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சுற்றாடல் அமைச்சு
Ministry of Environment



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மத்திய சுற்றாடல் அதிகாரசபை
Central Environmental Authority

Contingency Response Action Plan for Deterioration of Air Quality in Sri Lanka

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ABBREVIATIONS

AAQMS	: Ambient Air Quality Monitoring Unit
ARM&NOU	: Air Resource Management & National Ozone Unit
AQI	: Air Quality Index
AQI-SL	: Air Quality Index for Sri Lanka
CRAP-DAQ	: Contingency Response Action Plan for deterioration of Air Quality
CEA	: Central Environmental Authority
DMC	: Disaster Management Centre
DG	: Director General
DOL	: Department of Labour
DMT	: Department of Motor Traffic
MOE	: Ministry of Environment
MOPA&LG	: Ministry of Public Administration and Local Government
MOP&E	: Ministry of Power and Energy
MOTH	: Ministry of Transport & Highways
NBRO	: National Building Research Organization
PM	: Particulate Matter
SL	: Sri Lanka
UDA	: Urban Development Authority
US EPA	: United States Environmental Protection Agency
WHO	: World Health Organization
CEB	: Ceylon Electricity Board
CPC	: Ceylon Petroleum Corporation

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1. PURPOSE

This Contingency Response Action Plan (CRAP) provides a framework for preventing and mitigating ambient air pollutant levels that may risk to the public health hazard. Its purpose is to establish new criteria for determination of the existence of an emergency episode whilst meeting the requirements of National Environmental Action Plan 2022-2030 (NEAP – theme 1, strategy 5.3). Thus, it prevents the excessive buildup of air pollutants during air pollution episodes. This CRAP mainly focuses on particulate matter (PM₁₀ & PM_{2.5}) which contributes to the degradation of air quality as the prime criteria air pollutant during past decades in Sri Lanka based on regulatory and scientific data. It identifies criteria for the three trigger levels for emergency episodes for public announcements whenever an episode has been identified, the specified emission control strategies to be taken with each successive level of PM emergency episodes. The highest concentration ever recorded in previous years during air pollution emergency episodes in Sri Lanka was 142 µg/m³ at 1-hour average for PM_{2.5} at Battaramulla AAQMS on 11.12.2020 between 7:00-8:00 pm, while for PM₁₀ it was 218 µg/m³ at 1-hour average in 06.12.2022 between 7:00-8:00 pm at Battaramulla AAQMS.

2. HOW CRAP-DAQ-SL IS OPERATIONED?

2.1 Stakeholders of CRAP-DAQ-SL

- Ministry of Environment
- Central Environmental Authority
- Ministry of Health
- Disaster Management Centre
- Ministry of Industries
- Ministry of Transport & Highways
- Ministry of Power and Energy
- Ministry of Public Security
- Urban Development Authority
- University of Moratuwa
- University of Peradeniya
- National Building Research Institute
- Department of Meteorology
- Department of Motor Traffic
- Ministry of Education and Higher Education
- Ministry of Administration, Home Affairs & Provincial Councils & Local Government
- Environmental Protection Division of Police
- Department of Labor
- Vehicular Emission Testing Programme
- Ministry of Mass Media
- Board of Investment (BOI)
- Road Development Authority

2.2 Operational Procedure

The steering committee accounts for the decision taking (whether to declare of an air pollution emergency situation) based on technical validation of daily air quality monitoring data and forecasting scenarios. Then the chairman of the steering committee (Secretary/Ministry of Environment) shall take decision to declare the emergency occurrence and Director General/ Central Environmental Authority declares the air pollution emergency to the public through press conference. Parallely the responses to be taken by the public/government shall be passed over to implementation committee which consisted of relevant stakeholders who can take/initiate ground level response actions. In the same manner steering committee is authorized to declare the termination of the existed emergency episode. The steering committee shall frequently evaluate the actions and implementations of the CRAP-DAQ-SL.

