

Thirteenth Session of the Intergovernmental Meeting on
Malé Declaration on Control and Prevention of Air Pollution and
Its Likely Transboundary Effects for South Asia (Malé Declaration)
20 May 2013, Dhaka, Bangladesh

**Draft guidelines for the next steps of implementation on strengthening
the framework on air pollution reduction in South Asia**

I. Introduction

1. The objective the Malé Declaration on Control and Prevention of Air Pollution and Its Likely Transboundary Effects for South Asia (Malé Declaration) is to aid the process of providing a clean environment through clean air. The Declaration calls for the regional cooperation to address shared local air quality problems and the increasing threat of transboundary air pollution and its possible impacts. Through a process of mutual consultation, the Declaration also calls for the continuation of this process in phases, to formulate and implement national and regional action plans and protocols based on a fuller understanding of transboundary air pollution issues. The Malé Declaration has a yearly session of the Intergovernmental Meeting to discuss the ongoing activities and future programmes to implement the Declaration. Its implementation has been in phases since its adoption in 1998.
2. The Phase IV implementation of the Malé Declaration continued to assist the member countries to strengthen the regional cooperation and monitoring, enhance the impact assessment capacity of the national institutions, and also strengthen the initiatives started in the first three phases. The Twelfth Session of the Intergovernmental Meeting (IG12) held in June 2011 adopted, with modifications the “Report of the Task Force on Future Development of Malé Declaration (TFFD)”, and its Annexes which include: the Feasibility Report on Strengthening the Regional Framework on Air Pollution Reduction in South Asia.
3. During the IG12, it was stressed that the regional guidelines/standards be developed on air pollution prevention and control in South Asia. It was pointed out that a legally binding instrument will not be applicable at this point in time. It was mentioned that some agreements/frameworks agree on minimum standards on air pollution.
4. This document was discussed at the Third Meeting of the Task Force on Future Development of the Malé Declaration held in Chonburi, Thailand in August 2012, for submission to the Thirteenth Session of the Intergovernmental Meeting (IG13) for its review and guidance. Since the TFFD3, the document was further elaborated as requested by the Task Force members.

II. Previous Discussions

5. On the “Feasibility Study Report on Strengthening the Regional Framework on Air Pollution Reduction in South Asia”, the air quality standards exist for all the member states except for the Maldives. Generally, the Ambient Air Quality Standards are defined in all the member states for sulfur dioxide, carbon monoxide, nitrogen oxide, black smoke, hydrocarbons, nitrogen oxides, suspended particulate matter, lead and ammonia. The criteria for categorization of the pollutants are also more or less the same for all the member states industrial, commercial, residential and sensitive areas. Bhutan, Iran, Maldives and Sri Lanka have established specific emission standards for vehicular emissions. Nepal and Pakistan have defined specific standards for extreme winter seasons, atmospheric washout, natural cleansing, poverty level, and institutional capacities.
6. The Annex 1 highlighted key air pollutants of priority concerns to Malé Declaration member states, quoted from Feasibility Study as mentioned above.
7. The Secretariat made a presentation on the draft guidelines for the next steps of implementation on strengthening the framework on air pollution reduction in South Asia during the TFFD3. Major discussions on this topic were as follows:
 - It was stressed that each country has its own air quality standards and developed based on weather conditions and other consideration for setting the standards in a particular country in the region. Standards implementation has a legal backing and it is important to the countries.
 - It was mentioned that countries could have common guidelines but not common standards.

III. Next steps of activities

8. Based on the IG12 decision, the TFFD shall do the next steps of implementation on strengthening the framework on air pollution reduction in South Asia.

The following are proposed for the activities on this topic:

1. Identify the key sectors
2. Establish expert group for each sector
3. Review existing standards, guidelines and methodologies for emission control
4. Develop common standards/protocols/guidelines for emission reduction
5. Consultation with the Task Force for Future Development (TFFD)
6. Consultation with the Intergovernmental Meeting (IG)

Identify the key sectors

9. On developing guidelines/standards and protocols, there were suggestions to prioritize by sectors, eg. motor vehicles, industrial sector, and dominant industrial pollutants in the South Asian region. The participating countries shall discuss this matter as a first step.

