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ENGLISH ONLY

**UNITED NATIONS
CENTRE FOR REGIONAL DEVELOPMENT**

In collaboration with

**Ministry of Physical Infrastructure and Transport (MoPIT), Nepal
Ministry of the Environment (MOE), Japan
United Nations Economic and Social Commission for Asia and the Pacific (UN ESCAP)**

**Intergovernmental Ninth Regional Environmentally Sustainable Transport (EST)
Forum in Asia
17-20 NOVEMBER, 2016, KATHMANDU, NEPAL**

Accelerated Action on Rural Transport in Asia-Pacific Region

(Background Paper for Plenary Session 6 of the Provisional Programme)

**Final Draft
November 2015**

This background paper has been prepared by the Partnership on Sustainable, Low Carbon Transport, and the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) for the Eighth Regional EST Forum in Asia. The views expressed herein are those of the authors only and do not necessarily reflect the views of the United Nations.

List of Abbreviations

AADT	Annual Average Daily Traffic
ADB	Asian Development Bank
ASCAP	Asia Community Access Partnership
CBA	Cost-Benefit Analysis
CE	Cost Effectiveness
CODATU	Cooperation for Urban Mobility in the Developing World
COP	Conference of the Parties
DFID	Department for International Development
ESCAP	Economic and Social Commission for Asia and the Pacific
EST	Environmentally Sustainable Transport
GDP	Gross Domestic Product
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
IDA	International Development Association
IMTs	Intermediate means of transport
INDCs	Intended Nationally-Determined Contributions
IRAP	Integrated Rural Access Planning
IRF	International Road Federation
IRTP	Integrated Rural Transport Planning
JICA	Japan International Cooperation Agency
KOICA	Korea International Cooperation Agency
LDCs	Least Developed Countries
LICs	Low income countries
MDB	Multilateral Development Banks
MICs	Middle income countries
MoRD	Ministry of Rural Development (India)
NAPAs	National Adaptation Programmes of Action
NAPs	National Adaptation Plans
NDF	Nordic Development Fund
NGO	Non-governmental Organization
NRAP	National Rural Access Programme (Afghanistan)
PIARC	The World Road Association
PMGSY	Pradhan Mantri Gram Sadak Yojna (Prime Minister's Rural Roads Program, India)
RAI	Rural Accessibility Index
RAP	Rural Access Programme (Nepal)
RAIP	Rural Access Improvement Project (Afghanistan)
ReCAP	Research for Community Access Partnership
SDG	Sustainable Development Goal
SEACAP	South East Asia Rural Community Access Programme
SLoCaT	Partnership on Sustainable Low Carbon Transport
SUTP	Sustainable Urban Transport Project
TILD	Transport Induced Local Market Development
UN	United Nations
UNFCCC	United Nations Framework Convention on Climate Change
UNITAR	United Nations Institute for Training and Research
WB	World Bank
WDR	World Development Report

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Accelerated Action on Rural Transport in Asia-Pacific Region

Partnership on Sustainable Low Carbon Transport (SLoCaT) and United Nations Economic and Social Commission for Asia and the Pacific (ESCAP)

I. Introduction

Why rural transport is a key topic for the EST Forum

Although the Ninth Environmentally Sustainable Transport (EST) Forum in Asia is focused to a large extent on climate adaptation and disaster resilience for transport in urban settings, rural transport is an issue that is not to be overlooked, when discussing sustainability in transport for several key reasons. Firstly, rural poverty is a major impediment to realizing sustainable development goals; secondly, rural areas produce the food products for consumption in growing urban areas; and thirdly, climate change will create significant impacts for rural transport as well as urban transport.

Consequently, this paper will discuss the nexus of rural poverty and rural transport, explain why access to markets is important for the supply of cities with agricultural goods as well as for poverty alleviation, and show how rural transport infrastructure and services must be adapted to climate change to increase resilience to extreme weather events. The treatment of rural transport within the recently-adopted Sustainable Development Goals (SDGs) and is an important focus of this paper as well. With this paper, we are not aiming to address these elements in isolation, but rather to emphasize the critical nexus between them, thus defining rural connectivity as a function of rural development, rural resiliency, and rural empowerment.

On the topic of rural resiliency, we are not focusing solely on climate or disaster resiliency, but rather on a broader definition of socio-economic resiliency. For instance, improved rural transport systems and connectivity (along with better supply chain logistics) will contribute to the socio-economic resiliency of rural communities and farmers in terms of rural productivity, income and livelihood security. Further, improved rural transport and accessibility will have significant implications prior to, during, and after extreme events (e.g. more efficient evacuation, relief mobilization, relocation and rehabilitation). Finally, investment towards building resilient society vis-à-vis resilient rural transport infrastructure and services can progressively reduce government expenditures by limiting the extent of damages and losses during extreme events. Thus, resilient rural societies can not only achieve required disaster risk reduction, but can also develop capacities that will be pivotal to achieving key goals post-2015 development agenda.

Relation of Rural Transport to SDGs and COP21

Rural Transport and SDGs

Transport was not explicitly included among the Millennium Development Goals (MDGs) and this omission was widely viewed in the transport community as a missed opportunity to create a stronger linkage between transport and economic development to advance the attainment of the MDGs, as transport is undoubtedly a substantial enabler to the achievement of the MDGs. Now,

a new 15-year development framework, the Sustainable Development Goals (SDGs), has been adopted by the United Nations General Assembly in September 2015. This time, transport is reflected in the framework as a key contributor to achieving the sustainable development goals. The SDGs comprise 17 goals and 169 targets; five of those targets directly involve transport, and attaining at least another six will critically depend on it (Figure 1, SLoCaT Partnership 2015a).

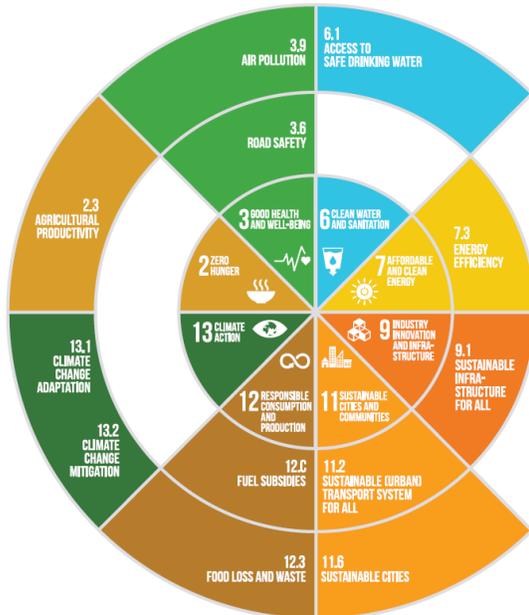


Figure 1. Direct and Indirect Transport Targets in Sustainable Development Goals

The transport sector is mainstreamed into many of the SDGs, in areas including energy, food security, health, infrastructure, urban development, and climate change. The mainstreaming of transport across the SDGs — in many cases explicitly through supporting targets — underscores its importance as a critical crosscutting sector to enable the achievement of goals in other sectors. Indeed, in some cases, the largest benefits of action in transport are often visible in other sectors.

In the context of rural transport and rural access, SDG 1 (“End poverty in all its forms everywhere”) and SDG 2 (“End hunger, achieve food security and improved nutrition and promote sustainable agriculture”) are central goals, as access is by far the largest contributor to poverty reduction in remote communities and is a critical enabler of shifting from subsistence to commercial farming. Rural transport makes specific contributions to the following targets:

- Target 1.4: By 2030, ensure that all men and women, in particular the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services, ownership and control over land and other forms of property...
- Target 2.1: By 2030, end hunger and ensure access by all people, in particular the poor and people in vulnerable situations, including infants, to safe, nutritious and sufficient food all year round
- Target 9.1. Develop quality, reliable, sustainable, and resilient infrastructure, including regional and trans-border infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all.

- Target 11.2. By 2030, provide access to safe, affordable, accessible, and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities, and older persons.

Rural transport is also a critical enabler of achievement in other sectors' targets, such as access to safe drinking water (Target 6.1), reduction of food loss (Target 12.3), and climate change adaptation and mitigation (Target 13.1).

