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# Current Context of Transport Sector in South Asia: Recommendations Towards a Sustainable Transportation System

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# Current Context of Transport Sector in South Asia: Recommendations Towards a Sustainable Transportation System


## Abstract

**Purpose:**

Given the current focus on sustainable development, there is a need to identify the current status of the transport sector in developing countries and the obstacles to the development of a sustainable transport system. Thus, this paper aims to provide a critical review on what needs to be done in such countries towards a sustainable transportation system. The focus of the paper will be on the South Asian context. In order to achieve the aim, the paper examines the current issues, the policy context and the key actions required in the countries selected in South Asia (i.e. Afghanistan, Pakistan, Sri Lanka, Bangladesh, Bhutan, Maldives and Nepal).

**Design/Methodology/Approach:**

The main method used for the project was a combination of semi-structured interviews and focus groups. In addition, a policy analysis was also carried out with a use of secondary data. Altogether 348 interviews and 16 focus groups (with 157 participants) were carried out in the selected 06 countries. Although the purpose of the research methods was to carry out a situational analysis of each country mentioned above on seven societal challenges identified under the EU's Horizon 2020 research programme, this paper only focuses on presenting the findings relating to sustainable transport.

**Findings:**

Findings reveal that South Asian countries need to improve different aspects of their transportation sector, starting from national level transportation policies. Sustainable transportation is not merely about mobility but also about creating safer, convenient and environmentally friendly transportation systems. Some key actions needed for these include introducing driver and passenger safety regulations, establishing vehicle emissions test centres to reduce CO2 emissions, and introducing public-private partnerships where useful.

**Originality/Value:**

This study provides a robust policy direction towards the introduction/improvement of a sustainable transportation system in South Asian countries.


**Keywords:** Government policies; Mobility; Safety; South Asia; Sustainable transport.

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## 1. Introduction

Transportation involves the process of conveying people and/or goods from one place to another. Transportation systems incorporate two main aspects i.e. transport infrastructure (e.g. road networks) and transport modes (e.g. trains, cars, bicycles) (Sohail, Maunder, & Cavill, 2006). As Egan (2004) highlights, transportation and connectivity are a key requisite to creating sustainable communities and also for sustainable development. According to GTZ SUTP (2010), the world's population is expected to surpass 9 billion by 2050, with more than half living in Asia, including South Asia, mostly in urban areas. Thus, there is a need to identify the current status of the transport sector in Asia and the obstacles to the development of a sustainable transport system. The focus of the paper will be specifically on South Asia as currently, South Asian countries face many obstacles in introducing a sustainable transportation system.

The paper is based on the work of an FP7 INCO-NET Action on 'Collaborative Action towards Societal Challenges through Awareness, Development, and Education – CASCADE', which aims to provide the foundation for a future international co-operation network programme, targeting South Asian countries. Based on the project findings, this paper aims to provide a critical review on what needs to be done towards a sustainable transportation system in the South Asian context. In order to achieve the aim, the paper investigates the current status of road transportation including the status of public and private transportation, the status of rail transportation, the status of other international and domestic air transportation methods and water transportation wherever applicable in country specific cases. In addition, this paper will examine the current status of transportation related infrastructure and an analysis on existing transportation policies in South Asia. Once the current status is thoroughly examined, this paper will critically identify the obstacles associated with the transportation sector in South Asia, followed by possible solutions and/or key actions to overcome the identified obstacles.

## 2. Literature Review

This section comprises of two main sub-sections. The first sub section introduces what is meant by sustainable transportation and the second section introduces the status of transportation in developing counties with a special focus on South Asia.

### 2.1-What is Sustainable Transportation?

The purpose of this section is to provide an overall idea of what is meant by sustainable transportation. Since the key focus of this paper is to identify the current status and the obstacles for the transport sector in the South Asian region, it is important to have an overall idea of sustainable transportation.

Sustainable transportation can be defined by two perspectives. One perspective is defining sustainable transportation in accordance with the sustainable development, which encompasses social, economic and environmental indicators for sustainable transportation.

The other perspective examines the sustainability of the transport system itself, focusing on the positive and negative values and externalities of traffic and transport as they appear now or in the near future. There are certain indicators to measure sustainable transportation. Some of the key indicators are $CO_2$ emissions of vehicles, noise pollution, traffic congestion and safety of transportation modes. However, the concept 'quality of life' is associated with sustainable transportation (Steg and Gifford (2005). As BREEAM (2012) indicates, quality of life is often associated with social, economic and environmental development. Therefore, in order to enhance the quality of life, the transportation sector should be safe and convenient for its users. Black (1996) defines sustainable transportation as being more to do with environmental sustainability. This argument is based on different emissions released from different transportation modes. Accordingly, it is suggested that precautions are taken to reduce vehicular emissions rather than discussing sustainable transportation in a broader perspective.

Litman and Burwell (2006) define sustainable transportation from a broader perspective. Accordingly, it is stated that sustainable transport tends to favour more integrated solutions including improved travel choices, economic incentives, institutional reforms and land use changes as well as technological innovation. As Litman and Burwell (2006) further elaborate, sustainability planning may require changing the way people think about and solve transportation problems.

