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Initiative for Climate Action Transparency - ICAT

ASSESSMENT ON MRV & INSTITUTIONAL ARRANGEMENT OF TRANSPORT SECTOR IN SRI LANKA

UNEP DTU
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Deliverable 1

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Climate Smart Initiatives (Pvt) Ltd

January 2019

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PUBLISHED BY

Climate Change Secretariat, Ministry of Mahaweli Development and Environment

Ministry of Transport and Civil Aviation

PREPARED UNDER

Initiative for Climate Action Transparency (ICAT) project supported by the German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety, the Children´s Investment Fund Foundation (CIFF), the Italian Ministry for Environment, Land and Sea Protection, and ClimateWorks

The ICAT project is hosted by the United Nations Office for Project Services (UNOPS)

Acknowledgement

According to the Sri Lankan Nationally Determined Contributions (NDCs) submitted by the Government of Sri Lanka to the United Nations Framework Convention on Climate Change (UNFCCC) in 2016, and the Sri Lanka's Readiness Plan for Implementation of Intended Nationally Determined Contributions (INDCs) in 2016, the establishment of a national MRV (Measuring, Reporting & Verification) system is considered as a national priority. Sri Lanka has also to present the status of achieving the NDC goals in 2020. In this context, Sri Lanka has been looking for assistance from various parties to support the establishment of its national MRV system in the transport sector.

This initial report on Assessment of monitoring reporting and verification (MRV) of mitigation actions and institutional arrangement for transport sector in Sri Lanka is the first deliverable of the assignment on developing a national MRV System for Transport Sector in Sri Lanka under the project Initiative for Climate Action Transparency (ICAT). This report was produced under the direct guidance and supervision of Climate Change Secretariat (CCS) of Ministry of Mahaweli Development and Environment (MMDE), Ministry of Transport and Civil Aviation (MTCA), and UNEP DTU Partnership.

To carryout this task, UNEP DTU Partnership awarded a short Term International Consultancy Contract to Climate Smart Initiatives (Pvt) Ltd (ClimateSI). In this regard, Climate Smart Initiatives (Pvt) Ltd wishes to express its gratitude to UNEP DTU partnership and ICAT for facilitating Sri Lanka to develop this national transport sector MRV system.

Our appreciation is also extended to Mr.G.S. Withanage (the secretary of MTCA), Mr. Thilakarathne Banda (additional secretary of MTCA), the heads and the staff of all the institutions under MTCA, the head and staff of CCS, and the heads and the staff of other relevant ministries. We also express our profound thanks to Dr. Sunimal Jayathunga (Director of CCS) and Mr. S.S.A. Kularathne (Director of MTCA) for providing their invaluable guidance, comments and suggestions through out this assignment.

We appreciate the regular guidance, feedback and supervision provided by Fatemeh Bakhtiari (Senior Researcher, UDP) and Subash Dhar (Senior Economist, UDP) in the design and preparation of this report.

Finally, ClimateSI wishes to thank all those who helped and contributed to make this assignment a success.

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Climate Smart Initiatives (Pvt) Ltd.

Sri Lanka.

List of Acronyms

AD	Activity Data
AFOLU	Agriculture, Forestry and Other land Use
BUR	Biennial Update Reports
BAU	Business As Usual
CAGR	Compound Average Growth Rate
CCS	Climate Change Secretariat
CDM	Clean Development Mechanism
CTF	Common Tabular Format
COP	Conference of the Parties
CMA	Conference of the Parties serving as the meeting of the Parties to the Paris Agreement
EDGAR	Emission Database for Global Atmospheric Research
EF	Emission Factor
GEF	Global Environment Facility
GFEI	Global Fuel Efficiency Initiative
GHG	Greenhouse Gas
IPPU	Industrial Processes and Product Use
INDC	Intended Nationally Determined Contribution
IPCC	Intergovernmental Panel on Climate Change
LULUCF	Land Use, Land Use Change and Forestry
MMDE	Ministry of Mahaweli Development & Environment
MMWD	Ministry of MegaPolis & Western Development
MoF	Ministry of Finance
MoH	Ministry of Highways
MoPRE	Ministry of Power & Renewable Energy
MoPS	Ministry of Petroleum Resource Development

MTCA	Ministry of Transport & Civil Aviation
MRV	Monitoring, Reporting, and Verification
NAMA	Nationally Appropriate Mitigation Action
NDC	Nationally Determined Contribution
NTC	National Transport Commission
SNC	Second National Communication
UDA	Urban Development Authority
UNFCCC	United Nations Framework Convention on Climate Change

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1. Introduction

1.1. Background

Sri Lanka is an island with total land area of 65,610 km^2 and the total population of about 21 million. As a rapidly growing lower middle income country, Sri Lanka has GDP per capita of USD 4,037 in 2017[1] and maintains average GDP growth of 5.3 % per annum from 2011-2018[2]. Sri Lanka, having an urban-based economy, is led by manufacturing and services sectors. Increased energy demand and use in Sri Lanka is a result of having an urban-based economy. Increased energy use has also led to increased air pollution, GHG emissions, and growing economic vulnerability to volatile fossil fuel supplies and prices. Over 40% of Sri Lanka's primary energy depends on imported fossil fuels, mainly coal, fuel oil and petroleum. Majority of fossil fuel imports will be used to meet the needs of growing transport sector, which contributes to the highest GHG emissions in the country

As a tropical country, Sri Lanka is highly vulnerable to the adverse effects of climate change, in particular, rise of sea level, increase in the frequency and intensity of disasters (especially droughts and floods). This will lead to serious damages to the country, including the transport infrastructure. According to the conservative estimates of the impact of climate change on Sri Lanka's economy, it indicates a 1.2% loss of annual GDP by 2050 due to its direct adverse impact on major economic sectors, such as power, transport, agriculture, water resources, fisheries, tourism, etc. Climate change will also likely to bring about other intangible negative impacts, such as decline of unique ecosystems and biodiversity.

1.1.1 National GHG Emissions

According to Sri Lanka's second national communication (SNC) total GHG emissions excluding LUCF in 2000 was approximately 19 $MtCO_2e$, which represented less than 0.1% of global emissions (EDGAR, 2017). As per SNC, Carbon Dioxide (CO_2) emissions have shown the highest contribution (58% of total GHG emissions in 2000), which is followed by Methane (CH4) and Nitrous Oxide (N_2O) (36% and 6% of emissions in 2000 respectively)

As shown in table 1, the energy sector, which includes the transport sector emissions as well, has the largest share of total national GHG emissions (61.4% of total national emissions in 2000),

[1] https://www.cbsl.gov.lk/sites/default/files/cbslweb_documents/statistics/otherpub/economic_and_social_statistics_of_SL_2018_e_0.pdf

[2] http://www.statistics.gov.lk/national_accounts/dcsna_r2/production.php

Table 1: Breakdown of GHG emissions by sector[3]

Sector	$MtCO_2e$ in year 2000 (CO_2, CH_4 and N_2O)	%
Energy (Power, Transport, Energy use in Industry)	11.562	61.4%
Industry	.492	2.6%
Agriculture	4.709	25.0%
Land Use Change & Forestry	0.045	0.2%
Waste	2.033	10.8%

Source: Second national communication 2012, MMDE

1.1.2 GHG Emissions in transport sector

Sri Lanka's transport sector GHG emissions is growing rapidly and it is 5 $MtCO_2e$, which represents 35% of Sri Lanka's net total CO_2e emissions, and almost half of the emissions from the energy sector in the year 2000. The majority of emissions come from road transport, representing 88% of total CO_2e emissions from the transport sector.

Table 2. Breakdown of emissions in transport sector by emission type and sub-sector in 2000[2]

Sub-sector	Emissions ($MtCO_2e$) in the year 2000						
	CO2	CH4	N2O	CO	NOx	NMVOC	SO2
Road Transport	4.444	0.00047	0.00004	0.131	0.047	0.025	0.0075
Railway Transport	0.080	0.00001	0	0.0001	0.001	0.00022	0.00015
Air Transport	0.497	0	0.00001	0.0007	0.002	0.00035	0.00016
Sea Transport	0.037	0	0	0.0005	0.00075	0.0001	0.00017
Total	***5.058***	***0.00048***	***0.00005***	***0.134***	***0.051***	***0.025***	***0.008***

Source: Second national communication 2012, MMDE

[3] ClimateSI converted the original figures, which were in Gg, to Mt.

1.1.3 NDCs of Sri Lanka

While Sri Lanka takes adaptation measures as a priority given its high vulnerability to climate change, the country is committed to contribute to global mitigation efforts. Sri Lanka has put forth two key goals for climate change mitigation as part of its NDCs submitted in accordance with the Paris Agreement under the United Nations Framework Convention on Climate Change (UNFCCC):

- Reduce GHG emissions in the energy sector against the Business-As-Usual (BAU) scenario by 4% unconditionally and an additional 16% conditionally by 2030
- Reduce GHG emissions against BAU scenario by 10% in other sectors (transport, forests, industries and waste) by 3% unconditionally and an additional 7% conditionally by 2030

Sri Lankan NDCs cover five main sectors: energy, transport, industry, forestry and waste, and it was submitted to UNFCCC in April 2016. In addition, "Readiness Plan for Implementation of INDCs" was also prepared by MMDE in 2016 to facilitate the implementation process of NDCs by identifying policy and institutional gaps, as well as technical capacity and resources required to implement the NDCs.

1.1.4 Transport sector NDCs

Sri lankan NDCs related to transport sector consists of eleven main NDCs and thirty one sub NDCs. The main NDCs are listed here.

1. Establish energy efficient and environmentally sustainable transport systems by 2030.
2. Upgrade of Fuel Quality Standards (FQS) to reduce harmful emissions that cause environmental pollution and health hazards.
3. Reduce unproductive transport systems from current usage.
4. Shift passengers from private to public transport modes.
5. Enhance the efficiency and quality of public transport modes.
6. Reduction of GHG emissions in the maritime sector.
7. Gazette new emission standards to reduce GHG emissions.
8. Encourage and introduce low emission vehicles such as electric and hybrid.
9. Reduce traffic congestion in order to reduce GHG emission.
10. Reduction of GHG emissions in the aviation sector.
11. Establishment of a database management system for monitoring NDCs of transport sector.

1.2. Objectives & Outcomes

This report on assessment of MRV and Institutional arrangement of transport sector in Sri Lanka is the first report in a series of reports prepared to achieve the objectives of the ICAT and its assistance in developing national MRV system for the transport sector in Sri Lanka.

Objective of the Initiative for Climate Action Transparency (ICAT)

Monitoring reporting and verification of the progress on NDC implementation is needed to meet country's international reporting requirements, and "to build mutual trust and confidence and to promote effective implementation, an enhanced transparency framework for action and support, with built-in flexibility which takes into account Parties' different capacities and builds upon collective experience." (Article 13.1 of the Paris agreement). MRV of NDCs is also important to meet domestic requirements. These could include reports: (a) to the parliament and the public in order to improve transparency; and (b) to policy-makers informing decisions on changes to the existing mitigation or adaptation actions. ICAT was founded to respond to these critical need to support improved transparency and capacity building under the Paris Agreement. The primary objectives of ICAT are to;

a) Strengthen institutional and human capacities in countries to develop and implement domestic system to MRV mitigation policies and actions (MPAs); and

b) Develop tools and guidance that can be used for an effective system for MRV MPAs implementation.

In order to achieve these objectives in the implementing countries, ICAT has three implementing partners: UNEP DTU Partnership; Voluntary Carbon Standard (VERRA); and World Resource Institute (WRI). Roles of the implementing partners are to coordinate with the implementing country, and the selected consultants to achieve the objectives of ICAT project in the implementing country.

Objective of ICAT project in Sri Lanka

With the view of achieving above mentioned objectives, the ICAT agreed to facilitate building a national MRV system for Sri Lankan transport sector based on a request from Sri Lanka. During a stakeholder consultation held in Sri Lanka, it was identified that Sri Lanka does not have a transport sectorMRV system. Most of the experience in the MRV area is limited to energy sector. In addition, there are some ongoing MRV activities in energy sector under energy NAMA coordinated by UNDP Sri Lanka. However, there were not many MRV related activities in transport sector, which represents 50% of energy sector emissions. Further the transport sector is becoming the largest GHG contributor in Sri Lanka due to the rapid growth in the sector. In order to address this rapid growth of transport sector emissions and to meet the international obligation on reporting the status of achieving transport sector NDCs, it is vital to develop an affective national MRV system. As such, it was agreed between Climate Change Secretariat (CCS) under the Ministry of Mahaweli Development & Environment (MMDE), Ministry of Transport & Civil Aviation (MTCA), and UNEP DTU Partnership to prioritize the development of MRV system for the transport sector.

Objective of the ICAT project in Sri Lanka is to fill the gaps of MRV and institutional needs for reporting of NDCs by developing an affective national MRV system through enhancing existing institutional set up for the transport sector NDCs.

The assignment will focus on reviewing existing MRV and institutional arrangement within transport sector,identification of appropriate methodologies to measure GHG impacts of prioritized NDCs, design of MRV system, which includes: establishing institutional arrangement (roles an responsibilities, reporting channel), designing data management system, developing reporting templates; and identifying necessary legal arrangements. This will facilitate a robust and continuous national MRV system. The consultant will work in close cooperation with National Focal Point, UDP representative and national experts to deliver the expected output.

Output of ICAT project in Sri Lanka

i. A report on the assessment of MRV & Institutional arrangement in transport sector

ii. A report on selected methodologies for assessing the impacts of GHG emissions on transport sector policies and actions

iii. A report on designing MRV system and establishment of roles & responsibilities for transport sector

1.3. MRV systems in Sri Lanka

What is a MRV system?

According to the Bali action plan which brought about the term MRV, climate change mitigation actions, mainly GHG emission reductions shall be implemented in a measurable, reportable and verifiable manner. Measurement, Reporting and Verification (MRV)[4] are key elements for: (a) ensuring greater transparency, accuracy and comparability of information with regard to climate change in order to identify good practice, foster a learning process, and allow an international bench marking; (b) recognition and visibility of mitigation achievements to raise ambitions of other countries; (c) attribution of quantified impacts to policies; (d) accounting national and international progress; (e) identifying gaps and international support needs; and (f) creating access to international public and private finance.

MRV is generally required to meet the national and international requirements. Following table list the national and international drivers of MRV.

