

## MAINSTREAMING SDGs IN NATIONAL POLICIES: THE CASE OF TRANSPORT SECTOR IN NEPAL<sup>11</sup>

Kamal Pande<sup>12</sup>

### ABSTRACT

*Nepal is committed to developing a robust transport network to achieve the SDGs by 2030. Poverty reduction, the main target of the SDGs, has primarily been the thrust of the road program. The poverty rate for Nepal is 25 per cent, which increases to 46 per cent in the less connected Mid-Western and Far-Western regions. About 30 per cent of Nepalese lives under US\$ 14 per month. In addition to reducing poverty, an efficient transport system contributes significantly towards meeting the SDGs as it establishes basic mobility through road connectivity, which helps to bring down incidences of death by increasing access to basic health services and reducing road accident fatalities and injuries. In addition, increased connectivity increases access to education services, markets and income generating opportunities, in turn supporting economic growth as well as encouraging gender equality in the country. Moreover, Nepal is also moving towards introducing and scaling up clean transport services to efficiently manage rapid urbanization and increase energy security to meet targets set in SDGs 7, 9 and 11.*

*The process of internalizing SDGs into national programs began in the Fiscal Year 2014/15. Preliminary targets have been set and budget allocation to support these programs have already started. The current need is to develop a strong monitoring mechanism at the policy level (National Planning Commission/concerned development ministries) and at implementation level (implementing agencies) to monitor the progress as well as identify and mitigate issues that impede the process/programs. A strong nexus that exists between the transport sector and SDGs must be further explored and strengthened to achieve SDGs within 2030.*

**Keywords:** Transport sector, National policies, Nepal, SDGs, National development priorities

### INTRODUCTION

A Nepal has a diverse topography consisting of Terai (plains), Mountainous (hilly) and Himalaya regions. Within a short horizontal distance of 145 to 241 km, the ground altitude changes from 50 m (Terai) to 8,488 m at the peak of Mount Everest (Himalaya). Such a sharp vertical landscape is one of the major challenges in developing transport infrastructure in the country.

About 80 per cent of Nepalese live in rural areas and most of them depend on subsistence farming for their livelihoods. Poverty in rural Nepal is a massive problem. About 23.8 per cent of the Nepali population lives on less than US\$ 1.25 per day (NPC, 2015a). The current per capita income of Nepal stands at US\$ 762 (as of 2016). It was remarkable that even at the height of the conflict, during 1996-2006, a steady growth in Nepal's economy was observed.

Although population living below poverty line has declined in the last decade, the disparity between rich and poor remains high. The Gini Coefficient, based on consumption expenditure, reached 0.353 in the urban area, 0.311 in the local area, and 0.328 in Nepal overall (CBS, 2014). In addition to poverty reduction, Nepal has achieved gender parity in education and reductions in infant and maternal mortality. According to the WHO report, the maternal mortality rate of 548 deaths per 100,000 populations in 2000 was reduced considerably to 258 deaths per 100,000 populations in 2015 (WHO et al, n.d).

<sup>11</sup> The paper is based on the background paper entitled "Improving Rural Connectivity and its impact on Sustainable Development Goals (SDGs) – Case of Nepal" presented to 10<sup>th</sup> EST Forum in Vientiane.

<sup>12</sup> Transport Infrastructure Specialist, Nepal.

### Transport Sector Assessment

The transport sector has been playing a key role in the social and economic development of the country. Nepal's transport infrastructure mainly consists of roads and civil aviation. It is dominated by the road subsector, which provides for the movement of approximately 90 per cent of all passengers and freight within the country. Since air service is limited and expensive to the locals, it only contributes to passenger movements in commercial and tourist destinations. The basic objective of the transport sector development is aimed at strengthening regional interconnectivity and reducing socio-economic imbalances by enhancing people's reach to basic facilities such as health services, market centers and education.

Road infrastructure in Nepal is made up of the Strategic Road Network (SRN) comprising of National Highways and Feeder Roads, along with the Local Road Network (LRN) comprising of District, Urban and Village Roads (see Figure 1.). The road network has grown from merely 276 km in 1956 to around 72,000 km in 2015/16. LRN constitutes a significant proportion (82 per cent) of the Nepal's Road System. A summary of the Nepal Road System is given in Table 1.

Table 1: Nepal Road System			
Road Class	Km (2015)	Description	Respective Network
National Highways (NH)	12,894	<i>The Main Arterial Route</i>	DOR
Feeder Roads (FR)		<i>Important Roads with a more Localized Nature</i>	
District Road Core Network (DRCN)	25,728	<i>Roads Connecting Village HQ (economic centers)</i>	DDC
Urban Roads	3,000	<i>Roads Within a Municipal Boundary</i>	Municipality
Villages Roads	>31,903	<i>Non-through roads linking single villages to roads of a higher class.</i>	VDC

**Network and Connectivity**

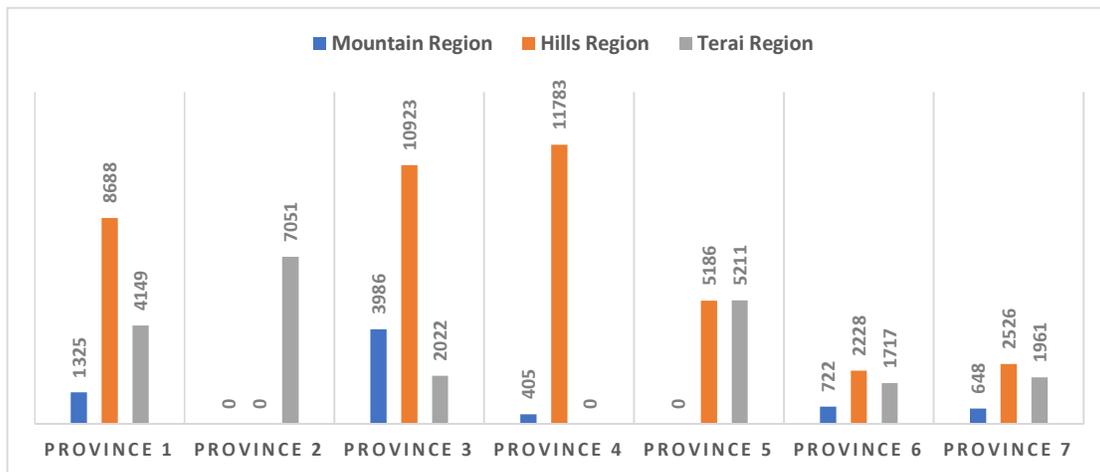
In terms of transport sector development, the early 1990s marks an important milestone for rural road connectivity. With the “Build Your Own Village” campaign initiated by the Government in 1994, provision of a lump-sum grants of USD 3,000 to each Village Development Committee was instrumental in raising people’s aspiration towards building rural access. To pursue the Agricultural Perspective Plan and stimulate rural growth, the government established Department of Local Infrastructure Development and Agricultural Roads (DoLIDAR).

The Green Road concept in rural road construction was introduced in 1990. Two significant pilot projects, “Rampur – Aryabhanjhyang Road” in Western Region and “Kathmandu – Sitapaila - Bhimdhunga Road” in Central Region, were launched with this same concept. The results obtained from these pilot projects were later used to develop specification and design standards for both feeder and rural roads.

Nepal’s road system has been developed in stages. The first stage begins with track opening, which is followed by upgrading activities such as gravelling, construction of drainage structures along with, river crossing structures and finally bituminous pavement. According to Statistics of the Strategic Road Network (SRN), there is a total of 12,898 km of the SRN linking east to west and north to south of the country (as of 2013). However, half of the SRN is still unpaved and 35 per cent of it is still in an earthen condition. The total road assets in Nepal stands over USD 3.5 billion<sup>13</sup> which is around 15.9 per cent of the current GDP. Effective maintenance of gravel surface pavement has remained a challenge<sup>14</sup> due to extreme weather events: excessive rain during monsoon and complete dry spells afterward. Generally, after three to four years of the operation, the gravel surface is found to have reverted back to the earthen stage, owing to the excessive loss of gravel.

