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Road Accessibility Analysis of Waling Municipality and Its Peripheral Settlements

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Abstract

This paper aims to investigate the concept of accessibility and how it can be incorporated in transport between urban and rural areas. Accessibility refers to people's ability to reach goods, services and activities, which is the ultimate goal of transport activity. Accessibility can be evaluated from various perspectives including a particular group, mode, location or activity. Field data were collected from two different methods; one was the observation method and the other was interview method. The observation method was used for the collection of primary data in Waling. One of the main concerns of this study was to describe the accessibility analysis of urban center with periphery areas. The Interview method has been used for the access facilities survey. The interview was conducted on the basis of sample. Urban centers provide the access to goods and services for rural people with help of connecting paths, roads and other transport facilities to destinations and therefore activities (also called opportunities). Hence in this study accessibility refers the relative ease of reaching rural people to Waling urban center by use of the different mode of transport facilities for various purposes. This study has also explained in terms of travel time and cost and frequency of public transport service. The case of observed periphery because of the direct blacktopped and graveled road connection with Waling Urban center, therefore, villagers can easily transport agricultural products in the urban centers frequently. The study showed a significant role of transport services in the mobility of people between urban center and rural areas. The planner and policy makers should emphasis the purposed for the improvement of the transport network, however, has to be based on the anticipated growth of traffic volumes in the future which depend upon several factors like growth and distribution of population, location of industries and other socio-economic functions.

Keywords: *Access, transport facility, mode of transport, frequency of periphery*

Introduction

Cities are the foundation of modern civilization; they are the engine room of economic growth and the center of culture, entertainment, innovation, education, knowledge, and political power. (Roberts and Kanaley,2006) maintain that urbanization the spatial concentration of people and economic

activity is arguably the most important social transformation in the history of civilization since man changed from being a nomadic hunter gatherer and adapted a settled, subsistence agricultural way of life. Accessibility can be understood as the ease of reaching desired destinations given the number of available opportunities and the intrinsic barriers to travel from the origin to the destination. Barriers to access in the context of transport can be defined not only through travel speed and costs, but as well seasonal and weather dependent accessibility. Road plays important role in rural development.

The empirical analysis suggests that providing extensive road access to urban centers would confer substantial benefits on average, much of these going to poor household in Nepal. However, the benefits would not be large enough or targeted efficiently enough to appreciably reduce income inequality in the population (Jacoby,2000). It is the physical access to goods, services and destinations which is what people usually mean by transportation. Similarly, accessibility means the ease of contact with relatively little friction i.e., less wastage in time and energy. Nobody wants to wastage of time unnecessarily for procuring his requirement.

The existence of towns more often depend on the ease of contact with their surrounding territories. Thus, road accessibility provides a measure to examine the effectiveness of road transportation in regional development. Hence, unless the details about the transport network and its services are put forth in terms of accessibility, no development plan will be considered complete. Accessibility which is supported to be the best indicator of the degree and efficiency of the transportation in a region, include two factors distance and time and it is in these context that accessibility is dealt with and measured. Transport and communication play a significant role in developing relationship between urban and rural areas.

A place located at favorable geographical environment has more accessibility. Accessibility is explained in terms of transportation links or connectivity. High accessibility is found in central location where as it is low in peripheral areas. Every service center is a center for services to surrounding areas. The services that a center possesses may include activities of commercial, administrative, social, technology, finance, educations and health for its inhabitants as well as for the surrounding people. The centers in turn are dependent on surrounding areas for the supply of agricultural crops, dairy products, labour, capital, and a variety of industrial raw materials. The accessibility factor is important to determine the extent of relationship between urban center and its hinterland areas. On the other hand, transport network is important to determine the movement of goods, services, people and information.

A good transport network is vital for effective access to service. The change in accessibility brings a number of changes in the actual costs of transport and travel. Service delivery is more effective if accessibility to them is maximized. Furthermore, decision makers need up to date information on the spatial distribution of urban centers and their activities and existing road connection for sustainable and suitable planning for regional development and livelihood of the people through efficient rural urban linkage (Huber, 2015).

