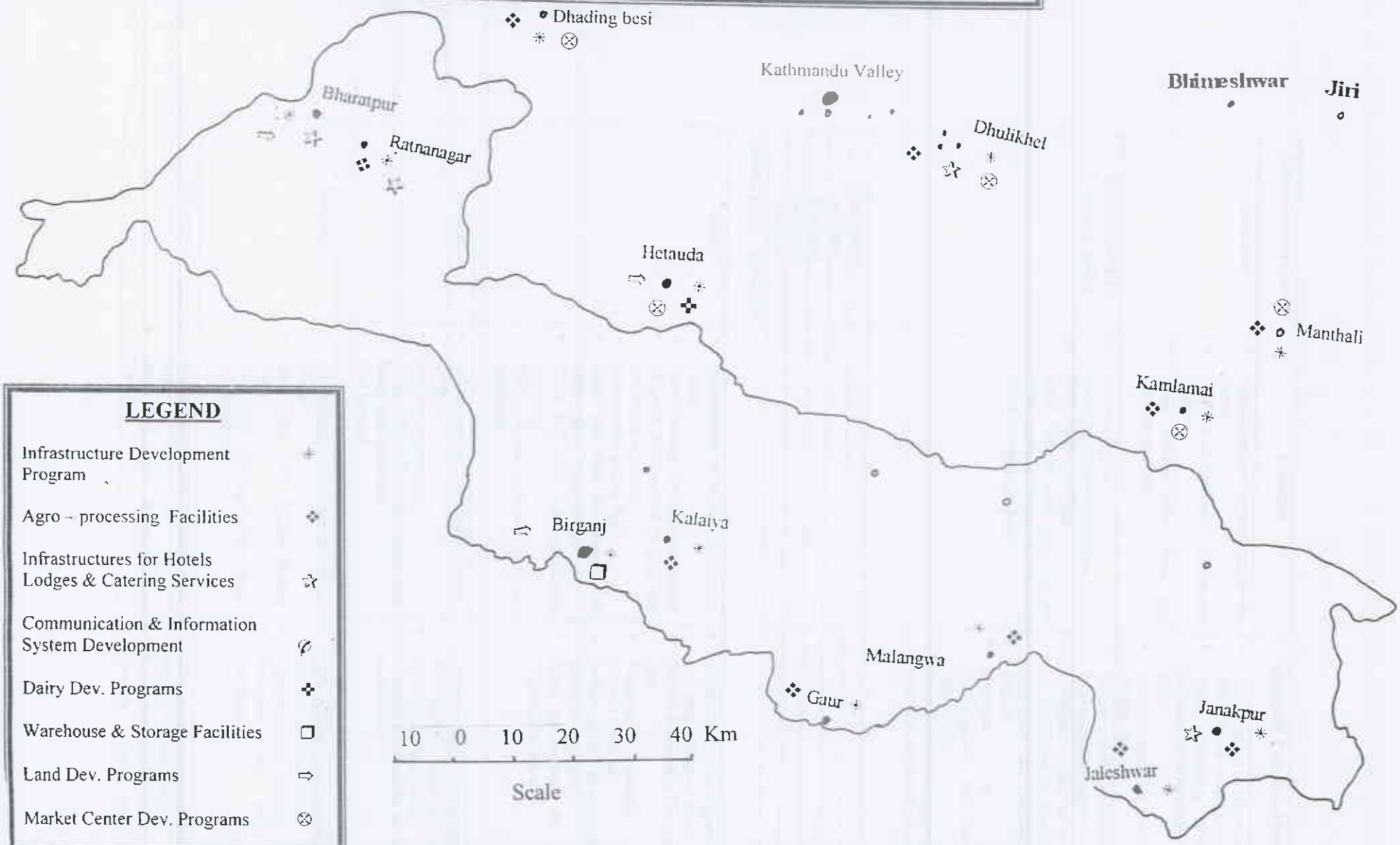
Strategic Program Framework: Terai & Hill Eco – Region