[4] Page 18 of https://www.transparency-partnership.net/system/files/document/mrv-tool-4-2.pptx__0.pdf

Table 3: Drivers of MRV

National drivers	International drivers
MRV systems underpin national GHG data quality	Improve trust among Parties
MRV helps identify national priorities (including NAMAs), as well as challenges and opportunities	International recognition for national performance
Policy planning and prioritisation and improving policy coherence – important to keep track of lessons learned from implementation of mitigation policies and action in order to develop better policies in the future (continuous improvement of MRV systems and implementing NAMAs)	Provide lessons learned
For internal national record: Keeping a record of mitigation policies and actions in place, tracking progress of the effectiveness of mitigation policies and actions (e.g. emission reductions and progress to achieve objectives)	Data quality is key to address national reporting obligations to the UNFCCC mechanisms and progress national engagement in the UNFCCC process.
Data quality assurance: important to access climate finance and participate in market mechanism (e.g. emission trading system)	
To demonstrate to donors the emission reduction and impacts of mitigation policies and actions.	

Source: How to set up national MRV system, draft 4.2, GIZ

According to the "handbook on Measurement Reporting and Verification for developing country parties"[5] published by UNFCCC, MRV is applied in three areas:

(a) MRV of emissions (estimation of emissions at national, regional, sectoral levels);

(b) MRV of NAMAs (MRV of the impacts of mitigation policies and actions); and

(c) MRV of support (MRV of financial flows/technology transfer/capacity building and their impacts).

[5] https://unfccc.int/files/national_reports/annex_i_natcom_/application/pdf/non-annex_i_mrv_handbook.pdf

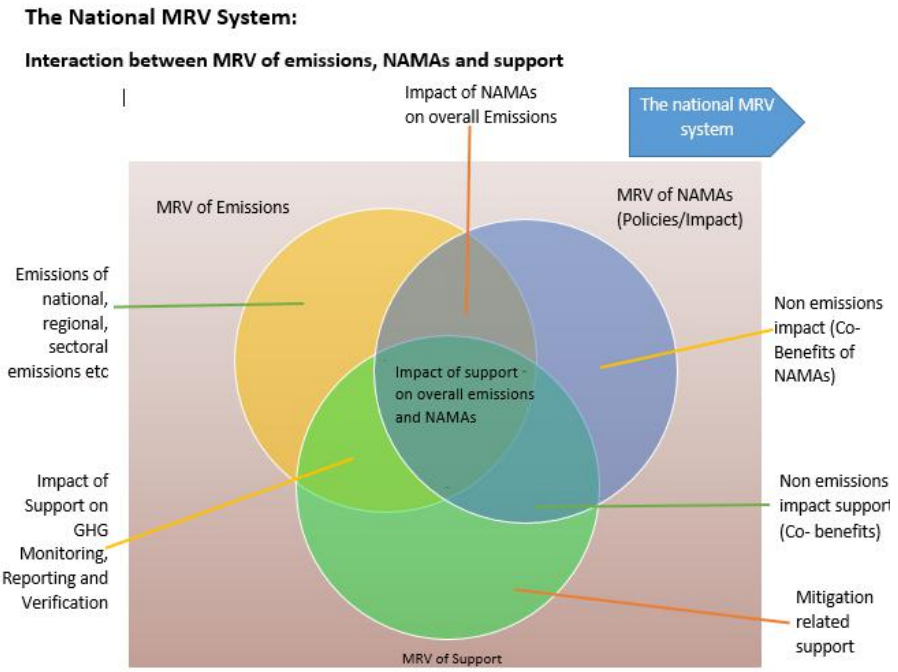

Figure 1: Interaction between MRV of emissions, NAMAs and support adapted from "Handbook on Measurement Reporting and Verification for developing country parties, 2014

MRV of GHG emissions in Sri Lanka

Since Sri Lanka is a party to UNFCCC, it is mandatory to report the GHG inventory periodically as part of the national communications (every four years) and biennial update reports (every two years). As a result, Sri Lanka has the expertise and experience of MRV of emissions in developing national GHG inventories as part of national communications to UNFCCC, so far, the island nation has developed two national communications (Initial National Communication - INC and Second National Communication - SNC) under the leadership of Climate Change Secretariat. Further CCS is leading the preparation of the third National Communication (TNC), which is expected to be completed by early 2019. All three national GHG inventories are developed based on IPCC Tier 1 approach.

MRV of NAMAs (policy and actions) in Sri Lanka

In relation to MRV of policies, Sri Lanka has not established any MRV system yet. For MRV of actions, Sri Lanka has expertise in applying CDM methodologies for:

a) Over 22 energy and waste sector projects under UNFCCC CDM;

b) Energy generation and end use sector NAMA for three technologies (rooftop solar PV, high efficient motors, and bio gas) under GEF funded project managed by UNDP;

c) Modern biomass energy technology project under GEF funded project managed by UNDP;

d) 4 energy projects under Sri Lanka Carbon Crediting Scheme (SLCCS); and

e) Developing BRT NAMA project in the transport sector.

The experience in the application of the CDM methodologies can be used while developing MRV framework, in particular, establishment of the baseline, monitoring framework, data management system, etc. Further Sri Lanka also has an approved institutional arrangement for NAMA, which include MRV component as well. Though Sri Lanka has MRV experience in the energy sector, it has a limited experience in other sectors. MRV experience in the transport sector is limited only to the development of a proposal for BRT NAMA project as the only framework for MRV. MRV experience in the waste sector is limited to a small number of CDM projects, whilst negligible experience exists in the industry sector.

Sri Lanka has implemented few CDM projects, SLCCS and Global Environment Facility (GEF) funded projects, and has gained first-hand experience of MRV. Apart from these projects, the majority of relevant programs described in the previous section, such as the CPF, energy & end use NAMA, and the transport NAMA programs, are still in the design or pilot stages, and have not yet had a significant impact on capacity building of local experts.

Sri Lanka has limited MRV experts, who have experience in the application of MRV methodologies for emissions, policy & actions. In relation to the verification component of MRV, the island nation has few domestic institutions while it relies mostly on the international institutions.

1.4. Scope

Scope of this report which is the first of three reports on building national MRV system for transport sector of Sri Lanka, is to conduct an assessment on existing national MRV system and institutional governance structure in the transport sector with the aim of developing national MRV system in line with Nationally Determined Contributions.

1.5. Limitations

There are 11 NDCs and 31 sub NDCs for the transport sector. However, it is not possible to cover all NDCs and sub NDCs due to the limited time and budget. As such, CCS & MTCA together with UNEP DTU Partnership agreed to prioritize the NDCs and Sub NDCs based on a quantitative method. Please refer the methodology section (1.6) on the proposed methodology to select the prioritized NDCs.

1.6. Methodology

The assessment is conducted in four steps. First, desk review of existing MRV systems and institutional governance structure is conducted using the publicly available data. Secondly, several interviews are conducted with various organizations, in transport sector and other related institutions which are listed in annex 8 Thirdly, stakeholder consultation is held to collect and validate the information, and get feedback for the assessment. Finally draft report is prepared and discussed with the relevant stakeholders.

Methodology to identify prioritized NDCs

Three criteria (financial feasibility, political preference and effect on GHG reduction) will be applied and each criteria will be given a weight between 1 (least possibility) and 5 (highest possibility) with a discussion between MTCA, CCS of MMDE and ClimateSI (the consultant). In addition, selection of the prioritized NDCs and sub NDCs will be further validated during workshop held for all institutions under MoT and CCS of MMDE. Please refer to annex 1 for further information on the template used to identify prioritized NDCs

Approach to group the prioritized NDCs

ASI (Avoid-Shift-Improve) is a transport sector approach with dual objectives: to achieve significant GHG emission reductions; and to reduce energy consumption. This approach promotes alternative mobility solutions and develop sustainable transport system to achieve its dual objectives. As such, this approach will be used to categorize the prioritized NDCs into three groups.

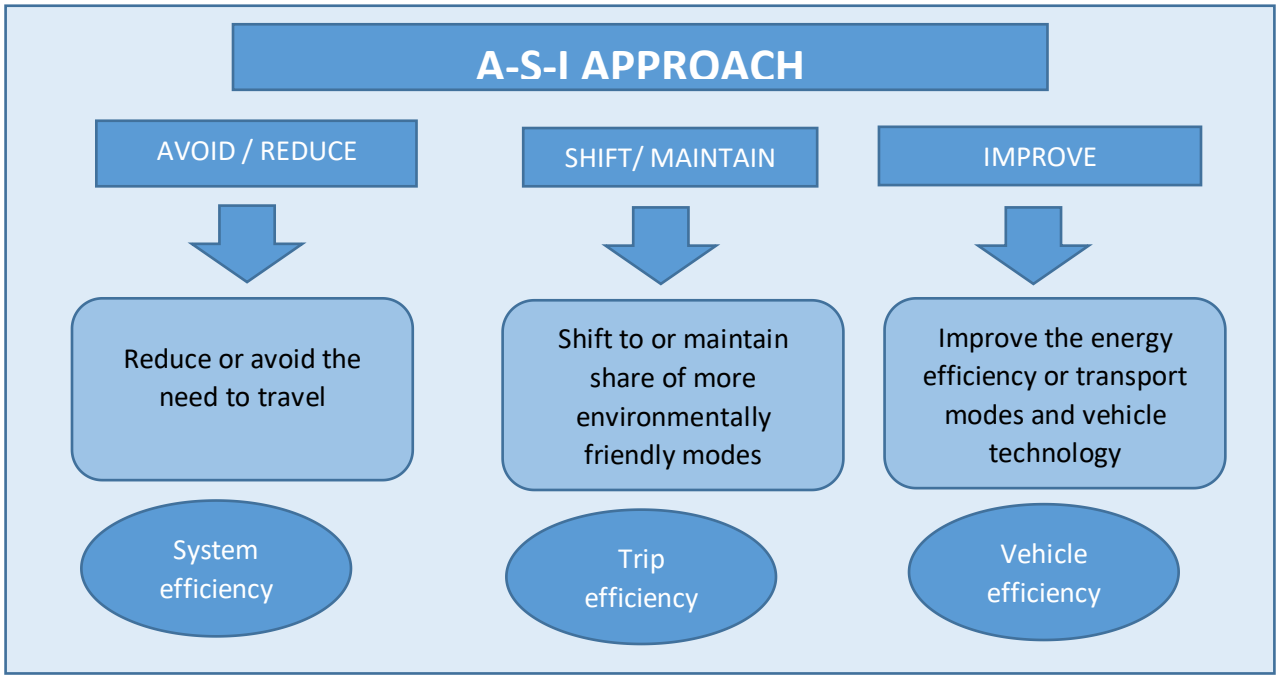

Figure 2: ASI Approach

2. Assessment of institutional set up in Sri Lankan transport sector

2.1. Institutional arrangement in Sri Lankan transport sector

The institutional arrangements for the transport sector is relatively fragmented and are spread over several ministries and agencies in Sri Lanka (Kumarage, 2011). While MTCA has overall responsibility in for developing policies, programs and projects in the transport sector including the road, rail, air and marine sub-sectors at present, there are nine institutions under the purview of MT&CA for implementing the transport sector policies, programmes and projects. These institutions are;

Department of Sri Lanka Railways;

Sri Lanka Transport Board;

National Transport Medical Institute;

Department of Motor Traffic;

National Transport Commission;

Civil Aviation Authority;

Lakdiva Engineering Company (Pvt) Ltd;

Airport and Aviation Services (Sri Lanka) Ltd;.

National Council for Road Safety.

In addition to these institutions, there are few ministries who are involved in the transport related activities, such as: Ministry of Megapolis and Western Development; Ministry of Provincial Council & Local Authorities; Ministry of Power & Renewable Energy; Ministry of Petroleum Resource Development; Ministry of Finance; and Ministry of Defence. Figure 3 depicts the institutions which function in the the transport sector of Sri Lanka. Roles and responsibilities of those institutions, who are working on the transport related activities, are listed in annex 9.

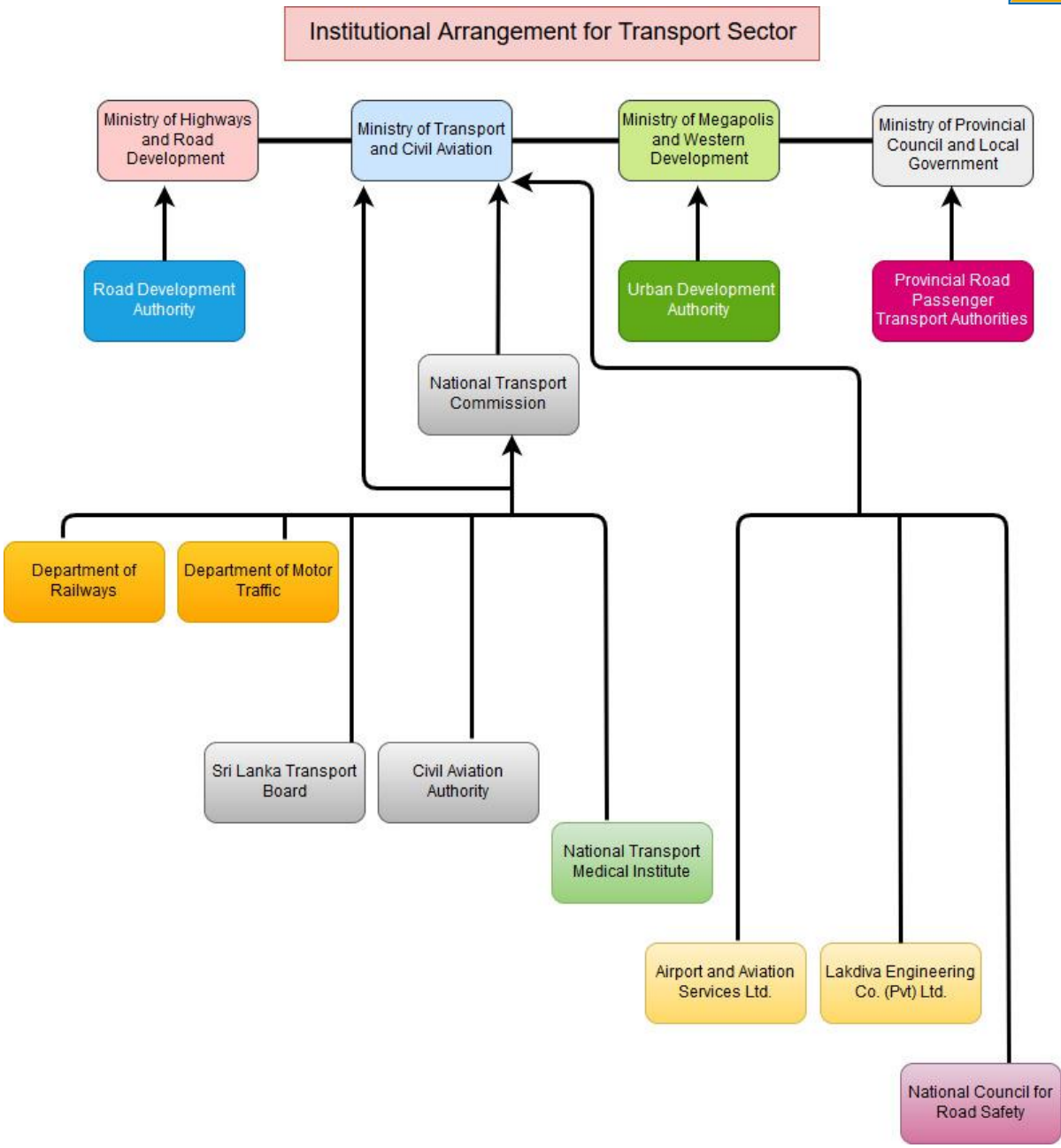

Figure 3: Institutional arrangement in transport sector

MTCA is the primary regulatory body in relations to transport related activities in Sri Lanka. It has nine institutions directly under its supervision as shown the figure 3. In terms of reporting to the MTCA, each institution directly reports to MTCA while Airport and Aviation Services Ltd reports to both MTCA and Civil Aviation Authority. National Transport Commission (NTC) prepares annual report on the status of transport sector. As such, five institutions, Department of Motor Traffic (DMT), Department of Railway, Sri Lanka Transport Board, National Transport Medical Institute, and Civil Aviation Authority also provides necessary data to complete the annual report by NTC.