In addition, specific rural transport-related objectives indicators may be included as a means to track progress toward the SDGs and supporting targets. Specifically, a green indicator (classified as indicators with general agreement at IAEG-SDG meeting) proposed under Target 9.1 on sustainable infrastructure has included rural access by referring to the share of the rural population who live within 2km of an all season road.

Efforts by the sustainable transport community to influence the post-2015 development agenda are still underway, as the accompanying indicators will remain under development until anticipated adoption in March 2016.

Rural Transport and COP21

The outcomes of the COP21 conference in December 2015 will have broad implications for the on-going resilience of rural transport both through top-down United Nations Framework Convention on Climate Change (UNFCCC) processes and through bottom-up country-level adaptation planning, noting the particular vulnerability of rural areas.

While adaptation is a growing focus within the UNFCCC framework, adaptation in the transport sector could be better integrated in global policy mechanisms on climate change and sustainable development. As an example, the COP21 input report from the UNFCCC Adaptation Committee gives little detail on sectoral approaches to adaptation, and associated references make only superficial reference to transport; thus, this mechanism could benefit from further detail on sectoral approaches, including transport.

Furthermore, the need for adaptation is reflected in a general manner in the national adaptation plans (NAPs) and Intended Nationally Determined Contributions (INDCs) that countries are submitting to the UNFCCC to record their climate change related policy commitments. While developing countries (or non-Annex I Parties) have called for greater emphasis on adaptation, more effort is required to incorporate their urgent and ongoing adaptation priorities into UNFCCC planning and funding mechanisms.

Thus, the ultimate position of rural transport vis-à-vis global climate processes will depend greatly on the terms of an anticipated agreement at COP21, and in the detailed inclusion of adaptation and resilience in transport sector-specific climate plans – both in urban and rural context – before the period of implementation begins in 2020.

Rural Transport, Poverty and Equity

Importance of connecting rural people to reduce poverty/isolation

Many of the world's poorest people live in rural areas, isolated by distance and terrain from employment and economic opportunities, markets, healthcare and education. Lack of basic infrastructure (paths, trails, bridges and roads) and access to transport services makes it difficult for poor people to access markets and services, including in many rural areas of Asia. There is

clear evidence that rural isolation is associated with low agricultural productivity (e.g. due to poor access to markets and modern agricultural technologies), and it is also linked with poor health outcomes (e.g. high perinatal mortality rates despite globally-available solutions) and low school enrollment. Furthermore, a lack of rural access can further isolate the elderly and people with disabilities.

Twenty years ago, little attention was paid to the poverty implications of transport investments: it was assumed that investments in urban and rural roads stimulated economic growth and social development. Recent research has shown that transport investments tend to benefit the ‘non-poor’ most, and that investments must be consciously designed to avoid further impoverishing poor people. Where transport investments have stimulated economic growth, the poor have often benefitted only marginally; in many cases, they have not had the resources to take advantage of the opportunities afforded by better access. Good transport infrastructure is a necessary condition for economic growth and poverty alleviation, but transport investments alone cannot address the problems of the poorest households.

The importance of rural accessibility

In broad terms, rural transport is comprised of both internal trips in and around the village (the so called “first mile,” as shown in Figure 2), as well as external trips outside the village to reach local markets and social services. While for internal transport often footpaths, tracks and earth roads are used, external transport is dominated by gravel and paved roads, bridges and river jetties, among other infrastructure.

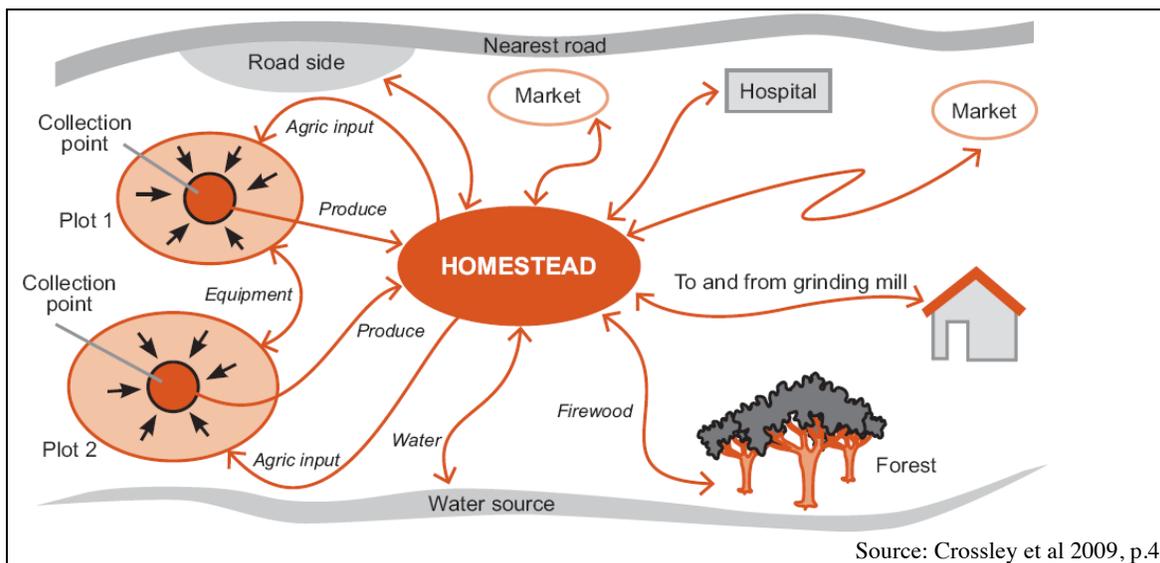


Figure 2. Local transport destinations

The primary way rural people access markets and services is through roads that connect rural communities to market towns, and in some regions waterways are also important. Many people live more than two kilometres (a roughly 25-minute walk) from the nearest all-season road (see below discussion of the Rural Access Index), and in very remote areas, communities may be more than a day’s walk from a road. There is much evidence that building roads (and/or trails and footbridges) to connect rural communities to the road network provides numerous benefits and reduces the numbers of people in extreme poverty. Trails and roads also make it more likely that service providers (e.g. health workers, teachers) are able to reach isolated rural areas.

There is strong evidence that providing basic road connectivity to rural villages can generate significant social and economic benefits. Evidence from Ethiopia, Ghana, Nepal, Uganda and elsewhere shows that upgrading footpaths to basic motorable roads provides much greater benefits than upgrading existing rural roads to all-weather quality. Analyses from China show that the greatest returns to investments came from the construction of basic low-volume rural roads. The investment in such roads had a greater influence on poverty reduction and national GDP than investments in higher-volume and better-quality roads. Investment in rural roads leads to greater school enrolment and can lead to better staffing at village primary schools (based on evidence from India, Zambia and elsewhere).

Agricultural Production and Food Security

1. Improved agricultural production and marketing

Rural transport makes a key contribution to social resilience as an enabling factor for food security. Increased agricultural production is critically important to feed the growing world population, especially in developing countries. Global food production must increase 60% from 2005-2007 levels to meet projected demand by 2050. Roughly 2.5 billion people derive their livelihoods from agriculture, and in many developing countries the agricultural sector accounts for over 30% of gross domestic product (GDP). (FAO 2014).

An efficient rural transport system is crucial to developing agriculture and reducing rural poverty. Reducing rural transport costs can raise farm-gate prices, increase farmers' incomes and help reduce the price of food in urban areas. It can also facilitate timely distribution of farm inputs (e.g. fertiliser, insecticide), increase agricultural yields and extend cultivated areas, and reduce post-harvest losses. In India, fruit and vegetable post-harvest losses amount to 40% of total production due in part to a lack of reliable rural transport options (though this issue is being addressed by rural road improvement program described in Box 1) (World Bank 2008). Yet at present, rural transport systems in most developing countries are still far from optimal.

In India, the Pradhan Mantri Gram Sadak Yojna (PMGSY) (the Prime Minister's Rural Roads Program) was launched in 2000 under the Ministry of Rural Development (MoRD). The aim was to provide all weather farm-to-market connectivity to all population centers of more than 500 people (and more than 250 people in hill, desert and tribal areas). A key development has been more transparent and rational organization and planning procedures, which allows funds to be used to increase efficiency and sustainability. Another important step is the creation of State Rural Roads Developments, which have allowed individual states to develop capacity in rural road management and monitoring of various agencies.