LEGEND

- Infrastructure Development Program
- Agro – processing Facilities
- Infrastructures for Hotels Lodges & Catering Services
- Communication & Information System Development
- Dairy Dev. Programs
- Warehouse & Storage Facilities
- Land Dev. Programs
- Market Center Dev. Programs

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Figure 33

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	▪ Good Link with agriculture based rural hinterland	hinterland
Urban/Market Centers	**Potential**	**Suggested Program Framework**
Gaur	▪ Administrative/Commercial/Service Center ▪ Good Link with Indian Border Town ▪ Good Link with agriculture based rural hinterland	▪ Infrastructure development at intra and inter settlemnt level ▪ Agro processing facilities ▪ Transport link with rural hinterland
Kalaiya	▪ Administrative/Commercial/Service Center ▪ Good Link with agriculture based rural hinterland	▪ Infrastructure development at intra and inter settlemnt level ▪ Agro processing facilities ▪ Transport link with rural hinterland
Bharatpur	▪ Administrative/Commercial/Service Center ▪ Location at cross road ▪ Good transport linkage with Kathmandu and other cities of Nepal ▪ Good linkage with Tourist attraction places of Royal Chitwan National Park ▪ Plenty of land for expansion	▪ Infrastructure development at inter and intra settlement level ▪ Planning for Bharatpur and periphery as rapid growing area ▪ Infrastructure development for hotels, lodges and catering services ▪ Infrastructure development for industrial growth ▪ Land development programs for catering the needs of inmigrants
Ratnanagar	▪ Commercial/Service Center ▪ Location at East – West Highway ▪ Good linkage with other parts of Nepal as well as rural hinterlands ▪ Good linkage with touristic places of Royal Chitwan National Park	▪ Infrastructure development at Inter and intra settlement level ▪ Agro – processing facilities ▪ Infrastructure development for hotels, lodges and catering services

The above mentioned Program Framework has been graphically presented in Figures 30, 31, 32, and 33. These Figures clearly suggest the vital role of the Hill Towns in Regional context as well as National context which has already been shown in Figure 28. ***National Urban System*** is also guided by the investment pattern. The roles and functions of an urban center are very much dependent upon the extent of investment in that center in addition to its potential and interlinkage with the other urban centers. The interlinkage is more dependent upon the investment made on transportation and communication system in that region. The growth of urban/market centers along the newly constructed highways is the result of better interlinkage system. Investment Strategy should consider the following aspects:

- To use the opportunities for development that are available in small urban/market centers because small urban/market centers are the ones which are in direct

contact with larger area of rural hinterlands and thus are more conductive to growth of agro-processing small scale industries and local craft work.

- To establish functional linkage with urban/market centers of different hierarchies as well as with other regions.
- To aim at providing minimum services such as health, education, drinking water, electricity and communication at intra city level
- To focus huge investment in identified areas of rapid economic growth in the region and exploitation of natural resources in national interest
- To pay more attention in the areas where private sector is interested to make huge investment
- To improve linkage between Hill Towns and nearest Terai Towns.

6.4 Strategy Recommendations for National Urban System:

6.4.1 **Migration**:

As the population migration trend (Figure: 17, Table: 11) shows mass migration of population from hill towards Terai towns and Katmandu Valley towns, there is an urgent need to slow down this process by proper integration of small urban/market centers with urban centers of higher order as well as with rural hinterlands. Properly integrated urban system will provide ample economic opportunities at the small urban/market centers so that the migration towards Kathmandu valley and Terai towns will be lessened. The carrying capacity of the Terai must be studied carefully to formulate appropriate policy on mass exodus of population from rural hills and mountains to the rural and urban Terai in general. There is an urgent need to safeguard the Kathmandu valley against loss of ecological balance, cultural heritage and environmental situations. Further concentration of population in the Kathmandu Valley must be stopped for the conservation of National Heritage and safeguard from environmental degradation. Dispersal of several attracting means of the valley such as concentration of economic opportunities, administrative, education and health facilities have to be made from the valley because it is the right time because before it is too late. For dispersal, the other well linked cities such as Hetuda, Pokhara and Bharatpur are appropriate because of the availability of land for further expansion as well as adequate linkage and high

potential; the only needed factor is the ***Migration Policy*** and policy regarding ***National Urban System.***