Ministry of Megapolis and Western development is the responsible for modern transport related projects within mega cities. However, it coordinates with MTCA when they conduct such projects.

Ministry of Highways and Road Development also engages with the national transport related projects and it coordinates with MTCA.

Ministry of Provincial Council and Local Government is responsible for provincial transport related activities, and it also closely work with MTCA while implementing those projects.

2.2. Institutional set up for addressing climate change

Institutional arrangements for climate change mitigation

Ministry of Mahaweli Development & Environment (MMDE) is the national focal point for UNFCCC. Climate Change Secretariat, which comes under MMDE, acts as the operational focal point for climate change. Since the climate change is a cross cutting issue, CCS coordinates with multiple ministries, institutions and agencies to implement climate change related activities. CCS also creates platform for addressing climate change issues at the national level. CCS is responsible for: (a) developing relevant policies and programs; (b) liaising with sectoral agencies to identify priorities and implementation mechanisms; and (c) monitoring impacts of national climate responses. Moreover, CCS is responsible for engaging other ministries and departments in addressing climate change.

As part of the climate policy making process, three committees were established under the CCS to enhance stakeholder engagement. These cross functional committees are;

- The Inter-Agency Committee on Climate Change ; This is a coordinating body made up of members of line ministries and line agencies, designed to ensure climate-related policies are aligned with the national development agenda, and also to guide policy makers on how to integrate international & national climate adaptation and mitigation into relevant policies and strategies. Along with this committee, two cross-sectoral, technical sub committees were also established.

- The National Expert Committee on Climate Change Mitigation: This committee was set up in 2012 to provide guidance in the development of climate mitigation policies, legal instruments and action plans to address climate change as discussed under the international climate change negotiations.The committee was also tasked with supporting the preparation of the national greenhouse gas inventory, and guiding the implementation of NAMAs, CDM and other similar mechanisms.

- The National Expert Committee on Climate Change Adaptation:This was set up in 2014 to raise Ministries' awareness of the country' vulnerability to climate change and to inform policies, strategies and action plans to avoid/minimize adverse impacts of climate change to people, livelihoods and ecosystems.

Central Environmental Authority (CEA), which is also an institution under the MMDE, is responsible for specifying environmental standards, as well as coordinating and carrying out the preparation of reports related to the environmental management of natural resources, fisheries, wildlife, forestry and soil conservation. In accordance with the environmental protection standards and other criteria set out by CEA, sectoral agencies are required to submit an environmental impact assessment report to ensure that environmental considerations are integrated into policies and plans (CEA, 2000).

Institutional arrangements for climate change mitigation actions/NAMAs

National climate change policy (2012) identifies the need for implementing GHG reductions actions. In order to systematically implement those actions, MMDE has initiated to set-up institutional arrangements. First institutional set up developed to implement mitigation actions in Sri Lanka is the NAMA institutional arrangement, which covers energy, transport, waste, industry, agriculture and forestry sectors. Further this has been approved by the cabinet on 19th July 2017. As shown in Figure 4, the NAMA institutional arrangement covers both project approval and MRV process.

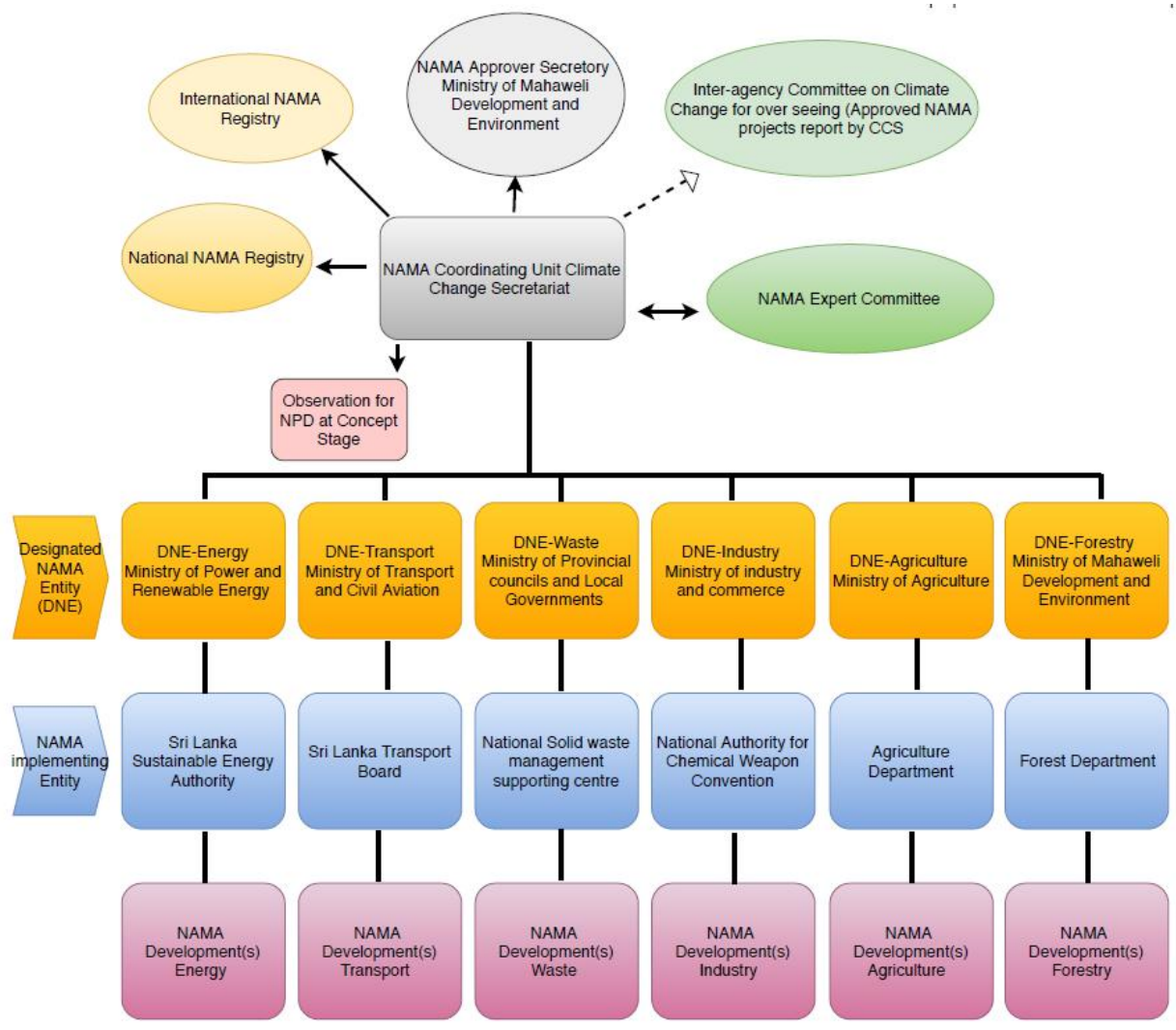

Figure 4: Institutional arrangement for NAMAs in Sri Lanka

NAMA Approver/MMDE: The secretary to MMDE acts as the NAMA approving entity. All NAMAs to be implemented in Sri Lanka are required to get the approval from the NAMA approver.

NAMA Coordinating Entity/CCS: The director of CCS acts as the head of NAMA coordinating unit For any NAMA to be implemented in Sri Lanka. Related MRV will have to be carried out by the NAMA expert committee of CCS. In addition, MRV and NAMA registry will be maintained by NAMA coordinating entity.

Inter-Agency Committee on Climate Change: CCS will report to this committee on the approved NAMA proposals.

NAMA Expert Committee: This committee will be approved by the secretary to MMDE, and it will be a sub committee of existing National Expert Committee on Climate Change Mitigation (NECCC - Mitigation). This sub-committee consists of chairman and one sector expert of NECCC - Mitigation, representatives of five Implementing Entities (one from each implementing entity), one representative from National Planning Department, one representative from External Resource Department, one representative from NAMA coordinating unit (who will be the convener of this committee), three representatives from resource pool at CCS. This committee will play an advisory role for the process of formulating general guidelines to project developers and guidance to sectoral NAMA implementing entities.

Designated NAMA Entity: This is the Ministry of the relevant sector. This Designated NAMA entity is to submit project proposals to NAMA Coordinating unit with recommendations and should represent the inter-agency over-sight committee.

NAMA Implementing Entity: This entity can be appointed by the relevant designated NAMA entity of each sector, and it has the capacity to evaluate NAMA proposals.

NAMA Developer: NAMA Developer can be a private/public (PPP) entity interested in developing future NAMAs, and it can also submit voluntary or supported NAMAs to the relevant implementing entity.

One transport sector NAMA was designed for sustainable transport in Sri Lanka through an electric bus rapid transit system (BRT NAMA) and primarily aimed to reduce GHG emissions while it has secondary objectives such as energy security, improved access to transportation, improved air quality and local job creation. This BRT NAMA proposal also included institutional arrangement for data collection.The details of the proposed institutional structure is shown in figure 5.

Institutional arrangement proposed under BRT NAMA

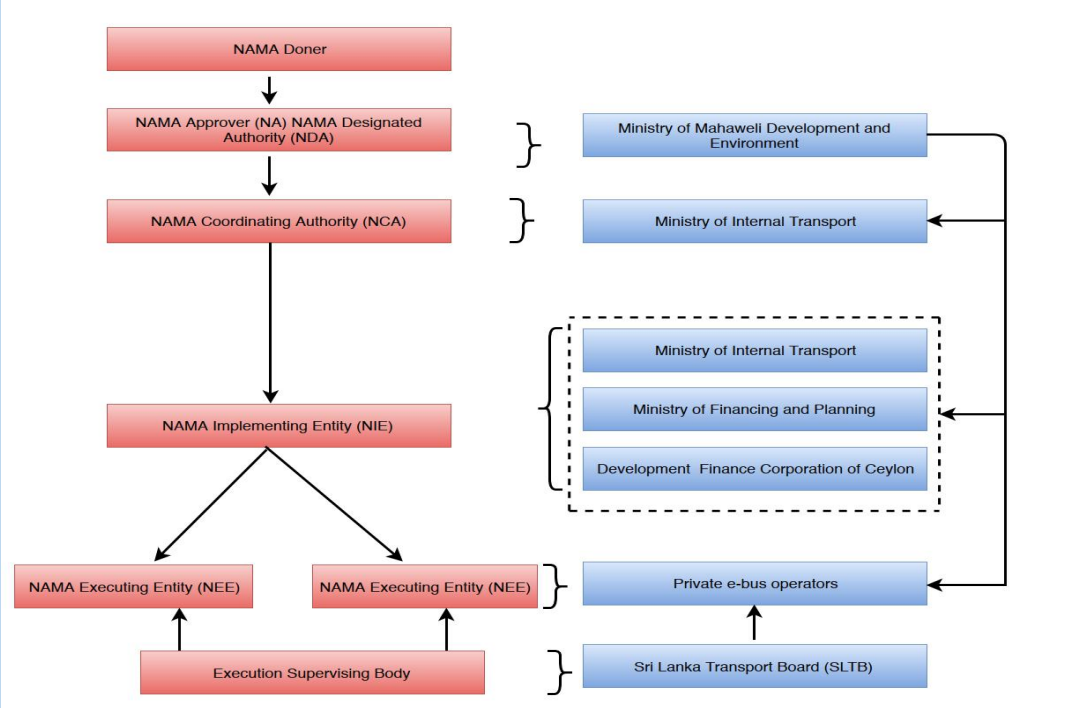

Figure 5: Institutional arrangement under proposed BRT NAMA

The institutional structure of the BRT NAMA has proposed four institutional bodies for the its operation.

National NAMA Focal Point or National NAMA Approver (NA)
NAMA Coordinating Authority(NCA)
NAMA Implementing Entity (NIE)
NAMA Executing Entities (NEEs)

National NAMA Focal Point or National NAMA Approver (NA): The proposed NA is supposed to be the national focal point to UNFCCC, which is Sri Lanka ***Climate Change Secretariat (CCS)***. According to the NAMA proposal, CCS is responsible for: approving NAMAs, which will be registered at the UNFCCC; providing guidance to the sectoral NAMA coordinating entities; issuing procedure for accounting of emission reductions to avoid double counting of emission reduction of various implemented NAMAs; and supporting the preparation of national communications, biennial update reports and summary of GHG reductions.

NAMA Coordinating Authority (NCA): According to the BRT NAMA proposal, **MTCA** will act as the NCA with the main tasks of acting as primary contact for international donors. In addition, MTCA will also be responsible for managing and directing the NAMA; approving NAMA targets; approving and updating eligible intervention; approving annual monitoring reports prepared by the NIE; supervising financial flows; and implementing the process with regard to the submission of project applications and the disbursement of funds.

NAMA Implementing Entity (NIE) : The BRT NAMA proposes establishment of NIE as the main operative body, which will be responsible for handling financial flows from funding entities to the beneficiaries of the transport NAMA in Sri Lanka**.** According to the proposal, MTCA ***along with Ministry of Finance and planning and DFCC Bank of Sri Lanka will take up the responsibility of the NIE.***

NAMA Executing Entities (NEE) : This will be the private sectors, who operate electric buses under this NAMA. Each NEE will operate electric buses on the proposed Galle BRT and inform NIE about the performance of their buses and collect data for monitoring purposes.

Even though BRT NAMA was prepared due to various reasons, it never came into operation. However, the proposal and the institutional structural proposed within it can be useful guideline for preparation of transport sector MRV.