3. LEGAL AUTHORITY

National Environmental Act 1980 (No. 47 of 1980) empowers the Central Environmental Authority (CEA) as the prime legislation in Sri Lanka to control the emission of air pollutants that negatively affect public health and livelihoods. In addition to CEA, other relevant institutions, together with local governing bodies, to declare a local emergency when air pollution creates conditions of extreme risk to the safety of communities within the particular local area. Once such a local emergency is declared, the relevant authorities shall implement the CRAP emergency plan and take actions to mitigate or prepare local community for the emergency situation.

4. AIR QUALITY INDEX FOR SRI LANKA (AQI-SL)

Declaration of the decision of emergency episodes identified in the CRAP-DAQ-SL has a direct relationship with [\(Air Quality Index for Sri Lanka\)](#) (AQI-SL). It is a standardized, color-coded system developed by the Central Environmental Authority (CEA) to measure and report daily ambient air quality based on local standards, which align with World Health Organization (WHO) Tier 2 guidelines. It indicates you how clean or polluted ambient air is, and what associated health effects might be a concern for the public health. The AQI-SL focuses on health affects you may experience within a few hours or days after exposure to polluted air. AQI data is obtained by averaging readings from an air quality monitoring stations and equipment established in 24 districts. The reading the air quality sensors can be elevated due to high emission concentration that can increase air pollution.

It is also apparent that different countries have their own air quality indices, corresponding to their ambient air quality concerns and standards. AQI-SL has been formulated by the CEA consultation with expert scientific group by generally corresponds to the present air ambient quality status and standard levels for protecting public health. AQI-SL calculate based on five major pollutants: particulate matter, carbon monoxide, sulfur dioxide, nitrogen dioxide and ground level ozone. In the CRAP the alert is declared

based on the standardized, color-coded system used to indicate daily air quality levels, ranging from 0 (Good- Green Color) to over 300 (Hazardous – Maroon color). It helps individuals understand the air quality associated health risks and take precautions, with breakpoints based on national standards and WHO guidelines (Table 1).

Table 1: AQI-SL (National Air Quality Index, Sri Lanka)

AQI Color	Level of Concern	Index
Green	Good	0 - 50
Yellow	Moderate	51 - 100
Orange	Slightly Unhealthy	101 - 150
Red	Unhealthy	151 - 200
Purple	Very Unhealthy	201 - 300
Maroon	Hazardous	301 - 500

5. EMERGENCY EPISODE CRITERIA

This plan includes, at a minimum, provisions for taking action necessary to prevent ambient PM concentrations at any location in any region/city from reaching higher trigger levels which are also provided in Figure 1, 2 & 3 and such location is known as “declared area” hereafter. As set forth in this plan, three trigger levels (stages) are established for PM_{2.5} and PM₁₀ pollution episodes: Alert level (150), Warning level (200), and Emergency level (300). Corresponding actions for each specified trigger level would be identified and will be implemented when the ambient PM hourly concentration measurements reach the specified trigger levels. These elements and actions should provide for rapid short-term emission reductions at each trigger level, to avoid high PM_{2.5} & PM₁₀ concentrations from reaching significant harm levels during an episode. Tables 1,2 and 3 summarizes three emergency episode trigger levels proposed by the CRAP committee for the 24-hour PM concentration. Following section identifies the corresponding actions for each trigger level, when the corresponding 24-hour PM concentration is reached.

5.1 Alert (Stage I) Episode

An alert status will be declared when following pollutant concentrations is exceeded at any monitoring site, as indicated in Table 1.

Table1. Alert Status

Pollutant	Threshold conc.	Threshold AQI	Color code	Averaging Time
PM 2.5	75 µg/m ³	150	Red	24-hour average
PM 10	150 µg/m ³	150		

According to the Air Quality Index, warning will be given when AQI value increase over 150, which indicates Code Red.

5.2 Warning (Stage II) Episode

A warning will be declared when air quality is continuing to degrade and additional control actions are necessary and when following levels is exceeded at any monitoring site, as indicated in Table 2.