Figure 1 presents the road network distribution in each province of Nepal, based on terrain conditions. The hills constitute a significant proportion of road network (58) in the all the provinces, except Province 2. Only 10 per cent of roads are in mountains and 31 per cent in Terai region. In mountains, the roads exist mostly in the form of track and are operational only during winter season. Based on terrain condition, 33 per cent of SRN is in Terai region with 55 per cent in hills. Only 22 per cent of SRN is in the mountainous region.

**Figure 1. Distribution of Road Network in Physiographic Region**



The SRN, which connects to international borders and district headquarters is critical. It helps to maintain administrative, political and social linkages with the districts. Figure 3 shows the status of SRN in terms of its pavement condition. As of 2011, 97 per cent people in Terai and 77 per cent in hills/mountains have access to SRN within two and four hours of walk respectively (see Figure 2).

<sup>13</sup> Source: Estimated

<sup>14</sup> The gravel loss (estimated to 22 – 25 mm/year) of the graveled paved road is also substantially high due to 9 months’ complete dryness of the surface, which causes a loss in the gravel moisture, and 3 months’ excessive rains during monsoon.

Figure 2. Strategic Road Network

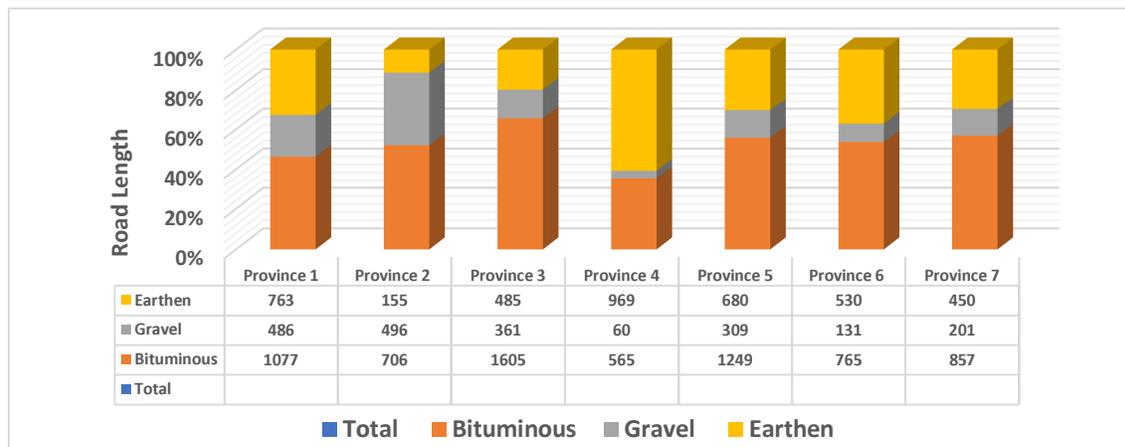
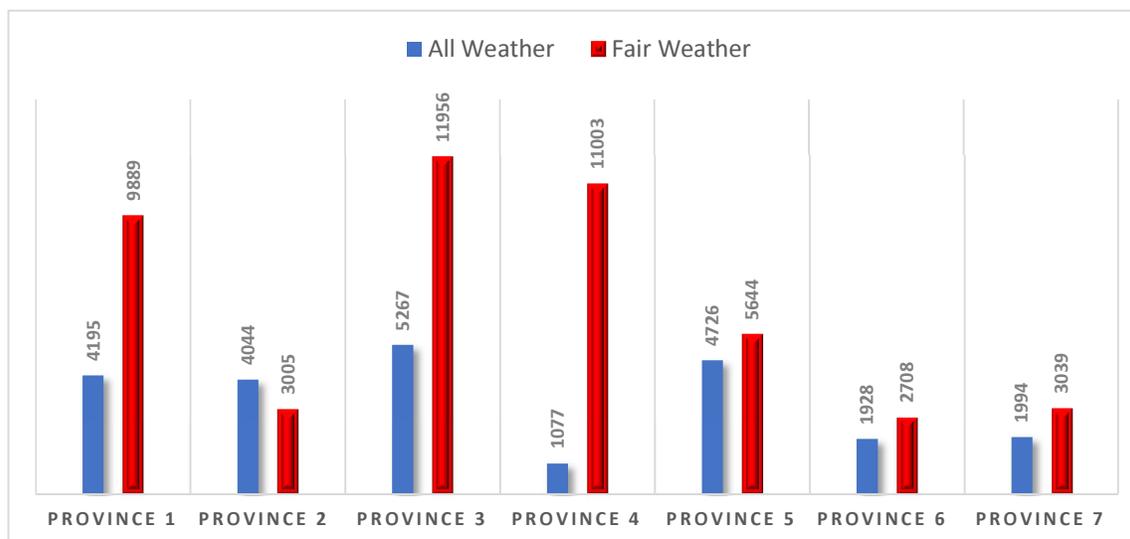


Figure 3. Total Road (SRN & LRN) in Provinces



The total road length in the country, including SRN, reached 70,400 km in 2016. 33 per cent of the total network has been identified as all-weather road and the rest are fair-weather which is seasonal and only operational during the dry season. 68 per cent of LRN is fair-weather out of which more than 50 per cent roads need major investment to bring the network into vehicle passable condition. Local village roads mostly fall into this category due to their poor design and lack of engineering input during construction. Figure 3 shows the distribution of all-weather and fair-weather roads (SRN and LRN) in different provinces. Compared to other provinces, province 1, 3 and 4 have a significantly higher share of fair-weather roads.

**Road Accessibility and Density**

Road density of the paved roads, which is normally an all-weather road, has currently reached 16 km per 100 sq. km. Although Nepal’s total (paved & unpaved) road density (49km/100km<sup>2</sup>) is higher than other mountainous countries such as Bhutan (20km/100km<sup>2</sup>) and Pakistan (32k m/100 km<sup>2</sup>), the transport services are limited to only around 50 per cent of the

network. The Government of Nepal's major focus is on constructing new roads in the rural areas, which puts provisions of adequate attention to upgrading earthen track to all-weather vehicle passable condition on the back seat. The terrain-wise road density is given in Table 2. Because of varied topography and settlement patterns, the distribution of roads in all the Development Regions and physiographic zones of the country is not even. The Central Development Region (CDR) has the highest road network, followed by Eastern (EDR), Western (WDR), Midwestern (MWDR) and Far Western Development Regions (FWDR). Similarly, the Terai has the highest road network followed by hills and mountains.

	Road density Km/100 sq.km	Road length (km)
<b>Mountains</b>	0.03	4,293
<b>Hills</b>	0.12	33,630
<b>Terai</b>	0.13	27,077
<b>Kathmandu Valley</b>	2.61	2,345
<b>Kathmandu District</b>	2.78	1,099
<b>Nepal</b>	0.49	70,400

As stated, the characteristics of the road transport system in Nepal is mainly guided to lessen walking time to reach nearby motorable road head in rural areas. Road development in Nepal is based on political classifications rather than functional classifications. Partly because of that, roads built with significant investment are found to be underutilized. Underutilization and unserviceability of roads combined with disruptions of local movement during rainy season call into question the efficacy of Nepal's road system planning and threatens return on the investment made to date on local roads. Fiscal Budget Allocation and Expenditures (Transport Sector).