Establish expert group for each sector

10. Expert group for each sector (e.g. motor vehicle, fuel and industries, etc.) would be established to work on air quality standards and protocols.

Review existing standards, guidelines and methodologies for emission control

11. In order to understand the importance of Malé Declaration for reducing air pollution and its likely trans-boundary effects, it is important to review to review existing standards, guidelines and methodologies for emission control. This will be done as the next step on strengthening the framework of the network. Some reviews were done on “Environment Degradation and Air Pollution in Malé Declaration Member States” in the Feasibility Study on Strengthening the Framework, presented in Annex 1. This could be further consulted.

Develop common standards/protocols/guidelines for emission reduction

12. We could have minimum air quality standards, e.g. automobile, brick kiln, fuels, etc. This would be strengthened by technical assistance of experts on standards and thus enable protocols to be drawn up. This will be left to each country to adopt or amend the protocol to make it more stringent based on national requirements.

Consultation with the Task Force for Future Development (TFFD)

13. Task Force for Future Development (TFFD) which was established to consider the expansion of the Malé Declaration could do recommendations for the study and submit it to the Intergovernmental Meeting (IG).

Consultation with the IG

14. The IG will review the report/result of the study on Malé Declaration submitted by the TFFD. It will discuss, review and make decision on the guidelines for implementation on strengthening framework on air pollution reduction in South Asia.

Quoted from MD/IG12/3/5

**FEASIBILITY REPORT ON STRENGTHENING THE REGIONAL
FRAMEWORK ON AIR POLLUTION REDUCTION IN SOUTH ASIA**

MD/IG12/3/5a. Analysis of Gaps and Weaknesses of the Malé Declaration

I. Introduction

1. This feasibility study has been conducted on the “Malé Declaration on Control and Prevention of Air Pollution and its likely Transboundary Effects for South Asia” to assess the socioeconomic situation of South Asia, the existing situation of air pollution in the countries and region, and the responses of countries to air pollution. It makes recommendations for strengthening the framework for air pollution reduction at regional and national levels in South Asia.
2. The Malé Declaration stated the need for countries to carry forward, or initiate, studies and programmes on air pollution in the member states Bangladesh, Bhutan, India, Iran, Maldives, Nepal, Pakistan and Sri Lanka.
3. Since its inception over twelve years ago in 1998, the Malé Declaration and its member countries have carried out a number of projects/ activities for the creation of a meaningful framework to limit air pollution.
4. A greater participation of Malé Declaration member states is required as its implementation progresses. A regional framework is needed for better understanding and cooperation among the Malé Declaration member states, on issues related to air pollution and to effectively implement with shared responsibilities, air pollution reduction measures across the member countries for the protection of environment and safeguarding public health, especially of future generations.

II. Socio-Economic Status of Malé Declaration Member States

5. In order to understand the importance of Malé Declaration for reducing air pollution and its likely trans-boundary effects, it is important to first review the socioeconomic situation of the Malé Declaration member states. This section of the report describes the existing socioeconomic situation of the region and provides a review of the same.
6. South Asian countries with a combined population of roughly 1.6 billion people, have adopted the Malé Declaration. As a low-income region, South Asia is home to half of the world’s poor. Traditionally, the South Asian economies are centered on agriculture, however recently manufacturing and services have become major contributing sectors as well. The strong recovery in India and the growth in the economies of Bangladesh and Sri Lanka are the

primary reasons for this economic rebound (World Bank, 2010a). India, as an emerging economy of the world is the dominant political power in the region.

7. The state of education and health in the region leave much to be desired. With the worst score on the Global Hunger Index (GHI)¹, South Asia along with Sub-Saharan Africa suffers from the highest level of hunger (International Food Policy Research Institute, 2010).