Therefore, access facilities are very important for linkages between periphery and urban area. Accesses of people to service facilities can vary depending upon the location of any specific settlement in the wider settlement system. It was considered that the roads would improve the transport and in turn transport would solve the access problems. Due to access facilities, most of the periphery people easily visit the urban centers for the use of services. The frequency of visit to the urban centers would be high.

In present time, municipal government construction of a model bus park in Sitalnagar in waling municipality market area aims to achieve to improve regional transport system and reduce urban congestion. Similarly, the government of municipal plans a 16 km corridor along the And hikhola River to relieve pressure on the existing highway and provide an alternate intra-municipal route. This Paper examined about accessibility pattern between urban center and their peripheral settlement. It tries to highlight a general accessibility pattern between urban centers with periphery areas in terms of, trail network, road network.

The study of accessibility covers mode of transport used, travel time and cost, frequency of public transport service. Similarly, this study also describes about the traffic frequencies at the periphery because of easily direct road connecting with Willing Urban center as well as explained about entry points and destinations points of the vehicles on Waling Municipality.

Objective of the Study

The objective of this study is to assess the spatial accessibility pattern in the study area of Waling urban centers with their periphery.

Methods and Materials

The primary source of data is the main basis of this study. The detail information for this study has been acquired from the extensive field survey. For the detailed field survey has been done one urban center Waling and measure their accessibility analysis. Field data were collected from two different methods; one was the observation method and other is interview method. The observation method was used for the collection of primary data in Waling. One of the main concerns of this study was to describe the accessibility analysis of urban center. The interview method has been used for access facilities survey. The interview was conducted on the basis of a sample. The public transport survey was also carried Sample units were selected purposively. The interview was carried out at the bus stop of the selected urban centers. The interview has been conducted with the staffs, member of transport enterprises committee and traffic police. This survey was done to get information on provision of transport facilities and to measure frequency of transport services on the study area. The information on year of establishment of transport enterprises, frequency of trips of vehicles, and the flow of vehicles was also taken.

In this study interpretation of the available data and information are mostly descriptive and in some cases an analytical interpretation with quantitative technique is also done. In addition of these, other

quantitative and graphic techniques such as percentage, ratio, tabulation, cumulative table and so on are used wherever possible. Similarly, the analysis is further strengthened with the help of cartographic technique. This is one of the important basic tools of the method of analysis of this study.

Study Area of the Study

This study area lies along the Siddharatha highway in Syangja district of Gandaki Province. This Municipality has chosen as a study area because it is a home town of researcher. Although, there are five municipalities in Syangja district with different sizes among them the most important urban centers in locational strategy, easy accessibility larger periphery areas and located transport nodal point are distinct characters which may be regarded as prominent components.

The study area, Waling municipality is located at the latitude between 28 ° 3 '2.412" North to 27 ° 55' 26.58 " North and longitude between 83 ° 41 '36.852" East to 83 ° 50' 18.456 " East. The extent of the municipality is 128.4 sq. km2 and divided into 14 wards as it sub-administrative unit. The municipality headquarter is located at ward no 8 at Katawze bazar. There are 11,365 household occurred in the municipality. The average household size in the municipality is 3.76 people, with a total population of 50,932 (Census, 2021) including 23,657 males and 27,27 female. The sex ratio is 86.95. The annual population growth rate is – 0.14 percent and the municipality population density are 393 per sq.km and literacy rate of municipality .is 83.38 percent among them male is account for 90.77 percent and female share about 77 percent (CBS, 2021).

There are four major caste and ethnic groups in this municipality. They are Brahmin/Chhetri, Janajati ,Dalit and Thakuri. Among them, Brahmin/Chhetri is the largest group that shares 52.65 percent of the total population. Janajati is the second largest group which which account for 28.0 percent. The Dalit group has the third largest population group of the total population of Waling municipality. Similarly, Thakuri account for only 5.49 percent and other share 3.52 percent (Waling municipality profile, 2018 and CBS 2020).