Box 1: Rural Roads Improvement Program in India¹

The concept of the "first mile" is also crucially important for agricultural marketing. The costs of first-mile transport may account for over a fifth of total transport costs in the transport chain, as described in Box 2. First-mile movements usually involve transporting crops by humans (e.g. headload or backload) or IMTs (e.g. non-motorised or animal transport).

A study in Nyeri County, Kenya found that the costs of transporting onions over the first two kilometres accounts for around 10% to 20% of the net income that farmers would derive from sale and production. Due to difficulties of using trucks on low-quality tracks close to farms, produce had to be transported by humans, motorcycles, and animal carts. The study found that these forms of transport cost 16 to 30 times more on a per tonne-km basis than truck transport (Njenga et al 2014).

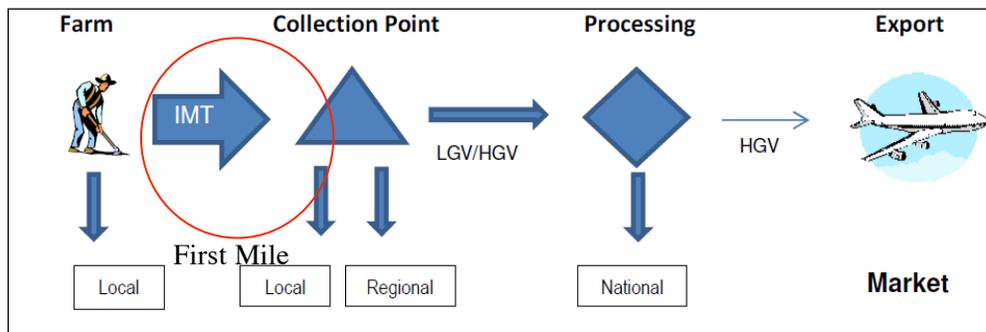
Box 2: First-mile Transport Costs in Kenya

¹ Rural Roads: A Lifeline for Villages in India. World Bank. <http://bit.ly/1MK0ZZX>

2. Facilitation of modern agricultural value chains

Exports of horticulture, livestock, fish, cut flowers, and organic products now make up 47% of all Developing Country exports, far more than the 21% for traditional tropical products such as coffee, tea, and cotton (e.g. flowers from Kenya, cherry tomatoes from Senegal, green beans from Niger, organic cucumbers from China are offered more and more in supermarkets of industrialized countries.). Additionally, since the 1980s in many developing countries, the proliferation of supermarkets has restructured logistics of agricultural markets. High value and high quality products are demanded by the rising middle class, and farmers are increasingly producing high quality products.

The marketing of these high-value products requires efficient logistic chains, particularly domestic transport, handling, and packaging. The new markets demand quality, timely deliveries, improved and innovative upstream and downstream practices, and this poses special challenges for smallholders and transporters. Figure 3 gives a general overview of how modern logistic chains in Kenya are organised.



Source: Kendat et al (2013)

Figure 3. Structures of modern logistic chains in Kenya

The example of the modern value chains shows that a simple planning approach that focuses exclusively on rural road improvements is far too narrow in order to facilitate the development of modern value chains. Only an integrated regional planning method may tackle these challenges, which must take the following factors into account (Sieber 2009):

- Improvement of road conditions;
- Organisation of farmers for marketing of products;
- Establishing contacts with commercial marketing enterprises;
- Facilitation of private investments in local grading sheds, cooling facilities, warehouses, and vehicle fleets;
- Endowment with modern communication facilities;
- Provision of transport and vehicle hiring services; and
- Training for the production according to quality standards.

At the regional level, conventional and modern transport chains may be planned using the approach of basic access provided by multimodal transport, embedded in the concept of central locations and combined with modern communication infrastructures, which will ultimately provide better integration of urban and rural areas, as described in Box 3.

The World Bank funded “Gansu Rural-Urban Integration Project in the Peoples Republic of China” aims to connect 48 villages and impact 168,000 people in rural communities. Intended outcomes include improved agricultural supply chain management and increased food safety and quality by enabling farmers to harvest

and market crops efficiently, while encouraging social integration between urban and rural. China's Logistics Industry Restructuring and Revitalization Plan is intended to improve agricultural produce value chains and goods circulation, and China's Ministry of Transport is working with the Asian Development Bank on its '13th Five-Year Plan', which aims to improve linkages between urban and rural community.

Box 3: Agricultural Produce Value Chains in the People's Republic of China²

The positive message from these developments is that small scale farmers may benefit from this development by establishing commercial farms, leaving subsistence behind and thus escaping the poverty trap. Additionally, considerable value can be added (and new jobs created) through processing, packaging and cooling of agricultural products.

Access to Markets and Basic Services

The Rural Accessibility Index (RAI) is the most accepted measure of rural access. The indicator measures the percentage of rural people who live within two kilometres (a roughly 25-minute walk) of an all-season road as a proportion of the total rural population. An "all-season road" is a road that is motorable all year round by the prevailing means of rural transport (e.g. a truck which does not have four-wheel-drive). Occasional short interruptions are accepted, particularly on roads with little traffic (Roberts et al 2006).

It is estimated that nearly one billion of the world's poor remain marginalized without direct access to an all-weather road, and only 56% of the rural population among World Bank International Development Association (IDA) countries had access³ to an all season road in 2006. Among EST member countries, less than one third of the populations of Afghanistan (22%), Myanmar (23%) and Nepal (17%) has access to an all-season road within two kilometers, and less than half of the populations of Bangladesh (37%), Bhutan (47%), Mongolia (36%) and Thailand (33%) enjoy such access (Figure 4).⁴

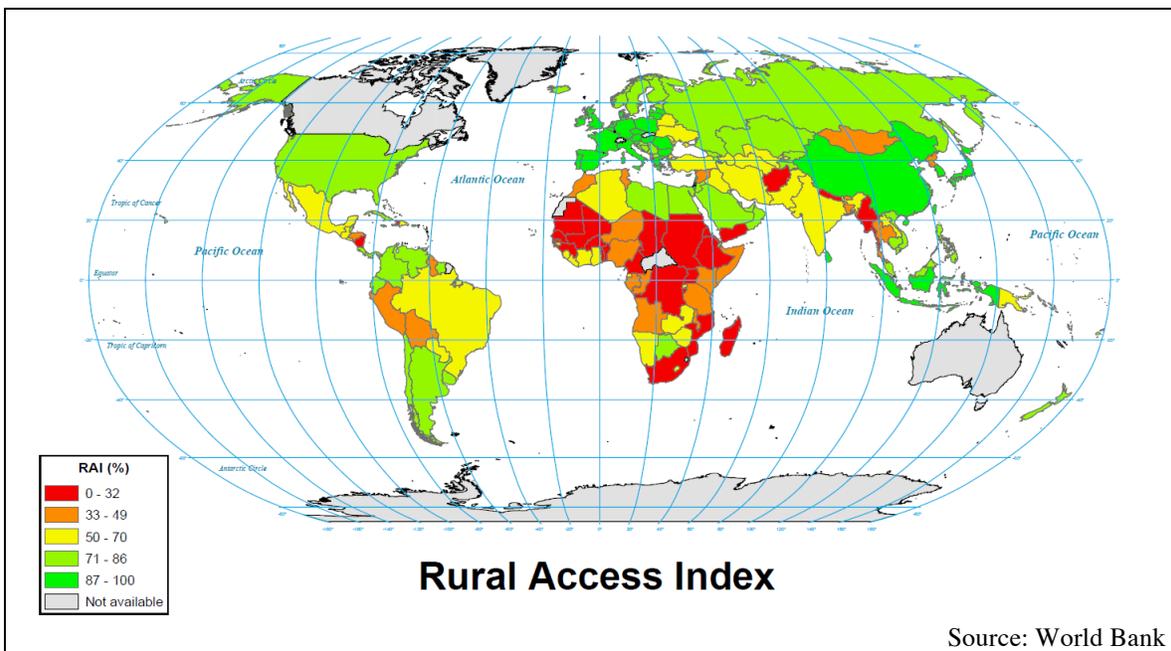


Figure 4. Share of population within two-kilometer walking distance from all-season road

² ADB's Strategy and Transport Policy Study on Promoting Logistics Development in Rural Areas in the PRC

³ Access is defined as less than a two-kilometer walk to an all-season passable road.

⁴ Rural Access Index: all countries (and territories) included in WDI. <http://bit.ly/10OR1XA>.

