

## A Review on Rural Road Improvement and Its Impact on Socioeconomic Development of Kaski District

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**Received Date** 12 February 2023

**Accepted Date** 1 March 2023

**Published Date** 24 March 2023

### ABSTRACT

Rural roads are the spinal cord whose connectivity to the settlements, cultivated lands and its improvement play an important role in sustainable socio-economic development of Kaski district as well as developing country like Nepal as a whole. The accessibility of rural road network is reflected in the field of education, health, employment, agriculture, marketing, tourism as well as in the changing pattern of daily livelihood of rural community in Kaski district. There is some level of achievement of fair weather road but is not sufficient regarding to accessibility to remote settlement and productivity. They need to be prioritizing for improvement to all weather road based on productivity. Improvement like upgrading, opening of track, culvert also seems to be necessary which too reflect positive impact on socio-economic development of Kaski district. This paper tries to review 19 district roads under government planning and emphasis for prioritization for upgrading (earthen, gravel, bitumen) based on cost-benefit ratio analysis. Indicators are taken basically on the basis of agriculture, school, health facility, access to market, access to district centre, water supply in the area, road condition. The average number of points of entire groups is calculated with the help of weights and benefits. Cost/Benefit ratio analysed for each rural road are then ranked as per ascending order of it. This will conclude remarks for the improvement of rural road network for sustainable socio-economic development of Kaski district whose satisfactory results are still to be obtained.

### KEYWORDS

Community participation, Cost-benefit Ratio, District Transport Master Plan, Fair weather road, Indicators, Poverty reduction, Social infrastructure, Socio-economic, Traffic factor

### INTRODUCTION

Nepal is a landlocked country and 83% of its territory is covered with hills and mountains. There are various modes of transportation like airways, waterways, railways and road transport. Among them waterways are not feasible in Nepal due to steepness in river flow. Air transport is costlier which cannot be affording by most of the people living in remote rural areas and villages. Rail transport is at the survey stage. Therefore, in this scenario road transport is only the means for providing easy access to most of the people living in remote areas of Nepal in present situation. The good condition of rural road reflects enormous savings associated with reduced travel time, safety of passengers and good and timely delivery of local produce, which enhance socio-economic development of a Nation as well as smooth transfer of policies from central government to the Communities in the rural areas.

The total area of Kaski district is 2017 sq.km. Geographically, the district lies on 83<sup>0</sup>40'East to 84<sup>0</sup>12'East Longitude and 28<sup>0</sup>06'North to 28<sup>0</sup>36'North Latitude. Five types of climate are found in this district, sub-tropical, temperate, temperate cold, alpine and tundra climate. The rainfall of district is measured maximum to 1701.7mm in 2009 August and similarly, the maximum temperature is recorded 32<sup>0</sup>c in summer and 2.2<sup>0</sup>c in winter season, which is varying these days due to global warming. The lowest elevation point is 450m and the highest elevation point is 8091m from the mean sea level of the district. Kaski district is famous for tourism, trade and industry and is the main place of agriculture production.

In the context of accessibility, Kaski district has air transport service as well as the surface transport facilities. However, district and rural roads are in poor condition, which requires upgrading, rehabilitation and proper maintenance. Better planning, construction, operation and maintenance of rural road will give efficient results. (District Transport Master Plan/DTMP of Kaski District, 2067/073)

Road network is one of the basic infrastructures in rural areas, which plays a vital role in socio-economic development of the community. It contribute significantly in rural development by creating opportunities to access goods and services located in nearby villages or major town and market centres. Several studies have already established that there exists a strong positive correlation between rural road investment and socio-economic and agricultural development. Roads reduce transportation costs and the cost of consumption and production of goods and services. At the household level, road development contributes to higher productivity and demand for labour. It is estimated that 15 per cent of crop produce is lost between the farm gate and the consumer because of poor roads and inappropriate storage facilities alone, adversely influencing the income of farmers. (World Bank and International Labour Organization (ILO) Report, 1997).

A good road network reduces transport cost, accelerates efficient delivery of farm inputs and enhances special agricultural production and distribution. Construction of rural roads inevitably leads to increase in agricultural production and productivity by bringing in new land into cultivation or by intensifying existing land use to take advantage of expanded market opportunities. (Mamun, 2018)

This study will cover a review on rural road network improvement through cost-benefit ratio analysis and its impact on socio-economic aspect of Kaski district. The information gathered regarding the study is presented in terms of tables respectively.