The annual budget of Nepal is targeted towards achieving economic growth, poverty reduction, employment generation and establishing foundations for overall socio-economic development. Over the last four years, the average annual fiscal budget increased in the tune of around 20.4 per cent (MoF, 2016a). However, due to various constraints<sup>15</sup>, only around 80 per cent of the allocation is spent annually. Table 3 gives annual budget allocation and expenditures between 2012 and 2016.

Two implementing agencies: Department of Roads (DoR) and Department of Local Infrastructure Development and Agricultural Roads (DoLIDAR) are involved in implementing road projects. Despite DoR's mandate to restrict its programs to implementation of SRN, it is still involved in rural road construction. For the fiscal year 2016/17, the total combined budget for these two agencies for managing and developing road connectivity is estimated to be 9.35 per cent of the total national budget (NPC, 2016a). In FY 2015/16, the total budget spending on transport infrastructure was approx. 8.5 per cent of the fiscal expenditures (NPC, 2016b).

The major aim of improving transport connectivity is to support poverty reduction program by focusing on creating additional employment opportunities and supporting the rural environment in creating additional income-generating activities to raise the living standards of the locals. The Government of Nepal is putting significant effort to bridge the connectivity gap between rural districts, national road network, and major tourist destinations. Different policies, programmes, and development projects have been launched by the government with the help of international organizations and development banks such as Rural Action Program (RAP), Strengthening National Rural Transport Programme (SNRTP), Model Villages Programme, Decentralized Rural Infrastructure and Livelihood Programme (DRILP), among others.

<sup>15</sup> Low spent allocation is contributed

<b>Table 3. Budget Allocation and Expenditures (in USD billion)</b>				
	<b>Fiscal Year</b>			
	<b>2013/14</b>	<b>2014/15</b>	<b>2015/16</b>	<b>2016/17</b>
<b>Annual Budget Allocation</b>	5.17	6.18	7.01	10.48
<b>Annual Expenditure</b>	4.1	5.31	5.85	
<b>Per cent Expenditures against Fiscal Allocation (Total Budget)</b>	79.30	85.92	83.45	
<b>Annual Allocation of Transport Sector</b>		0.476	0.615	0.953
<b>Annual Expenditures Transport sector</b>	0.368	0.438	0.580	
<b>Per cent Expenditures against Fiscal Allocation (Transport Sector)</b>		92.0	94.3	
<b>Annual Allocation for Rural Transport</b>		0.158	0.214	0.356
<b>Annual Expenditures for Rural Transport</b>	0.152	0.116	0.196	
<b>Per cent Expenditures against Fiscal Allocation (Rural Transport)</b>		73.4	91.5	

### ***SDGs and National Development Priorities***

Through adoption of the Sustainable Development Goals (SDG) agenda, member countries have acknowledged the importance of the transport infrastructure and services in achieving the SDGs. Sustainable transport particularly rural-urban connectivity and rural access closely linked to achieving the Sustainable Development Goals (SDGs).

Following the adoption of agenda on SDGs, Nepal Planning Commission carried out a review on the status of SDGs (NPC, 2015b). The review extensively covered the achievements of MDGs as well as progress related to SDGs 1,2,3,5,9 and 17.

The review also pointed out the issues and challenges that might be faced in implementing SDGs agenda in Nepal. A major challenge for a least developed country like Nepal, where there are limited resources, skills, and access to technology, is mainstreaming the SDGs agenda into the provincial and local level planning and budgeting as these new government levels are in the process of being formed. Making existing data generation system robust and databases in line with SDGs requirement and data disaggregation have also been a serious challenge in regularly tracking progress of SDGs. Other challenges include job creation and tackling nutrition deficiency and natural disasters and strengthening governance at all levels.

The review has also highlighted further need of a) Aligning and disaggregating (at sub-national level, by sex, age, social groups and disability) the targets and indicators of sectoral plans, long-term strategies and perspective plans with the SDGs; b) Shifting alignment of national M&E systems from MDG to SDG targets and indicators; c) Integrating SDGs into the current fourteenth periodic plan and other plans; and d) Aligning provincial and local government periodic plans, annual programmes and budgets with the SDGs.

The National Report on SDGs provides a preliminary assessment of current SDGs status and the preliminary set of targets to be achieved by 2030 (NPC, 2015b). This report has been further revised and updated in June 2017 to draft Baseline Report published by the NPC Secretariat (NPC, 2017)

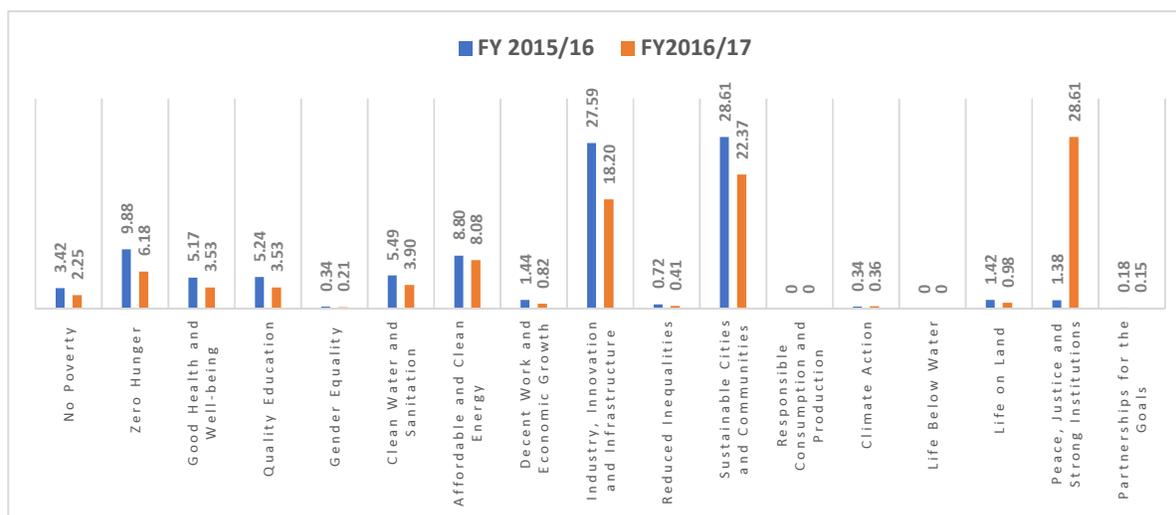
The Baseline Report also highlights the agenda and the challenges in aligning sectoral outcomes impacting SDGs. The major challenges that have been identified in the Baseline Report includes: a) creating environment for mobilizing domestic and foreign investment to accelerate growth by strengthening microeconomic policy; b) further disaggregating the SDGs to match the development environment and its capacity to deliver in a structured time line; c) building medium and long-term sectoral plan to match SDGs; e) strengthening monitoring, evaluation and reporting mechanism for applying corrective measures in a timely manner to ensure SDGs outcome; f) establishing apex

monitoring and evaluation mechanism at center to guide and coordinate sectoral outcomes with SDGs. In carrying out these activities, good governance practices need to prevail.

**Annual Budget and SDGs**

Nepal is one of the few countries which achieved substantial progress in aligning the annual budget with the SDGs. Considering the activities and the programs targeted in each SDGs, for FY 2015/16, resource allocation ranges from 0.18 per cent (Partnerships for the Goals: Goal 17) to 28.61 per cent (Sustainable Cities and Communities: Goal 11). In terms of the budget allocation, Goal 9 and Goal 11 receive highest percentage resources. A massive program has been launched to address the rapid urbanization in the country. Industry, Innovation, and Infrastructure (SDG 9) receives 27.59 per cent of the allocated resources targeted to support 94 development programs. Around 50 per cent of these resources are aimed at strengthening the overall rural connectivity. Figure 4 provides details of the consecutive two fiscal year budget allocation aligned to SDGs. The allocation for FY 2016/17 is almost in the same proportion as of FY 2015/16 except for Goal 16 (Peace, Justice and Strong Institutions), primarily due to the government’s commitment to hold all three level (Local, Provincial and Federal) elections within this FY 2016/17 as part of the constitutional provisions in the new constitution.