6.4.2 **Productive Sectors:**

Since ***National Urban System*** integrate the urban/market centers in their respective resource framework, thus proper articulation and integration of urban centers is closely related to economic development of productive sectors. The principle economic concern is the need to overcome the Poverty Cycle, which is the main objective of the Ninth Plan as well. More opportunities for jobs in urban/market centers which is spreaded to the rural areas well can be one of the main means for alleviating poverty situation. The following productive sectors are of prime concern:

- **Agriculture:** Most of the economically active population even in the urban areas are dependent upon agriculture sector (see Table 17) and therefore pragmatic policy towards agriculture sector is of utmost importance. The settlement system plays an important part in the distribution of agriculture inputs (improved seeds, fertilizers, and technology) and outputs (through market centers) as well as agro – processing industries. The linkages between urban/market centers of different hierarchical orders need to be more closely defined and improved. The Terai offer the best hope for increasing agricultural production whereas the mountain, hill and Kathmandu Valley are in desperate need of more equitable assistance in agricultural products. (see Appendix E) Boosting agricultural production will also increase the agro – based industries in Terai Urban Centers.

- **Industry:** Industrial production is closely tied to agricultural production and also to locational attributes. It is important that HMG integrate policies regarding location of industry where they can be most beneficial because whatever industrial growth has taken place in urban areas has happened spontaneously as an indirect result of the operations of various locational factors. "Development of infrastructure (roads, power lines, telephones) along the highways leading North from major border towns appears to have induced the growth of industrial establishment along the 'ribbon

zones'. Small scale industries seem to seek location in the inner city, medium scale industries at certain nodes at the outer city and large scale industries in the ribbon zone and periphery" (A study of Industrial Location in Urban Areas of Nepal, 1990, pp-74-87)

Many of the large scale and capital – intensive industries are located in the growth corridors such as Hetauda – Birganj Growth corridor as well as periphery of towns inside the Kathmandu valley and periphery of Bharatpur area. (see figure 24) The reasons for such establishment may be listed as : i) Land availability ii)Accessibility to highways joining major towns and increased public transportation iii) Availability of electricity and telephones iv) No strict pollution controls and zoning laws v) No municipal taxes In this way, it can be said that the periphery and the Growth Corridor area seem to be the areas of future activity, especially for large – scale, capital – intensive and polluting industries. Therefore comprehensive spatial policy is of great concern regarding the location of industries of different types and sizes. Not all towns, transport corridors and peripheries show potential and prospect for the kind of industrial growth that is required for absorbing a larger proportion of migrants into the urban areas. The present trend of spontaneous growth of industries has lead to haphazard way of land utilization. Thus there is an urgent need of land use zoning regulations.

- **Tourism:** The mountain area has very high potential for tourism due to very popular trekking routes in Langtang National Park in Rasuwa district and Helambu area in Sindhupalchok districts. The existence of seven World Heritage Sites in the Kathmandu Valley is the major attraction of a large amount of foreign tourists in Nepal. Similarly, Royal Chitwan National Park in Chitwan is another destination of majority of foreigners who visit Nepal and Parsa Wildlife Conservation is also a place of potential attraction for the tourists. Besides these areas, there are many religious and historical spots, which can be a very good attraction for the tourists. CDR has potentially very large scope for tourism development if necessary infrastrucural services and linkage facility is provided at these places. The economic benefits for the area are restricted to the employment

of porters and guides except for pretty trades like lodge keeping and catering for tourists. Large City based tours and travel agencies or central government agencies absorb the larger benefits but the local community suffers from resource depletion of their area. Therefore, the policy for Tourism Sector should take into consideration of long-term perspective and the benefits need to be diverted towards the potential areas. For this interlinkage system should be developed so that tourists are better served by the local skilled manpower and the major share of benefits are utilized for the economic upliftment of those potential areas.