### **Significance of the Study**

This study is important to study the improvement over rural road development regarding to prioritization. The existing rural road improvement of Kaski district is beneficial to rural people to uplift their livelihood through agriculture production, small-scale industries and tourism sector. The benefit of carrying out the study is directly associated with the socio-economic development of rural areas of Kaski district. (Figure 1)

### **Statement of the Problem**

Rural roads of Kaski district are in poor condition, which requires improvement (upgrading, rehabilitation and maintenance).Lack of road accessibility is increasing isolation, reduction in crop production and market activities. It discourages public services and help in transfer of technology. Adhoc decisions on road construction with wastage of resources set back the pace of road improvement, which is ultimately affecting the socio-economic development of Kaski District.

### Objectives of the study

- i) To study the improvement of rural road of Kaski district.
- ii) To study the impact of rural road on socio-economic development.
- iii) To determine priority ranking of rural road based on cost-benefit ratio analysis.

### Literature Review

Rural roads are the wealth of a nation, a tool for social inclusion, economic development and environmental sustainability. Rural roads link communities and their agricultural fields to the main transport system and markets. Improving rural roads reduces transport cost and stimulates marketing. This results in increased production and productivity, crop diversification and increased profitability. A bottleneck for socio-economic development is no more than a limited and poor quality of rural road network (Samanta, 2015).

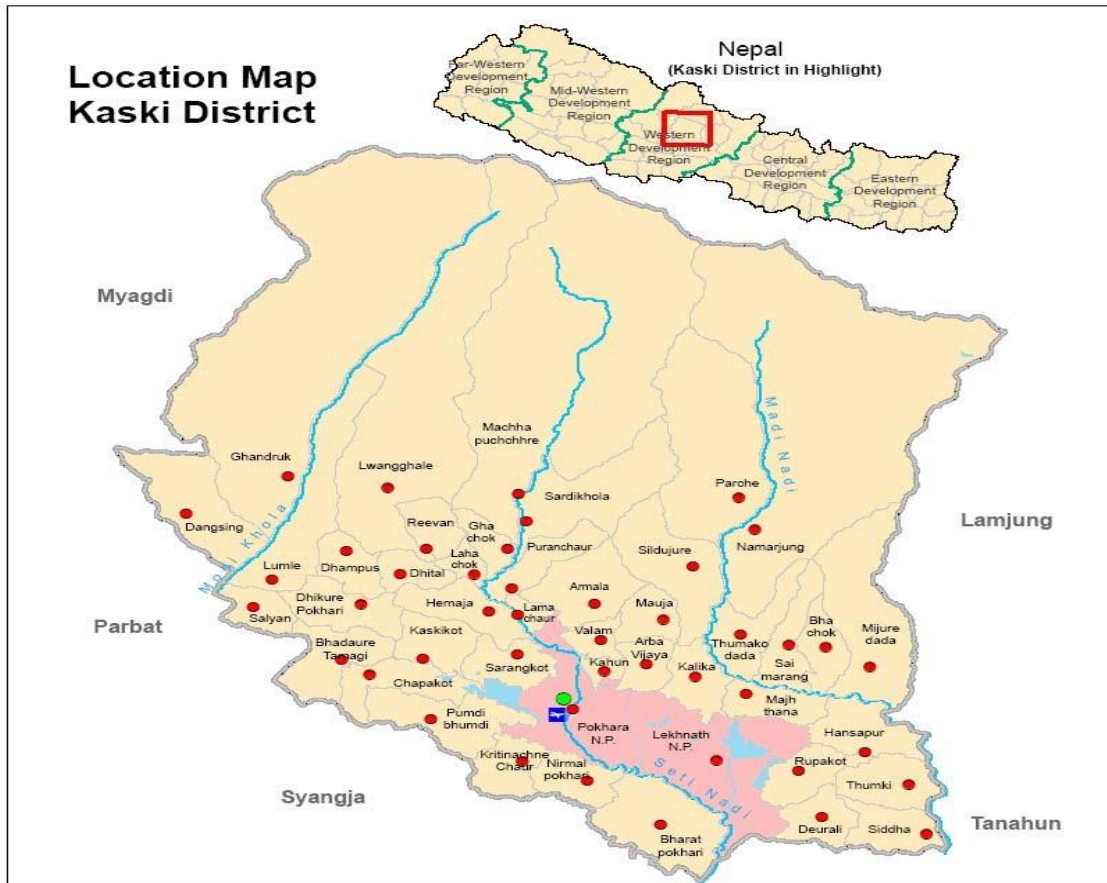
A recent study in India (where road connections and connectivity of some kind exist in most regions) showed that the socio-economic development of areas, considering education, health, family planning, employment, income and other variables, were generally positively correlated with the type and condition of the road. (AbashParida, 2014)