Thus, it can be noted that sustainable transportation is not merely about introducing environmentally sustainable transportation modes and methods. Nevertheless, it is also something which involves broader aspects such as convenience and safety of travellers, availability of adequate transportation infrastructure technology, access to rural areas and better frequency of public transportation to ultimately enhance the quality of life of present and future generations.

### 2.2- Sustainable Transportation in Developing Countries with a Focus on South Asia

The world's population is expected to surpass 9 billion by 2050, with more than half living in Asia, mostly in urban areas. At the same time, the rate of vehicle ownership is predicted to skyrocket from around 800 million cars a decade ago to around 2 billion in 2030 (World Resources Institution, 2012). Accordingly, within the context of developing countries, transportation presents a unique problem, as it is a situation which gets worse with population increase (GTZ SUTP, 2010).

At present, the emission share of transport in developing countries is rather small. The pace of growth in this area means that, by 2025, transport-related $CO_2$ emissions from developing countries will exceed those from developed countries.

The urban transport sector is also a significant employer in developing cities. Access to affordable transport is critical as it offers a way out of economic, social and physical isolation for people. Accessibility to transport depends upon a number of dimensions such as

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physical distance, financial affordability and the capacity of transport modes (Sohail et al., 2006). This is a major barrier to achieving the Millennium Development Goals (MDGs) set by the World Bank (2012).

The transport infrastructure gap has been cited as one of the main barriers to economic growth and attracting foreign investments in the developing world. Particularly in South Asia, transport has been highlighted as a constraint for regional and international trade. Transport systems are also essential for the competitiveness of regions (UNECE Transport Division, 2011). In terms of developing regional trade groupings, South Asia is lagging behind other regions. Deficiencies in cross-border transport systems, amongst various other economic and political reasons, has resulted in intra-regional trade in South Asia accounting for a mere 5% of total trade, which is the lowest of any region in the world (World Bank, 2008). Poor access to transportation has left a large proportion of the population of the South Asian countries without access to basic social and economic services, leading to a greater incidence of poverty among the region's large, rural populations.

UN-HABITAT (2013) highlights the typical challenges of urban transport institutions in South Asia. Some of the key challenges are fragmented policy formulation and implementation, with lack of co-operation among multiple ministries and transport agencies, bureaucratic procedural constraints that impede the delivery of urban transport infrastructure and services, inadequate legal and enforcement frameworks and capacities needed for urban transport and land-use developments. Furthermore, Asia represents one of the fastest growing regions in the world with respect to both tourism and transportation. Accordingly, future trends in global transport will undoubtedly have an impact on tourism in Asia. However, the current status of the Asian transportation sector does not sound good as currently, transport accounts for a substantial proportion of greenhouse gas emissions in Asia (Duval & Weaver, 2016).

It has also been highlighted that a sustainable transportation system is needed to achieve sustainable development goals. Furthermore, it has been revealed that connectivity is also important to the overall development of the South Asian region, one of the least integrated regions of the world. Lack of transport connectivity and poor infrastructure have resulted in the high cost of trade transactions and low volumes of intra-regional trade in the sub-region (Secretary-General's Global Sustainable Transport Conference-Summary report, 2016). Describing the magnitude of the transport sector issues in the Asian region, Starkey and Hine (2014) describe how the number of cars in the richer sections of the population in Asia is likely to grow faster than the improvements in infrastructure can cope with. Accordingly, it has resulted in a decline of car journey speeds. Furthermore, they describe how, in South Asia since the 1980s, the number of road deaths has grown by 66%.

The above discussions highlight the need to look at transport as being not just about improving the way people move from point A to point B, but also as a means of providing access and mobility for the poor and improving road safety, as well as reducing transport-related environmental impacts. This highlights the need for a different, more appropriate approach for tackling these issues, giving due consideration to economic, societal and environmental impacts in a holistic manner. Acknowledgement of the above has led to the transfer of the principles of sustainable development to the transport sector following a

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number of different international developments since the 1992 Rio Earth Conference. This is now commonly known as Sustainable Transportation.

## 3. Methodology

As mentioned in Section 1, this paper is based on an FP7 INCO-NET Action on Collaborative Action towards Societal Challenges through Awareness, Development, and Education – CASCADE. The main aim of the Action was to develop National Position Papers (NPP) from seven nations in South Asia namely; Afghanistan, Bangladesh, Bhutan, Maldives, Nepal, Pakistan and Sri Lanka. The NPPs detail a 'situational analysis' of each country mentioned above on seven, thematic, societal challenges identified under the EU's Horizon 2020 research programme: health, demographic change and well-being; food security, sustainable agricultures, marine and maritime research and the bio-based economy; clean and efficient energy; sustainable transport; climate action, resource efficiency and raw materials; a changing world - inclusive, innovative and reflective societies; and secure societies – protecting the freedom and security of the country and its citizens.