III. Environment Degradation and Air Pollution in Malé Declaration Member States

8. Environmental degradation remains a challenge in Malé Declaration member countries. With the projected increase in industrial activity, exponential growth in number of vehicles and population, the contribution of each Malé Declaration member country to regional air pollution will increase over time. India is the biggest energy user, followed by Iran and Pakistan (World Bank, 2010). With increasing urbanization and industrialization, air pollution is an increasing concern in South Asia. Sulfur dioxides, nitrogen oxides and particulate matter (PM) emissions have been rising steadily over past few decades. Owing to economic growth and increasing demand, greenhouse gas emissions have risen in South Asia by about 3.3% annually since 1990. Coal is the main source of energy in the region, followed by natural gas (World Bank, 2010c).
9. **Bangladesh:** Air pollution is one of the major sources of environmental degradation in Bangladesh. There are 3 main causes of air pollution in Bangladesh; these are (1) Vehicular emissions (2) Industrial emission (3) Brick kilns (Ministry of Finance - Bangladesh, 2009). In addition, due to the high density of vehicular traffic and industries in the urban areas of Bangladesh, air pollution is a growing concern for the inhabitants of urban areas. The geographic location coupled with low income and over reliance on climate sensitive sectors makes Bangladesh particularly vulnerable to natural disasters.
10. **Bhutan** is one of the few countries in the world where the environment is still protected. Two main reasons behind Bhutan's enviable record of environmental protection are (1) Recent start of the development process and (2) Constitutional protection given to environmental sustainability. The constitution of Bhutan specifically states that at least 60% of Bhutan landmass must be under forest cover at all times. Over the years the government has rigorously followed its policy of environmental sustainability and currently almost 51% of Bhutan's land mass falls into the category of protected areas and forests. Forest fires are the biggest sources of air pollution in Bhutan. Constitutional protections and government efforts have allowed Bhutan to limit air pollution to fairly low levels despite steady economic growth over the last few years.
11. **India:** Rapid growth and industrialization over the last few years has led to some major changes in India's environment. More and more cities are experiencing unhealthy levels of air pollution as a direct consequence of unplanned urbanization and growth in population. A number of reasons have contributed to the sharp rise in air pollution and environmental degradation in India. Some of these include (1) Coal, (2) Oil, (3) Process emissions and (4)

¹ Global Hunger Index (GHI) is a multidimensional statistical tool used to describe the state of hunger in countries. The GHI captures three dimensions of hunger: insufficient availability of calories, shortfalls in the nutritional status of children, and child mortality (IFPRI, 2010).

Traditional sources of energy. Coal is India's most abundant source of energy and currently almost 60% of its commercial energy needs are fulfilled by it. Besides having a very high ash content that is responsible for particulate matter emission, coal is also a large source of sulfur dioxide emission in India because of its high sulfur content. Oil is another major source of pollution emissions in India. Lastly, widespread use of traditional sources of energy such as fuel wood and animal dung has also been contributing to air pollution. Estimates indicate that nearly 3 in 4 rural households depend on traditional sources of energy for cooking, heating etc. (Ministry of Environment - India, 2010).