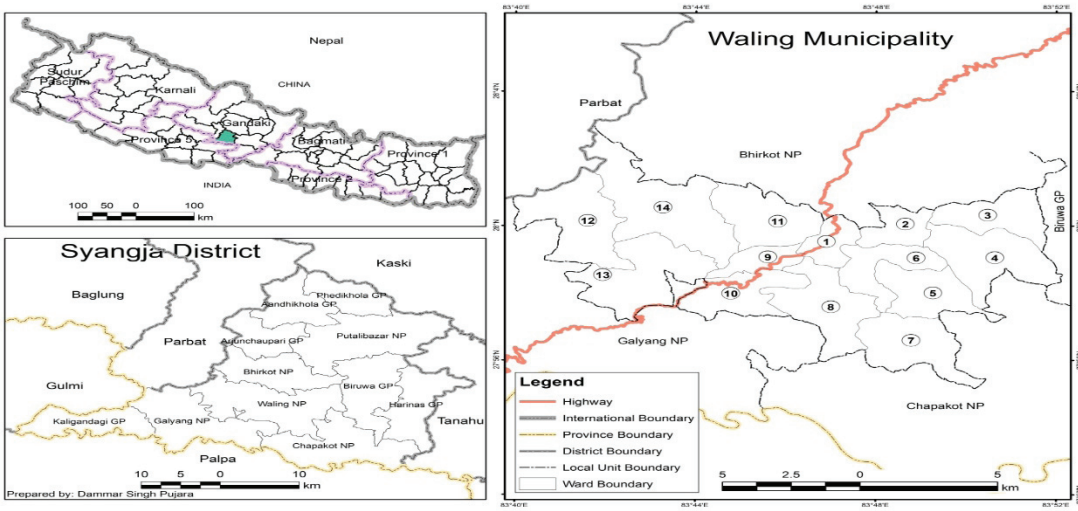
On the south of municipality occur Galyang municipality. Bheerkot municipality in the north side of Waling municipality, Parbat district and Galyang municipality in the west boundaries of waling municipality. Similarly, on the east of Waling municipality are demarcated from the Biruwa Rural municipality and Chapakot municipality respectively.

At first, Waling municipality was announced on 2053/10/11 BS by the Government of Nepal by joining the areas of Village Development Committees Dhanubans, Pekhu Baghkhor and Waling. Later in order to reform the structures of Municipalities and Rural Municipalities for the Federal Government System, it's area has been increased in 2073 BS by joining the previous Waling Municipality, Majhkot Shiwalaya VDC, Yeladi VDC, Jagat Bhanjyang VDC, Keware Bhanjyag VDC, Sirsekot VDC, Thumpokhara VDC, ChhangChhangdi VDC(Ward No. 1,4-6), Malyangkot VDC (Ward No. 4), Tindobate VDC (Ward No. 2-5), Kalikakot VDC (Ward No. 1,2,9), Pelakot VDC (Ward No. 5-6), and

Sworek VDC(Ward No. 2,4-8).

The Waling is 62 Km far from the Capital of Gandaki Province, Pokhara and 27 Km far from District Headquarter, Syangja. The lowest elevation of the study area is 731 meters at the Andhikhola in the middle part of the study area where as the highest elevation is 1600 meters at Gharuwsur in the southern part of the study area. Most of the area is covered by hills. Municipality has a lot of developmental opportunities. Similarly,Waling will be the first municipality to have houses all covered with pink and will be named as pink city. The government of Nepal has listed to develop Waling as one of the Smart City of Nepal. So, Local Government is working for Smart Waling. Government of Nepal has declared the clean city of Nepal for fiscal year 2073. Therefore, Waling municipality is very famous among the municipalities in Nepal. The location map of the study area is shown in Figure 1.

Figure 1: *Location Map of Study Area*



Result and Discussion

In the study area the roads provide an effective means of transport for the movements of goods and passengers over medium and short time distances and to some extent even over long distances at least for certain special commodities governed by user preference. Hence within an integrated access development program ,proposed rural roads should be assigned a relatively higher priority using urban center strategy which organized the settlement into a hierarchy of a centers at appropriate levels and the should be connected by a hierarchical linkages.