2.3 Institutional gaps

Lack of coordination between relevant institutions

CCS of MMDE is the primary focal point in relation to coordinate and obtain GHG related data from all sectors and communicate with UNFCCC. With regard to the data collection in the transport sector, MTCA acts as the main focal point. At present, GHG related data are collected only for the purpose of preparing the GHG inventory as part of national communication to UNFCCCC. These data are collected by experts appointed by CCS and there is no proper arrangement for data collection through the ministries and the institutions under them. There is no adequate system in place to collect GHG related data in the country. Therefore, the data gathered for other purposes (such as policy making, performance monitoring, etc) are used in calculating GHG emissions of the country for the purpose of national communications. Further there is no system to verify those collected data. In addition, these data are not collected systematically and periodically, but in adhoc basis. As such, there is no continuous data collection system within each ministry and the institutions under them

Limited integration of NDC into strategies and inadequate priority

As stated in "Institutional capacities for NDC implementation: a guidance document"prepared by UNEP DTU Partnership[6] integrating NDC priorities into sectoral strategies is a pre-condition for successful NDC implementation. As NDCs were prepared based on existing policies and strategies, most of the transport sector NDCs are in line with national policies and strategies of the sector such as National transport policy, urban transport master plan and megapolis transport master plan. Even though NDCs are reflected in policies and strategies of transport sector, the level of priority given in implementation is still inadequate.Moreover there is sill a gap in integrating sub NDC s in to sectoral strategies.

[6] Bakhtiari, F., Hinostroza, M. L., & Puig, D. (2018). Institutional capacities for NDC implementation: a guidance document. UNEP DTU Partnership.

The inter ministerial committee on climate change, which has representatives from the ministries covering all the GHG sectors, is also functioning in the country to ensure the integration of the NDC priorities into sectoral policies and strategies. In addition, this committee also evaluate the progress of NDC implementation. However this committee does not meet regularly and progress of NDC implementation is not monitored and reported systematically. Further, the members of the committee lacks the knowledge and understanding on NDC implementation and climate change in general.

Lack of institutional capacity

The MTCA, the institutions under its purview, and other related organizations that interact with the MTCA do not have sufficient staff with relevant skills to collect the necessary data. The ministry even does not have any unit or at least a designated person to deal with the actions related to transport sector NDC implementation.

The MTCA received support from CCS of MMDE and UNDP to develop MRV system for BRT NAMA. However, this NAMA is not active, and does not involve MRV of four parameters identified to measure the GHG effects of BRT NAMA as this NAMA was not yet implemented. In addition, CCS of MMDE supports MTCA to collect and quantify national GHG emissions for transport sector. Institutional arrangements being developed under those initiatives can be utilized and reinforced to serve a greater MRV process for transport sector that will satisfy NDC requirements. The level of cooperation between departments under MTCA is very positive.

Inadequate regulatory framework

"Like any other aspect of public policy implementation, implementation of a Nationally Determined Contribution (NDC) necessitates an appropriate regulatory framework and regulatory framework is defined as the system of regulations, standards and administrative procedures that are relevant to NDC implementation and the mechanisms used to enforce their application"[7] Though some regulatory instruments for climate change mitigation, such as carbon tax, vehicle import tax and fuel import tax are available in the country, those are not fully contributing to the achievement of NDC targets. Also to implement the transport sector NDCs, some new regulation are needed. There is no legal requirement for the ministries and the institutions in the country to collect GHG related data. At the same time, most of the institutions does not have a mandate to collect and report GHG related data.

Absence of systematic data collection process

With regard to the data collection for GHG emissions, type of data to be measured and responsible institutions to measure each data are not properly defined for the transport sector. Further, frequency of these data measurement, reporting and verification are also not defined. Since there is no proper MRV system in place, roles & responsibilities of CCS of MMDE, MTCA & institutions under its purview are not clear. As such, the existing capacity of CCS requires reinforcement, while capacities in MTCA & the institutions under its purview require dedicated support to be able to integrate climate change and MRV needs into respective Programs.

[7] Bakhtiari, F., Hinostroza, M. L., & Puig, D. (2018). Institutional capacities for NDC implementation: a guidance document. UNEP DTU Partnership.

3. Assessment of MRV systems in the transport sector

Sri Lanka signed and ratified Paris agreement on 22nd September 2016. With that, Sri Lankan INDCs became NDCs. In Sri Lankan NDCs, clear contributions were defined to power and agriculture sectors separately while overall contributions were defined covering rest of the GHG sectors (transport, industry, waste, agriculture) without defining individual contribution for each sector due to unavailability of baseline emission data, baseline scenarios, methodologies, institutional set ups, etc. Further Sri Lankan NDCs stipulate the needs to set up a transparent and accountable means of monitoring and reporting, as well as verification system in the implementation of the NDCs. In addition, Sri Lankan NDCs emphasized that the national MRV system can be developed to be aligned with the Enhanced Transparency Framework and the Paris Agreement. As such, development of a national MRV system is a priority in Sri Lanka. Since each major sector has NDCs agreed as part of the Paris agreement, it is vital to develop national level MRV system for each major sector including transport.

3.1. Current MRV system in the transport sector

3.1.1 MRV system for the preparation of national GHG inventory for Second National Communication (SNC)

GHG Inventory of Sri Lanka SNC was prepared based on 2000 activity data, and communicated to UNFCCC in 2010. Sri Lanka applied IPCC Tier 1 approach to quantify the GHG emissions of the transport sector and also used default emissions factors for the fuel from IPCC 1996 guidance. Activity data for the preparation of the GHG inventory was taken from fuel sold for various transport sub sectors by fuel type. The data for road transport by fuel type (gasoline, diesel and LPG) was sourced from National energy balance prepared by Sri Lanka Sustainable Energy Authority (SLSEA). Sri Lanka Railway provided the data for rail transport by fuel type while Civil Aviation Authority & national energy balance of SLSEA provided the relevant data for air and water transport respectively. The relevant data are collected and the GHG quantification for the transport sector is done by the consultants appointed by CCS. Once the GHG quantification is reviewed by an independent panel, CCS submitted the national communication including the GHG inventory to UNFCCC.

CH_4 and N_2O emissions depend on vehicle technologies used. However, it was not possible to estimate fuel consumption by vehicle types. Therefore, the GHG inventory in SNC applied emission factors based on fuel itself as per IPCC tier 1 approach.

3.1.2 MRV system for NAMA in transport sector

As shown in Figure 4, the government has approved NAMA institutional arrangement for Sri Lanka. While this institutional arrangement mainly covers the evaluation and approval process of the locally identified NAMAs, it also includes the component to evaluate the MRV for each identified NAMA. This is due to the fact that the establishment of MRV system for each NAMA is mandatory in order to measure the GHG effects and to transparently report it. This approved institutional arrangement can potentially be further developed and used for national MRV system in transport sector.

MRV system proposed under BRT NAMA

As shown in figure 6 bellow, MRV system was also prepared for BRT NAMA, "Sustainable transport in Sri Lanka through an electric bus rapid transit system". While the primary objective of this NAMA was to reduce GHG emissions, it also had few secondary objectives, such as: energy security; improved access to transportation; improved air quality; and local job creation.

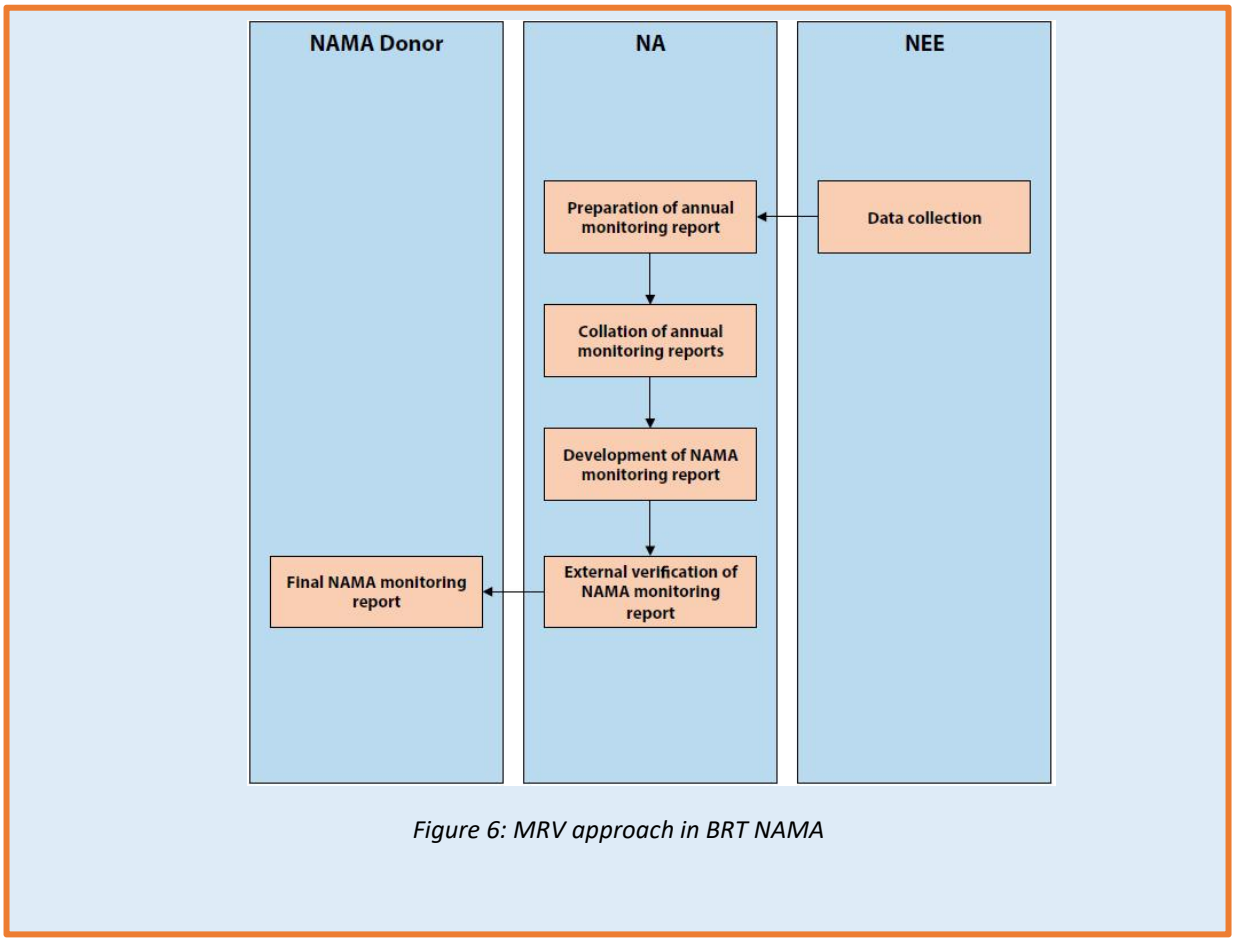

Figure 6: MRV approach in BRT NAMA

The main responsible entity for the MRV system of BRT NAMA is MMDE, which is the NA. MMDE will set the database and the compliance system, and may delegate some of the tasks to the organizations operating the intervention.

The process flow for the MRV management framework is as follows.

Monitoring process

- The monitoring agency (NA) will: (a) collect the data from the various NEEs; (b) combine them in a central monitoring database; and (c) summarize the results in a NAMA monitoring report.
- The NA also arranges for an external verification entity to verify the annual monitoring report.
- The final monitoring report together with the verification report of the external verifier is submitted to the NAMA donor.

Reporting Forms

The NAMA Coordinating Authority (NCA) is responsible for the development of reporting form templates. These forms will include at a minimum the following information:

- details of the technology used;
- details of the NEE, including contact details;
- description of the measuring system;
- data parameters measured;
- default values applied;
- sampling plan details;
- calculation of emissions reductions.

The reporting form template will be provided by the NCA to the NEEs. The completed forms will be submitted annually to the NIE by the NEEs.

Verification Mechanisms

Verification rules for NAMAs are usually based on the requirements of the NAMA funding agencies, as well as host country requirements. Before developing domestic capacity for verification, it is recommended that some of the existing CDM Designated Operational Entities (DOEs) or ISO 14064 certification bodies with experience in the transport sector and a good understanding of local conditions in Sri Lanka are used.

3.2 MRV gaps in transport sector

Following MRV gaps were identified during this assessment.

1. Unavailability of standards & methods to quantify the GHG effects of mitigation policy & actions.
2. Lack of capacities to identify data relevant to measure the GHG effects.
3. Insufficient resource to attend the data collection and GHG quantification as the government officers have to attend these activities in addition to their regular work.
4. Some of the data has to be collected at local level as the national level authorities do not have access to those data. However, there is a lack communication between local & national level institutions.
5. There is also a lack of capacity to understand on the concept of emission reduction, emission inventory and BAU scenario among the relevant government officials.
6. Lack of finance capability to use relevant GHG MRV tools, resources, etc.
7. Lack of technology support such as relevant tools, equipment to measure, report & verify GHG emissions.
8. Unavailability of GHG data management system for transport sector.

Therefore a sound MRV system to cover all the necessary elements of MRV as stated in the “Reference document on MRV in the transport sector”is a timely need. When Sri Lanka implements a MRV system for the transport sector in order to understand the total GHG emissions in the sector and the effects of the mitigation actions specified in NDCs, the starting point should be to build on the existing institutional arrangements for mitigating actions in the country.

4 MRV needs for prioritized NDCs

4.1 Process for selection of sub- sectors

The assessment is conducted in four steps. First, desk review of existing MRV systems and institutional governance structure was conducted using the publicly available data. Secondly, several interviews were conducted with various organizations, which are listed in annex 8. Thirdly, stakeholder consultation was held to collect and validate the information, and get feedback for the assessment. Finally, draft report was prepared and validated with the relevant stakeholders.

Based on this assessment, development of national MRV system for the transport sector was limited to five main NDCs representing 10 sub NDCs. Well-known, A-S-I (avoid, shift, improve) approach was used to categorize the sub NDCs into four main categories as shown the table 4.

Table 4. Prioritized NDCs and sub NDCs for transport sector ASIF

	NDC	Sub NDC
Improve railway	5 - Shift passengers from private to public transport modes	5.1: Electrification of railway 5.2 Purchase new rolling stock for Sri Lanka Railway
Improve road vehicles	8 – Encourage and introduce low emission vehicles such as electric and hybrid	8.3: Introduce electric buses 8.4: Introduce other electrified vehicles such as cars
Shift - traffic management	4 -shift passengers from private to public modes	4.1: Introduce park & ride system
	9 - Reduce traffic congestion in order to reduce GHG emission	9.4: Transport of heavy loads by railway
Improve regulations	7 – Gazette new emission standards to reduce GHG emission	

4.2 Status and trends of the prioritized sub sectors

4.2.1 Shift passengers from private to public transport modes

NDC 4.1 - Introducing park and ride system

Objectives of NDC

Though NDC 4.1 itself does not specify clear objectives of the park and ride system, it appears that this NDC has been introduced as a solution to the traffic congestion. In addition, pilot park and ride system (implemented in 2009) indicates dual objectives: to reduce the number of private vehicles entering the city in order to alleviate traffic congestion; and to reduce excess fuel consumption and environmental pollution by vehicle emissions. As such, this NDC can also be considered to have the same objectives as the pilot park and ride system.