**Figure 4. Annual Budget Allocation based on SDGs**



**INTER-LINKAGES OF TRANSPORT POLICIES AND ACTIVITIES WITH THE SDGs**

**Transport and Sustainable Development Goals**

Majority of the Nepalese population (81.39 per cent in 2015) live in rural areas, and most of these areas are isolated and lack transport connectivity. Sustainable transport infrastructure and services play a major role in the rural economic growth, rural productivity and rural resilience by providing access to basic utilities and services. Therefore, sustainable rural transport is the prerequisite for sustainable development. Provisions of improved rural transport connectivity bring multiple socio-economic benefits to rural communities. Transport acts as a stimulus to promote and accelerate programs that lead to successful achievement of SDGs within the targeted time frame. It encompasses all SDGs in case of Nepal except SDGs 12 and 14. Out of the 17 SDGs, 1, 2, 3, 4, 5, 9, 11, 13 and 17 have been assessed to have a direct relation with the transport infrastructure and services. The target of transport sector has been defined in SDG 9 but its inter-related target for other SDGs is yet to be established and worked out in detail. It connects rural communities with education, healthcare, administrative and welfare facilities, and it opens new opportunities for markets and

employment, both of which have significant implications to poverty eradication, hunger elimination, social integration and improved quality of life.

In case of Nepal, due to lack of functionality of the road system, roads can be commonly described belonging to either urban or rural category. As significant population lives in rural setting, the SDGs is basically focused on the uplift social and economic environment in the rural area. Therefore, there is a pressing need for improvement of rural transport and enhanced rural access in developing countries so that no one will be “left behind”.

Transport connectivity and rural-urban linkage would contribute directly/indirectly to the following SDGs and associated targets.

***Transport contribution towards ending poverty, hunger and achieving food security (Goals 1 and 2)***

Although transport is not directly linked to poverty reduction, many studies show that investment in urban and rural roads stimulate significant socio-economic growth. In the case of Nepal, improved transport connectivity is one of the biggest factors improving economic activities of areas that were earlier limited to porter services. Improving transport mobility and rural-urban connectivity can reduce rural poverty by providing economic opportunities and basic services for all sectors of society (men, women, youth, children, farmers, elderly and physically disables). Studies show that given a sufficiently long period of employment on the road, the poor can accumulate significant capital to invest in alternative livelihood opportunities and thus move away from poverty (ADB, 2002).

According to the national living standards survey conducted in 2010-2011, the overall poverty rate for Nepal is 25 per cent, which increases to 46 per cent in the Mid-Western and Far-Western regions. Over 30 per cent of Nepalese live on less than US\$ 14 per person per month. Based on the multidimensional poverty index, Nepal has made significant progress in reducing poverty by 4.1 per cent per year between 1999 and 2006, according to the study released by Oxford Poverty and Human Development Initiative (OPHI). Human Development Report shows that Nepal’s HDI value increased from 0.279 to 0.548 between 1980 and 2014 with the average annual increase of about 2.0 per cent. The percentage of poor people in Nepal dropped from 64.7 per cent to 44.2 per cent between 2006 and 2011.

Improved transport connectivity is one of the biggest factors in reducing the incidences of poverty. If planned and implemented properly, this could aid in achieving the SDG 1 target (i.e., reduction of poverty from 23.5 per cent in 2014 to 5 per cent in 2030). NPC (2015) specifies that eradication of poverty will be possible through an economic growth that is spurred by transfer of technologies and “support for innovation”. This type of economic growth is unimaginable without access to markets that road connectivity provides.

Although transport is not explicitly mentioned in SDG 2: ending hunger and increasing food security, rural transport is vital to achieving this goal. Evidence shows that investment in rural roads leads to greater food security. Improved rural transport infrastructure and services can make food more accessible and affordable for the poor by reducing costs of the agriculture products. Studies reveal that lack of proper transport facility and road linkage results in a considerable proportion of agriculture products getting lost or wasted in rural Nepal. Most of the Nepalese farmers used to spend three to five hours to carry their agriculture produce to the market causing a loss of 20-25 per cent of their agriculture products due to lack of transport services. Another study indicates that annually, Nepalese farmers lose about 25-30 per cent of their food products before reaching the market (New Spotlight, Vol: 06 No.23 May 31, 2013). Similarly, the estimated post-harvest loss of fruit and vegetable in Nepal lies in the range of 20-50 per cent (Gautam and Bhattarai, 2006 Post-Harvest Horticulture). Efficient rural transport systems and better supply chain and logistics connect rural communities with market and farm input suppliers which significantly contribute to ending hunger.

***Transport Support to Access Health Care and Education (Goal 3)***

SDG 3: to ensure healthy lives and promote well-being for all at all ages, is a prominent target for Nepal transport sector as it aims to reduce deaths and injuries from road accidents and increases the accessibility to affordable health services. The current global target is to reduce deaths and injuries from road accidents to half by the end of 2020. Following the UNRSC "Global Plan for the

Decade of Action for road-safety 2011 to 2020", Nepal has prepared its Road Safety Action Plan 2013-2020 and it is now under implementation. The objective of the Plan is to reduce current deaths and injuries to 35 to 50 per cent by the end of 2020.

Over the years, Nepal has suffered a great deal in road accidents due to limited efforts on educating people and reinforcing road safety measures. Despite several constraints including a) ineffective coordination among stakeholders; b) weak institutional setup c) flaws in existing legislation; and d) low priority to pedestrians (conflict between pedestrians and vehicle is high), efforts are being made to minimize road transport accidents. With these efforts, the fatalities have decreased from 24 deaths per 10,000 vehicles in 2001/02 to below 11 deaths per 10,000 vehicles in 2013/14. However, the negligence by the driver (43.7 per cent) and high speed (18.7 per cent) continue to remain as a major cause of accidents in Nepal. Nepal Road Safety Action Plan (2013-2020) provides the detailed formulation of the road safety strategy as one of the activities of this action plan. The strategy tries to address all the five pillars of the road safety management plan and include: a) Road Safety Management; b) Safer Roads and Mobility; c) Safer Vehicles; d) Safer Road Users; and e) Post Crash Response.

The availability of reliable transportation impacts a person's ability to access appropriate and well-coordinated healthcare and education. As the significant population lives in rural areas, the need of transportation services dominates the necessity of providing these services for the well-being of these resident's rural population. Access to healthcare services in Nepal is critical for rural residents. Because of poor transport facility, many rural residents suffer as they have to walk to access healthcare services during childbirth, disability, etc. Often children, elderly and physically disabled persons have greater healthcare needs than others, and living in rural areas isolated from healthcare providers causes them additional difficulties. Studies have shown that providing transportation for medical treatment and quality health services to the rural community is cost-effective, and improves the quality of life. However, Nepal's rugged terrain and the lack of transport infrastructure and services make it highly inaccessible, limiting the availability of basic health care for the rural residents.

In terms of access to health facilities, with the advent of road connecting Khimti to the Tamakoshi-Khimti Road, for example, the health post in Khimti can access the facilities provided by the Dhulikhel hospital. Thus, households in VDCs around Ramechhap and Dolakha that previously didn't have access to health facilities will now be able to travel a shorter distance to acquire quality health services. This shows that the targets set under SDG 3 (i.e., reduce maternal mortality rate to below 70 per 100,000 live births and eliminate prevalence of HIV, TB, malaria, and other water-borne diseases) is achievable through rural transport connections.