The work carried out as part of the development of the seven NPPs was divided into two phases. During Phase 1, there was a need to identify available policies in each area of societal challenges to identify the current context, gaps and key informants in the countries concerned. This was carried out using a content analysis approach of available policies in the selected countries (Please refer to Table 1 for an example of the type of policies reviewed) During the second phase of the project, due to the lack of empirical research on the seven themes mentioned above in the South Asian countries, an exploratory study was needed to be carried out to achieve the main purpose of the project i.e. situational analysis. Furthermore, in order to improve the robustness of data collected, there was a need to conduct the exploratory study with 'experts' who understood the themes well:

<Table 1>

A number of qualitative methods are available in order to get an idea of how experts perceive the current context of the seven areas of challenges in their respective countries, but given the questions to be asked (below), a combination of focus groups and in-depth qualitative interviews were considered appropriate for the study. The purpose of the focus groups, herein, were to compose a small number of target experts (from the seven themes) guided by a moderator, to examine how the respondents, collectively, discuss the answers to the following questions. As Brancato et al. (2006) highlight, in-depth qualitative interviews in a similar way focus on how the respondents interpret certain questions and on how they arrive at their answers; however, in contrast to focus groups, in-depth interviews are not based on a group discussion. For the purpose of the situational analysis, it was needed to have both the collective opinions and individual opinions of the experts to derive at robust findings.

1. *What are the problems or issues within your area of expertise that pose a challenge to the country?*
2. *From the problems/issues you mentioned above, what are the most critical issues?*

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3. *Why do you think the problems indicated above are the most critical societal challenges within your area of expertise?*

The experts chosen for the aforementioned approaches i.e. interviews and focus groups, were either from academia, research institutes, non-governmental organisations or government organisations (e.g. policy makers or from the local authority). An initial screening was carried out to choose the experts for the interviews and focus groups by collating information on the organisations they work for, their job title, professional background and expertise area (see Figure 1). Altogether, as per Table 2, 348 semi-structured interviews were carried out with experts in each area of social challenge in all seven countries to get individual opinions on the situational contexts. In addition to that, 16 focus groups were conducted with 157 experts from all seven areas of societal challenge to get an overall view on the situational context of each of these countries. The in country teams were given (by the project coordinator) the flexibility to choose a balance of focus groups and interviews due to the wide range of issues being discussed and the variety of expertise required. However, some variances between the use of interviews and focus groups across countries have occurred, e.g. Sri Lanka, due to issues relating to accessibility and availability of experts. However, the variances, in any way or form, have not produced biased results towards particular country/countries, as the purpose of the study was to do a situational analysis in each country. All the interviews and focus groups conducted were recorded and analysed using thematic analysis to come up with the overall findings of the project. The number of participants chosen for both interviews and focus groups was deemed adequate given that they were 'experts' and given the time allocated for data collection (approximately four months).

< Table 2>

One of the limitations of the methodology was that, since the data collection and analysis were completed by a local, in-country team, maintaining consistency during the process was difficult. However, to minimise this, data collection and analysis were co-ordinated between EU and South Asian partners. This was achieved through a series of briefing and training events, as well as the issuing of standard protocols and templates i.e. policy analysis guidelines/templates, interview guidelines/templates and focus group guidelines/templates, NPP templates, so that all followed the same format and structure for data collection and analysis.

As mentioned earlier, the focus of this paper is only on one societal challenge on sustainable transportation. The findings of the paper are presented after systematically reviewing and synthesising the above mentioned NPPs to provide an overall summary of the South Asian region's status and interests concerning 'Sustainable Transport'. QSR NVivo

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software was used for the systematic review of the NPPs to identify the main themes/categories of:

- Current context of the countries
- Policy analysis
- Key actions

Due to the lack of empirical research on the subject concerned, expert opinions and discussions gathered during the interviews and focus groups have become an integral part of the findings presented in the paper.

<Figure 1>

## 4. Results & Discussion

### 4.1- Current Context of Transport Infrastructure in South Asia

The empirical investigation based on the systematic review of the NPPs using the NVivo has revealed the current status of the transportation network and the road based transportation system of the seven South Asian countries. As stated in the methodology section, the NPPs were developed based on three research methods which are policy review, interviews and focus group discussions. Accordingly, the current context of the seven countries was revealed from the semi-structured interviews and focus group discussions. The following analysis presents a country-by-country analysis of their current status in terms of sustainable transportation.

- ***Afghanistan***

Analysis reveals that Afghanistan has the poorest road network and transportation infrastructure in South Asia. Modern infrastructure, which is essential for a strong transport sector, is limited in Afghanistan. 85% of the road network in the country is in bad condition or unpaved. In Afghanistan, the transportation sector is considered the major source of pollution in big cities. There is no technical supervision of vehicle condition; some vehicles are even 40 years old. The public transportation services provided by the Government are almost zero. 90% of the transportation services are provided by privately owned buses and cars. Poor infrastructure, management and transportation planning has led to congestion, traffic jams, noise and air pollution. There are no traffic signals and signs at intersections and roadsides. No awareness of traffic rules and regulations amongst drivers is a key issue in upgrading the transportation system.

The rail transportation system in Afghanistan is poor as there is only 75km of railway line in the country. There is a huge demand and need for a rail transportation system throughout the country, especially linking the rural areas but the current insecure environment in the country does not provide the necessary resources to construct a proper rail system.

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The air transportation system in Afghanistan is in a critical situation due to the current insecure status of the country. There are around 40 airports, including four international airports, but none of them meet international standards. Currently, the air traffic control is operated by the NATO peace teams and the condition of the air transportation infrastructure, including availability of passenger flights, is extremely poor.