6.4.3 Employment:

The urban centers are major sources of non-farm employment, which has higher contribution in generating wealth. Most of the rural employment is anticipated in agriculture sector, which is insufficient to meet the growing needs of rural labor force. Therefore there is an urgent need of policy regarding generation of non-farm employment for the growing rural labor force. The need of employment can be regarded as the major reason for migration of rural people to urban areas in all the eco – regions like mountain, hill and terai. Properly articulated National Urban System provides greater opportunities of employment for rural labor force in urban/market centers of different hierarchy. Service and Trades have already shown a significant amount of urban employment. The manufacturing sector is yet to be developed through appropriate policy framework. A comprehensive policy for non-farm employment can be an appropriate tool for heading towards the national goal of Poverty Alleviation. Another effective measure is towards Human Resource Development, which is able to generate self-employment opportunities. The rural migrants are often incompetent to the urban labors in skills and thus are more exploited as cheap labors. Similarly, the economic opportunities available in the place of origin are often ignored due to lack of appropriate skill and knowledge. Thus appropriate policy regarding vocational training opportunities for the rural labor force could be landmark in generating employment for a larger mass of population.

6.4.4 Infrastructure:

Infrastructure development at inter city level is of prime importance in articulation of ***National Urban System*** (See Table 25) . The existing stage of infrastructure development and the potential area for future expansion need to be studied before formulating any policy at regional or national level. Accessibility may be regarded as the major factor for developing interlinkage system between urban/market centers and rural hinterlands. Infrastructure plays an important role in resource utilization as well as in integrating the economies of urban/market centers with national stream. The development of infrastructure has to be supported by the potential of the affected area. The proposed Hetauda – Kathmandu Tunnel Highway has long term effect not only in the urban system of CDR but the whole nation because of the greater linkage of urban centers all around Nepal with the kathmandu valley. (See figure 25 and 26) Similarly the implication of Dry Port which is being constructed at Birganj in national context need to be assessed with greater attention.

6.5 Development of Urban Statistical Base:

The main source of primary urban data is from Census done by CBS every ten yearly. The detail census information exists only in designated urban areas. In this way very little is known about the dynamics of growing small towns and urban centers in Nepal as well as newly delineated municipalities with new geographical boundary. The issues of such urban centers remain unfocussed due to lack of comprehensive information base. The small urban centers, which play pivotal role in articulation and integration of ***National Urban System***, are not properly understood to rationalize the national or regional level policy formulation. Moreover the changing attribute of highly dynamic urban growth area may remain bypassed due to dependency upon census data.

The primary issue in this context lies with the definition of what constitute urban locality (municipality) in Nepal. The census is the key process in identifying whether a certain market/service center qualifies as an urban area or not. Another issue is to make the statistical base on small urban/market centers, which are the focal point for planning development activities at local level. Though it is not possible to get all the relevant urban information or the facts which are of urban character such as socio-economic composition of migrants, occupational distribution, availability of non-farm employment opportunities,

linkages with surrounding hinterlands and other bigger urban centers etc. from the census alone but the statistical accounting of several demographic trends such as migration, density, household occupations etc help a lot to understand the dynamism of a particular urban center.

Such primary data help to make decision for further detailed investigation regarding socio-economic characteristics such as functional interlinkages between settlements, functional role of settlements, socio-economic attributes of inmigrants etc. Due to lack of urban Statistical Base, several research studies don't reach to the exact solution of existing problems. The various decisions related to urban policy may suffer from several limitations due to unavailability of relevant data in right time.

Therefore, development of urban statistical base is needed for better understanding of the roles and functions of small urban/market centers, which will be growing to become bigger centers in future. Such statistical base is of utmost importance also for the preparation of investment plans in regional/national space.