#### ***Education and Transport (Goal 4)***

The aim of the SDG 4 is to achieve 100 per cent completion of primary education, 95 per cent enrollment and completion of grades one to eight and 90 per cent enrollment in pre-primary education by 2030. The provision of equal opportunity access to safe and reliable transport can promote equality and equitable educational opportunities for all.

Because of distance-related obstacles and lack of transportation facility, rural children in Nepal face many problems in reaching schools. As a result, school dropout rates are very high in rural areas, compared to that in urban areas. Increase in access to educational institutions through rural road connections not only reduces the travel time for the students but also decreases absenteeism. Rural transport connectivity and rural-urban linkage have significantly improved in the past few decades in Nepal, which has significant positive impact on different dimensions of sustainable development.

#### ***Gender Equality and Transport (Goal 5)***

In Nepal, there is a huge gap between men and women in terms of access to education, healthcare, and participation in decision-making. Infant mortality is much higher for girls than boys, and illiteracy is far more prevalent among women compared to men. Many rural women live in extreme poverty, without any means of improving conditions for themselves and their families. Within households, women often have less to eat than men, and mothers' insufficient calorie intake has led to chronic malnutrition among infants. At the same time, more women are heading households and

taking on the burden of sustaining the rural economy. Women constitute of more than 60 per cent of the agricultural labour force but have little access to land, production technology and training. In recent years, lack of economic opportunities has prompted many girls and women of rural households to migrate from Nepal. Safe, efficient and socially inclusive rural transport system opens new opportunities for women and girls that improve access to education, healthcare, markets, administrative and welfare facilities and employment opportunities.

Although Nepal has formulated Gender and Social Inclusion (GESI) approaches, challenges remain in the national and local implementation to achieve genuine social inclusions. In this regard, through the District Development Committees (DDCs), Village Development Committees (VDCs) and the Municipalities, the Government of Nepal has given considerable emphasis for implementing GESI approaches and ensured participation of women and disadvantaged groups (DAGs) in the decision-making process.

### ***Improving energy efficiency in the transport sector (Goal 7)***

Nepal's potentials to produce clean fuel is a well-acknowledged fact. GoN is strongly contemplating upscale of clean energy and subsequently reduce dependencies on imported fossils fuel to meet SDG 7. This will help to improve energy efficiency in the transport sector, utilize clean fuel to run mass transit system as well as railways. A feasibility study for projects such as the East-West Railway and prospects of monorail in Kathmandu are few such examples of the Government's efforts to introduce clean and efficient transport systems in the country.

Since the rate of vehicle ownership has been increasing on an average by 13 per cent every year, the need to switch to cleaner fuels to decrease the GHG emissions in the country is inherent. In addition, promoting clean energy-based alternate transport, converting public utility vehicles to LPG and renewable energy, promoting non-motorized transport especially the dedicated bicycle lanes and walkway facilities and conducting public awareness activities are some measures that can be taken to reduce the increasing stress (GHG emissions and air pollution) to the environment.

Since Nepal is a landlocked country, without local fossil fuel resources to meet its growing fossil fuel demand, it imports 100 per cent of its fossil fuels from neighboring countries. This has a negative impact on the energy security of the country. In response to the unofficial blockade in 2015, the government issued the National Energy Crisis Reduction and Electricity Development Decade Plan (2016) declaring Nepal's targets to realize 10,000 MW hydropower potential in the next 10 years to facilitate all energy-intensive sectors by providing electricity as fuel. This is a step to move towards a more modern fuel source.

The country is slowly transitioning toward cleaner fuels. Numerous policies, including the National Transport Policy (2001) and the Environment Friendly Transport Policy (2015), have emphasized the types of fuel for clean energy transport services, ranging from electricity to hydrogen fuel cells, that should be introduced in the country. For example, the Environment Friendly Transport Policy targets the share of environment-friendly vehicles to increase to 20 per cent of the total vehicle fleet by 2020. In addition, the policy emphasizes establishing charging stations and manufacturing plants to encourage the use of local resources.

### ***Development of quality, reliable, sustainable and resilient transport infrastructure (Goal 9)***

The Fourteenth Plan envisages major challenges that the sector is currently facing, which includes a) management of expensive construction works due to existing difficult terrain condition; b) difficulty in managing sufficient resources for road asset management; c) prioritizing resource allocation due to heavy demands; d) extending roads into dispersed villages; e) constructing dependable and safe road operating throughout the year; and f) consideration of natural disaster and climate resiliency (NPC, 2016c).

In the Fourteenth Plan, the transport sector investment requirements have been lumped together with storage and communication. Out of these three areas, it is estimated that the transport sector constitutes around 70 per cent of the projected investments. Compared with this projected investment, the proposed investment of the newly announced "Strategic Plan, 2072" is considered to

be highly ambitious (USD 8.16 billion in the next five year) (MoPIT, 2015). The investment in the transport sector for the next three-year period of Fourteenth Plan is given in the following table 4.

<b>Sector</b>	<b>2016/17</b>	<b>2017/18</b>	<b>2018/19</b>
<b>Transport, Storage and Communication</b>	1.58 (24.7 per cent)	2.08 (26.5 per cent)	2.40 (26.7 per cent)
<b>Total Investment</b>	6.49 (100 per cent)	7.89 (100 per cent)	9.68 (100 per cent)

Source: NPC

Although efforts are being made to make the transport infrastructure resilient, budgetary gaps in the sector constrain sustainable growth. Various studies carried out by the ADB and World Bank indicate that expenditure in the transport sector needs to be boosted to create adequate infrastructure support for growth. The ADB report suggests that Nepal should annually be spending 1.65 per cent of the GDP in the transport sector for the next 10-year period (2010-2020) (Bajracharya, 2010). The World Bank report suggests upscaling the investment in the transport sector to 3.49 per cent of the GDP in high GDP scenario and 2.65 per cent of GDP in low case scenario (Andres, Biller, and Dappe, 2013).

The Nepal Growth Diagnostic Study (2014) concluded that Nepal's transportation sector, as a whole, poses many constraints to the overall country's development as Nepal's road network is limited. In addition, implementation of border and customs policies also appear problematic. The degree to which any one of these issues contributes to the high cost of transport is not clear. However, given the importance of transporting goods and services from Nepal to regional and global markets, the high cost of transport is a binding constraint to economic growth in Nepal. Therefore, different private and public institutions have realized the importance of developing sustainable infrastructure, according to the SDG 9 target. Quick action in this area will be essential in meeting the targets in time.

#### ***Improvement of urban public transport system (Goal 11)***

The level of urbanization in Nepal remains low but the pace of urbanization has remained faster and is likely to remain so in the future (MoUD, 2017). Only 17.1 per cent of Nepal's population resided in 58 designated urban areas according to the 2011 census. However, with the addition and creation of 276 of Urban Municipalities, it estimated that the urban population is now around 40 per cent of Nepal's population. Although the urban growth rate in the intercensal decade was 3.43 per cent, the average annual growth between 1981-2011 has remained at a high rate of 5.3 per cent. The urban rural growth differential in 2011 was 2.4 per cent. Over half of Nepal's urban population reside in the hills and the rest of the Tarai. Physiographic and connectivity characteristics are important determinants of urbanization which result in wide variation in the regional levels of urbanization. The level of urbanization in the Kathmandu valley (three districts) and Pokhara valley (Kaski district) comes to 96.97 per cent and 79.52 per cent respectively, while it is only 18.28 per cent for the rest of the hills. Similarly, inner Tarai valleys<sup>2</sup> have a level of urbanization of 41.97 per cent compared to 38.94 per cent for the rest of the Tarai.