- ***Pakistan***

Adjoining Pakistan is in a better situation compared to Afghanistan. The country's current Government policies are focused on the development of transportation related infrastructure. Accordingly, the Government has planned 50 'mega projects' for the provision of better quality highways, expressways and motorways throughout the country during the next few years. However, currently, the road system is the backbone of the country's transportation. Furthermore, in terms of rural accessibility, it has been found that Pakistan has a better road network but the increasing number of vehicles has created congestion and the increasing use of fossil fuels has created environmental issues. The key issues identified for Pakistan are weak implementation of policies and regulation, heavily polluting vehicles which continue to ply the roads and lack of road maintenance.

Compared to the situation in Afghanistan, Pakistan has achieved some improvements in the railway system as they have introduced public/private partnerships for development. The 'Shalimar Train' is a good example of private sector investment. However, the rail service still operates in an ineffective manner and there is a huge need to link the railway line with the rural areas of the country.

The air transportation context of Pakistan is better than Afghanistan's but it still has similar issues due to security concerns. In addition, very recently, most of the flights of the Pakistan International Airline were grounded due to technical issues related to the aircraft, requiring major restoration.

Accordingly, it can be noted that the country needs many improvements in road, rail and air transportation in order to create a sustainable system.

- ***Sri Lanka***

Sri Lanka is emerging in the development of their transportation system by introducing new highways and new road infrastructure to reduce the traffic congestion and also to improve the quality of the transportation system. At the moment, 3600km of national highway restoration is going on. Inter-regional expressways, connecting west, south, central and north-western regions, have been completed. Feasibility studies have also been conducted to implement Mass Rapid Transit (MRT) in the cities. However, since the majority of the public depend on public transport services, there is a critical need to achieve resource-efficient transport. There is also a critical need to ensure the safety and reliability of the public transportation system. There is a lack of public confidence due to little available public transport. Existing road capacity in Colombo, the capital of Sri Lanka, cannot accommodate the current vehicular demand including the outer-city vehicular population. So far, the

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widening of 30% of single or intermediate lane national highways to dual or multi-lane standards has been undertaken to ease the congestion of inbound and outbound traffic.

In general, the need to improve the public system, providing safe and secure transportation, is the main obstacle ahead for Sri Lanka and this obstacle needs to be addressed starting at national policy level through to regional and local policy level.

Compared to the contexts of Pakistan and Afghanistan, the rail transportation system is comparatively better in Sri Lanka. However, Sri Lanka still needs to establish railway lines for the rural areas in order to increase accessibility.

Generally, it can be seen that the country has to have more focus on improving passenger safety, especially with regards to road transportation.

- ***Bangladesh***

The analysis reveals that Bangladesh has one of the lowest road densities in the region. Bangladesh has poorly developed transportation systems. Most of the rural roads are gravel roads which become inaccessible during the rainy seasons. Presently, the Bangladesh Government is making efforts in the construction of multiple flyovers for populated cities. However, unplanned city and traffic systems are a major upcoming obstacle for the Government. Overcrowding in cities like Dhaka and Chittagong, indicate the need for implementation of good and efficient transport systems. However, Bangladesh has made improvements in the reduction of the use of fossil fuels as they have introduced battery-operated bikes. These bikes significantly reduce local transportation costs as well as reducing air and sound pollution.

The railways in Bangladesh have good linkage to many parts of the country, compared to other neighbouring countries such as Bhutan and Nepal. Rail transportation acts as an important method of mass transport in Bangladesh. Many districts of the country are connected via railways.

Like Sri Lanka, the air transportation system in Bangladesh is in a better state. The country has several airline operators and covers many destinations while meeting international standards.

- ***Bhutan***

Bhutan's road network covers only 10,578.3km, however, this is an improvement compared to the status in the 1960s. The increasing number of vehicles has made congestion in the urban towns inevitable. The country merely relies on road transportation. As the analysis indicated, the Government is now seeking to introduce ways to go green and has announced the introduction of electrically operated green taxis to cities.

There are current agreements with the Indian Government to link the Indian railway to Bhutan. The market for Bhutan's air transportation is small and there is only one international airport in the country.

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- ***Maldives***

The Maldives consists of small islands that are sparsely spread over the Indian Ocean covering an area of 90,000 sq. km. About 99% of this territory is sea and the population is spread across 187 islands. Establishing a suitable transport network connecting the islands has always been an obstacle to the Government. Current modes of transport between the islands include sea and air transport. Wherever the road transportation is applicable, traffic congestion is a key issue, which has a negative impact on economic growth. Increased population density in Male, the capital, has resulted in increased demand for transportation. Almost one third of the Maldives' population lives in Male (less than 200 hectares). Due to limited transportation between the islands, communities demand that all the necessary services be provided on every inhabited island. This, in turn, has obstructed the development, as Government resources are often stretched to meet the needs of all the communities. The limitations in the inter-island transport network forced many people to migrate to the capital, Male.

The air transportation system in the Maldives does not face the same critical obstacles as Afghanistan and Pakistan but it needs some improvements in fleet size and facilities at airports.