12. **Iran:** Environmental and natural resources have been substantially degraded in Iran over the past few decades due to unsustainable development, inadequate enforcement of environment laws, and overpopulation. Urban areas in particular have had to endure exceedingly unhealthy levels of pollution. This is evident by the fact that schools in Tehran are closed occasionally due to dangerously high levels of air pollution (World Bank, 2010).
13. **Maldives:** is at the forefront of efforts to limit climate change impacts. Located in the Indian Ocean, most of the islands that comprise Maldives are between 1 and 1.5 meters above the sea level. Consequently, if global warming continues at its current pace, most of Maldives will be underwater before 2050 (MDEP, 2008B).
14. **Nepal:** Years of unabated population growth and lack of a stringent pollution regulation and management systems has left a deep imprint on the environment in Nepal. Air quality in both urban and rural areas is deteriorating in the country with Kathmandu in particular being at very high levels of risk. The bowl like topography of the Kathmandu valley restricts air movement, thereby accumulating high levels of dangerous pollutants (UNEP2008 D).
15. **Pakistan:** Air pollution is one of the most pressing concerns for environmental protection agencies in Pakistan. Despite having very low energy consumption in comparison to international standards, air pollution in Pakistani cities is soaring (Khwaja & Khan, 2005). Not able to afford gas or electric stoves and heaters, poor people across the country use firewood to cook food and provide heat during the coldest months of winter. Biomass burning is problematic because of the high level of particulate matter produced as well as carbon monoxide and other harmful gases. The level of particulate matter (PM) in major Pakistani cities is almost 2-3.6 times higher than WHO standards (Shigeta, 2000). Environmental challenges facing Pakistan today are the result of a rapidly growing economy, and also unplanned increases in industrialization and urbanization. Increasing economic growth over the years has resulted in overexploitation of natural resources. In addition, unplanned increases in industrialization are leading to air, water and land pollution all across the country (Ministry of Finance - Pakistan, 2009)
16. **Sri Lanka:** Rapid growth over the last few decades has had a massive impact on the environment in Sri Lanka. Years of development with little regard for the environment has resulted in the forest cover decreasing from 70% in 1900 to less than 20% currently (FAO, 1991). Similarly an increase in the GDP per capita over time has resulted in a rapid increase in the number of motor vehicles in Sri Lanka. This in turn has increased the levels of air pollution, especially in the urban areas. Some of the key sources of air pollution aside from motor vehicles include (1) Open burning of domestic and industrial refuse, (2) Combustion of commercial energy and (3) Indoor cooking using fire wood (York University, 2003).

17. Air pollutants can be transported across state and national boundaries covering a distance from about 100s to a few 1000s of kilometers, therefore pollutants produced by one country can have adverse impacts on the environment of neighboring countries as well. Down-wind areas of the countries are likely to be affected more than the up-wind areas. Especially for landlocked cities, trans-boundary air pollution is an issue that demands critical attention. In this context, the Malé Declaration adopted in 1998 provides the basis for a regional framework for air pollution reduction. Some key air pollutant of priority concerns to Malé member states are described below.

IV. Key Air Pollutants of Priority Concerns to Malé Declaration Member States

Particulate Matter:

18. The suspended particulate matter (SPM) is of great concern in Malé Declaration member states. In most of the Malé Declaration member countries, the levels of SPM exceed the set national standards and cause severe health impacts and environmental damage. WHO guideline levels of particulate matter (SPM) are exceeded in the air of most megacities in South Asia (Asian Development Bank, 2001).
19. The aggravated condition of SPM in Bangladesh, Bhutan, India, Iran and Maldives is no more a myth. In Bangladesh, the commercial sources include the combustion of fuels for power generation in industrial processes and powering motor vehicles. Another important source is different construction and development works (UNEP, 2008 B). 3 wheeler 2 stroke and 2-wheeler 2 stroke are important emission factors, each emitting 0.75 g/km of PM. The main natural sources of particulate matter in Bangladesh are winds blowing over dry soil, and pollen from trees and flowers. In Bhutan, the SPM are usually emitted during the combustion of biomass fuels and responsible for both indoor and outdoor air pollution. In India, the combustion of fuels in the domestic, industrial and transport sector are the major sources of SPM. Due to dry conditions, natural dust is one of the major sources of SPM both for indoor and outdoor air pollution. In industrial sector, cement sector is a major source of SPM besides the small scale industries like foundry, textile etc. The main source of SPM in Iran is incomplete fuel combustion, almost 79.5% of SPM emissions are due to traffic sector. Another important source is chemical reaction during chemical and industrial processes such as sulfuric acid and crude oil. SPM are also dispersed in the air through grinding and crushing of the materials used in construction and agricultural activities (Zandi, 2008). In Maldives, the particulate matters are usually found in the form of soot and coral dust. The main sources of their emission include the land and sea transport, power generation and construction activities (MDEP.2008 B).
20. The situation is no more different in Nepal and Pakistan regarding SPM but slightly better in Sri Lanka. In Nepal, the major source of SPM is vehicles, especially in Katmandu valley. The average values for PM₁₀ fall in the range of 23 to 295 µg/m³ in the core areas with the seasonal variation: higher in dry and lower in the rainy season (ADB and ICIMOD, 2006). Other main sources of SPM in urban areas include the industrial emissions. Very high levels of SPM are emitted from cement, brick, tile and textile factories (National Planning Commission Nepal and IUCN, 1992). In Pakistan, the main sources of SPM are vehicles. Dust due to mobile