Experiences from Asia and Africa over the past 40 years shows that a principal means for the poor to gain direct benefit from rural road program is through paid employment in carrying out physical works. Although employment on road construction is temporary, the short-term injection of cash can provide the necessary start-up capital for the poor to diversify livelihoods. However, there are some Governmental issues surrounding rural roads. Decision about road rehabilitation, maintenance and prioritization of work were often far from transparent. These were heavily influenced by prevailing political condition.

Rehabilitated roads significantly reduce the vehicle operation cost (VOCs) of existing transport service providers, largely through a reduction in maintenance cost. However, whether these benefits were passed to service users depend heavily on the level of competition that develops along the roads. For competition to emerge certain precondition like demand, distance to markets and maintenance of roads must be present. In Kurunegala, Sri-Lanka, little competition among transport providers emerged due to lack of demand caused by low production.

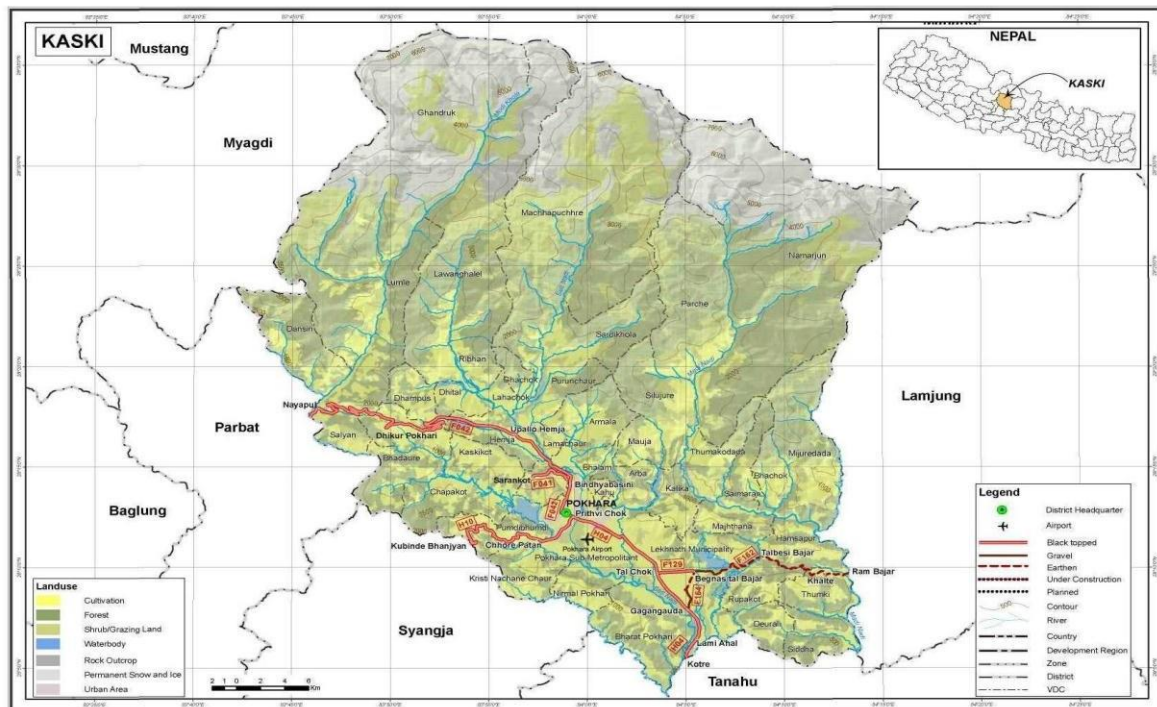
The change in village profile due to community well-being and development and the flow of goods and services is other part of positive impact due to road development. The socio-economic development can be observed only if there are changes in source of income and better accessibility to social services. Diversification of income such as crop diversification can reduce vulnerability to external shocks. Therefore, improvement in rural roads are vital to generate new opportunities to earn income and enhance accessibility to other essential services thus, broadening and diversifying livelihoods.