As a whole, the key concerns for the Maldives are reducing traffic congestion in the Main Island and Male and increasing the quality of sea transportation between islands.

- ***Nepal***

The road network in Nepal has been expanded in the last 20 years but the pace has been slow. Owing to difficult topography and geography (steep slopes), road construction has become difficult in the mountainous regions. Nepal is facing increasing road congestion in metropolitan areas. The increasing trend of motorisation (private cars and motorcycles), declining mode share of public transport and haphazard urban development without adequate road infrastructure, are major obstacles in the transportation system in Nepal. Other problematic issues include lack of an integrated planning system, lack of policy priority for non-motorised modes, inefficient practice of fuel subsidies (for diesel).

There is an urgent need to modernize the fleet by replacing older vehicles, directing the drivers and conductors, introducing green vehicles and mountain transfer, enhancing road safety. Policy/project initiatives currently being taken are, at best, on a marginal scale. However, the efforts are not enough to improve the situation significantly.

The Nepal Government is in the process of developing a railway network to increase rural accessibility. Air transportation in Nepal does not face critical obstacles but needs some improvements in fleet size, and improving facilities at airports.

Based on the aforementioned analysis, it should be noted that most of the problems and issues faced by these countries are common. There is a significant need to improve the transportation sectors of these countries in order to make them sustainable (the list of common issues is specified in Section 4.3). This needs to be addressed as a top-down

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approach as the government in any country has the main role in putting necessary systems in place, especially at policy level, in order to improve the transportation sector.

Herein, it is worthwhile looking at whether the current policies in these countries have considered or supported any improvement or development needs for the future. Thus, the following section presents a policy analysis in the seven countries.

## 4.2- Transport Policy Analysis in South Asia

The systematic review of the policies, based on the NPPs using the QSR-NVivo, revealed that some South Asian countries already have national transportation policies. However, implementation of the national policies is weak whilst some countries are still in the process of developing national transportation policies. Figure 02 presents a screen shot of the QSR-NVivo analysis for the policy analysis. It provides a brief idea of how the policies have been systematically reviewed in South Asia.

<Figure 02>

Out of seven countries, Afghanistan and Bhutan do not have any detailed transportation policy. Bangladesh, Maldives, Pakistan and Sri Lanka have their own national transportation policies and Nepal has a national transportation policy in draft stage.

Afghanistan has highlighted some priority policies for the transportation sector in their National Development strategy but there is no detailed and comprehensive transportation policy available. However, Afghanistan has membership with several international transit agreements and with neighbouring countries. This includes the Afghanistan and Pakistan Trade and Transit Agreement (APPTA-2010), Trade and Transit Protocol between Afghanistan and Turkmenistan in 2008. Generally, Afghanistan lacks adequate policies on transportation and therefore, the country needs to introduce a national transportation policy.

Pakistan has a national transportation policy called the National Trade Corridor Improvement Program (NTCIP). It is a comprehensive policy that looks to reform and consider opportunities in Pakistan's railway, roads and ports. However, the key issue is the poor implementation of the policy due to lack of co-ordination among the relevant authorities and the current security environment of the country.

There is a National Transportation Policy available in Sri Lanka but there are problems in the implementation as there are many authorities responsible for transport and the role of each authority is not clear. In addition, it has been identified that Sri Lanka has numerous policies for the improvement of public transport and road development but there is a lack of policies for road safety. Accordingly, it is noted that Sri Lanka needs to improve policy implementation while developing new policies for road safety to reduce the increasing number of road accidents.

The analysis revealed that the Bangladesh Government approved a National Land Transportation Policy in 2004 in order to improve the institutional environment for roads and

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railways in the country. In addition, Bangladesh has a transport related policy on reformation of transport labour laws for the improvement of the welfare and safety of transport workers. Furthermore, the country has approved a National Shipping Policy to reform ports and inland waterways. Also, in 2009, Bangladesh developed a multi model transport policy to integrate different transportation modes. Generally, analysis revealed that Bangladesh has a better transportation policy background covering roads and public transport as well as the inland water based transportation. However, even though they have sufficient policies, the implementation is weak for many reasons such as bureaucracy in Government departments; therefore, the Government has to take action to implement transportation policies.

There is no specific national transport policy available in Bhutan but there is a document called the Integrated Transportation Master Plan. However, the country still does not operate any integrated model as it relies mainly on land transportation. In a similar way to Afghanistan, Bhutan needs to have adequate policies on transportation in order to improve the sector.

In the Maldives, many national up-to-date policies are available to address issues in the transportation sector; however, the implementation of these policies seems to be critical due to lack of awareness by the relevant authorities and a lack of stakeholder engagement. In addition, the Maldives introduced a transport related policy integrating the natural environment. Accordingly, the Maldives developed policies to introduce environmentally friendly transport modes in order to protect and improve the aesthetic and ambient quality of the natural environment, whilst ensuring secure and safe mobility of people and goods.

Nepal has drafted a National Transport Policy but it is still in the process of being finalised before being implemented.

As a whole, it can be noted that these countries demonstrate some development towards sustainable transport as many of them have developed a national transport policy or are in the developing stages. Even the countries who do not have any national transport policy, such as Afghanistan and Bhutan, have their own priority policy which can potentially contribute towards sustainable transportation. However, the key issue regarding national policy is the implementation, as many South Asian countries are not progressing towards implementation of these national policies.