The NDC 4.1 is supported by several national policies (National transport policy 2009, draft national transport policy 2017, national Climate Change Policy and Sri Lanka strategy for SD 2014, Presidential manifesto 2015, and Vision 2025 - 2017). Please refer Annex 3 for further information on the policy assessment.

Vehicle population of Sri Lanka

Sri Lankan vehicle population has been steadily increasing and reached to 7.2 million vehicle as of 2017 as shown in Figure *7.* Major types of vehicles in the country are motor cycles (4 million), motor tricycles (1.2 million), and motor cars (0.75 million), which together represents around 90% of the vehicle population in the country.

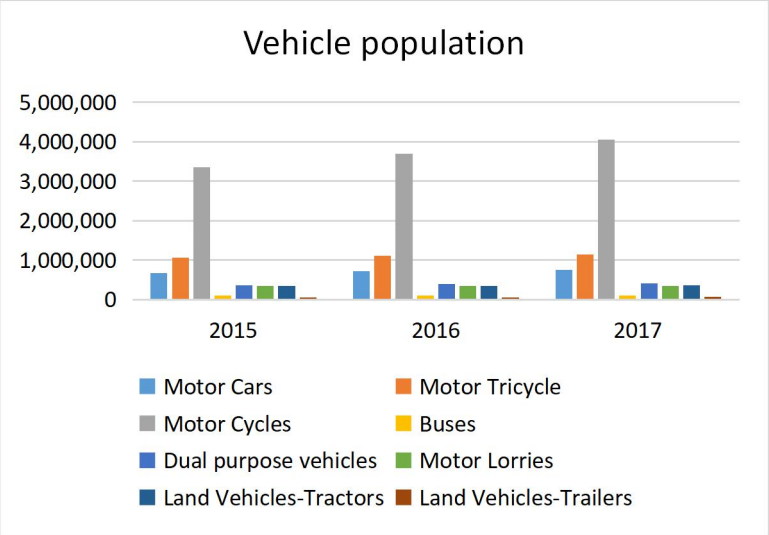

Figure 7: Vehicle population in Sri Lanka from 2015 - 2017 , Source: National Transport Statistic in Sri Lanka, 2017

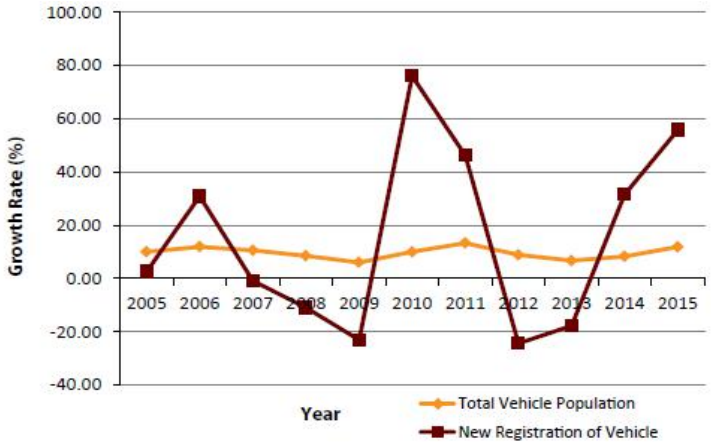

Figure 8: Growth rate of vehicle registration and vehicle population from 2005 - 2015,

Source: National Transport Statistic in Sri Lanka, 2016

Though the annual vehicle growth rate is increasing, expansion of the road to meet the increased vehicle and passenger demand is not at the same pace. As such, the increased vehicle population on the road is causing the traffic in the urban areas of the country.

Traffic congestion in Colombo city

According to a study by University of Moratuwa, 509,248 vehicles (private: 87.1%, public/mass: 5.7%, good: 7.2%) enter into Colombo every day with 1,880,777 people (private: 44.1%, public/mass: 51.9%, good: 74,965). Out of that, nearly 90% of the vehicles are private vehicles, which can carry only less than 50% of the passengers. Rest of the passengers are carried by public vehicles, which only represent 6% of the fleet. As an average, each private vehicle and bus carries around 2 and 33.6 people respectively. Figures 9A and 9B illustrate the composition and modal shares of the vehicle fleet entering Colombo municipal council through major corridors.

Figure 9A:Vehicles

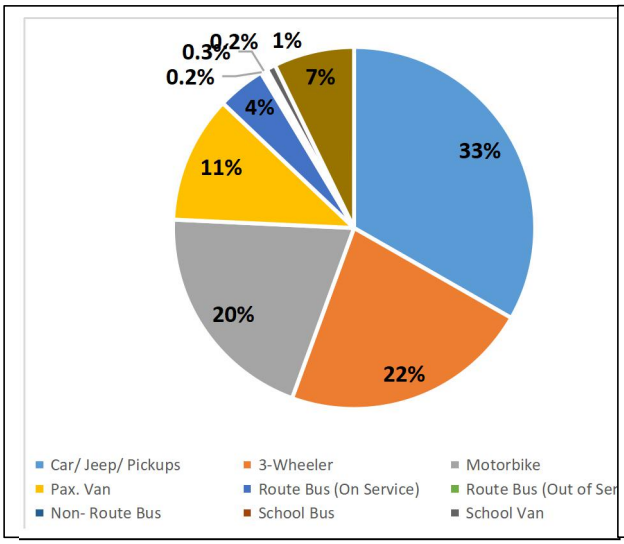

Figure 9B: Passengers

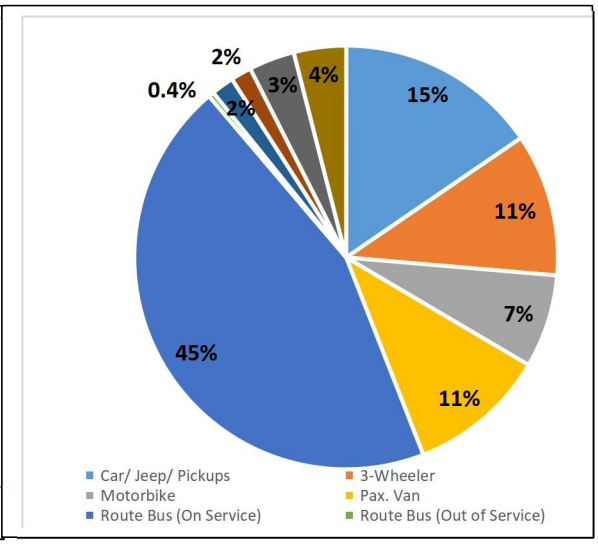

Figure 9: Average Daily Traffic (24 hour, 2-way) Flow on Major Entry Corridors to Colombo Municipal Council -2012

Source: National Transport Statistic in Sri Lanka (2015), study of Department of Transport & Logistics Management, University of Moratuwa

Table 5: Projection of vehicle fleet on road transport in Sri Lanka from 2015 - 2035

Type	2015	2020	2025	2035
Motor cars	669,174	719,362	773,314	893,661
Motor tricycles	1,059,042	1,161,769	1,274,460	1,533,697
Motor cycles	3,359,501	3,608,104	3,875,103	4,469,839
Buses	101,419	104,258	107,177	113,264
Total vehicle population WP[8]	5,979,000	6,900,000	7,700,000	9,100,000

Source: Motor Traffic Department, 2018

Further as given in Table 5, vehicle population of light vehicle category is expected to continue to grow and represent the largest share of the road vehicle population under the business as usual (BAU) scenario. Motor cycles expects to have highest share of vehicles by 2035 (4.5 million, nearly 50%), followed by motor tricycle (1.5 million, over 13%) and motor cars (0.9 million, nearly 10%). On the other hand, the number of buses is not expected to grow significantly under BAU. It is estimated that there would be around 113,000 buses in 2035, compared to 100,000 in 2015.

According to the Urban Transport System Development Project for Colombo Metropolitan region and Suburbs[9], this change in the modal share will reduce average passenger speed to 7.4 km/hr by 2035 from 19.4km/hr (2013). Further, this will also lead to increased economic loss of 471 billion Rs/year in 2035 from 14 billion Rs/year in 2013. Therefore, Significant efforts are required to promote the use of public transport, and limit the growth of inefficient, emission intensive private vehicles.

Mitigation actions implemented and planned

- ✓ Before including this mitigation action to the NDCs, the government had introduced park and ride system in 2009, which was called “Citi liner”. Main purpose of this system was to reduce the traffic congestion between Moratuwa to Colombo Fort via Nawam Mawatha. This was operated by a private company. But the system failed due to lack of passengers.
- ✓ Western Region Megapolis Transport Master Plan (WRMTMP, 2016) reiterated the possibility of establishing park and ride system in Hekitta and Peliyagoda area to reduce the number of vehicles entering across Kelani river to Colombo. The master plan also

[8] Megapolis Transport Master Plan
[9] Urban Transport System Development Project for Colombo Metropolitan region and Suburbs by Japan international cooperation agency oriental consultants co., ltd (2014)

indicates that the park and ride system can also be connected to Rapid Transit System line (RTS2, Fort - Maradana - Mattakkuliya / Peliyagoda).

- ✓ Aforementioned master plan also suggests park and ride facilities near: expressway (at Kadawatha, Peliyagoda and Kottawa) to attract people arriving on expressways; and Multi -modal Transport Hubs.
- ✓ Further it also indicates to connect the park & ride system to Cycle paths.

MRV system will be necessary to measure the GHG effects of the implemented and proposed mitigation under NDC 4.1. Mitigation actions and the relevant indicators for the prioritized NDCs will be discussed under deliverable 2: Harmonizing methodologies for assessing the GHG impacts of policies and actions in the transport sector.

4.2.2 Shift freight transport from road to rail

NDC 9.4: Transport heavy loads by railway

Objectives of NDC

Though NDC 4.1 itself does not specify clear objectives of the park and ride system, it appears that this NDC has been introduced as a solution to the traffic congestion. This NDC is also supported by National Transport Policy 2009.

Status of freight transport in Sri Lanka

According to National transport policy 2009, around 97% of freight movements are handled by road. The freight market share of Sri Lanka Railway (SLR) has come down to 21% in the recent past from 32% in 1979, which demonstrate a drastic decline in the efficiency and competitiveness of SLR in handling freight. Even though all three commercial ports had been connected by railway lines, no train operates at present to or from Colombo Port.

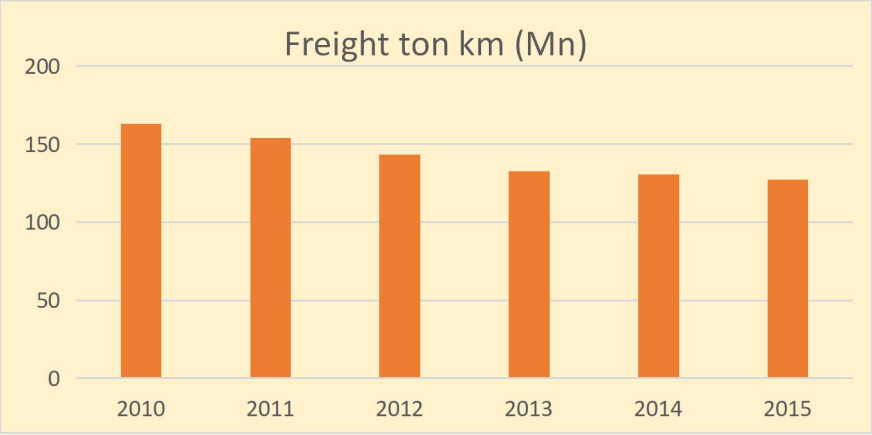

Figure 10: Freight ton km (Mn) by Sri Lanka Railway. Source: Sri Lanka Railway 2016

However, according to the National transport statistics report in 2016, Sri Lanka Railway provides service by 862 goods wagons and 160 oil tankers. Further 199 maintainable oil tankers are also available. According to the records, following are the type of goods and commodities that transport via railway from 2010 to 2015.

Table 6: Type of commodities transported by Sri Lanka Railway from 2010 - 2015

Commodity	2010	2011	2012	2013	2014	2015
Tea & Rubber	0	0	0	0	0	0
Rice	25,147	29,729	18,115	20,328	17,390	23,950
Flour	0	0	0	0	0	0
Sugar	0	0	0	0	0	0
Locally Grown Agriculture	0	0	0	0	0	0
Produce	0	0	0	0	0	0
Important Food Stuff	4,652	4,277	0	0	6,911	0
Coconut and Coconut Produce	0	0	0	0	0	0
Petroleum Products	517,079	573,686	607,584	574,236	594,043	581,835
Cement-Raw Material	2,129,156	1,319,990	1,426,769	1,314,648	1,235,931	1,218,061
Finished Product	875	2,527	2,664	2,046	353	276
Fertilizer	3,368	921	367	0	12	84
Other Manufactured Goods	2,136	2,794	0	0	1,645	0
Other	19,986	486	3,089	377	35	1,523
All Commodities	2,702,399	1,934,410	2,058,588	1,911,635	1,856,320	1,825,729

Source: National transport statistic (2016)

Generally, total amount of freight transported by rail has been decreasing over the time with sharp drop from 2010 to 2011 despite the slight increase from 2011 to 2012. Further operated freight kilometers also show significant decrease from 2010 (130.43 million km) to 2015 (127.39 million km). As a solution to reduce the traffic congestion, the government promotes, the shift of freight from road to rail which has also been included as a NDC.

Mitigation actions implemented and planned

In order to increase the share of freight transport several projects have already being identified and some are already started.

- ✓ Shift flour transport from road to railway: Sri Lanka Railway (SLR) has signed an agreement with Prima Ceylon (Pvt) Ltd on June 2017 to transport 15,000 tons of flour every month from china harbor to Galle and Seeduwa.
- ✓ Shift coal transport from road to railway: SLR has also entered into an agreement with Siam City Cement (Lanka) Limited (previously known as Holcim Lanka) to transport the imported coal from Trincomalee harbor to Maho station.
- ✓ Shift lime stone transport from road to railway: Sri Lanka Railway has given Siam City Cement (Lanka) Limited (previously known as Holcim Lanka) the right to use the rail track for the transport of lime - stones using their own locomotives and wagons from Aruwakkalu upon entering into an agreement entered with the Railway Department. Railway also hires locomotives to the company to transport lime stones on special charges.
- ✓ Shift petroleum products from road to railway: Ceylon Petroleum Storage terminals Ltd.(CPSTL) which manages the transportation of petroleum products, is also planning to use the railway to transport the products from main installation to bulk deposits.SLR is currently strengthening its assets. According to the SLR performance report of 2017, SLR is planning to add twenty oil tank wagons and twenty con tainer flat wagons within one year period to the fleet.