Thus, there is a clear need to improve rural access to basic services within these and other countries, though efforts are underway in countries such as Afghanistan, as described in Box 4.

The Government of Afghanistan established the National Rural Access Programme (NRAP) in 2002, which was supplemented by the Rural Access Improvement Project (RAIP) which is now in its third phase. The focus of the third phase is addressing the lack of all-season accessibility in the four northern provinces of Sari Pul, Samangan, Balkh, and Jawzjan, addressing the lack of a road maintenance management system in these areas, and building local capacity to address these issues.

Box 4: National Rural Access Programme in Afghanistan⁵

1. Access to markets

Access to markets is an essential condition for rural development. If subsistence farmers lack sufficient access to markets, they will be excluded from the monetary economy and thus will remain in poverty. 45% percent of the area in low-income countries (LICs) and 51% in the lower middle-income countries (MICs) are located more than five hours away from the next market. This picture changes considerable when shifting from area to population, as 45% of the population in LICs is within one hour from the next market. About half the agricultural area in these remote regions has sufficient agricultural potential, but lacks sufficient infrastructure for proper integration into the wider economy (WDR 2008, p.54).

Numerous studies⁶ confirm the positive impacts rural roads have on Transport Induced Local Market Development (TILD). For example, Ren Mu and Dominique van de Walle (2009) researched the rural roads and local market development in Vietnam and found “significant average impacts on the presence and frequency of markets and on the availability of various services.” The project also resulted in households switching from agriculture to non-agricultural, mostly service-based, activities. These studies also establish the positive impact TILD has on rural poverty.

2. Access to health care

Reliable rural transport infrastructure and services are crucial to overcoming the potentially fatal ‘three delays’ in health care (particularly perinatal care); the decision to seek health care, the travel to reach care and the treatment within the healthcare system (including referrals) all depend on access to transport.

Where people are far from roads, their decision to travel is influenced by the problems of travelling by human portorage, stretchers, animals, bicycles or motorcycles. Atsushi (2015) researched rural road improvements in Brazil and found “that improved rural roads changed people’s transport modal choice. People used more public buses and individual motorized vehicles after the rural road improvements.” De Walle (2002) confirms these findings through his research in Vietnam: “The time needed to reach the closest hospital in case of a serious injury declined by three-quarters of an hour. In general, however, there are positive impacts on the availability of services in the project communes; in particular, increases in pharmacies.”

Sufficient access to infrastructure and transport services are also needed to ensure medical staff and supplies are available in health centers. Evidence from India, Nepal and other countries suggests that constructing and maintaining rural roads, paths and bridges leads to improved health

⁵ UNOPS website. Rural Access Improvement Project Phase III. <http://bit.ly/1PBx3Vc>

⁶ References: Bangladesh: Khandker (2006) Kandler/Bär (2004), Brazil: Atsushi (2015), Cambodia: KfW (2013), Cameroon: Raballand (2009), China, Yunnan: Qiaolun Ye (2006), Indonesia: Gertler et al (2014), Papua New Guinea: Gibson et al (2002), Peru: Escobal (2003), Vietnam: Van de Walle (2009), Van de Walle (2002).

outcomes and healthier rural communities (although there can be complex interactions and externalities that affect poor people).

3. Access to educational opportunities

Numerous of the above quoted studies confirm the positive impacts rural roads have on education. This is confirmed by Atsushi (2015) who researched rural road improvements in Brazil and found that school attendance increased, particularly for girls. Better rural accessibility has also been found to increase female school attendance in Morocco, and female school enrollment rates in Pakistan, and in Vietnam, Ren Mu and Dominique van de Walle (2009) state that “most notable, the project had significant, early and sustained impacts on primary school completion rates.” (SLoCaT and AFCAP 2015).

II. Key Issues for Rural Transport and Rural Access

Rural Transport Infrastructure

Rural roads, by definition, are often unpaved and narrow, often consist of a single lane, and generally carry very low traffic volumes (e.g. less than 200 vehicles daily), but they are a vital means of conveyance for rural communities. Rural roads are not to be confused with inter-urban expressways and national highways that run through rural areas.

Rural road investment may take many forms, from spot improvements of an earth track, to laying a gravel surface, through to the building of a bitumen or concrete-surfaced road. Because the costs of moving goods by alternative methods are so expensive (i.e. head loading can be up to 30 times more expensive per ton km than by a medium truck) vehicle passability is extremely important.

It is widely accepted that for efficient and consistent allocation of resources, prioritization for transport projects should be on the basis of economic cost-benefit principles, selecting those projects that demonstrate the highest economic rates of return. In practice the task is much more complex. Political interests may impose certain distortions in allocations, and rural roads should have a wider criteria for justification because their core economic case may not always be initially satisfactory.

The Department for International Development (DFID)-funded South East Asia Rural Community Access Programme, (SEACAP) provided a potential platform for developing guidance on prioritization methods. Clearly the case for providing rural access goes far beyond a traditional cost-benefit analysis (CBA) and needs to take into account many other considerations (e.g. food security, economic opportunity, social, health and education needs of remote communities).

Ultimately these justifications can be strengthened by being more efficient in the delivery of rural access projects thus reducing the need for funding. Much work has been done to research, produce evidence and pilot innovation that has proved on a value-for-money basis that whole life costing, and making the most of the opportunity of adapting local resources and materials – in addition to increasing the participation of local people in the planning, implementation and maintenance of rural access – provides the basis of sustainable rural development.

Funding of rural transport infrastructure

1. Cost Benefit Analysis

The methods of cost-benefit analysis were originally developed for projects in more urbanized and high-traffic density developed countries. In such cases consumer surplus calculations would include cost and time savings in terms of vehicle and journey times, covering a range of vehicles from motorized and non-motorized vehicles and pedestrian traffic and agricultural production gains. (Van De Walle, 2000)

A drawback in using cost-benefit analysis is when using willingness to pay estimates for the estimated benefits. Since the rich have a higher willingness to pay, there may be a bias and lead to under investment in rural roads serving the poorer populations. Another call to move away from cost benefit analysis would be when traffic is low and the true impact of roads may not be captured by traffic cost savings. (Hine 1982; Gannon and Liu, 1997; Van De Walle, 2000)

In this case there is an argument to measuring the producer surplus gains brought about by the induced agricultural development. However even when both consumer and producer surplus are factored in, there is a likelihood of still under-funding rural roads. Health, education and distributional gains have been systematically ignored. These factors result in a high proportion of rural roads benefits being ignored and when ranking investment in terms of observable benefits, would lead to under investment. (Carnemark et al. 1976, and Beenhakker and Chammari,1979)

Consumer surplus measurements do not consider the cost savings for consumers for goods that are non-transport even though they are also impacted with lower costs as a result of the roads. In the same vein, producer surplus measures are also incomplete as non-farm employment is not factored in. Another compounding factor of this calculation is that the data quality is often poor, thus resulting in generalizations that do not consider household and geographic specific factors when considering marginal benefits. (Van De Walle, 2000)

Considering economic viability, using whole life costing there are a range of varying procedures to establish the associated benefits and costs of investments in rural roads. In terms of economic benefits, reduced roughness of the road, reduced travelling time due to shorter routes, faster speeds and changes in vehicle compositions can reduce vehicle operating costs. In the long term there may also be changes to road maintenance costs.

When evaluating these projects, economic analysis considers projects from a national point of view. Using “economic” prices and including the costs and benefits regardless of who incurs them. Sometimes, distribution weighting is used, on average each dollar of benefits is treated as being of equal value to each individual for all income levels, gender or status. This viewpoint does not favor equity and may lead to under investment in rural roads. (Fouracre, Dyson, O’Neill, 2006) While standard economic CBA is not suitable, some methods still do include it in a basic format to bolster the reliability of the ranking.

One example is the Ghana Method. When ranking is used, the composition of the population benefitting from the road is directly used as a proxy of the social benefits, either solely or with other traffic based benefits. For example for a project in Andhra Pradesh, the cost is divided by the population served for the cost effectiveness ratio as an indicator of the project effectiveness (Lebo and Schelling, 2001). However, if the aim is to improve road standards and connectivity, the road condition itself is not factored into the measure. Given that this should be highly correlated with the cost, some measure can be said to be included in the index, even if not

directly. This is a gap in the measure, because those are vital factors that impact the road effectiveness and so the cost effectiveness of the measures employed.