## 4.3- Key actions for a Sustainable Transport Sector in South Asia

As revealed by the systematic review of the NPPs using semi-structured interviews and focus group discussions, it can be noted that many of the transport related problems and obstacles are common among the South Asian nations. However, some nations have their own country specific obstacles. Accordingly, the following list can be identified as common obstacles faced by the South Asian nations.

- Accessibility to the rural areas (internal accessibility)

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- Improvements to the existing road network
- Demands to introduce highways and flyovers
- Improve the effectiveness of the public transportation network
- Ensure the public transportation system is safe and secure for passengers
- Ensure that vehicle emissions are minimal and introduce green transportation modes
- Reduce traffic congestion and ensure that road transportation is convenient and efficient
- Enhance the airports and fleets to meet international standards
- Reduce the number of transport related accidents, especially reduce the number of road accidents

In order to address the aforementioned issues, the Governments of South Asia need to take key actions if the countries are to develop sustainable transportation. Accordingly, as stated in the methodology, the NPPs were further systematically reviewed using QSR-NVivo in order to reveal the key actions required for a sustainable transportation system. These key actions finally led to identifying the common priorities to be considered for sustainable transportation in the South Asian region.

### 4.3.1-Accessibility to the Rural Areas (Internal Accessibility)

It has been identified that Afghanistan needs an integrated transportation sector strategy for regional development. The Government has recently developed the transport and civil aviation strategy (2007/08-2012/13), which covers short and long-term development projects, which act as a guide for the relevant departments. However, there are no specific policies addressing the obstacles faced by this sector. Accordingly, there is a huge demand to introduce an integrated policy to plan and design a national network, which connects the different regions and the rural areas. Like Afghanistan, Nepal has a critical need for an integrated policy framework in order to plan and implement a rural and regional connecting strategy.

In the context of Pakistan, the Government has taken the initiative to utilise the Indu River's waterways for freight, linking the regions and the rural areas. Sri Lanka needs to achieve 100% rural accessibility and connectivity through the repair of national, provincial and rural roads and rural road upgrading. In the context of the Maldives, it has been noted that they need to develop a regional development plan through an efficient and affordable transport network. There were no specific actions identified for Bhutan and Bangladesh. However, as identified, Bangladesh has already established better regional linkage through rail transportation.

As a whole, the South Asian region needs an integrated and efficient transport network enabling the environment for a globalised economy. Effective integration of the transport system in South Asia could also contribute greatly to enhancing access to remote areas, thereby extending economic development.

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#### 4.3.2-Improvements to the Existing Road Network

This is one of the most common obstacles identified in South Asia, especially in Afghanistan and Bangladesh. In Afghanistan and Bangladesh, many of the existing rural roads are gravel. There is a crucial need to prioritise a strategy in Bangladesh to ensure the maximum efficiency in using the existing transport network facilities. Afghanistan and Nepal have identified the need for an integrated national transportation policy, which will provide required funds and resources to improve the existing road network. Pakistan has identified the need for an indigenous tool to design and re-engineer the existing road network. Furthermore, it has been identified that Sri Lanka needs a better network capacity to share resources to improve the current road network. As a whole, the countries in the region need to have an integrated transportation policy for their nations, which specifically allocates resources, and funds for the improvements of their existing road networks.

#### 4.3.3-Increasing Need to Introduce Highways and Flyovers

This is another key obstacle faced by the countries in the South Asian region but this issue is specifically applicable to countries such as Sri Lanka and Pakistan. They have an increasing need for highways and flyovers due to increasing traffic congestion. Accordingly, the key actions required for this obstacle is an integrated transportation system. However, in the contexts of countries such as Bangladesh, Afghanistan and Nepal, there should be a specific priority to improve the condition of the current roads and inter-regional accessibility before developing strategies to introduce highways and flyovers.

#### 4.3.4-Improve the Effectiveness of the Public Transportation Network

The analysis revealed that Afghanistan needs an integrated transportation strategy, including private partnership, to address the development of all modes of transport to provide a safe and convenient public sector. Similarly, the analysis revealed that the Maldives needs a public/private partnership for the public transportation sector to increase its effectiveness. The key action identified in the context of Nepal is to introduce a railway for efficient and reliable mobility. Like Nepal, Pakistan needs to restore the railway transportation system, which is outdated at the moment, through increased investment involving the private sector. As a whole, the countries in the South Asian region need Private Finance Initiative (PFIs) or Private Partnerships (PPPs) to increase the effectiveness and the convenience of the public transportation system.

#### 4.3.5-Ensuring the Public Transportation System is Safe and Secure for Passengers

It has been noted that Afghanistan needs private sector involvement to upgrade the condition of current public transportation to ensure the safety and security of passengers. For example, privately managed and operated bus services are required for an effective and secure system. Comparably, the Maldives also needs to attract private financing to introduce safe and secure vessels for public transportation among the islands. Furthermore, Sri Lanka needs to establish safety regulations for public transport and strict enforcement policies. In

conclusion, South Asian countries need to establish missing safety regulations and strict enforcement of laws to ensure a safe and secure public transportation system.