Therefore, access facilities are very important for linkages between periphery and urban area. Accesses of people to service facilities can vary depending upon the location of any specific settlement in the wider settlement system. It was considered that the roads would improve the transport and in turn transport would solve the access problems in the study area. This study also includes name of road, types of road length in km, mode of transport, transport frequency discuss with fair in Nepali currency

(RS) and flow of goods and people between urban centers with peripheral settlements.

Trail Network in Waling

About six decades ago the road facility was completely absent in the Hilly Region of Nepal. The main means of transportation was the foot trail. In the past, Waling was a main market center of Syangja, Palpa, Gulmi, Baglung and Parbat districts. From these, the large number of foot trails was converged in waling. One trail route starts from Kaski to Syangja. It is 125 km long. It passes through Karkineta, Setidobhan, Satupasal,in Syangja district and it trail parallel connect Palpa-Tansen to Butwal market centre.

In Waling several foot trails have converged in the historic period of time. The most important foot trail is Rampur Waling trail. This trail passes through in Palpa district and connects the Chapakot and Barikuna of Syangja district. It is 35 km long. But it cannot help to develop market centers. Next important foot trail is Kaakmi-Waling trail. It is 30 km long. Under this route different types of foot trails are converged with a motorable road. Now, local people travel through this foot trail very rarely.

Road Network and Transport Services in Waling

There are various roads that connect Walings. The Siddharatha highway passed the middle part of the Waling municipality this road is the most important road in terms of mobility of people and goods. It is 20 km long along the municipality. It connects Pokhara sub-metropolitan with Siddharathanagar municipality of Rupandahi district. This is the most important road that connect Waling to Pokhara . Different types and sizes of roads are converging in this section. It is 65 km long. The flow of vehicles is very higher on this road than other road. Before the construction of the Siddhartha Highway people had to rely on the trails and tracks. In the historic period different types of foot trails converged in Waling. East-West foot-trail is very famous. It originated from Kaski district and it passed through Syangja, Palpa and Rupandehi district. The flow of goods and mobility of people was very high in the historic period of time. But in present time, that foot trail is transferred into Siddharatha Highway.

Waling has total length of 50 km within the municipality (HMG, 2005). Waling has road connection with number of places. (Table 1. 1) shows road connections with different places, types of roads length of roads, mode of transport, frequency of transport services and fair.

Table: 1.1: *Road Network and Transport Services in Waling Municipality and its Periphery settlements.*

Name of the road (units)	Type of road	Length in km	Mode of transport	Frequency	Fair (in Rs.)
Bhumre,rawatdanda,deurali,thana dhansa,sirbani road	Earthern	13	Jeep (6)	One an hour (interval)	200/per person
			Mini Bus (4)	Four times (per day)	390/per person
Waling—Huwas road	Black topped+ graveled	30			
			Bus (4)	four times (per day)	400/per person
Waling rashkhola,keware	Earthern	7	Trax (3)	Two an hour interval	110/per person
			Jeep(4)	four times (per day)	200/per person
Simalchaupari,sirubare singarkot majkot aladi ratne	Earthern	18	Trax (3)	Three times (per day)	200/per person
Waling –Pokhara	Black topped	65	Microbus (10)	Ten times (per day)	400/per person
Surkawdi amale tapu sorek maidan	Earthen	16	Jeep +trax (6)	Six times (per day)	300/per person
			Trax (12)	Six times (per day)	310/per person
Baitari rethebari,kokhe ,chandrakot devesthan,kaule sadak	Earthen+ blacktopped	14	Jeep (6)	Six times (per day)	200/per person
Waling-Chapakot road	Blacktopped	27	Jeep+Trax(8(	Eight Times per day	250/per person
Waling Damachaur road+shankhar	Blacked+graveled	32	Jeep+Trax(7)	Seven Times per day	350/per person
Amale,simle panchhamul and titapani	Earthern	6	Trax(4)	Four Times perday	180/ per person
Walingmode BP chowak ,chithak,kaphaldanda,rogdithati	Blacktopped +earthern	8	Trax+ Jeep(6)	Six times per day	230/per person
Madikhola,devisthan bajkot	Earthern	8	Jeep(2)	Two times per day	230/ per person
Waling, Jagghat,Miningkot Kakmi	Blacked Topped	30	Jeep+ Trax(6)	Six times per day	300/ per person

Source: Field Survey, 2024

Note:- Figure in parenthesis shows the number of vehicles.