A second approach is to derive separate indices for passable and impassable roads. For impassable roads, ranking is prioritized by the minimum cost per head of establishing the access. For passable roads the prioritization index would measure the ratio of estimated number of trips for direct services like agriculture and fishing. The given level of access change is calculated by the difference in rating before and after rehabilitation. This is then compared with the rehabilitation cost per km.

A third approach is to identify the social benefits as the product of the population multiplied by the prospective change in transport costs. This has been used in the recent Ghana feeder road prioritization procedure, where seasonal accessibility is a major cause for concern. Therefore a more complex measure of benefits was used, which incorporates both motor vehicle users and the hinterland population. This measure of accessibility change is common to both in the Ghana Prioritization Index.

Given the scale of road projects, creating the infrastructure requires a magnitude of resources that causes governments and aid donors to consider the value of these investments on grounds beyond economic viability, it is necessary to also consider environmental and social impacts (Fouracre, Dyson, O'Neill, 2006), as described in the following alternatives to CBA.

Alternatives to Cost Benefit Analysis

1. Ranking of Projects

Social benefits and ranking criteria are used more for rural access and feeder road programmes as compared to conventional transport CBA as the former is more appropriate for when road access is created where before there was none which dramatically affects trip making and for the latter, the benefits would be limited to savings in transport costs. (Fouracre, Dyson, O'Neill, 2006) For rural roads, 'ranking' or 'screening' procedures are used to prioritize low volume feeder roads. These include indicators or measures of social and economic demand, need or benefit that differ from conventional economic appraisal. A large emphasis is placed on consulting with local communities to determine selection and prioritization of road investments. As a result, rankings are more subjective, which leads to a wide variation in the formulation of rural road criteria and knowledge becomes fragmented.

Ranking criteria are advantageous in that comparatively, there is speed and simplicity, transparency, the ability to incorporate a measure of social benefits and the potential to incorporate community choice. However, drawbacks lie in that weighting may combine factors that are not compatible, and may vary widely across countries where they are based in large part on qualitative judgment. This may lead to economically inefficient outcomes and a consequence would be that poverty reduction may not be sustainable.

A minimum rate of return may also be set along with a stated budget. It is necessary then to devise a method to gauge if the budget set is appropriate and a complementary method to prioritise projects. An index can be developed pertaining to the benefits from the investment weighted by the expected benefits and the degree of poverty of the recipients. The projects to be selected should then be ranked based on their ratios of benefits to costs. (Van De Walle, 2000)

2. Cost Effectiveness Calculations (CE)

Another alternative to CBA can be referred to as multi-criteria analysis. The focus here is to obtain an outcome indicator that measures the social value of a project and considers the next best alternative forgone to quantify its value. This measure also focuses on the given program and there is no need for consistency with other programs. This measure allows for a wider set of benefits and is usually used when the benefit is difficult to quantify especially when traffic volume is low (e.g. less than 50 vehicles per day) yet there is potential for considerable social benefits.

This method is adopted by first selecting projects that pass an arbitrarily-defined level of costs. Those above will still be subject to a cost benefit analysis on efficiency grounds. For those that pass the test, within these projects, the sub projects will be subject to the social criteria which mostly use the population per unit cost as a measure. However, it does not follow that cheaper projects will necessarily lead to higher benefits, and potential gains from a more cost intensive area may have greater gains from access than the cheaper projects. Another area of contention is that the weighting of variables is subjective and when decided by external parties may not be as accurate as local valuation of benefits. Thus, a balance between the benefits deemed by the technical experts and that of locals is important in this aspect. (Van De Walle, 2000)

3. Challenges in quantifying social benefits of rural roads

One issue with quantifying social benefits associated with rural roads rehabilitation is that local areas are unique in cultural norms, belief systems and economic structure. For example, while technical experts may assert that better road access could lead to more children benefitting from higher education and thus increased long-term earnings, such education may not be valued (e.g. because children may be more useful working, cultural beliefs about the usefulness of education accruing solely to boys). Increased earnings may also be speculative, as improvement to roads alone does not always catalyze and sustain economic reform as an isolated variable. Due to these factors, calculations may be made across geographic entities which oversimplify cultural factors and thus can lead to significant biases.

In sum, weighting of variables can greatly influence outcomes, yet these variables may be highly subjective and open to manipulation. In addition, it may be difficult to achieve an adequate definition of poverty, which is also subjective and cannot be easily generalized across differing cultures and communities. A further challenge is to allocate proper amount of funding for a given outcome and to decide if the initial amount is too little or too much.

A Potential Way Forward

In the above discussion we see that priority in project prioritization is often placed on efficiency over equity, which can lead to a bias against projects that benefit poorer people in remote areas. One way forward would be to look simultaneously at areas where both poverty and economic potential are high and access is low. Using proxy data for the three criteria for communities in Vietnam, it was determined that there was little correlation between the factors and so assuming that one factor alone would be sufficient in ranking projects could lead to biases in selection. Thus, weighting these three factors in combination can help to prioritize projects and the intersection of the three would be where the returns to road investments would be the highest.

In road appraisals the problem comes back to the two objectives of equity and efficiency and which of the two to prioritize. Variables pertaining to attributes of the road and the people in specific communities would determine the overall benefits attained by the project. To facilitate

analysis we look at projects and confine their impacts to the communities surrounding them, which would then need to be weighted in terms of eventual impact. Variables determining the social benefits would be the other factor to consider. These variables would help identify the socio economic state of the people in the community, and the poorer the community the higher the value of this social weight. Ultimately a value judgment would determine the importance attached to equity versus efficiency based on how the infrastructure benefits and social welfare indices are scaled. To ensure the best outcome, a multi disciplinary group comprised of government and non-government experts may need to be assembled.

Using this method the ratio of benefits to social weight would determine the projects chosen. However given the innate differences in projects and communities, it would be realistic to expect differing rates of return for differing scenarios, and thus it is not possible to use just one rate. For the non pecuniary benefits, estimates from evidence on other projects can be used to identify benchmark rates for differing types of projects, since projects may not be easily transferable, however, this could require significant set-up costs and time for data collection and analysis. (Van De Walle, 2000)

However, it is not necessary to consume resources in time and money doing a detailed analysis of the procedures and prioritization of roads. Given that the funding comes in cycles, if a road is not prioritized in the first round, it can be improved in the next. What is most important is to develop a time- and cost-efficient procedure that local authorities could successfully replicate based on the relevant prioritization of roads. (Fouracre, Dyson, O'Neill, 2006)

Importance of maintenance regimes to preserve asset value of rural transport infrastructure

The biggest bottleneck related to rural infrastructure is its poor condition, which hampers all-season access to markets and causes excessive vehicle operation costs. A poor road maintenance regime means an inevitable increase in fares and goods tariffs as explained in Box 5. A comprehensive overview on these issues is provided by the Rural Transport Knowledge Base (DFID et al, not dated).

In Pakistan, operators, particularly of pickups, are known to add a 50-100 % premium to prices on rough roads to cover increased repair requirements (Essakali 2005, p.7). In Iringa Region, Tanzania, traders, using a hired vehicle, incur three times the cost for travelling on a gravel track compared with travelling on a paved road (IT Transport 2009). In rural Kinshasa, Congo, transportation is twice as expensive on poor roads as on good quality paved roads (Minton and Kyle 1999, p.494).

Box 5: Costs Incurred from Poor Maintenance Practices

Much has been written on the problems of road maintenance, which shall not be reiterated here. However, the most essential points shall be highlighted briefly: Many countries spend just 20-50% of required maintenance of their road network (Heggie/Vickers 1998). For the private sector, each dollar saved on road maintenance causes three dollars of higher vehicle operating costs. As rule of thumb, a fuel levy of US 10 cent/liter would be sufficient to maintain the entire road network⁷.

Rural roads should thus be part of a road sector reform that includes features such as agencies rather than government departments, independent road boards representing user groups, second

⁷ Benmaar (2006, p. 12) reports that in Sub Saharan Africa the average fuel levy for petrol and diesel is 8 and 7 US cents/liter, respectively. More information on international fuel prices is given on the GIZ website: <http://www.giz.de/expertise/html/4282.html>

generation Road Funds and appropriate charging mechanisms such as fuel taxation (Amos 2004). Since the local ability to raise revenues for rural roads is generally modest, a cross subsidy from other networks is necessary. Countries allocate on average about 60% of national road budgets to main roads, 18% to rural roads and 15% to urban roads (Benmaar, 2006, p. 12). Unpaid maintenance of rural infrastructure by local beneficiaries has often been tried, but proven to be inefficient, socially unjust and not sustainable.