#### 4.3.6-Ensure that Vehicle Emissions are Minimal and Introduce Green Transportation Modes

$CO_2$ emission released from the vehicles in Afghanistan is comparatively high as the vehicles in use are often more than 40-50 years old. Accordingly, the country has identified the need to introduce environmentally friendly means of transport to minimise environmental impacts. However, the Government has not taken any particular action. As identified in Section 4, Bangladesh has already identified actions to reduce $CO_2$ emissions by introducing battery-operated bicycles, and currently, the Government is in the process of introducing battery-operated taxies. Bhutan needs to explore the potential of clean and green transport such as electric vehicles but with advanced technologies, to ensure the used batteries will not be hazardous to the environment. The Maldives has identified the need to encourage academia to research on green and energy efficient transportation. In Pakistan, there is a need to install vehicle emission testing stations and to introduce environmentally friendly vehicles. As a whole, countries in the South Asian region need to take action to reduce $CO_2$ emissions by introducing measures to test vehicle emissions. They also need to invest in research on fuel-efficient technologies.

#### 4.3.7-Reduce Traffic Congestion and Transport Related Accidents

Traffic congestion is one of the most critical obstacles in the South Asian context. It was revealed that Afghanistan needs a new traffic management system and awareness program to inform people about the traffic regulations in order to reduce the congestion and also to reduce the number of accidents. Similarly, Bangladesh needs a traffic management system to reduce the congestion and the driving licensing authorities need to be strengthened in order to train vehicle drivers properly, to reduce road accidents. It has been identified that Nepal needs a new policy framework to address the rapid motorisation and increasing road congestion in the cities. Pakistan needs a new traffic management framework, which includes education of transport users, traffic safety and enforcing traffic regulations. Similarly, Sri Lanka needs to establish missing safety regulations, supported by strict enforcement laws.

As a whole, the countries in the South Asian region should create awareness among people about road congestion. They need to also attract investment from multilateral institutions to improve their accident-prone highways. Priorities also include awareness programmes to influence the behaviour of road users and improved care and rehabilitation following accidents.

## 5. Conclusions

This study aimed to investigate the current status of the transport sector in South Asia including an analysis of existing transportation policies. Furthermore, this study aimed to

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critically identify the obstacles associated with the transportation sector in South Asia, followed by possible solutions for the identified obstacles. Accordingly, the study provided a good background and a guideline to the policy makers to prioritise their work to introduce a sustainable transportation system in South Asia.

Based on the findings, it can be noted that the South Asian region faces many obstacles to achieve sustainable transportation. The analysis revealed that there are some common obstacles applicable to all countries in the South Asian region. Some of the common obstacles are inaccessibility to rural areas, increased number of traffic and transportation related accidents and higher vehicular emissions.

Accordingly, in order to achieve sustainable transportation in South Asian countries, policies need to be implemented to make people aware of traffic rules including policies on driver and passenger safety. Also, it is vital to address the issues, which have led to poor implementation of current policies. Countries in the South Asian region need to update policies to achieve sustainable transportation. Furthermore, they have to heavily invest in introducing ways to reduce $CO_2$ emissions from existing vehicles. Also, Governments in South Asia should provide adequate support to improve people's awareness of traffic rules and passenger safety. Most importantly, government institutions in the transportation sector should identify the need for sustainable transportation; they should receive adequate training and knowledge on sustainable transportation.

Finally, it can be noted that this work will significantly help the theory as well as the practice by providing a new contribution to the body of knowledge. Theoretically, the research findings will be useful for academics to further investigate the transport sector in South Asia to achieve sustainable transportation. Practically, these findings will benefit society as they may directly guide the decision makers and the practitioners to identify the existing situation in their region and their country. This will help to identify the key actions to be taken in order to improve transport systems to ultimately achieve sustainable transportation.

Despite the significant contribution of this work to the body of knowledge, it is important to state the limitations of this study as it helps other researchers to design any future research on this matter. Initially, one of the key issues was the lack of availability of literature on sustainable transportation particular to the South Asian context. The other key limitation was finding experts on sustainable transport. Many of the experts in the South Asian context involved in the transportation sector are specialised in their own area e.g. experts in road development, experts in public transportation improvement and so forth, rather than experts on integrated transportation development. Sustainable transportation is something which is an outcome of an integrated effort. Therefore, the research team had to screen experts for the study. However, after an extensive screening exercise, the research team could select the most appropriate experts for the study.

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| *Part A- Interviewee details* | | |
|---|---|---|
| 1. Name | | |
| 2. Affiliated institution | | |
| 3. Job title | | |
| 4. Professional background | | |
| 5. Expertise (please indicate the most relevant area of expertise) | Health, demographic change and wellbeing | |
| | Food security, sustainable agriculture and forestry, marine and maritime and inland water research and the Bio-economy | |
| | Secure, clean and efficient energy | |
| | Sustainable transport | |
| | Climate action, environment, resource efficiency and raw materials | |
| | Inclusive, innovative and reflective societies | |
| | Secure societies - protecting freedom and security of citizens | |

Interviewee Details

112x84mm (72 x 72 DPI)