Roads are critical social arteries for the penetration and exchange of ideas, culture and information. It act as a positive force in exposing villagers to new and dynamic flows of information and opportunities and increase the desire for mobility. However, meanwhile with increased opportunities there is a risk of exposure of negative influences from towns and cities, such as drugs and sex trade in nearby urban centres and sex trafficking, particularly for young, poor rural women. Provincial health official in the Philippines identified the risk of sexual exploitation and drugs as key negative impact arising from improved rural road network. (ADB Report, 2006)



**Figure 1: Location Map of Kaski District**  
(Source: DTMP 067/073)

Kaski district has 19 numbers of district roads class “A” which are mostly gravelled with a total length of 335.68Km and 24 numbers of district roads class “B” with a total length of 255.17Km which are mostly earthen respectively. Most of the district roads are all weather roads (Figure 2). Similarly, many other existing roads approximately 72 prevail in Kaski District where many VDC lies with a settlement.



**Figure 2: Kaski District Road Network Map**  
 (Source: DTMP 067/073)

## Methodology

Field observation and secondary data are being used during the study. The sample size of almost covering all population of 19 rural roads was being covered for the study, which was of varying length. Almost all are fair weathered road.

Summary profile of a relevant indicator of a Kaski district has been prepared which will provide a quick overview of the study area (Kaski) regarding to the general Socio-economic characteristics and access situation in a particular area of influence. The relevant indicators, which may influence by road, are:

**Table 1: Indicator as per area of Influence due to Rural Road**

Indicator	Area of influence(AOI)
1	Agricultural potential
2	Other Non-Agricultural potential
3	Existing health-service used by population
4	Primary school attendance
5	Secondary school attendance
6	Present access to the District centre
7	Present access to the Markets
8	Water supply in the area
9	Road condition before improvement
10	Road condition as community problem
11	Road condition as community priority

(Source: PROJECT LAO/95/001 IRAP ISSUE PAPER 3 "Rural Road Planning")

Each factor are rated(Scaled) into 3 levels as “high”, ”Medium” and “Low” which receives a different scores “5”, ”3”, ”1” respectively. Weights for different factors/indicators are assigned as 5, 4, 3, 2, 1 respectively where:

5=Very important benefit, 4= fairly important benefit, 3=Medium important benefit, 2=little important benefit, 1=Not important benefit

Based on this benefits point for each rural road is calculated and finally C/B ratio is determined.

$$\Sigma \text{Indicator} * \text{Weight} = \text{Benefits... (1)}$$

$$\text{C/B ratio} = \text{Total cost/Population} * \text{Benefits... (2)}$$

The best rural roads are obviously roads that serve a relatively large number of people and serve an area with a relatively large Socio-economic potential. Priority roads for improvement (upgrading, maintenance) are roads having the largest impact per investment unit.

### Data Collection

The data required for study are all collected from secondary source. District Transport Master Plan (DTMP067/073), National Population Census data and basic indicators used by ILO (Table no.1) for analysis of cost/Benefit analysis (Table 3) using different weight (Table 2) are being used for the study of rural road in Kaski district. Some rural road and influence area were also observed during the study.

### Data Analysis

The data analysis is based on rural road length, cost and indicator used as per area of influence by the road as calculated in Table 1, Table 2 and Table 3 respectively.

**Table 2: Average Numbers of Points and their Corresponding Weight.**

S.No.	Weight	Average number of points=Weight of an indicator
1	1	2.2
2	2	1.8
3	3	2.4
4	4	2.8
5	5	1.6
6	6	2.8
7	7	2.8
8	8	2.8
9	9	2.0
10	10	2.8