sources is mainly responsible for air pollution in Sri Lanka. Annual average ambient PM₁₀ level in Colombo over the years have remained relatively within the 72 to 82 ug/m³ range, peaking only in 2001. These values, however, consistently exceeded WHO latest annual guidelines value of 20 ug/m³ for PM₁₀, suggesting very unhealthy situation in relation to the PM pollution in Colombo (MDEP, 2008 A).

Sulfur oxides:

21. The sources of sulfur oxides vary from country to country, for instance in case of Bangladesh, Bhutan, India, Iran, Maldives, Nepal and Pakistan these considerably differ from each other. In Bangladesh, the major sources of emissions of sulfur Dioxide are vehicles, brick kilns, paper and pulp industries, oil refineries and sulfuric acid production plants. The high emission factors of trucks (1.13 g sulfur dioxide/km), followed by minibuses, diesel powered, indicate that substantial sulfur dioxide emissions come from these sources. The estimated emission levels of SO₂ in Bhutan have indicated that major source is households. The petroleum refineries, textiles, pulp & paper and industrial chemicals produce about 87% of sulfur emission in India. The main emission factors for sulfur dioxide are coal, oil and industrial process of paper and pulp, copper, zinc and lead smelting, thermal power plants, oil refineries and sulfuric acid. In Iran, sulfur dioxide is mainly emitted from oil refineries during processing. In Maldives, land transport vehicles largely contribute to the air pollution of the country including sulfur dioxide along with carbon dioxide, carbon monoxide, oxides of nitrogen, lead, particulate matters and volatile organic compounds (MDEP, 2008 B). In Nepal, incomplete combustion of fossil fuels, including petrol, diesel, kerosene and coal produce large amounts of carbon monoxide, sulfur dioxide, oxides of nitrogen and hydrocarbons (National Planning Commission, Nepal and IUCN, 1992). Coal consumption in Pakistan is very low as compared to neighboring countries, so the predominant source of Sulfur Dioxide is vehicular emission. (UNDP, 2006). Other sources of SO₂ are vehicles, refuse burning, open dump burning, vehicular automobiles and aircrafts (Pak EPA and UNEP, 2004). In Sri Lanka, SO₂ emissions are mainly from industrial activities, especially thermal power plants. Unlike ambient PM₁₀, which was fairly stable within a small range of values, SO₂ levels in the Colombo air have shown an increasing trend from 1997 to 2000 and then a general decreasing trend from 2003 (MDEP, 2008 A).

Nitrogen oxides:

22. The sources of nitrogen oxides are also different for MD member countries. In Bangladesh, Nitrogen Oxide is mainly emitted during energy consumption including energy transformation industries, transport and biomass burning. Nitrogen Oxide is also emitted during processing of iron and steel industries. Another major source of nitrogen oxide emission is burning of agricultural residues. In Bhutan, the sector wise emissions estimates of nitrogen oxide indicate that domestic sources are responsible for NO emission. In India, sources of nitrogen oxides emissions are vehicles. In India, the road transport is the main source of nitrogen oxide emissions (7.63 Million Tones/Year) as compared to industry and power sector. The number of vehicles, registered in India was 21 millions in 1990-91 which has grown to around 37 millions by 1996-97 (UNEP, 2008 C). Another important source of nitrogen oxide emission is industrial process, especially the production of nitric acid, used in fertilizer manufacturing. In Iran, the major source of nitrogen oxide is transport, followed by

power plants and industries. In Maldives, the domestic combustions are responsible for nitrogen oxide air pollution. In Nepal, the major nitrogen oxide sources are associated with the combustion of fossil fuels and from fuel combustion in industries, especially cement industry.

23. In any preventive pollution control strategy, “Reduction at Source” is considered to be the very first option. The same needs to be considered for air pollution reduction in Malé member states, to minimize the resulting economical, environmental and health impacts in the region.