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| Name | Sources |
|---|---|
| Availability of National Transportation Policy | 7 |
| No detailed national transport policy | 2 |
| Transport policy Available | 4 |
| Available in draft stage | 1 |
| Membership with international transport policies,transit agreements | 1 |
| Transport related policy | 2 |
| Availability of National Shipping Policy | 1 |
| Multi model transport policies | 1 |
| Need for specific Policies on public transportation and road development | 1 |

NVIVO analysis for policy review

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Table 01: Policy Analysis in Challenge 4 (Transport) in Sri Lanka – An Example

| Challenge 4 | PART A- Identification of policies and trends | | | | | PART B- Situation and gap analysis | | |
|---|---|---|---|---|---|---|---|---|
| **Key areas** | **Importance Scale:1-3 *** | **Statistics** | **Source** | **Policies available** | **Reference** | **Analysis of the current situation** | **Gaps** | **Key Informants** |
| Resource efficient transport that respects the environment | 1 | Total CO2 equivalent of all emissions is 5084 Gg C02; Road transport has a total CO2 equivalentof 4466 GgCO2. | Ministry of Environment (2011) | National Transport Policy (i.e. improvement of mass public transport systems and Motor Traffic Act) | Ministry of Environment (2011) | 1) There are a couple of transport service initiatives minimising carbon footprint but are PPPs, such as the Green Bus Transport system (but this is deployed only on specific inter-city transport routes) and the provision of a carbon neutral bus fleet for large scale events such as CHOGM 2) Initially SL incentivised buying electric and hybrid cars with no import duties but this was recently increased on larger hybrid vehicles causing confusion among consumers. | 1) Target is a an emission reduction of 20% 2010-2020 or 2% per year 2) Bio-fuels in transport upto 10% by 2016 2) The Haritha Lanke Programme has two relevant missions of "Clean Air-Everywhere" and "Cities for Health and Prosperity" which both focus on improving air quality through vehicular emission control. | Sustainable Energy Authority (Ministry of Environment & Renewable Energy), Ministry of Transport |
| | | Number of registered vehicles is 3,954,311 (2010) | WHO Global Health Observatory Data Repository (2014) | National Action Plan for Haritha Lanka Programme 2009 - 2016 | National Council for Sustainable Development (2009) | | | |
| | | Per day, number of average bus fleet is 7696 and number of average buses operated is 4299 with 880,336 kilometres operated and 34,132 number of employees (2012) | Ministry of Transport (2014) | Green Bus Inter-City Transport System and Carbon Neutral Bus fleet | Ministry of Transport & Walkers Tours | | | |
| | | | | | | | | |
| Better mobility, less congestion, more safety and security | 1 | The crude death rate (per 1000 population) was 6.9 (2011) | WHO Global Health Observatory Data Repository (2014) | Mahinda Chinthana Vision for the Future: Public Investment Strategy 2014 - 2016 (2013) | Dept of National Planning (2013) | 1) Investment of 713 bn Rs for road network development (2005 - 2012) focussing on high mobility inter-regional expressways, capacity enhancement of network and rehabilitation of National highways. | 1) Land acquisition in congested Colombo has been a challenge for road widening and construction of bypass roads | Ministry of Transport, Road Development Authority (Ministry of Ports & Highways), Urban Development Authority (Ministry of Defence). Asian Development Bank. |

*** 1 – Very important, 2 – Medium, 3 – Not important**

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Table 02: Number of interview and focus group participants

| Challenge | Afghanistan | | Bangladesh | | Bhutan | | Maldives | | Nepal | | Pakistan | | Sri Lanka | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | IN | FG | IN | FG | IN | FG | IN | FG | IN | FG | IN | FG | IN | FG | IN | FG |
| **1** | 2 | 2 | 13 | 2 | 5 | 3 | 4 | 2 | 3 | 2 | 18 | 4 | 2 | 5 | **47** | **20** |
| **2** | 2 | 3 | 18 | 4 | 7 | 5 | 6 | 2 | 2 | 2 | 19 | 4 | 1 | 4 | **55** | **24** |
| **3** | 4 | 2 | 7 | 1 | 3 | 2 | 5 | 2 | 2 | 3 | 13 | 1 | 1 | 5 | **35** | **16** |
| **4** | 3 | 1 | 6 | 2 | 4 | 2 | 4 | 2 | 2 | 6 | 19 | 1 | 1 | 5 | **39** | **19** |
| **5** | 5 | 3 | 27 | 3 | 7 | 4 | 5 | 2 | 2 | 2 | 29 | 5 | 2 | 4 | **77** | **23** |
| **6** | 2 | 1 | 13 | 7 | 4 | 9 | 2 | 3 | 4 | 4 | 8 | 1 | 2 | 5 | **35** | **30** |
| **7** | 2 | 1 | 7 | 2 | 4 | 10 | 4 | 2 | 2 | 3 | 39 | 2 | 2 | 5 | **60** | **25** |
| **Total** | **20** | **13** | **91** | **21** | **34** | **35** | **30** | **15** | **17** | **22** | **145** | **18** | **11** | **33** | **348** | **157** |
| **Total number of Focus Groups** | | **1** | | **3** | | **1** | | **2** | | **1** | | **2** | | **6** | | **16** |

IN: Number of Interviewees

FG: Number of Focus Group participants

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