**Table 3: Cost/Benefit Ratio Analysis and Corresponding Rank of District Rural Road Kaski**

S.No.	Road Link	Cost('000)	Population served	Benefits	Cost/Benefit ratio	Rank
1	40A002R	4050	17,703	696	0.32	4
2	40A003R	3500	3,884	552	1.63	8
3	40A004R	62840	2,376	888	29.78	19
4	40A005R	25315500	3,869	648	10.09	16
5	40A006R	47059	14,963	744	4.22	14
6	40A007R	33100	274361	696	0.17	2
7	40A008R	22250	19254	744	1.55	7
8	40A009R	55411	261751	792	0.26	3
9	40A0010R	11732	328114	648	0.05	1
10	40A011R	36700	21564	696	2.44	12
11	40A012R	36420	10568	744	4.63	15
12	40A013R	8804500	7323	840	1.43	6
13	40A014R	13200	10857	888	1.36	5
14	40A015R	26600	10243	1032	2.51	13
15	40A016R	29000	19953	744	1.95	9
16	40A017R	32980	5322	600	10.32	17
17	40A018R	23014	14116	744	2.19	11
18	40A019R	15400	2378	408	15.87	18
19	40A020R	29800	21564	648	2.13	10

## RESULTS

From the above tabulated value it can be seen that road link 40A010R (Dobilla-Bagmara Road) with a total length of 12.20km should be given first priority for improvement and from socio-economic aspect. Likewise second priority must be given to 40A007R (Chorepatan-Kristi-Nirmalpokhari Road) with a total length of 22.50km. Similarly, third priority must be given to road Link 40A009R (Saatmuhane-Rupakot-Thumki Road) with a total length of 23.1 km regarding its improvement and socio-economic development. The priority for improvement of rural road will be as per calculated value of cost/Benefit ratio. With increase in cost/Benefit ratio, the priority of its improvement will be fall behind. From the above (Table 3) it can be observed that of all rural roads, road Link 40A004R (Kahu-DudhPokhari Road) of total length, 37.32km will get least priority regarding its improvement.

## DISCUSSION

The improvement of the road based on priority ranking (upgrading, maintenance and rehabilitation) directly impact on socio-economic development such as in the area of agriculture, trade, tourism, health, education, employment of Kaski district. The rural road improvement is justified if there is increase in positive Socio-economic impact, which can be analysed through use of indicators, performing cost-benefit ratio analysis, prevailing to the study area.

The best-appreciated rural road is that which can integrate accessibility with social infrastructure. Agricultural land is also an important factor for the development of economy of study area. Mostly traffic volume per cost, market service centre and cost are utilized to calculate score during priority ranking of road. Meanwhile in this study various indicators are

included to calculate cost/Benefit ratio and almost all rural road are covered as per which priority ranking is made which assist the study to be more reliable.

## LIMITATION

- i) All the District roads as per their class are not taken into consideration for the study.
- ii) The total upgrading cost for all types of roads whatever in existing condition either gravels, bitumen or earthen is taken as per DTMP for the study of improvement of rural road excluding bridge and culverts.
- iii) Population of Villages only along the road alignment from origin to destination are taken into consideration from population Census data.

## CONCLUSION AND RECOMMENDATION

The rural roads are no more than tertiary roads in rural network system. From the above study it can be concluded that the rural road based on priority must be put forward for improvement (upgrading and maintenance) such that the transport of chemical fertilizers, seeds and pesticides will become easier also with considerable crop diversification ( switch from food crop to cash crops) such as ginger, sugarcane and other vegetables. An improvement in rural road also impact in generating self-employment which will definitely increase the source of income. This will result in reduction of poverty of Kaski district with increase in household income.

Faster access to health facilities and increase in frequency of visit by health workers especially in far villages like (Siding, Siklesh, Taprang, Polangtar) along with ambulance facilities in need are positive social impact. This can also be observed in the field of education. Teachers far from rural areas feel easy to go school in remote areas of Kaski district as well as students with easy, safe and comfort travel. Overall, to say the major impact of rural road is trend towards urbanization which can be observed in many places like Bharatpokhari, Kahun, Dhikurpokhari, Arba, Mauja, Pumdi, Armala, Panchase)

So, observing all this impact of improved rural road it is recommended to look at how to make better use of existing rural road and infrastructures. This could be achieved by making investment in tracks, paths, culverts and crossings as well as improving transport modalities and their carrying capacity, especially intermediate (non-motorized) means of transport that benefit the poor which will finally assist in socio-economic development of Kaski district. The connectivity of fair weather road after improvement to almost all settlements as well as to external link to strategic road and feeder road network thus proves to be economical in long run for socio-economic development of Kaski district.

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**ISSN: 2362-1303 (Paper) | eISSN: 2362-1311 (Online)**

**JOURNAL OF ADVANCED ACADEMIC RESEARCH (JAAR)**

**March 2023**

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