Maintenance is not primarily a technical issue, since many tested maintenance and road surface options are available. Instead, it is a political question, related to the level of fuel levies or subsidies, and to the distribution of available funds among urban, interurban and rural roads. Often bilateral negotiations between donors and recipient countries are not successful, since the question of fuel prices is a highly political question and a arguably necessary increase in fuel levies is frequently not accepted by the public. Since low fuel levies are a major obstacle to sustainability, progress in this area (e.g. through SDG Target 12.c on rationalizing inefficient fossil fuel subsidies) would bring more weight to the above arguments and have impacts not only on the transport sector, but to other sectors such as energy.

Involvement of local communities

Evidence from many countries in Asia, Africa, and Latin America shows that involving local people in labor-based road construction and maintenance can provide valuable employment for poor people and can help empower women and disadvantaged groups. For maximum pro-poor benefits, employment opportunities have to be clearly targeted at poorer or disadvantaged individuals. Transport engineers often favor mechanized approaches to road construction which are quicker and simpler to contract out, but mean that much less of project expenditure is spent on employing rural people. An innovative approach to increasing involvement of local communities in Nepal is described in Box 6.

The Rural Access Programme (RAP) developed by the Government of Nepal is exemplary on multiple fronts. This programme promotes the economic development of local communities through involvement in rural road development, thus creating jobs and developing expertise in engineering and road project management. The programme is also notable for its involvement of women, which allows them to earn an income as well as developing a skill set.

Box 6: Nepal Rural Access Programme⁸

Knowledge and Capacity

In urban transport, various platforms, courses and databases have been established (e.g. GIZ, UNITAR, SUTP, CODATU), while similar rural transport activities are missing. The DFID-financed Rural Transport Knowledge Base (DFID et al, not dated) is still available online, but ongoing activities have been halted. UNITAR and GIZ are conducting international courses on urban transport, but similar courses on rural transport are less available due to a lack of funding options. The establishment of the DFID-SLoCaT partnership is helping to develop a rural transport stakeholder database and a number of knowledge products on rural transport (SLoCaT Partnership 2015b), but additional efforts are needed to expand knowledge and capacity on rural transport.

Adaptation and Resilience

Rural transport is highly sensitive to variations in weather and climatic events, and the need to ensure basic vehicle access throughout the year is essential. Building climate resilience into road designs involves balancing performance, cost, and volume. There is a wide variety of rural road

⁸ Government of Nepal / U.K. Department for International Development. Rural Access Programme website. <http://www.rapnepal.com/home>

designs including seasonal tracks, earth or gravel roads, and bituminous-surfaced roads. Ensuring ‘basic motor vehicle access’ throughout the year usually involves an earth road with water crossing structures (e.g. culverts, simple bridges). Since gravel is increasingly scarce in many parts of the world, engineers have developed solutions to improve the performance of earth roads and bituminous-surfaced roads using low-cost paved road designs suitable for lower traffic volumes.

To cope with increasing climatic impacts to rural transport, adaptation projects co-financed by the Nordic Development Bank (NDF) and the Asian Development Bank (ADB) are increasing the resilience of rural roads in [Cambodia](#) and [Viet Nam](#) (Nordic Development Fund 2010 and 2011), to complement similar projects in Africa and Latin America. And countries such as Nepal that are subject to frequent landslides often pre-position road construction equipment before the monsoon season to more quickly resolve disruptions to the road network (SLoCaT Partnership 2015c). Adaptation and resilience are also gaining prominence in national policies through the UNFCCC-driven national adaptation plans (NAPs) and intended nationally-determined contributions (INDCs), which will have long-term implications for rural transport.

Regarding National Adaptation Plans (NAPs), nine of 24 EST member countries, have published reports on comprehensive national climate change or disaster management strategies, and while eight other countries have touched upon or integrated adaptation in their national development strategies, many of the rest are still at the stage of National Adaptation Programmes of Action (NAPAs) (a means to identify priority activities that respond to LDCs urgent and immediate needs to adapt to climate change). For those countries that have developed more detailed climate change strategies (e.g. India, Russia, Sri Lanka), the transport focus is generally centered on mitigation rather than adaptation, or included in the context of enhancing infrastructure resilience of transport assets (e.g. roads, ports, bridges, railways, airports). The more developed EST countries (e.g. Japan, Republic of Korea), are more likely to have a designated adaptation plan than the less developed EST countries, but the attention given to transport is very limited across the board.

INDCs communicate to the UNFCCC secretariat country-level commitments and strategies to reduce carbon emissions and increase resilience for the post-2020 period (UNFCCC 2015). Climate adaptation has generally received less attention than mitigation in INDCs, although being mentioned in an economy-wide scope in 109 of 129 INDCs submitted (as of November 5, 2015). Most countries have included adaptation in a broad sense as part of their INDCs, yet the number of countries that have specified transport specific adaptation measures is relatively small compared to corresponding mitigation measures.

The transport sector is mentioned in general terms among climate adaptation measures in 16% of INDCs, and 5% of countries identify transport-specific adaptation strategies, with the latter group of countries including Bangladesh and Maldives within the EST region. In Bangladesh, general adaptation priorities include climate resilient infrastructure, and improvement of drainage systems to address urban flooding, with specific transport adaptation projects underway through the Bangladesh Inland Water Transport Authority and the Ministry of Road Transport and Bridges. Correspondingly, Maldives’ INDC includes coastal protection measures to protect the shoreline of Hulhule (the island which contains Ibrahim Nasir International Airport) as well as for other air and seaports.

Thus, national and local-level policies on climate change and sustainable development could more fully incorporate strategies on adaptation in the transport sector. National adaptation plans (NAPs) – and notably those in developing countries in the EST region – could include more

detailed strategies for adaptation in the transport sector; this would allow countries to meet projected mobility demands, reduce life-cycle costs due to damage, and increase mitigation potential with efficient and reliable transport systems. While regional coordination is key, it is also important to recognize that each country has different characteristics and that projects must be designed to fit into local contexts by means of thorough project preparation. Finally, successes at the project level can increase the likelihood of national and local implementing agencies taking ownership and raising these efforts to sectoral levels through mainstreaming in policy reforms.

Rural Transport Services

Importance of rural transport services

1. Rural transport services and intermediate means of transport (IMTs)

In developing countries, few rural people own cars and mobility mainly involves walking, IMTs and public transport. Rural transport services are often provided by informal sector entrepreneurs using buses, trucks, pickups, 'rural taxis' (minibuses or estate cars), motorcycles, bicycles, tricycles, animal-drawn carts or pack animals. In many countries, IMTs (including motorcycles) provide most of the transport between villages and markets. National transport authorities tend to neglect the importance of non-motorized IMTs for poor people; nevertheless, bicycles and work animals provide crucial mobility options to access markets, healthcare and schools. They also provide employment opportunities, including bicycle taxi operations.

Motorcycles are increasing rapidly in most developing countries, and motorcycle taxi services have often arisen spontaneously, which also offer employment opportunities, especially for young men. Motorcycle taxis offer very flexible services and often travel off the roads and along village paths, thus 'extending' the road to more isolated villages. Motorcycle taxis are often the only form of rural transport readily available. They can account for a high proportion of goods and passenger movements. Although they can be uncomfortable and more expensive per passenger kilometer than conventional transport, motorcycle taxis are highly valued by rural people (including the poor who use them for emergency transport). Motorcycle taxis do increase road accidents, mainly due to risky operator behavior. While some authorities have tried to ban them, others have tried to regulate them positively for improved safety. Motorized three-wheelers, two-wheel tractor trailers, and animal-drawn carts offer greater safety and carrying capacity, but they are not so fast and reliable. The poorest people are unlikely to own such transport, but can benefit from informal services offered by others.