Table 2: Warning Status

Pollutant	Threshold conc.	Threshold AQI	Color Code	Averaging Time
PM 2.5	150 µg/m ³	200	Purple	24-hour average
PM 10	275 µg/m ³	200		

According to the Air Quality Index, warning will be given when AQI value increase over 200, which indicates Code Purple.

5.3 Emergency (Stage III) Episode

The emergency level indicates that air quality is continuing to degrade toward a level of significant harm to the health of persons and that the most stringent control actions are necessary. An emergency will be declared when the following levels is exceeded at any monitoring site, as indicated in Table 3.

Table 3. Emergency Status

Pollutant	Threshold Conc.	Threshold AQI	Color Code	Averaging Time
PM 2.5	250 µg/m ³	300	Maroon	24-hour average
PM 10	450 µg/m ³	300		

According to the Air Quality Index, warning will be given when AQI value increase over 300, which indicates Code Maroon.

6. PROPOSED ACTIONS FOR CONTINGENCY RESPONSE ACTION PLAN

Step 1: Air Pollution Forecasting

Currently no air quality forecasting system prevailing in Sri Lanka. This area should be compulsory to develop if this emergency response plan to be executed successfully. Use of Forecasting modelling will able to predict the next day ambient air quality in any area thus enforcing the plans to curtail the emission reduction in case of PM exceeds the above trigger levels. By

strengthening relevant authorities for measuring, modeling and forecasting of ambient air quality enables them to perform step 1 activity effectively. These predictions will be also strengthened by continuous set of air quality data followed by the reinforcement of national air quality monitoring network.

Step 2: ***a. Technical Evaluation***

Technical committee shall be responsible for evaluation of technical inputs and support the decision making in the steering committee. Technical committee is responsible for validity of air pollution data sources and readings of air quality measurement data prior to submission to the steering committee and Technical Committee is chaired by the DG of the Central Environmental Authority.

Technical evaluation committee

- Central Environmental Authority (CEA)
- National Building Research Institute (NBRI)
- University of Moratuwa (UOM)
- University of Peradeniya (UOP)

b. Declaration of the Decision of emergency

Steering committee chaired by Secretary/ Ministry of Environment shall take the decision of declaring an emergency episode based on the above trigger levels.

Steering committee includes

- Ministry of Environment (MOE)
- Central Environmental Authority (CEA)
- Ministry of Health (MOH)
- Disaster Management Centre (DMC)
- National Building Research Institute (NBRI)
- Department of Meteorology
- Sri Lanka Police
- Ministry of Mass Media
- Ministry of Power and Energy
- Board of Investment (BOI)

Meeting frequency:

Steering committee will gather when and where necessary in the onset of incident whereas in the absence of incident, it shall gather once in three months.

Step 3: *Implementation of the CRAP*

The decision taken by the steering committee for declaration of an emergency episode should be executed by the implementation committee and chaired by Central Environmental Authority which includes

- Ministry of Public Administration, Home Affairs & Provincial Councils & Local Government
- Ministry of Health (MOH)
- Ministry of Power & Energy
- Ministry of Mass Media
- Ministry of Transport & Highways (MOTH)
- Sri Lanka Police (SL Police)
- Board of Investment of Sri Lanka (BOI)
- Ceylon Petroleum Corporation (CPC)
- Ceylon Electricity Board (CEB)
- Central Environmental Authority (CEA)
- Urban Development Authority (UDA)
- Road Development Authority (RDA)
- Disaster Management Centre (DMC)
- Department of Labor (DOL)
- Ministry of Education and Higher Education (MOE&HE)

Requirement: Whenever the 24-hour average of PM measured at any permanent location in Sri Lanka, reaches or is predicted to reach any of the episode trigger levels (stages) as shown in Tables 1, 2 and 3, DG/CEA shall declare that an alert/warning/emergency episode is in effect within the area declared. In addition, CEA can request assistance from responsible institutions, to implement measures as described in this Plan.