MRV system will be necessary to measure the GHG effects of the implemented and proposed mitigation under NDC 9.4. Mitigation actions and the relevant indicators for the prioritized NDCs will be discussed under deliverable 2: Harmonizing methodologies for assessing the GHG impacts of policies and actions in the transport sector.

4.2.3 Improve energy efficiency by introducing electric vehicles

NDC 8.3: Introduce electric buses

NDC 8.4: Introduce other electrified vehicles such as cars

Objectives of NDC

Though NDC 8.3 & 8.4 does not specify clear objectives of electric vehicles, it appears that this NDC has been introduced to reduce the GHG emissions and health impact due to the air pollution in the cities.

Status of passenger transport on the road in Sri Lanka

Sri Lanka public road transport system carries 1,019 million passengers per year while private road transport modes carry 2,949 million passenger per year (NTC, 2016). Sri Lankan road transport mostly consists of conventional diesel and petrol vehicles. In order to reduce the dependence on conventional gasoline, which leads to increase the GHG emissions and health threat, the government introduced electric vehicles in the country with special tax rebates. In addition, the government also included introducing electric vehicles as NDC. Please refer Annex 3 for further information on the policy assessment. In addition, these NDCs are also supported by draft national transport policy 2017 and Vision 2025.

Share of hybrid and electric vehicles has been steadily increasing its share since 2014 despite the dominance of conventional fossil fuel vehicles in the transport sector. This seems to be attributed to the tax reductions for the electric and hybrid vehicles, and higher fuel efficiency of the hybrid vehicles.

Table 7: Number of electric vehicles registered in respective years

Year	2014	2015	2016
Electric vehicles	90	3,238	983
Other vehicles	429,466	665,669	399,017

The modal share[10] of the considered vehicles is given below (in 2015)

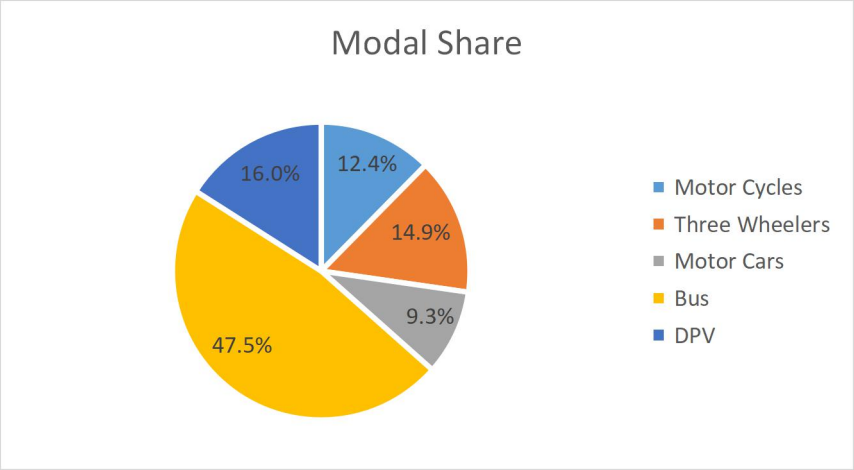

Figure 11: Modal share of road vehicles by type in 2015. Source: Motor Traffic Department, 2016

[10] 17th IUAPPA World Clean Air Congress and CAA 9th Better Air Quality (BAQ) Conference Convention Hall, BEXCO, South Korea; Session Topic: Institutionalizing Fuel Economy in Asia; Organizers: UNEP, GIZ, Clean Air Asia ; Presentation by Dr.A.G.T.Sugathapala, University of Moratuwa.

Mitigation actions implemented and planned

- ✓ Introducing 50 electric buses to the national fleet as per national budget for 2018.
- ✓ Introducing 250 electric and 750 hybrid buses main towns in western province and expressways with the aim of achieving target of having 100% electric of hybrid government vehicles by 2025.
- ✓ Reducing import tax for electric and hybrid cars.
- ✓ Increasing tax for conventional fossil fuel cars.
- ✓ Introducing carbon tax for vehicles based on the age and the engine capacity.

MRV system will be necessary to measure the GHG effects of the implemented and proposed mitigation under NDC 8.3 & 8.4. Mitigation actions and the relevant indicators for the prioritized NDCs will be discussed under deliverable 2: Harmonizing methodologies for assessing the GHG impacts of policies and actions in the transport sector.

4.2.4 Improving railway by electrification (NDC 5.1)

NDC 5.1 : Electrification of railway

Objective of the NDC

Though NDC 5.1 does not specify clear objectives of electric vehicles, it appears that this NDC has been introduced to reduce the GHG emissions and health impact due to the air pollution in the cities.

Status of passenger transport by railway in Sri Lanka

Currently Sri Lanka Railway (SLR) carries 120 million passengers per year, which represents 5% of public motorized passenger transport in Sri Lanka (National Transport policy 2009). The country has 323 railway stations and 1,449 km length of rail network that covers most part of country. As shown in figures 16 & 17, main & coastal lines carries nearly 90% of the passenger volume.

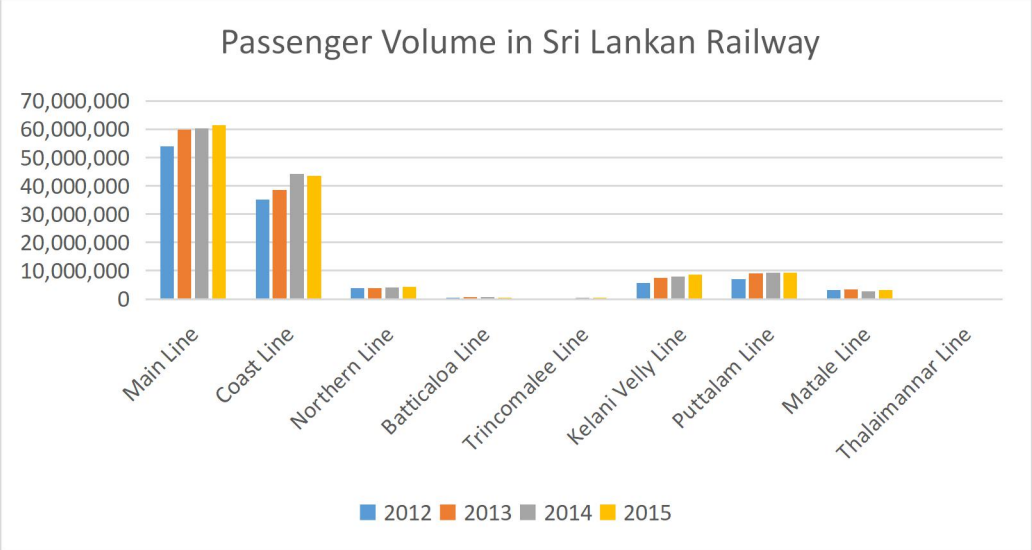

Figure 12: Passenger Volume in Sri Lankan Railway Source:National Transport Statistics report-2016

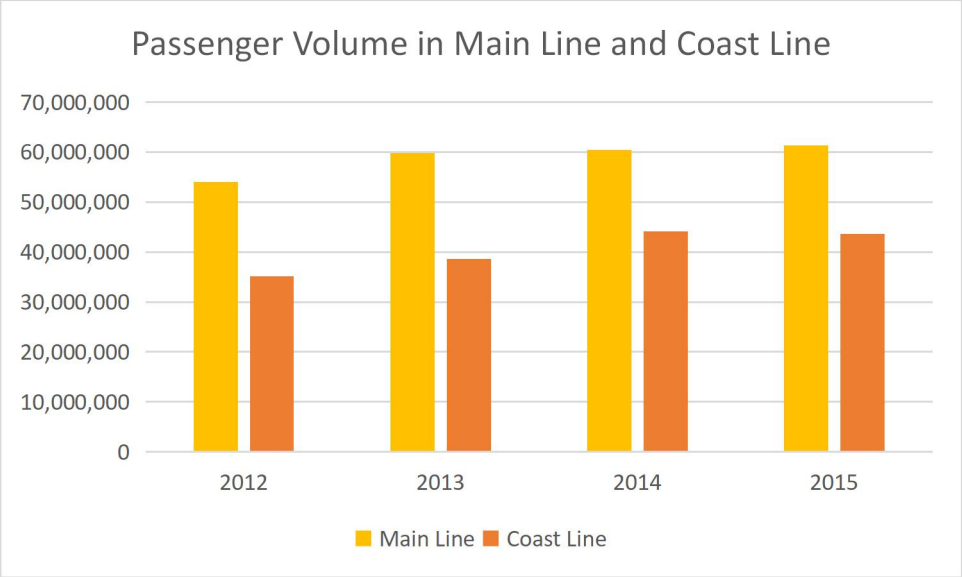

Figure 13: Passenger volume in main and coast lines in Sri Lanka. Source:National Transport Statistics report-2016

According to the National Transport Statistic Report 2016, total passenger kilometers by railway has increased by 8.2 % from 2014 (6,841.9 million km) to 2015 (7,407.39 million km). This increase is attributed to relatively low tariffs, recommencement of railway services on Northern line, addition of imported power sets (for suburban), and introducing new long distant train service. According to the western region megapolis transport master plan, there are number of railway lines proposed to be electrified.

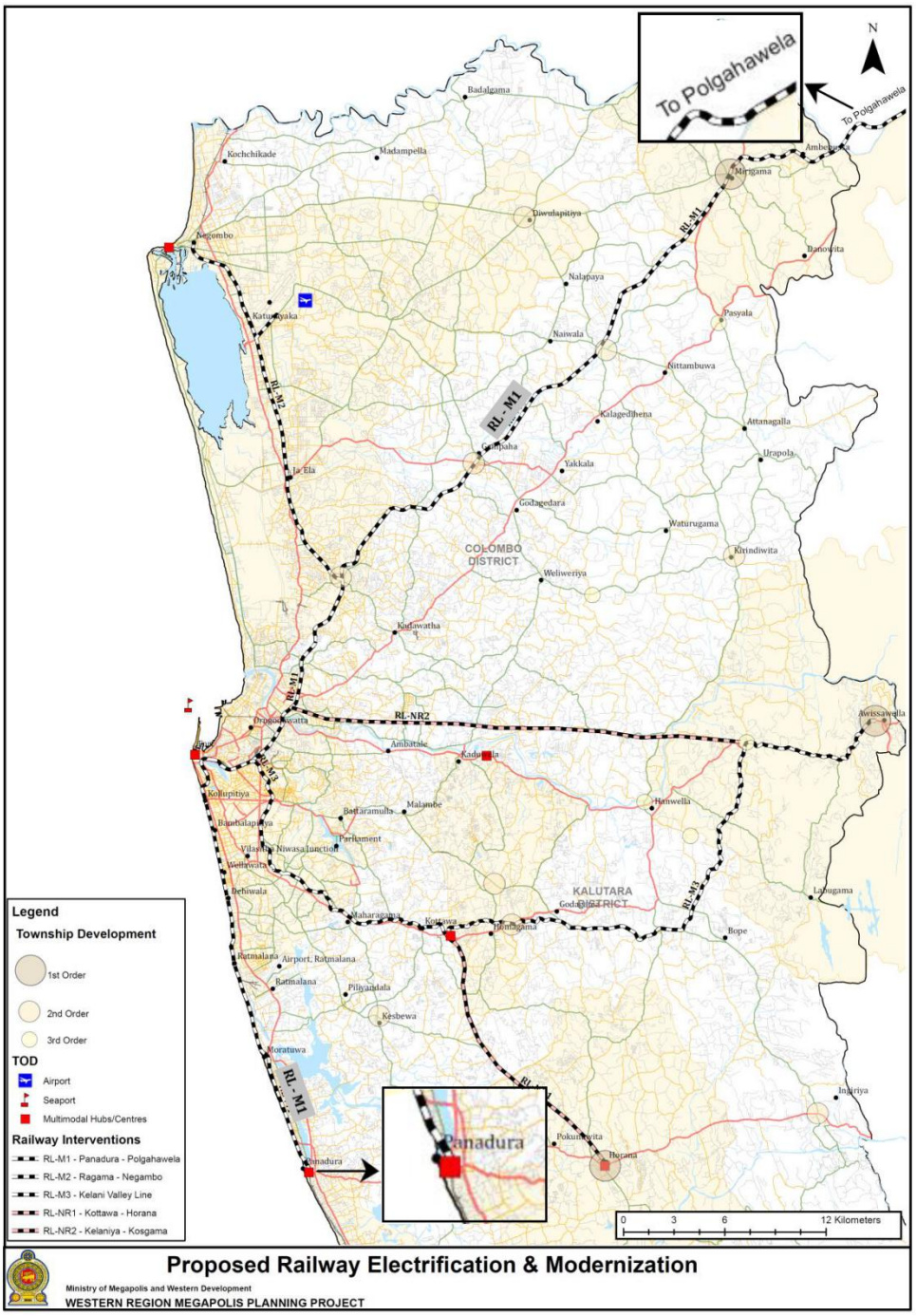

Figure 14: Proposed Railway Electrification & Modernization plan

Mitigation actions implemented and planned

NDC 5.1 is about electrification of a specific railway line-Panadura - Veyangoda railway line which is a part of both Coast Line and Main Line. According to National Transport Statistic 2016, fluctuation of passenger volume in each railway line is shown in the following graphs.