Those investing in rural roads (e.g. road authorities, MDBs, bilateral donors) often assume that if roads are built, private sector transport services will spontaneously develop. This is not always the case, and thus many rural roads have no 'conventional' transport services at all. Research on transport in developing countries has emphasized the need to invest in ensuring there are appropriate transport services for rural people. Lower passenger and small freight fares are associated with larger vehicles, and poor people who travel benefit from passenger trucks and buses that allow the 'mixed' transport of small freight. Studies suggest it is difficult to provide profitable bus or minibus services on small rural roads, which explains the common use of low-cost and overloaded vehicles. Poor rural transport services also create a gender equality issue, as women are less likely to travel when services are unpredictable.

Financing rural transport services

In many countries where rural transport services do exist, they are often expensive, of poor quality and unreliable. The supply of rural transport tends to be dominated by cartels, and the lack

of competition encourages excessive numbers of old inefficient vehicles to compete in a limited market. Although there is no shortage of second-hand vehicles to operate rural transport services, the informal sector that operates these services cannot often get access to conventional bank finance, and funds are generally understood to be provided through family and informal connections, though there is a lack of knowledge on the precise terms and arrangements. Overall the current management and funding of rural transport prevents the development of competitive and efficient rural transport market and service provision, and as a result, a large part of the rural population is not able to realize their development potential.

For most of the poorer developing countries, road building and maintenance is the only form of assistance provided for rural transport. Provision for transport services is very much left up to the informal market, and although there have been a number of small-scale IMT initiatives, on the whole these have not been particularly successful. In contrast, nearly all developed and many middle-income countries have significant subsidy programs for rural public transport. For many countries there is an explicit 'right to transportation' that is enshrined in law, and there are specific subsidy programs for otherwise un-remunerative services, which provide rural transport services to benefit the elderly, people with disabilities, and school children. Experience from the developed world show that transport services rarely exist without subsidies. However, supplying subsidies for transport services leads to a number of questions:

- What level of subsidy for rural transport services be justified, relative to allocating needed funding for social services such as hospitals and schools?
- If rural roads are not properly maintained, should public funds be spent on rural transport services, which would thus be subjected to increased transport costs?
- How can misuse of public subsidies be prevented, especially taking into account the existence of rural transport cartels and high levels of corruption?
- How can rural transport markets be regulated in countries which have inefficient rural administrations that may be easily influenced by aforementioned cartels?

Since adequate answers to these questions remain elusive, financing of rural transport services is an area that requires additional investigation.

III. Challenges to Improving Rural Transport

Costs associated with connecting sparsely populated communities

As previously discussed, the efficiency of planned road investments is often measured by CBAs, that compare investment and maintenance costs with project benefits (e.g. reduced vehicle operating costs and time savings) and reduced external costs (e.g. due to accidents, emissions and congestion). These assessments are used to justify and prioritize road investments. However, this method favors road investments on the superior network with large traffic volumes. Even small changes in impacts per trip result in large overall benefits when multiplied by the large number of vehicles using the roads; thus often timesavings make up 60-80% of total benefits.

Rural roads are disadvantaged in this respect, since their low transport volumes only generate minor benefits; minor benefits; therefore rural roads should be primarily justified through their access improvements. Even if improvements. Even if benefits, such as improved marketing, agricultural surplus, improved health, better health, better education, access to services and information, may be monetized, their estimation is costly and costly and subject to uncertainty. Thus, instead of elaborate CBAs it is recommended to rank rural road rural road investments according to simple cost-efficiency criteria, such as (investment and maintenance) costs

maintenance) costs per inhabitant benefitting from the investment or number of households served per unit served per unit investment, as suggested in Table 1. Economic assessment of rural and inter-urban roads

	Rural Roads		Inter-urban Roads	
Transport Volume (AADT)*	<400	<2,000	2,000-6,000	5,000-15,000
Design Speed (km/h)*	20	20	30-40	40-80
Functionality	Access to local markets and services		Access to the regional and national network	
Assessment criteria	Social impacts and equality		Efficiency improvements	
Benefits of road improvement	Improved access to social services and markets		Reduced transport costs, time and external costs (accidents)	
Impact Assessment Method	Verbal description of impacts, cost efficiency		Cost-Benefit Assessment	
* Example from China				

Table 1. Economic assessment of rural and inter-urban roads

Lack of local capacity to deliver high quality infrastructure

Specific to rural road infrastructure, experience has shown that there can be operational advantages in having strong local management to promote optimal outcomes and ensure sustainability. An important component is support for strengthening local institutions. Some of the major areas of concern would be unclear responsibilities, disintegration of the planning system, insufficient and uncertain maintenance funding, inadequate local capacity and inappropriate design standards and methods.

One key trend in rural road infrastructure development is delegating central decision-making to local authorities or decentralization of the central authority to the regional or local ministries to increase transparency, accountability, responsiveness, efficiency, equity and opportunities for broad participation. It has been hoped that decentralization could simplify complex bureaucratic procedures, better align decision makers with local conditions and needs, and increase political stability by giving citizens more control over public programs at the local level (Stiedl and Robinson, 2000).

In practice, this move to decentralization has made some broad assumptions and many of the intended benefits have not been realized. One major issue lay in the perception that rural roads are technically less complex, when in fact, because of their location, geographically and geologically, making the best judgments on engineering local resources is arguably more difficult than other roads. Financing rural roads also makes decentralization problematic, since road investment projects would be much larger than the projects handled at the local level. The combination of a lack of predictable medium term funding and inadequate technical capacity at the community level (along with limited political influence at the national level) are the main reasons for the less-than-favorable outcomes (Steidl and Robinson, 2000). Thus, to alleviate these issues, more emphasis must be placed on country based development partnerships, along with budgetary aid and resource mobilization at local and national levels.

Technical assistance can be provided to provinces, which would have to produce proposals themselves identifying which projects are the most cost effective. A consequence of allocating funds according to those with the best benefit-cost ratio would be that the projects may get concentrated in certain areas. While this may be more economically efficient, it is clearly not equitable. Some regulations for allocation can prevent this, and it can be specified that each province should get at least a minimum amount of the total fund. Another approach is to divide

the fund equally where one half is used to ensure that all provinces get some degree of rehabilitation and the other half is used to finance the most cost-effective projects.

The South East Asia Community Access Programme (SEACAP) is the forerunner to the current DFID-funded Research for Community Access Partnership (ReCAP). SEACAP outputs were an important benchmark showing the importance of ensuring that rural road rehabilitation is sustainable and cost efficient by using the local knowledge and capacity to ensure long-term maintenance. The methods and materials should be tailored to the local community and resources readily available and also take into consideration the main uses of the roads to ensure that the most cost efficient and durable options are utilized. One example is an area in southern Vietnam where traditional road making rock and materials were not present, so a solution was found in the use of Mekong delta clay baked and used as bricks for road building. Another example of standardizing rural road construction materials in Sri Lanka is described in Box 7.

The Maga Neguma Rural Road Development Programme in Sri Lanka, which ran from 2004 to 2009, has produced an innovative approach to using pre-cast concrete blocks in the paving of rural roads. The Ministry of Highways regulated the technical production of these blocks, which ensured both quality control and ease of maintenance. In addition, through the participation of community based organizations in roadway, rural communities have achieved an increased standard of living.

Box 7: Innovative Rural Road Construction in Sri Lanka⁹

Another method is the Integrated Rural Access Planning (IRAP) developed from the Integrated Rural Transport Planning (IRTP) method. The transition occurred as the prioritization moved away from simple provision of transport to access which came to be seen as the key priority for rural communities. IRAP is now used as a general planning tool in addressing rural development issues, but at the regional level it too may have to be adapted to incorporate more spatial planning, which will have a significant impact on transport needs, demands and patterns. (Airey and Taylor, 1999)

The road prioritization process may be part of a more general rural development strategy if funding is sourced through a regional or district budget, and thus techniques like IRAP may have a broader application. Road development would be part of a wider development program rather than an individual development project. At present the rural development strategy is usually not detailed enough to have planning framework for rural roads and this is a common gap. Currently when there is a single source of funds for rural roads (at national or local levels) the funds are allocated through a 'bottom up' procedure facilitated by regional and local engineers. Thus, there is a need for more good practice examples that cover a range of different solutions and contexts.

Limited capacity/funding for maintenance of existing infrastructure at local levels

The development of rural road networks requires local solutions that are knowledge- and ownership-intensive and also require sustainable maintenance regimes. Technical planning of good practices is to be encouraged with 'spot improvement' techniques, appropriate standards and specifications tailored to local geography, climate, and patterns of use. For instance, unsealed gravel roads are to be fervently avoided to avoid valuable investment funds disappearing in clouds of dust, which in turn affect the health of those traveling on such roads and those living alongside them.