Step 4: *Declaration to the public*

- a. The emergency episode (alert/warning/emergency) shall be declared by DG/ CEA through press conference
- b. Media center for contingency response action plan is answerable to the media after first time declaration and is chaired by Central Environmental Authority.

Members of the Media center for CRAP-DAQ-SL

- Ministry of Environment (MOE)
- Ministry of Health (MOH)
- Central Environmental Authority (CEA)
- National Building Research Institute (NBRI)
- Disaster Management Centre (DMC)

Step 5: *Termination*

Steering committee shall take the decision to terminate the emergency episode occurrence after carefully evaluating by the technical committee. Termination notification is also delivered to the public through a press conference by DG/CEA.

Requirement: Once declared, any status reached by application of these criteria will remain in effect until the criteria for that level are no longer met. At such time, the next lower/higher status will be assumed.

Step 6: *Review of CRAP*

The steering committee shall frequently review the actions and implementations of the CRAP-DAQ-SL, especially when the air quality falls or is likely to fall in the 'Emergency' status. The steering committee may decide upon additional measures and exceptions to the schedule of the CRAP-DAQ-SL, under different air pollution trigger levels as per the prevalent AQI and forecast. The chairperson of each committee may subject to change as necessary. The work flow of implementation the action plan is summarized as in Figure 1.