Acknowledging the contributions made by the urban areas and its increasing share in GDP growth, it is imperative that urban transport system is accorded as the priority area for investments. Transport is the growth engine for these urban cities. A bad transport planning not only ruins the general condition of the liability but also continue to create missed opportunities. A study carried out by Nepal Rastra Bank in 2012 finds that Kathmandu Valley contributes 23 per cent to the GDP. In this context, there is a strong case for the level of investment required in urban transport infrastructure and services to increase to match its contributions to the GDP.

Following the Kathmandu Sustainable Transport initiative, an agenda for reform in the public transport is now being actively pursued. Road hierarchy in Kathmandu Valley is being established to accommodate size and capacity of the public transport vehicle. Incentives are being provided to small public transport operators to upgrade their fleet to an environmental friendly higher class of public transport. An alternate mode of transport for mass transit in Kathmandu valley is being explored and

is pursued. Various options including metro, light rail, and urban ropeway system are being examined for its suitability and viability.

### ***Climate impacts on transport and mitigation and adaptation measures (Goal 13)***

Since Nepal is a country with varying topography, different parts of the country are subjected to different climatic conditions. The mountainous region of Nepal is more prone to landslides, mudflow, debris flow and rock-falls, due to heavy rainfalls, that blocks the flow of traffic and can also cause damage to the road infrastructure. In the Terai region, the increase in temperature escalates the instances of cracks on the roads and heavy precipitation leads to potholes. The poor road conditions resulting from such natural calamities increase chances of accidents and delay transportation of necessities as well as increasing consumption of fuels.

Nepal is significantly affected by temperature increase as it causes the melting of the glaciers and consequently, washout of the roads. High temperature also causes increased fatigue to the bituminous pavement, deterioration of gravel surface, thermal expansion of bridges, buckling of joints of steel structures, etc. When there's a temperature drop, the infrastructure becomes vulnerable to snow conditions. High rainfall and flooding caused significant damage to the road drainage structures, breaching of road embankments, scouring of bridge foundation, washouts, etc. Apart from climate change impacts, there are natural disasters (such as earthquakes and landslides) impacts that have been significantly felt in Nepal. These also cause major road blockages and failures.

### **Adaptation measures**

The cost of building and maintaining road infrastructure in Nepal is high compared to other countries in this region. Road building in extreme terrain condition, maintaining it and facing frequent disaster leading to premature failures of the road structures are common issues of the road system in Nepal. To be able to adapt to such adverse conditions and disasters, special consideration is needed while designing transport infrastructures. Infrastructures need to be emphasized to be able to adapt in such a way that operation and maintenance costs are kept to a minimum. A long-term life cycle cost (LCC) principle needs to be adopted while making the investment decision. To make a proper assessment on infrastructure planning, Nepal took several initiatives to prepare the "Climate Resilient Planning – A Tool for Long-term Climate Adaptation" along with the National Adaptation Programme of Action (NAPA) and Local Adaptation Plans for Action (LAPA) in 2011. These documents were prepared to facilitate the preparation of resilient periodic development plans and to aid in making the environment and people adapt to the adverse impacts of climate change. The Climate Change Vulnerability Mapping of Nepal under NAPA has been established as a tool to help identify the areas that are the most vulnerable to different kinds of disasters in Nepal.

In Nepal, bioengineering has been successfully adapted to decrease the occurrence of landslides and its negative impact on roads. However, no design specifications have been formulated to climate-proofing roads. To address these, it is extremely necessary that the country develop a framework to i) identify locations for extreme climate conditions, ii) carry out risk analysis and impact assessment in that location, iii) plan an appropriate response to the risks, iv) calculate the life-cycle costs of building roads, v) design the infrastructure accordingly, vi) implement the plan and vii) carry out continuous monitoring and evaluation. Although this does not prevent extreme climate conditions, it will help in reducing the life cycle costs of the road.

Eight strategies have been identified to reduce the impacts of climate change and disasters on road infrastructure. The consideration of these strategies will be useful while revisiting the much-awaited revision on "National Transport Policy". The strategies focus on a) building awareness; b) developing project screening guidelines; c) integrating "Avoid – Shift – Improve" strategy in formulating, designing transport mode; d) classifying road system based on vulnerability to climate change impacts and disasters; e) developing design standards; f) operationalization of maintenance practices to minimize secondary impact; g) strengthening environmental and social safeguards; and, h) enhancing institutional capacity.

***Collaboration and partnership to develop sustainable transport system (Goal 17)***

The current road length has reached around 65,500 km (including SRN and LRN) out of which around 20,000 km is all-weather. A recent study carried out by the DoR concludes that by the end of 2013, over 90 per cent of the population is within the 2 to 4-hour accessibility criteria (i.e., 77 per cent of the Hill population within 4 hours and 97 per cent of the Terai within 2 hours) (DoR, 2015). Two-thirds of the population (17.2 million) is within 1 hour of the SRN and less than 9 per cent is more than 4 hours away. The additional inclusion (32,000 km) to the existing Local Road Network raises the total population served to 99 per cent (based on the 2hr/4hr criteria) – with less than 250,000 people in the remote northern mountain areas more than 4 hours away from a road. Overall, 99 per cent of the Terai population and 77 per cent of the Hill population is located within an hour of access from a road.

The major challenge now lies in consolidating the gains established so far by the construction of the existing road network and progressing to implement other sectoral actions. Tourism, energy, trade, and manufacturing industries all depend on reliability and competitiveness of the transport cost. By bringing the existing road network into a maintainable condition, (by applying a series of activities like upgrading, widening, pavement strengthening, etc.) reliability, dependability, cost-effectiveness and safety will be ensured to the users.

The transport sector consumes a considerable part of the overall infrastructure investment in Nepal. A major proportion of the transport sector budget is expended in improving and maintaining roads. The sector has the greatest potential of not only creating additional employment opportunities but also supporting the economic agenda of the nation for an accelerated growth.

The other area of investment is to identify and implement mega projects with the notion of reaping economic benefits. Implementation of projects like Kathmandu – Terai Fast Track, with high economic return (IRR 31 per cent), will boost the economy of the country.

Six decades of development in the transport sector's agenda has so far remained in developing people-centered mobility (intra and inter). The efficiency was never a factor while planning and developing transport network. Competitive transport cost considerations were never carried out in selecting the road alignment. The political dictation in the making of the primary network pass through each village before reaching the final destination, this made our network costly as well as inefficient.

In its Country Program Strategy, both Asian Development Bank and World Bank have accorded highest priority for investment in the transport sector. The combined portfolio of WB and ADB is around 40 per cent of the current expenditures in transport sector (MoF, 2016b). Besides WB and ADB, the other major development partners involved in financing the transport sector are: a) Government of India (bilateral grant and loan); b) Government of People's Republic of China (bilateral grant and loan) c) Government of Japan (bilateral grant and loan); Swiss Agency for Development and Cooperation (SDC); d) Millennium Challenge Corporation (MCC, USA); Department of International Development (DfID, UK) etc.

WB's engagement in the sector is continuing in a) transport connectivity, with a focus on rural transport and connectivity to India; b) improving access to markets for the poor and to facilitate national and regional integration; c) strengthening key institutions in the transport sector, which remains hampered by overlapping institutional roles and mandates; d) improving the maintenance, safety and quality of transport infrastructure and services.

Recently ADB's engagement to upgrade two-lane Narayanghat – Butwal section of East-West Highway to four-lane standards marks the beginning of an era of four-lane highway in Nepal. ADB's engagement with rural transport is continuing and is demonstrating the impact on social and economic conditions of rural areas.