⁹ Government of Sri Lanka, Ministry of University Education and Highways website. "Maga Neguma" Rural Road Development Programme. Accessible at <http://bit.ly/1WM10aK>

Bilateral donors and multi-lateral banks have been forthcoming with regards to rural road interventions as the target audience has been the rural poor. Those donors and agencies with a focus on poverty alleviation are more interested in funding feeder road investments either solely or as part of a rural livelihoods program. However, the focus has been on upgrading existing roads rather than on ensuring roads are passable to vehicles all year round or in expanding the road network and in so doing extending vehicle access to as many communities as possible.

Management and financing arrangements for rural roads are often unclear, as administration is often fragmented among communities, local governments and the ministries of public works, transport and agriculture. Furthermore, rural roads are often not classified and indexed, so their extent and condition is unknown. For example, about one third of the total road network in Tanzania and more than half of the Kenyan network is unclassified (Lema et al 2008, p. 25). This type of infrastructure often does not qualify for allocations of funds from national budgetary resources but is left to be attended by local authorities and communities that often have little capacity, skills and resources to manage them. This situation results in a general neglect of road maintenance.

Increasingly in recent years, many funding agencies have opted for coupling investments in construction or rehabilitation of rural roads with long-term maintenance funding commitments. SEACAP, for instance, implemented a ‘training the trainer’ program, in which individual district employees are trained in a central location and then returned to their districts to take back the techniques to instruct others on good practice maintenance regimes.

Lack of global dialogue on rural transport amongst broad stakeholders

There is a need for an enhanced global dialogue to foster progress on rural transport issues. This will ensure progress on all fronts, as best practices are shared and organizations working on regional and global levels can work together as well as avoid common pitfalls and share new findings.

As an example, UNESCAP and the World Bank in Viet Nam organized a meeting on Road Maintenance and Management in Hanoi, Viet Nam in May 2013. The meeting was hosted by the Ministry of Transport, Government of Viet Nam, and brought together many countries of the Asia region to share innovative and good practices in road maintenance and management and discuss ways to raise the profile of road maintenance issues in the international development agenda. Meeting participants included experts from national road authorities and rural development authorities from selected South and South-East Asian countries, as well as representatives from donor agencies including the Asian Development Bank (ADB), World Bank (WB), Department for International Development (DFID), Japan International Cooperation Agency (JICA), Korea International Cooperation Agency (KOICA), and the International Road Federation (IRF).

DFID through its ASCAP (now ReCAP) program have launched a joint initiative with the SLoCaT Partnership entitled “Promotion of Sustainable Rural Access in the Post 2015 Sustainable Development Agenda”, whose objectives include advancing a global dialogue and agenda on rural transport. SLoCaT and ReCAP conducted outreach on rural transport dialogue with an initial set of rural transport stakeholders at the PIARC XXV World Road Congress in Seoul, Republic of Korea in November 2015.

A proposal to enhance global dialogue on rural transport was received mostly positively by the stakeholders, with some seeing added value in raising the profile of rural transport and creating

opportunity to get policymakers pay attention to research findings. The process was also seen as an opportunity for stronger interaction with other sectors and inclusion of other global topics such as climate change and adaptation. However, some participants, questioned the utility of such a dialogue, suggesting that “another talk shop” would not add substantially to current efforts.

Generally, it was agreed that the rural transport community could do more to promote key issues to a wider audience, including innovative developments. Thus, an ongoing dialogue must make clarify new approaches and strengthen the narrative linking rural transport to SDGs; however, it remains unclear which new elements would have to be included. Clarity is also lacking regarding the key target groups for expanding the dialogue (e.g. ministers and/or funders and/or UN bodies and/or development agencies). These topics are discussed further in the following section.

IV. Recommendations for More Ambitious Action on Rural Transport

Summary of key issues

Investments in rural infrastructure and services are an effective avenue to help eradicate extreme poverty and hunger, as such investments can increase agricultural production, lower input prices, and enable reliable low cost transportation of crops by reducing the monopoly power of agricultural traders. In addition to its contributions to food security, improved rural transport gives the poor increased mobility and thus more access to economic opportunity and basic services (e.g. education and healthcare), and through this access can help to improve livelihoods and increase gender equality.

These contributions are consistent with the objectives of the sustainable development goals (SDGs) and can help in achieving the major targets of SDGs 1 and 2 of the post-2015 sustainable development agenda. In addition, investments in rural access can also help alleviate climate change concerns, in promoting more sustainable forms of transport, increasing travel times through better road conditions, and thus reducing energy use and emissions by increasing efficiency and decreasing travel delay.

To achieve the above goals, it is important that rural access is provided through the provision of infrastructure in a cost efficient manner, using local resources, knowledge and funding to ensure equity and sustainability. To preserve infrastructure asset worth, it is essential to that capital investments are coupled with sound maintenance regimes, which also involve local communities, in order to increase capacity and contribute to adaptation and resilience. Finally, rural transport services must be supported with sufficient funding at national and local levels, to ensure that that investments in rural transport infrastructure translate to meaningful improvements in rural access.

Forging a global community of practice

It is of vital importance to converge a community of rural transport stakeholders to share best practices, form a network to develop and implement rural access schemes, and in so doing to advance mutual objectives for rural access. To operate efficiently and effectively, this community could include at a minimum the following participants and respective roles:

- *UN System*: Raise the profile of the development of rural transport and increase its efficacy in supporting and advancing the global development and climate goals.

- *Multilateral and Bilateral Institutions*¹⁰: Provide technical expertise and financial support necessary to make progress toward rural access goals.
- *National Governments*: Create enabling policies and institutional structures that facilitates progress on rural transport by providing necessary institutional support and mobilizing financial resources.
- *Local Governments*: Provide funding, maintenance, monitoring and management of resources to ensure sustainability of rural transport investments.
- *Local Communities*: Share local knowledge/perspectives on needed rural transport elements; contribute to the planning, implementation and supervision of projects; and provide manpower to maintain investments and develop technical expertise.
- *Business Sector*: Contribute to the development and maintenance of rural roads to develop economic viability in rural communities in chains of production; provide needed transport services to maximize the usefulness of these roads.
- *Civil Society*¹¹: Advance progress on rural transport through relevant technologies and expertise; research cost effective ways to increase equitable distribution of resources; provide innovate approaches to achieve key rural access objectives.

It is hoped that in creating of a community of practice in rural transport and access, the major stakeholders could come together and leverage comparative advantage through the sharing of knowledge and expertise. This would also facilitate the learning from each other's successes and shortcoming and so to drive innovation and fill gap. It is further hoped that the development of such a community would foster more in-depth collaboration and dialogue. Several questions can be raised about a proposed dialogue process:

- How should an institutional dialogue on SDGs and rural transport be designed?
- Should the dialogue consist of stand-alone events or be integrated in existing events?
- Will other sectors be ready to actively take part in the transport-oriented focus?

One option how to raise more interest in rural transport would be to find a prominent champion who promotes the issue internationally. This would be either a person involved in politics or a high-ranking official from an international organization. Another option would be to form an interest group within relevant international organizations.

One issue remains uncontested: considerable resources would be needed to conduct the dialogue, with funding needs dependend on the contents, the intended activities and the number of stakeholders involved in this dialogue. Networking would be an indispensable part of the process that has to be outsourced to another institution or enterprise. Additionally, international get-togethers would be required to create face-to-face contact. Costs would depend on the number of events, participants and travel involved. Thus to initiate further dialogue on rural transport, strong support is indispensable, which would not only include the above-mentioned funding, but also political support in promoting the international dialogue amongst bi- and multilateral donors.

In sum, it is necessary to build on initial efforts by UN-ESCAP and SLoCaT-ReCAP to enhance dialogue on rural transport in the EST region, and to extend this dialogue to shape an effective global agenda on rural transport, with the ultimate goal of ensuring that the world's most remote and vulnerable populations are not left behind in the post-2015 and post-COP21 world.

¹⁰ For example, bilateral and multilateral development banks, Road Management Initiative (RMI), Sub-Saharan African Transport Policy (SSATP) program).

¹¹ For example, NGOs, advocacy organizations and research organizations.

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