6.6 Conclusion:

Appreciation of spatial reality in formulating development programs has always been a matter of prime concern for planners but how to incorporate this reality remains as the main issue. The Growth Axis concept of the Fourth Plan (1970 –75) aimed in integrating the potentials of the mountains, hills and Terai and emphasized five growth corridors with several growth centers. The Seventh Plan (1985 – 90) introduced the spatial planning thought with the ***hierarchical concept*** in urban development by classifying the urban areas of Nepal into five classes as special growth centers, first, second, third and fourth classes of urban areas. The Eighth Plan (1992 – 97) further emphasized in the identification of ***National Urban System***. Now, the running Ninth Plan (1997 – 2002) has given more emphasis on ***Market Oriented Urban System*** for equitable development and poverty alleviation. For developing market oriented urban system, the roles and functions of urban/market centers have to be identified and integrated physical and social infrastructures have to be developed. Then the other important aspect is the formulation of pragmatic policy towards ***National Urban System*** which help in exploring the potential of the urban/market centers in their respective resource potentials and also rationalizing the investment plan. Therefore, the basis of urban strategy lies in articulation of well integrated National Urban

System by proper interlinkage of the roles and functions of the urban/market centers, physical and socio – economic infrastructures and investment pattern.

The various aspects of ***National Urban System*** are very complex in nature and have not been fully analyzed in the present thesis. There lie several fields for further research analysis such as

- Study of relationship between physical & social infrastructures and roles and functions of urban/market centers in Nepalese context
- Assessment of interlinkage system of urban/market centers with those of same, lower and higher orders in the context of regional/national development
- Investigation of considering the Kathmandu Valley as National Capital Region for development planning
- Study of sub – regional planning concept such as Hetauda – Birganj Growth Corridor (i.e.Greater Birganj Development Plan Concept) and its application in National context

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APPENDIX

Appendix A:

Major Groups of Economically Active Population in CDR Districts

District	Year	Prof., Adm. & Clerical Workers	Farm & Fishing Workers	Sales services & Production Labors	Others & not stated	Total
MOUNTAIN						
Sindhupalchok	1991	2076	134688	7888	1604	146256
	1996	2199	142683	8356	1699	154938
Rasuwa	1991	436	17383	1140	524	19483
	1996	480	19145	1256	577	21458
Dolakha	1991	1915	79879	4093	1069	86956
	1996	2053	85629	4388	1146	93216
HILL						
Dhading	1991	3562	98997	21167	3939	127665
	1996	3970	110322	23589	4390	142270
Nuwakot	1991	2216	101629	6916	1043	111804
	1996	2433	111603	7595	1145	122776
Kavre	1991	2701	132622	10086	3297	148706
	1996	2775	136242	10361	3387	152765
Makwanpur	1991	3541	112014	15379	4527	135461
	1996	4018	127105	17451	5137	153711
Ramechhap	1991	1340	86576	4273	1522	93711
	1996	1445	93405	4610	1642	101103
Sindhuli	1991	1531	83207	4865	4332	93935
	1996	1689	91777	5366	4778	103610
TERAI						
Dhanusa	1991	6402	115147	30587	7694	159830
	1996	7166	128891	34238	8612	178907
Mahottari	1991	4245	100440	19428	2689	126802
	1996	4682	110785	21429	2966	139862
Sarlahi	1991	3902	120059	25925	3469	153355
	1996	4334	133336	28792	3853	170315
Rautahat	1991	3562	98997	21167	3939	127665
	1996	3970	110322	23589	4390	142270
Bara	1991	3340	96250	27919	4354	131860
	1996	3805	109644	31804	4960	150213
Parsa	1991	4544	78539	29963	5225	118271
	1996	5192	89730	34232	5970	135123
Chitwan	1991	5003	105498	26653	1981	139135
	1996	5830	122956	31063	2309	162159
KATHMANDU VALLEY						
Kathmandu	1991	36094	60323	115510	24973	236900
	1996	45412	75896	145329	31420	298056
Lalitpur	1991	11508	42544	37521	5369	96942
	1996	13550	50091	44177	6321	114139
Bhaktpur	1991	4033	44967	16597	4169	69766
	1996	4195	46771	17263	4336	72566

Source: Nepal District Profile, 1997