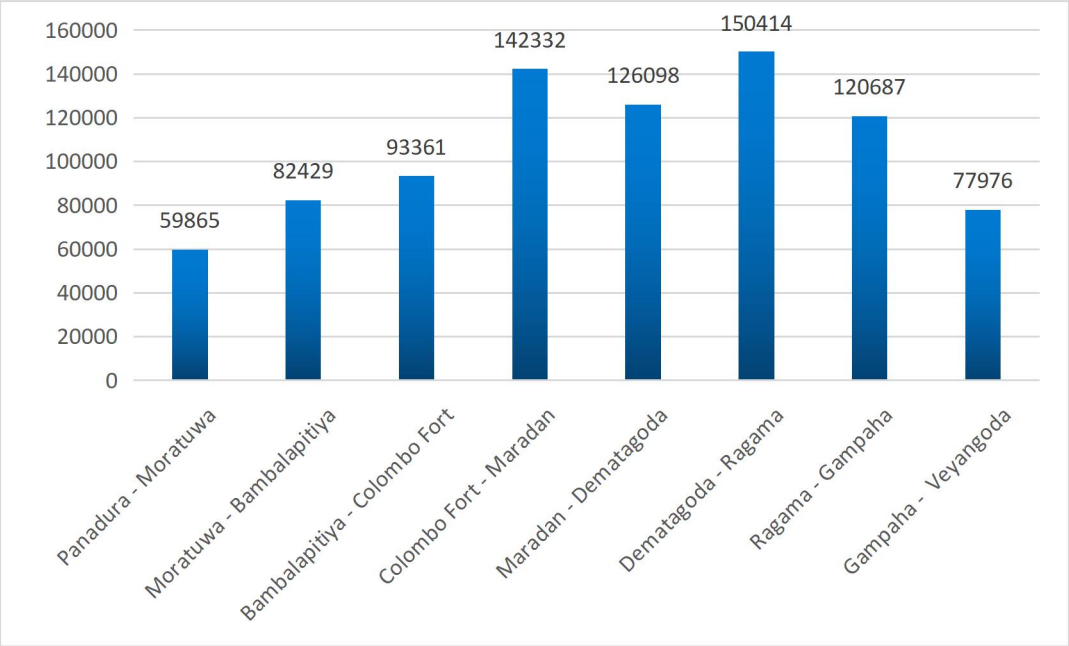

Figure 15: Flow of number of passengers 2015 (Panadura - Veyangoda)

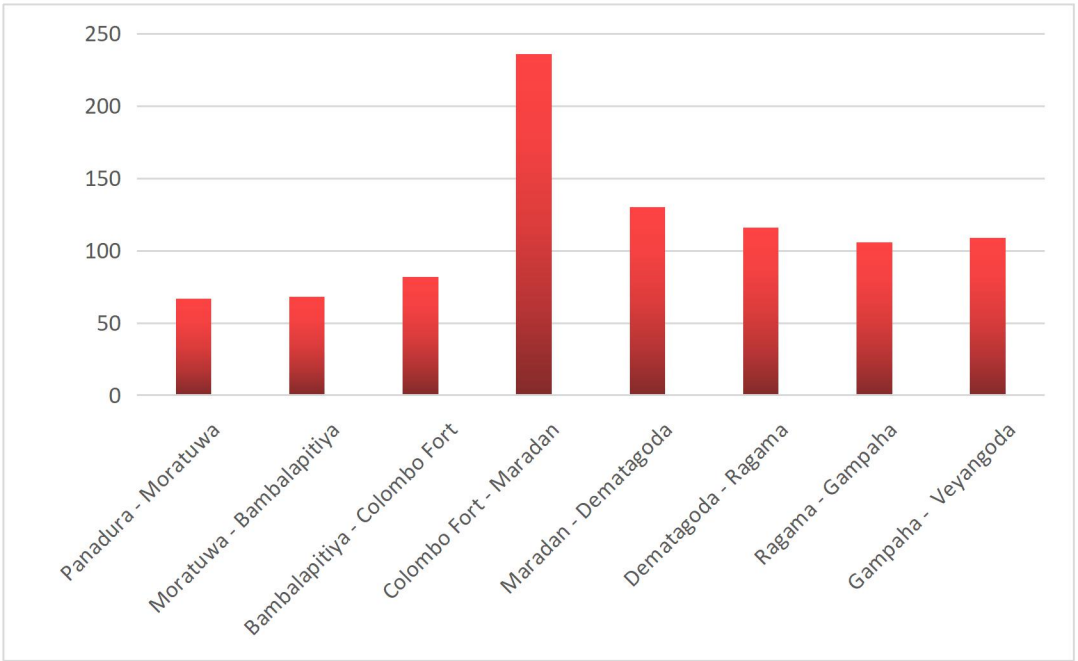

Figure 16 Number of trains in 2015 (Panadura - Veyangoda)

4.2.5 Improve railway by purchasing new rolling stocks

NDC 5.2: Purchasing new rolling stocks

Objective of the NDC

Though NDC 5.2 does not specify clear objectives of purchasing new rolling stocks, it appears that this NDC has been introduced to promote the railway as high efficient and low emission transport mode.

The need for new rolling stocks has also been identified in the national transport policy, national climate change policy,presidential manifesto 2015 and vision 2025.

Status of rolling stocks in Sri Lanka

Table 8: Summary of rolling stocks available in 2017, according to statistics of Ministry of Transport and Civil Aviation.

Type of Rolling Stocks	Availability
No of Diesel Electric Loco	95
No of Diesel Hydraulic Loco	42
No of diesel Multiple Units	102
No of Carriages	583
No of Good Wagons	234
No of Oil Tankers	228
No of Operable Steam Locomotives	3

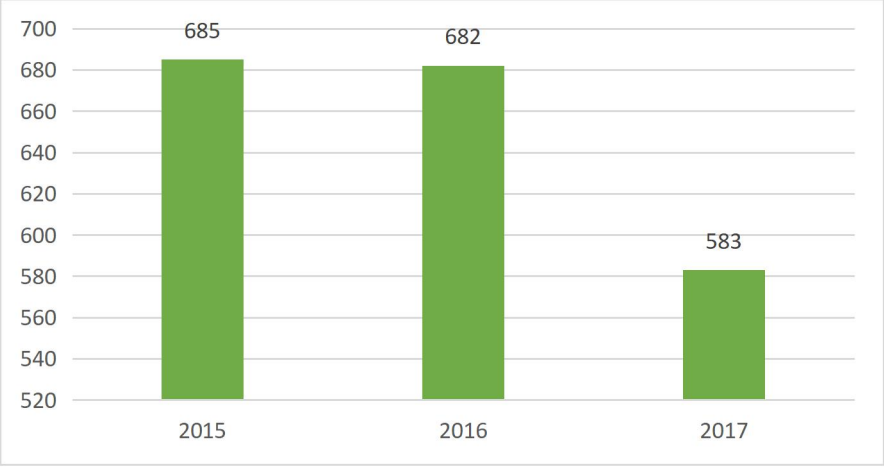

Figure 17: Carriage (Passenger Coaches - In Service), Source: Ministry of Transport and Civil Aviation.

Mitigation actions implemented and planned

According to 2016 performance report, SLR has planned to: purchase six power sets and 10 locomotives to be used island wide; and nine power sets and 12 Locomotives to upgrade the up country train service. SLR has also planned to rehabilitate 200 abandoned carriages with the assistance of private sector to increase the number of passenger carriages.

4.2.6 Improve regulations by introducing new emission standards

NDC 7: Introduce new emission standards

Objective of the NDC

Though NDC 7 does not specify clear objectives of introducing new emission standards, it appears that this NDC has been introduced to reduce the environmental pollution and health impact due to the air pollution in the cities.

Despite all these measures taken by Sri Lankan government, fuel consumption of Sri Lankan light duty vehicles (LDVs) is around 13.15 L/100 km in 2015, which is significantly higher than the current global benchmark of 7.7 L/100 km) in 2015, and global target of 4.2 L/100 km by 2030 under the Global Fuel Efficiency Initiative (GFEI) (GFEI, 2016).This assessment demonstrates that the measures taken so far are not sufficient to achieve the global target, and Sri Lanka needs to take more urgent measures to implement fuel standards to reduce GHG emissions and to control air pollution. As a solution to enhance the fuel consumption of the vehicles and reduce the transport emissions, the government added introducing new emissions standards as a NDC . As a result of this NDC and other initiatives, Sri Lanka recently introduced Euro 4 emissions standards which was enforced from 2018.

Status of emission standards in Sri Lanka

In 2003, citizens of Sri Lanka were requested to measure air pollution by vehicles and to introduce vehicle emission standards as a result of a Supreme decision (Application NO:569/98). Following that decision , Sri Lanka Vehicle Emission Standards were gazetted in 2003 under the National Environmental Act No 47 of 1980. Further, Sri Lanka Vehicle Emission Testing Programme was started in mid-2008 in the Western Province and subsequently the Program was implemented island wide since 2013. The government has also tighten the legal provisions related to the emission test programme by introducing extra ordinary gazette Number 1533/17 on 2008.01.25 under the Motor Traffic Act. In addition, two private sector companies namely Cleanco Lanka Ltd and Laugh Ecosri Pvt Ltd were selected to implement the program in 2005. The two companies established fixed mobile emission testing facilities island-wide. By 2016, there were 388 emission testing centers operated by both companies.

In 2018, Sri Lanka decided to apply Euro 4 fuel standard from July 2018. Vehicles with engines that meet the Euro 4 standard should emit 68 % less particulate matter (PM), 57 % less nitrogen oxide, and 50 % less carbon monoxide than the Euro 2 standard implemented since 2003. In

addition, use of hybrid vehicles has also improved the fuel economy by 15 %. Moreover, Sri Lanka has been using only low sulphur “unleaded petrol” of grades 95 Octane and 92 Octane.

Mitigation actions

- ✓ Introducing amendments in 2015 to the existing emission standards.
- ✓ Introducing Euro 4 emission standard in 2018

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Annexes

Annex 1: NDC Prioritization

NDC no	Financial feasibility	Political preference	Effect on GHG reduction	Total weight	Ranking
1. Establishment of energy efficient and environmentally sustainable transport systems by 2030.					10
1.1 Develop Urban Transport Master Plans (UTMP) to improve the transport system in line with the Megapolis Plan that is currently being finalized, and integrated into key urban areas of the country,					
1.2 Introduce an Intelligent Transport System (ITS) based bus management system,					
1.3 Introduce a canal transport system					
2. Upgrade of Fuel Quality Standards (FQS) to reduce harmful emissions that cause environmental pollution and health hazards				80%	1
2.1 Introduce 95 Octane	5	5	2	80%	
3.Reduce unproductive transport systems from current usage	2	1	2	33%	8
4.Shift passengers from private to public transport modes.				60%	5
4.1 Introduce park & ride system	4	3	4	73%	
4.2 Establish bus depots next to railway stations	2	2	3	47%	
5. Enhance the efficiency and quality of public transport modes.				62%	4

5.1 Electrification of the railway system from Veyangoda to Panadura,	3	3	4	67%	
5.2 Purchase new rolling stock for Sri Lanka Railway	3	3	3	60%	
5.3 Rehabilitate the Kelani Valley railway line.	3	3	3	60%	
6. Reduction of GHG emissions in the maritime sector.				33%	9
6.1 Implement international laws and regulations on maritime safety & security related to climate change,	2	2	2	40%	
6.2 Maintain international standards related to climate change in maritime transportation.	2	1	1	27%	
7. Gazette new emission standards to reduce GHG emissions	3	2	2	47%	6
7.1 Improve vehicle emission testing programme, and spot testing for all vehicles,					
7.2 Introduce a heavy smoke vehicles spotter programme					
7.3 Introduce a road side vehicle emission testing programme					
7.4 Inspect and monitor vehicle emission testing centres					
8. Encourage and introduce low emission vehicles such as electric and hybrid.				68%	3
8.1 Introduce electrified three - wheelers to reduce emissions	3	2	4	60%	
8.2 Introduce electrified boat service	1	2	3	40%	
8.3 Introduce electric buses	4	4	4	80%	
8.4 Introduce other electrified vehicles such as cars	5	5	4	93%	
9.Reduce traffic congestion in order to reduce GHG emission				70%	2

9.1Introduce canal transport systems	2	2	2	40%	
9.2 Introduce Centralized Traffic Management Systems (CTMS)	4	5	5	93%	
9.3 Establish highways	4	4	4	80%	
9.4 Transport of heavy loads by railway	3	3	4	67%	
10. Reduction of GHG emissions in the aviation sector				43%	7
10.1 Identify the current profile of GHG emissions from Sri Lankan operators (Sri Lankan Airline and FITS Aviation) in international operations and domestic operators	2	2	4	53%	
10.2 Forecast the BAU future emissions from the above operators	2	1	3	40%	
10.3 Identify GHG mitigations options	1	1	3	33%	
10.4 Identify implementation mechanisms and resource requirements for the implementation of mitigation options	2	2	3	47%	
11. Establishment of a database management system for monitoring NDCs of transport sector.					11
11.1 Establishment of a separate unit for the implementation of NDCs					
11.2 Software development					
11.3 Capacity development					

Notes:

1. Since NDC 1 is a broad NDC, which covers almost all NDCs, this was excluded from the prioritization.

2. Since NDC 2 was implemented in 2010, this was not considered as a prioritized NDC.

3. Since NDC 11 does not have a visible GHG reduction, this was also not considered.

4. Least priority (1) to highest priority (5).

"Avoid" refers to the need to improve the efficiency of the transport system. Through integrated land-use planning and transport demand management the need to travel and the trip length may be reduced.

"Shift" instruments seeks to improve trip efficiency. A modal shift from the most energy consuming urban transport mode (i.e. cars) towards more environmentally friendly modes is highly desirable. In particular, the shift towards the following alternative modes:

Non-Motorised Transport (NMT): walking and cycling. They represent the most environmentally friendly options.

Public Transport (PT) : bus, rail, etc. Although PT also generates emissions, lower specific energy consumption per pkm and higher occupancy levels imply that the associated CO2 emissions per passenger-km are lower compared to cars.

"Improve" component focuses on vehicle and fuel efficiency as well as on the optimization of transport infrastructure. It pursues to improve the energy efficiency of transport modes and related vehicle technology. Furthermore, the potential of alternative energy use is acknowledge.