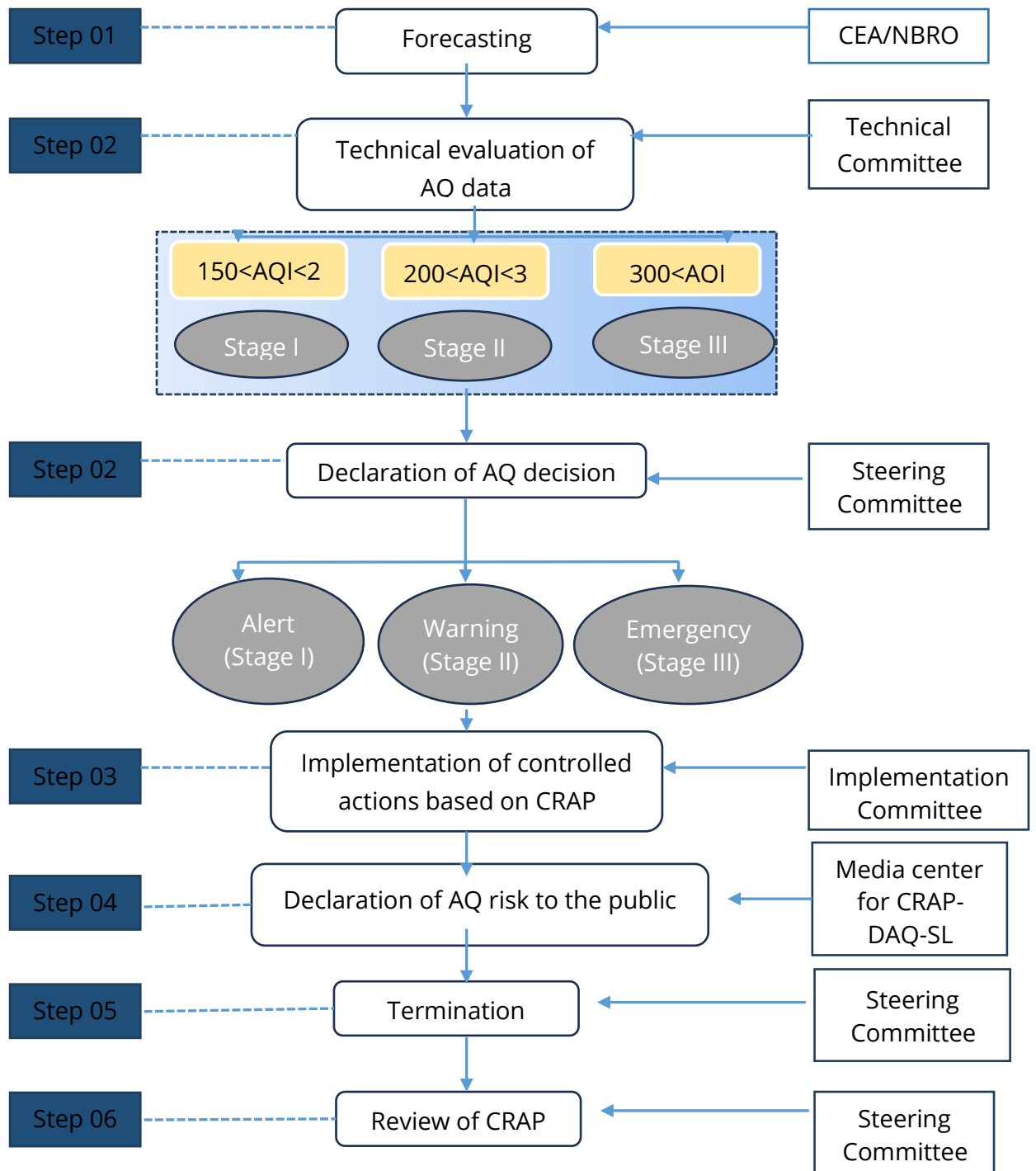


Figure 1: Work flow of implementing CRAP

7. CONTROLLED ACTIONS FOR LOCAL EMISSION REDUCTION

CEA is responsible to restrain any source from causing or contributing to emissions that present an imminent and substantial endangerment to public health, welfare, or the environment or to take other action as may be necessary.

7.1. Alert (Stage I) Episode

Controlled actions

Sector	Controlled actions	Responsible/Implementing Agency/Authority
General	Information dissemination through all communication channel including social media, mobile apps should be used to inform people about the pollution levels, enable them to report polluting activities/sources to the concerned authorities and actions that will be taken by government based on the level of pollution	DMC/ MOH/Media/CEA/MOE
	There shall be no open burning by any persons of tree waste, vegetation, refuse, or debris in any form	SL Police/CEA/MOPA
	For sensitive groups – Avoid all outdoor physical activity. Encourage indoors activities or reschedule to a time when air quality is better	MOH/Media
	Everyone else – Avoid prolonged or heavy exertion. Consider moving activities indoors	MOH/Media
	Encourage work from home	MOPA&LG/DOL
	Minimize air emission from equipment Eg: diesel generator	MOP&E
Construction	Encourage the proper implementation guidelines on dust mitigation measures at construction, road development, and demolition sites	UDA/ Local Authority/CEA/ RDA
Transport	Carry out periodic mechanized sweeping and/or water sprinkling on roads	Local Authority/ RDA
	Deploy traffic police for smooth traffic flow at all identified corridors with heavy traffic and congestion prone intersections	SL Police/ RDA
Industrial	Any industry responsible for the operation of a source of air contaminants listed below shall	CEA BOI CEB

	take all required control actions for this alert level • Coal power plants • Primary metal extraction industry • Petroleum refining operations • Cement manufacturing / repacking Industries	CPC DOL
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7.2. Warning (Stage II) Episode

Controlled actions

Sector	Controlled actions	Responsible/Implementing Agency/Authority
General	Information dissemination through all communication channel including social media, mobile apps should be used to inform people about the pollution levels, enable them to report polluting activities / sources to the concerned authorities and actions that will be taken by government based on the level of pollution	DMC/ MOH/Media/CEA/MOE
	There shall be no open burning by any persons of tree waste, vegetation, refuse, or debris in any form	SL Police/CEA/ MOPA&LG
	For sensitive groups – Avoid all physical activity outdoors. Move activities indoors or reschedule to a time when air quality is better.	MOH/Media
	Everyone else – Avoid prolonged or heavy exertion. Consider moving activities indoors or rescheduling to a time when air quality is better	MOH/Media
	Work from home	MOPA&LG/DOL
	Prohibit the diesel generator sets as regular source of power supply	Local authority / SL Police
	People to use public transport and minimize use of personal vehicles	SL Police
	Stops the use of incense sticks, mosquito repellent coil in indoor	MOH
	Ensured the reduction of dust around the houses and offices through sweeping and/or water sprinkling	MOH/Local Authority