Waling has road connections with ten major destinations. They are Waling,pokhara, waling-Bhumre ratuwadanda deurali thana serbani. Waling-damachaur road + shankhar, Waling-BP chowak chithak kaphaldanda rogdithati and Waling- chapakot road this runs from south to north and links different of the district ares. It has vast service areas. It is 27 km long (Table 1.1). Waling - Butwal road is very important in terms of flow of goods and people. It is 102 km long. It has link with different gaunpalika of Syangja, Palpa and Rupandehi district.

There is a regular public transport facility from Waling to other places and hinterland areas. It also provides greater mobility of people and goods. Nearly ten micro buses leave. Through Waling to Pokhara per day. The bus fare is Rs. 400. Minibus, and taxi and van leave for Pokhara two times a day (Table 1.1). There is direct road connection between Waling with its surrounding periphery but these roads are narrow and poorly maintained. Trucks, buses, mini-trucks, trax, are frequently used for transporting goods and people.

In this area, mini-trucks, jeep, vans and trax run on the gravel road almost in the year. Besides this, some parts of remote rural areas in Syangja district have not regular bus services with Waling. From these Prephery jeeps, vans and mini trucks run only in the dry season. On the other hand from Waling to Kathmandu there is frequent schedule leaves buses and microbuses early in the morning and evening. Katmandu is about 260 km. far from Walling and the average travel time is about 8- 10 hours. There are number of taxies leaves from Waling to Pokhara average travel time is about two hours. Similarly, there is a regular daily bus services connecting Waling with Nepalganj the bus fare is per persons 1700 Nrs.

The roads provide an effective means of transport for the movements of goods and passengers over short and medium distances and to some extent even over long distances at least for certain special commodities governed by users preference. Hence within an integrated road development program, proposed rural roads should be assigned a relatively higher priority using urban center strategy which organized the settlement into a hierarchy of center at appropriate levels and these should be connected by a hierarchical linkage.

Conclusion

Urban centers provide certain levels of transport facilities and services to the people living within their surrounding areas. From the surrounding areas people commute for study, health treatment, buying and selling their agricultural goods and employment under urban center. It is the functional linkage. Agriculture which is by far the most important economic activity in periphery areas has undergone structural changes in recent years. Three decades ago the whole of periphery was almost exclusively under paddy whereas now the area under paddy is insignificant and much land is under vegetable a fruit crops sold in the Waling urban centers.

A Variety of vegetables is supply for the urban centers. Other cash crops contribute significantly to the local economy. Thus based on the above discussion, it concludes that accessibility of the

relationship development of Siddhartha has brought more accessibility in the study area. Many feeder roads converged in waling. These have roads and access facilities in the study area. There is regular public transport service facility from Waling to their periphery areas. Few households use porters to transport agricultural goods from rural areas to town. The frequency of visit declines during monsoon period. Similarly, the frequency of visits also varies due to the economic condition of the rural people. Generally speaking rich people visit town more frequently than poor people.

The public transport services from Waling to their periphery areas have caused greater mobility of people and goods. Due to the transport facilities village people are benefited to supply their vegetables in the town in time. The use of different modes of transport between towns and rural areas has positive impact on periphery economy. The composition of vehicles within the study areas can be analyzed. In general, buses hold first place, minibus and tractors both together stand second, and other traxs, vans and cars and came third place. Inside the rural areas an auxiliary mode of transportation is cycle bicycle by which forms transport goods.

There is a regular auto tempo transport services through waling center to other places of Waling municipality. The network of feeder roads, village, and roads are increasing significantly in the study area. However, district and village roads are mostly in poor condition that requires upgrading, rehabilitation and poor maintenance. As transport and accessibility is key to development, policy makers aspire to improve accessibility through sufficient transport infrastructure planning. The urban mobility and accessibility mainly depend upon the urban road network planning.

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