Annex 3: Assessment of national policies, legislation, strategies, action plans, mitigation actions (policies and projects) related to the prioritized sub sectors

Due to the vital role transport sector plays in economic, social and environment sector of Sri Lanka, government has acknowledged the transport sector in different policies. As such,

- National transport policy (2009)
- National transport policy – draft (2017)
- National Climate Change Policy and Sri Lanka strategy for SD (2014)
- Presidential manifesto 2015
- Vision 2025 (2017)

Legislative acts and regulations with possible emissions-related components and potential links to MRV

TYPE	NAME	Relevant agencies	Mitigation actions (policies and projects)	RELEVANT NDC
Policy	Draft National Transport Policy 2017	NTC	This is the key document addressing the national objectives and strategies for Sri Lanka's transport sector (MMDE and UNDP, 2016). The National Policy proposes specific steps to reduce dependency on petroleum fuels for its mobility requirements. This would be achieved by actively promoting the use of less energy consuming modes of transport, with an emphasis on increasing the share of users on public transport, reduction of unnecessary travel, improved vehicle technology and better management of transport systems including the road and public transport network. These proposed strategic areas would be implemented through fiscal and non-fiscal measures.	
			Shifting of passengers from private to public modes of transport	4
			Taxation rebates for vehicles having newer fuel efficient technology such as hybrid technology which promotes greater fuel efficiency and also for use of non-fossil fuels	8

			Encouragement of the use of high occupancy vehicles (promoting less energy consuming transport modes) and non-motorized transport	4&5
			Testing of emissions annually Implementation of Vehicle Emission Testing Program or Green Test requiring compulsory testing of all vehicles	7
			Reduction of unnecessary travel	
			Encourage the use of alternative fuel types	
			Discourage the importation of inefficient vehicles – Revising tax structure	
			Higher taxation of vehicles for private use with higher engine capacities	
	National transport policy 2009 Traffic management			
			Objective: To influence modal shift from road to rail transport, and take steps to provide the public the widest possible choice of different modes of goods and passenger transport. Targets: To increase the modal share of freight sector of railway from 2% to 5% by 2016 To attract freight transport from road to rail.	
			To de-regulate railway freight tariffs	
			To determine tariffs competitively by SLR	
			To collaborate with the private sector towards achieving	
			To undertake joint ventures for increasing the carriage of goods by railway	
			To assist in developing several rail based logistics centers or villages	

			To take urgent steps to facilitate the development of a sea-air hub for freight transport with good land transport connections using both rail and road	
Plan	Urban Transport Master Plan 2014	MoTCA	The purpose of this plan is to promote public transport in Colombo Metropolitan Area (MMDE and UNDP, 2016). The plan is a comprehensive document which proposes various strategies for public transport and road networks, while taking into consideration the institutional set-up and financial arrangements for the proposed activities.	
Plan	Western Region Megapolis Master Plan		This identifies areas to lower emissions in the road transport.	
	Improving (railway electrification and modernizatio n)		1. Panadura - Veyangoda - Polgahawela (RL-M1) - 110km (85 kms within WR)	
			2. Kelani Valley (KV) line (RL-M3) - 60km	
			3. Ragama – Negombo line with new airport Access (RL-M2) - 26km	
			4. Kottawa to Horana (RL-NR1) – 22km	
			5. Kelaniya to Kosgama via Biyagama, and Dompe (RL-NR2) - 30km	
Plan	Western region transport master plan			
	Traffic management (Shift passengers/fr eight from roal to rail)		New Kelaniya –Kosgama passenger/freight railway line (RL-NR2), which will give access to proposed plantation city at Avissawella, and the proposed logistic zone. This line passes through the Sapugaskanda oil refinery making necessary connection for oil transportation as well. These projects will improve the connectivity by railway while increasing the passenger and freight handling capacity by rail.	
			Develop multimodal transport hub and centers, with this project main trip generation zones will be connected by both railway and roads. For especially good transportation, key economic centers will link to national markets.	
	Improving road		Establishing park and ride system in Hekitta, Peliyagoda, Kadawatha, Peliyagoda, and Kottawa	

	transport (electrification)			
	Improving railway (electrification & modernization)		Panadura - Veyangoda - Polgahawela railway line	
			Kelani Valley (KV) railway line	
			Ragama – Negombo railway line with new airport Access	
			Kottawa to Horana railway line	
			Kelaniya to Kosgama railway line via Biyagama, and Dompe	
Policy	Presidential menifesto 2015			
			work towards coordinated bus and train services for the public deploying both State and private sectors - Increases the efficiency of public transport and switch passengers from private to public mode, traffic reduction	4,5
			Investment for transport services on highways and train services will be encouraged - switch passengers from private to public mode and increases the fuel efficiency	4,5
			Improve Quality and quantity of public transport sector & discourage the use of private vehicles - switch passengers from private to public mode and increases the fuel efficiency	5
			Increase fuel efficiency	2
			Improve driver awareness - maintains vehicles in good condition and reduces the fuel combustion at traffic etc.	9
			Encourage the use of electric trains and electric vehicles - switches passengers from private to public mode and increases the fuel efficiency	4,5
			Reduce the travelling requirement - Reduces the fossil fuel combustion	

Policy	Vision 2025			
			Establish multi-modal transport centers with park and ride facilities	4,5
			Electrify the existing railway system between Veyangoda and Panadura	4,5
			Double track the Kelani Valley railway	4,5
			Construct new rail tracks connecting Kurunegala and Habarana via Dambulla	4,5
			Introduce bus priority lanes and an advanced traffic management system	4,5
			Introduce light rail transit (LRT)	4,5
			Reduce the use of private vehicles	1,8
			Promote energy efficient vehicles	1,8
Policy	National Climate Change Policy	CCS of MMDE	A number of broader, cross-cutting strategies and plans also propose relevant mitigation interventions for the transport sector. National Climate Change Policy highlights the need to take action to promote integrated transportation systems, low emission fuels and improved fuel efficiency.	
			Integrated transportation systems	4
			Introduce low emission fuels	2
			Improved fuel efficiency	4,5
Strategy	Sri Lanka Strategy for SD		A number of broader, cross-cutting strategies and plans also propose relevant mitigation interventions for the transport sector. Sri Lanka Strategy for SD, highlights the need to take action to promote integrated transportation systems, low emission fuels and improved fuel efficiency.	

Plan	Energy Sector Development Plan for a Knowledge-Based Economy	MoPRE[11]	This includes broader mitigation efforts for the energy sector as mentioned above, has set a target to reduce petroleum fuel use in the transport sub-sector by 5% by 2020 through the introduction of alternative strategies such as efficient modes of transport and electrification of transport.	
Plan	Clean Air 2025			
	Traffic management		To establish green freight transport system by using train for freight transport, improving road rail linkages, relocation of freight & container yards closer to express way entry points and railway links.	
Policy	National Policy on Urban Air Quality Management (2000)		This maintains and enhances air quality so as to reduce related health expenditure	
Regulation	Air emission standard (2003; updated 2015)	MMDE	No owner or user of a motor vehicle is permitted to operate a motor vehicle that discharges exhaust emissions into the atmosphere that exceed the Vehicular Emission Standards. Every owner or user is required to produce an annual compliance certificate of Vehicular Exhaust Emissions, issued by an accredited vehicle emission testing center.	Data on CO2, N2O, vehicle type, age, engine size

[11] Ministry of Power & Renewable Energy

Regulation	Fuel Standard (2003; updated 2015)	MMDE	No person shall supply, sell or distribute fuel for the use of any motor vehicle that is not in compliance with the permissible fuel standards.	
Regulation	Vehicle Importation Standard (2003; updated 2015)	MMDE	Every person who imports a motor vehicle shall produce a compliance certificate of Vehicle Exhaust Emission Standards.	

Annex 4: Legislative acts and regulations with possible emissions-related components and potential links to MRV

TYPE	NAME	Relevant agencies	DESCRIPTION
Cabinet decision	Procurement of new Rolling Stock and rehabilitate abandoned carriages	MTCA	Procurement 10Nos. of Locomotives, 6 Nos .of Power sets, 160 Nos. of passenger carriages, 30Nos. of Tank wagons & 20Nos. of container wagons under the India Line of Credit.
			A cabinet approved project to rehabilitate 200 of abandoned carriages.
Other decision	Agreement between Sri Lanka Railway Department and Prima		Transporting 15 MT of flour every month via train

Annex 5: National climate change mitigation and sustainable development policies

TYPE	NAME	Relevant agencies	Mitigation policy/action	RELEVANT NDC
Policy	National Climate Change Policy	CCS of MMDE	A number of broader, cross-cutting strategies and plans also propose relevant mitigation interventions for the transport sector. National Climate Change Policy highlights the need to take action to promote integrated transportation systems, low emission fuels and improved fuel efficiency.	
			Integrated transportation systems	4
			Introduce low emission fuels	2
			Improved fuel efficiency	4,5
Strategy	Sri Lanka Strategy for SD		A number of broader, cross-cutting strategies and plans also propose relevant mitigation interventions for the transport sector. Sri Lanka Strategy for SD, highlights the need to take action to promote integrated transportation systems, low emission fuels and improved fuel efficiency.	

Annex 6: Climate change mitigation activities

TYPE	NAME	Relevant agencies	DESCRIPTION
Regulation	Ban on importation of three wheelers with two-stroke engines (2008)		Importation of three wheelers (or tuk tuks) with two-stroke engines was banned in 2008 since two stroke engines are considered to be a key source of air pollution as well as heart and respiratory diseases.
Regulation	Vehicle tax reforms (2016)	MoF	Vehicle tax reforms were introduced in 2016 based on the engine capacity of individual vehicles in order to promote certain types of electric and hybrid vehicles. In particular, lower grade. Electric vehicles such as Nissan Leaf, will see a share drop in taxation rate, while luxury electric vehicles such as Tesla Model S are expected to see a significant increase in overall price. The tax reforms only impact family grade vehicles, and do not affect commercial grade vehicles such as vans, trucks. (Carmudi, 2016) (Economy Next, 2016)
Programme	Sri Lanka Transpoprt NAMA	MTCA, MoH, MoPS, UDA of MMWD	The overarching target of the Sri Lanka NAMA in the transport sector is the promotion and adoption of clean, sustainable and efficient means of public transportation within the Colombo Metropolitan Area, resulting in a modal shift from private to public mode of transportation. Include the development of a framework for MRV for the shift to public transport. CDM methodology, specifically AMS-III.C

Annex 7: Different type of MRV

MRV of emissions:

National level: Sri Lanka has developed two national communications (INC and SNC) so far, and is developing the TNC. As part of national communicatons, it has developed GHG inventories covering transport sector using IPCC Tier 1 approach. As such, it has expertise and experience in MRV of emissions for transport sector based on IPCC tier 1 approach. However, the island nation may need some support to improve the GHG inventory using high tier (Tier 2 & Tier 3) approaches and improve the accuracy of data.

Organization and facility level: Sri Lanka is familiar with MRV of emissions at organization level as there are many organizations who have applied ISO 14064 standards, GHG protocol, etc for measuring, reporting and verifying GHG emissions at organization & facility level. In addition, some facilities are measuring GHG emissions of facilities in accordance with above standards, and report under national green reporting system. Most green industries identified as part of this green reporting system are recognized and awarded during presidential green awards organized by CEA annually. During the measurement of GHG emissions at organization and facility level, they also measure transport related emissions such as transport emissions related to employee commuting, business travel of employees via air/road, freight transport via road/sea/air/water, etc. As such, organization & facilities have experience in measuring, reporting and verifying transport emissions. Some entities report the results of these measurements under national green reporting system to CEA while some others report these measurement to other corporate level committee who organize CSR awards. However, none of these information are systematically reports to CCS of MMDE, who is the focal point for UNFCCC with regard to national communication of Sri Lanka.

MRV of policy & actions:

GHG effects (change in GHG emissions due to mitigation actions): Sri Lanka has pipeline of several mitigation policies and actions for transport sector while some of them are under Sri Lanka NDCs (introduce electric vehicles, electrification of railway, introduce park & ride system, introduce new emission standards, introduce tax rebate for electric & hybrid vehicles, etc) while others are not covered under NDC, but covered under national policies/strategies/plans. Transport NAMA developed with the assistance from UNDP, which focuses on introducing electrict BRT system in Galle road, has a MRV system using CDM methodology AMS III C. However, this was not implement, and do not have first-hand experience. In conclusion, transport sector does not have MRV system developed to measure GHG effects of policy & actions except of transport NAMA.

For other sectors: Sri Lanka's experience in MRV of actions is limited to CDM (22 CDM projects in energy & waste sectors), SLCCS (3 energy projects), CPF (programme for energy sector), two NAMAs (energy & transport sectors). These have mainly focused on hydropower and biomass use, plus more limited activities in MRV for solar, wind and end use energy efficiency. Experience in Sri Lanka has been gained in the use of CDM methodologies and associated MRV procedures through the development of the 22 CDM projects that have been registered in the country, as well as the three SLCCS projects. In addition, many of the on-going programs and projects involving MRV of emissions and emission reductions are

based on the use of CDM methodologies. This is particularly true of the SLCCS, CPF and Transport NAMA, and to a lesser but still significant extent for the Energy NAMA. Apart from projects under the CDM and SLCCS, which have been implemented and where first-hand experience of MRV has been gained, the majority of relevant programs described in the previous section, such as the CPF and the two NAMA programs, are still in the design or pilot stages, and have not yet had a significant impact on capacity building of local experts.

Annex 8: List of stakeholders

i. Ministry of Mahaweli Development and Environment
ii. Climate Change Secretariat
iii. Ministry of Transport and Civil Aviation
iv. Ministry of Megapolis and Western Development
v. Ministry of provincial council and local development
vi. Ministry of Petroleum Resource Development
vii. Ministry of Finance
viii. Census and statistics Department
ix. Department of Sri Lanka Railways;
x. Sri Lanka Transport Board;
xi. National Transport Medical Institute;
xii. Department of Motor Traffic;
xiii. National Transport Commission;
xiv. Vehicle Emission Testing Programme
xv. Civil Aviation Authority;
xvi. Lakdiva Engineering;
xvii. Urban Development Authority
xviii. Ceylon Petroleum Corporation
xix. Ceylon Petroleum Storage Terminals Limited

Annex 9: Institutions that are relevant for transport sector MRV

Main organization	Sub organization	Role
Ministry of Transport and Civil Aviation		Implementation and maintenance of Sri Lanka's road ,rail air and marine transportation including policy formation and development
	Sri Lanka Railway department	Provision of rail service for passengers and freight and development and maintenance of railway infrastructure
	Department of Motor traffic	Enforcement of rules and regulations provided in the motor traffic act including registration of vehicles and licensing of drivers.
	National Transport Commission	Advice the government on national policy relating to passenger transport services by omnibuses.
	Sri Lanka Transport Board	Advise the government on national policy relating to passenger transport services by buses.
	National Transport Medical Institute	Provision of medical service and assistance to drivers and operators
	National Council for Road Safety	Creation of a safer road environment for road users
	Civil Aviation Authority	Undertaking of all regulatory operational and commercial functions which include operating air services, airport and air navigation services
	Lakdiva Engineering Company (Pvt) Ltd.	Repair and maintenance of SLTB buses
	Airport and Aviation Services Ltd.	Management and development civil airports (international and domestic) in Sri Lanka
Ministry of Highways and Road Development		Formulation of policies, programmes and projects in regard to the subjects of highways
	Road development Authority	To maintain and develop ,manage and maintain national highway network.
Ministry of Megapolis and Western Development		Formulation of policies, programs and projects, to monitor and to evaluate in regard to the subjects of megapolis and Western development
	Urban Development Authority	Promotion of integrated planing and implementation of the economic social and physical development of the declared areas.
Ministry of provincial council and local development		To formulate policies and legislations to develop the provincial and local government system
	Provincial road passenger transport Authorities	Provision of provincial level passenger transport services