Construction	Prohibit the dust generation activities at construction, road development, and demolition site and closely monitor and conformed the actual situation through vigilant supervision	UDA/RDA/ Local Authority/ SL Police
Transport	Shall carry out periodic mechanized sweeping and/or water sprinkling on roads	RDA/ Local Authority
	Shall deploy traffic police for smooth traffic flow at all identified corridors with heavy traffic and congestion prone intersections.	SL Police
	Persons operating motor vehicles must reduce operations by the use or car pools and increased use of public transportation and elimination of unnecessary operation	MOTH
Industrial	Any industry responsible for the operation of a source of air contaminants listed below shall take all required control actions for this warning level: • Coal power plants • Primary metal extraction industry • Petroleum refining operations • Cement manufacturing/repacking industries • Chemical Industries • Grain industry	CEA BOI CEB CPC DOL

7.3. Emergency (Stage III) Episode

Controlled actions

Sector	Controlled actions	Responsible/Implementing Agency/Authority
General	Information dissemination through all communication channel including social media, mobile apps should be used to inform people about the pollution levels, enable them to report polluting activities / sources to the concerned authorities and actions that will be taken by government based on the level of pollution	DMC/ MOH/Media/CEA/MOE
	There shall be no open burning by any persons of tree waste, vegetation, refuse, or debris in any form	CEA/ SL Police/MOPA&LG

	Prohibit all outdoor physical activity. Strictly involve into indoor activities or reschedule to a time when air quality is better	DMC/ MOH/ SL Police
	Strongly encourage to use electric burners, and gas burners instead of wooden hearth for cooking at indoors	DMC/ MOH
	Ban the use of diesel generator as regular source of power supply and strictly monitor and confirm such activity	Local Authority / SL Police
	Strongly encourage people to use public transport and minimize use of personal vehicles	DMC/ MOH/ SL Police
	Strongly recommend not to use of incense sticks, mosquito repellent coil in indoor	MOH
	Governments to decide on allowing public, private offices to work on 50% strength and the rest to work from home Government may take a decision on permitting work from home for central government offices	MOPA&LO/DOL
	All places described below shall immediately cease operations. Establishments rendering amusement parks & theaters, Nursery, elementary and secondary schools, universities, professional schools, vocational schools, and public and private libraries	CEA/ MOE&HE/All relevant parties
Construction	Prohibit the any construction activities which generate the dust at construction, road development & demolishing sites and strictly enforce the prohibition	RDA/ UDA/ Local Authority
Transport	Ensure water sprinkling along with use of dust suppressants on roads to arrest road dust especially at hotspots, heavy traffic corridors, vulnerable areas (before peak hours)	RDA/ Local Authority
	Prohibit / Limiting the entrance of vehicles into city area or affected areas except in emergencies with the approval of local police	SL Police/ RDA
	Encourage to use of public transportation and elimination of unnecessary operation of public transport	MOTH/ SL police

Industrial	All air polluting industries which generate the air emission including the industries listed below shall take all required control measure to reduce the air emission and vigilant monitoring and confirmation should be implemented • Coal power plants • Primary metal extraction industry • Petroleum refining operations • Cement manufacturing/repacking industries • Chemical Industries • Grain industry	CEA BOI CEB CPC DOL
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Prepared by:

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With the collaboration of

- Ministry of Environment
- Ministry of Health
- Disaster Management Centre
- Ministry of Industries
- Ministry of Transport & Highways
- Ministry of Public Security
- Urban Development Authority
- University of Moratuwa
- University of Peradeniya
- National Building Research Institute
- Department of Meteorology
- Department of Motor Traffic
- Ministry of Education and Higher Education
- Ministry of Administration, Home Affairs & Provincial Councils & Local Government
- Environmental Protection Division of Police
- Department of Labor
- Vehicular Emission Testing Programme

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