In upscaling the investment in road infrastructure, it is equally important to explore and establish a sustainable financing mechanism to support future road programs. Strengthening institutional capacity and the delivery are other areas which need greater attention. A strong collaborative approach with development partners is needed now to solicit additional resources as well as internalize the gains so far made in this sector.

### ***Improved Transport for Economic Growth***

Improved transport infrastructures and services play a major role in economic growth. Nepal Living Standard Survey 2010/11 illustrates that during the last 15 years, accessibility has improved almost universally for all types of facilities, which have a significant impact on the economic growth in the rural areas in Nepal. Efficient rural-urban connectivity helps connect rural areas to urban centers, boosts trade and commerce, and creates new jobs. It further allows for safe and efficient movement of people and goods from production to consumption through better supply chain and logistics.

Most of the studies demonstrate that investment in minor rural road remarkably reduces the travel time from farm to market, which in turn significantly reduces the transport cost of the agriculture product, and improves the productivity and economic growth in the rural areas.

Realizing the fact that the good transport infrastructure and services are essential conditions for economic growth and poverty alleviation, the Government of Nepal has given considerable emphasis on the development of the rural roads. As a result, transport connectivity has significantly improved in past few decades. Since then, rural connectivity has been playing an important role in economic growth of rural areas.

Improved rural transport connectivity further helps the rural people to enhance their traditional skills, support for microenterprises in rural areas, promote tourism industry and support planning and implementing other infrastructures such as hydropower, and industry etc.

### ***Overall Impact of Rural Transport in Achieving SDGs in Nepal***

To drive rural as well as urban economy and uplift the social environment, connectivity has been playing an important role in Nepal's development endeavor. Lately, transport infrastructure has gone into a substantial transformation from an early stage mule track to the motorable road. The road connectivity within the district started only after the district got connected with the National Road Network. At the end of Eight Periodic Plan (1993-1997), only 19 districts were yet to be connected to the National Road System (NRS). Today, only two districts- Humla and Dolpa are yet to be connected to the National Road System.

In 1997, 13 districts were identified by ICIMOD as the worst performing districts in 11 combinations of four dimension of development performance: namely, poverty and deprivation, socio-economic, institutional and infrastructure development, women's empowerment, and natural resource endowment and management. Out of those 13 districts, 10 districts<sup>16</sup> were not connected to National Road System at the time of the study in 2001. A comparative assessment of Human Development Index of 2001 and 2011 reveals the fact that the pace of human development<sup>17</sup> in districts that were not connected to the NRS in 2001, is significantly higher than those of other districts which were recorded with higher HDI in 2001.

Nepal Living Standard Survey 2010/11 confirms that during a period of the last 15 years, accessibility has improved significantly. Within the same period, the accessibility to the paved road has just doubled and whereas for accessibility to dirt road has increased by 37 per cent.

A comparative finding of the Nepal Living Standard Surveys carried out in 1994/95, 2004/05 and 2010/11 is given in the following table (Table 5). It shows that the improved connectivity has made a significant impact on enlarging the coverage of household in making access to the basic services within 30 minutes.

<sup>16</sup> Districts: Achham, Bajhang, Kalikot, Humla, Mugu, Doti, Jumla, Bajura, Rukum, Dailekh, Jajarkot, Rolpa and Baitadi.

<sup>17</sup> The average increase of HDI in 10 years (2001-2011) of these 7 districts (Bajura, Bajhang, Humla, Kalikot, Achham, Dolpa, Mugu) not connected to road network in 2001 is estimated to be around 29.7 per cent. The average increase for developed districts (Kathmandu, Lalitpur, Kaski, Bhaktapur), the increase is only 4.9 per cent.

Table 5. Percent of household within a reach of 30 minutes

Facility	Nepal Living Standard Survey		
	1994/95	2003/04	2010/11
Primary School	88.4	91.4	94.7
Secondary School			71.5
Higher Secondary School			56.3
Health Post/Sub-health Post	44.8	61.8	61.8
Public Hospital			33.6
Private Hospital/Clinic			53.4
Bus Stop	33.1	53.0	66.2
Paved Road	24.7	37.2	51.4
Dirt Road Vehicle Passable	58.0	67.6	79.8
Dirt Road Vehicle Impassable		94.3	97.1
Local Shops/shops		86.2	92.0
Haat Bazaar	41.4	60.7	64.0
Market Center	24.2	34.4	44.7
Agriculture Center	24.5	31.9	42.8
Cooperatives	25.9	33.7	53.9
Bank	20.7	27.8	39.9

Public and private buses are the most common means of long-distance travel in the country. Access to the bus stop is conditional upon access to the road. About 66 per cent of households are within 30 minutes of reach to the nearest bus stop. For nearly one-fourth of households, it takes around 30 minutes to 3 hours, and for around 10 per cent of households, it takes more than 3 hours to reach the nearest bus stop. Among development regions, the central development region has the best access to bus stops (78 per cent households can reach a bus stop within 30 minutes) while the far-western development region has the worst access, only 43 per cent of households are within this reach. In case of urban households, the mean time taken to reach a bus stop is much lower (12 minutes) than the time taken for rural households (73 minutes). Increase in access to road encourages mobility of goods and expands the labor market, which in turn positively affects living standards of people.

A survey gathered data on three types of roads: paved road, vehicle passable dirt road and vehicle impassable dirt road (including horse trail). Overall, 51 per cent households can reach the nearest paved road within 30 minutes, and three out of four households can reach the nearest paved road within two hours. Around 80 per cent of households, on the other hand, can reach the nearest vehicle passable dirt road within 30 minutes. Access to the paved road decreases with the household consumption quintiles. Meantime taken by a household in the richest quintile to reach the nearest paved road is 66 minutes and that for a household in the poorest quintile is 253 minutes.

External evaluation of six district project roads constructed and maintained by District Road Support Program<sup>18</sup> presents a strong case for the positive impact on the socio-economic aspect of the project area contributed by improved road connectivity (Starkey, Sharma, and Tumbahangfe, 2013). The findings are summarized in the following Table 6.

<sup>18</sup> Swiss Government funded project implemented in six districts: Kavre, Sindupalchok, Dolakha, Ramechhap, Okhaldhunga and Sindhuli.

Table 6. Impact of DRSP Roads

Impact	Indication	Link to	Remarks
<b>Access to Roads</b>	<ul style="list-style-type: none"> <li>The proximity to road increased (i.e., to four hours or less walk to road) for about 100,000 of the population residing around the six roads.</li> <li>Half of the beneficiaries are under one hour of the road.</li> </ul>	Connectivity	
<b>Access to Services</b>	<ul style="list-style-type: none"> <li>95 per cent of the sampled population using access roads to reach district headquarters.</li> <li>55 per cent of the population used the access roads to travel to the regional markets with small retail shops being set up along the roads.</li> <li>Increase in the number of women accessing health posts for antenatal care.</li> <li>Women could travel and come back the same day.</li> <li>Education facilities were opened nearby.</li> </ul>	Access to Market, Education and Health Facilities	
<b>Transport Services</b>	<ul style="list-style-type: none"> <li>Heavier vehicle such as buses, cars were more common.</li> <li>Fare prices were in the range from NPR 2.6/km in Kavre and Sindhupalchowk to NPR 6.9/km in Okhaldhunga.</li> </ul>	Affordability	
<b>Impacts of Roads on Rural Livelihoods</b>	<ul style="list-style-type: none"> <li>Although importance of agriculture has declined, it remains the main source of income followed by non-agriculture wage labor, micro-enterprises, etc.</li> </ul>	Support to Agriculture	
<b>Impact on Agriculture Sub-Sector</b>	<ul style="list-style-type: none"> <li>Increased productivity of cereal crops with increase in the cropped area for all crops, excluding maize.</li> <li>Commercialization of potatoes and oranges with increase in access to markets.</li> </ul>	Support to Agriculture	
<b>Impact on Off-Farm Activities</b>	<ul style="list-style-type: none"> <li>Increase in off-farm income from 7 per cent to 17 per cent.</li> <li>Increase in livelihood diversification of the population in the disadvantaged as well as non-disadvantaged groups.</li> <li>New skills related to masonry and gabion weaving were acquired through road construction due to which the population with the skills could earn higher wages.</li> </ul>	Support to Agriculture and skills development	
<b>Migration and Remittance</b>	<ul style="list-style-type: none"> <li>After roads were constructed, remittance contributed to only 2 per cent to the household income.</li> <li>Agriculture and local employment remained more important for income than remittances.</li> </ul>	Local income	
<b>Changes in Household Incomes</b>	<ul style="list-style-type: none"> <li>Average increase in the income since the roads were constructed was 25 per cent with Janajati and non-advantaged groups benefiting the most.</li> </ul>	Increase in average income	
<b>Changes in Households Expenses &amp; Savings</b>	<ul style="list-style-type: none"> <li>Only 55 per cent of the surveyed population said household produce was only sufficient for six months in a year.</li> <li>25 per cent of household expenditure was spent on buying food grains, which was followed by expenses on children's school fees and buying vegetables, oils and spices.</li> </ul>	Increase in household savings	

	<ul style="list-style-type: none"> <li>75 per cent of the respondents were part of at least one savings and credit group with majority of them being women.</li> </ul>		
<b>Changes in Living Standards</b>	<ul style="list-style-type: none"> <li>Increase in latrines from 7 per cent to 65 per cent for disadvantaged groups and from 41 per cent to 80 per cent for non-disadvantaged groups.</li> <li>Significant increases in the use of metal roofing sheets.</li> <li>Access to the national grid due to grid expansion with the advent of the roads.</li> </ul>	Access to better sanitation	
<b>Gender Empowerment</b>	<ul style="list-style-type: none"> <li>Increase in security for women as they could travel to their destination and return on the same day.</li> <li>Equal pay and work during construction of roads empowered the women.</li> <li>Formation of groups gave opportunities to share knowledge about women's health, education, etc.</li> </ul>	Gender equality	
<b>Economic Impact and Benefits</b>	<ul style="list-style-type: none"> <li>The economic rate of return (based on traffic growth) of the Dolakha-Singati road, Sindhulimadi-Bhimsenthan road and Ghyangdanda-21kilo road is greater than the projections of the development banks.</li> <li>Increase in the value of land in closer proximity to the road.</li> <li>The economic rate of return (based on agricultural production, land and social benefits) of the Dolakha-Singati road, Ghyangdanda-21 kilo road and Sindhulimadi-Bhimsenthan road are in the range 33-39 per cent.</li> </ul>	Economic return	
<b>Impact on Governance</b>	<ul style="list-style-type: none"> <li>The DRSP transparency tools helped to provide fair opportunities for the poor and women.</li> <li>Public audits and public hearing helped in smooth running of the project.</li> </ul>	Support to good governance	

## CONCLUSION

Inclusive, balanced, resilient, affordable, safe and sustainable road systems are pre-requisites of an efficient transport system in the country. Only an efficient transport system supports the socio-economic growth and avoids missed opportunities. The role of the transport sector is relevant to almost all SDGs. Transport connectivity acts as a catalyst in increasing livelihood of the majority of the population in the rural areas of Nepal. Locations that lack robust road transport systems not only deprive locals an opportunity to gain from trading in bigger markets elsewhere but also cause a loss of 25-30 per cent of the produce of those that dare to walk towards viable market areas. In addition to reducing the poverty level, the SRN and LRN have been seen to provide access to educational and health care services. Donor-supported projects through different projects, the Government of Nepal realizes the importance of road transport network in meeting the Sustainable Development Goals. However, lack of governance structures as well as proper monitoring and verification mechanisms and politically motivated constructions have been major hindrances in road construction. The issue of aligning transport sector development to SDGs (in terms of resource allocations, tracking results) has become further challenged by the ongoing institutional restructuring under federalization.

Nepal has pioneered in aligning the development activities (fiscal priorities and resource allocation) with SDGs, but the internalization of this process is yet to be functionally established. Sectors are yet to detail out their task/activities in line with SDGs target. The major challenge for the Government lies on: a) expediting macroeconomic policy reforms to promote domestic as well as foreign direct investment highly essential to harness infrastructure that drives the growth process; b) a complete needs assessment of the transport sector and its financing requirement under SDGs; c) disaggregating indicators of SDGs to match expectations of transport sector in areas specific to SDGs; d) Strengthening data, reporting, and progress dissemination system; e) coordinating SDGs implementation at the federal, provincial and local levels; f) improving governance around the SDGs; and g) putting apex monitoring and evaluation system in place.

The transport planning, design, technology adoption and implementation modalities have great influences on steering the results for the expected outcome, as can be seen through projects supported by Development Partners. The challenges lie in internalizing these well-documented initiatives into projects supported solely under Government funding. Hence, a strong nexus that exists between the transport sector and SDGs must be further explored and strengthened to achieve SDGs within 2030.

## REFERENCES

- Andres, L. Biller, D. Dappe, M.H (2013). Reducing Poverty by Closing South Asia's Infrastructure Gap. World Bank, Australian Aid.
- Bajracharya, B.N. (2010). Estimating Demand for Infrastructure in Energy, Transport, Telecommunications, Water and Sanitation in Asia and the Pacific: 2010-2020. ADBI Working Paper Series. Asian Development Bank Institute.
- Central Bureau of Statistics (CBS) (2014). National Population Census 2011. Nepal Planning Commission. Government of Nepal.
- Department of Roads (DoR) (2015). Mid-term Review of Sector Wide Road Study and Priority Investment Plan 2007. Ministry of Physical Infrastructure and Transport. Government of Nepal. Government of Nepal and Millennium Challenge Corporation. 2014. Nepal Growth Diagnostic Study.
- Ministry of Finance (MoF) (2016a). Annual Budget Speech 2016/17. Government of Nepal.
- Ministry of Finance (2016b). Economic Survey. Government of Nepal.
- Ministry of Physical Infrastructure and Transport (MoPIT) (2015). Road, Rail and Transport Development for Prosperous Nepal, Five Year Strategic Plan, 2072. Government of Nepal.
- Ministry of Urban Development (MoUD) (2017). National Urban Development Strategy. Government of Nepal.
- National Planning Commission (NPC) (2015a). Poverty Census. Government of Nepal.
- National Planning Commission (2015b). National Review of Sustainable Development Goals. Government of Nepal.
- National Planning Commission (2015c). National Report (Preliminary) on Sustainable Development Goals (2016-2030). Government of Nepal.
- National Planning Commission (2016a). Budget Allocation: Annual Development Program (Part I) 2073/74. Government of Nepal.
- National Planning Commission (2016b). Annual Development Plan. Government of Nepal.
- National Planning Commission (2016c). Approach Paper, Fourteenth Plan. Government of Nepal.
- National Planning Commission (2017). Sustainable Development Goals, Baseline Report (Draft). Government of Nepal.
- Starkey, P. Sharma, S. Tambahangfe, A. (2013). External review of District Roads Support Project: Final Report. Building Roads and improving livelihoods in Nepal. Swiss Agency for Development and Cooperation (SDC). District Roads Support Programme (DRSP).
- WHO, UNICEF, UNFPA, World Bank Group and United Nations Population Division. n.d. Maternal mortality in 1990-2015. Maternal Mortality Estimation Inter-Agency Group.