

Maldives is one of the most environmentally vulnerable countries in the world. While it has very successfully overcome the historical health scourges of communicable diseases, it now faces huge challenges due to environmental degradation both in the physical setting and in human behaviour as the country tussles with the negative environmental health consequences that result from its engagement with national economic development in a globalizing world and a new democratic governance process in this new century.

NEHAP – Maldives 2015-2020

**Towards an Environmentally
Friendly and Healthy
Maldives**

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The National Environmental Health Action Plan (NEHAP: 2015-2020) Maldives

Part I – Background and Situational Analysis

Introduction

Health is not the mere absence of disease. The physical and the biological environment around her/him affect the human health. Humans themselves alter humankind's physical and biological environment and this alteration can have either negative or positive impact on human health. Thus, human health is ultimately dependent on society's capacity to manage the interaction between human activities and the physical and biological environment. This management has to be in a manner to safeguard and promote health and to preserve the integrity of the natural systems on which the physical and biological environment depends.

The decade of the 1990s had witnessed an increasing number of international conferences devoted to various aspects of development. The message that came through from all these conferences was that development was no longer perceived in economic terms alone and that the additional dimension of human wellbeing is equally important.

At the Earth Summit held in Rio de Janeiro, in June 1992, the largest ever meeting of the world leaders, 179 countries agreed on an Agenda of action towards sustainable development in the 21st Century. They proclaimed that human beings are to be unequivocally entitled to a *healthy and productive life in harmony with nature*. They also recognized the prime importance of investing in improvements to people's health and their living environment, as a prerequisite for sustainable economic growth. This was the *Agenda 21*.

Human health depends on a healthy environment and health concerns and their relation to environmental degradation and economic development are well addressed in Agenda 21, and by adopting it, the Earth Summit heralded a wholly new approach to the consideration of health and environmental issues in national development processes.

Health, environment, and development linkage

Unsustainable development places undue burdens on the natural resources of the environment thus damaging human health. Short-sightedness, selfishness, wastefulness, and craving for superfluities of life have been the basis of orientation for such development. Indiscriminate spraying of pesticides in an attempt to grow more food and the expansion of irrigation or hydropower often considered merely for development precipitate health effects for which a nation has to ultimately pay. The growth of industry increases toxic emissions and indiscriminate disposal of wastes, causing polluted air, land and water, and posing hazards to human health.

The impacts of development on human health as a result of environmental degradation (polluted air, land and water) varies from the young lives taken by preventable communicable diseases to the less certain, often less severe, effects of work place. Therefore, it is important to foster development activities in such a way that those activities have minimum impact on the environment and hence promote and protect human health.

Sectors working in isolation tend to neglect health and environment concerns in their development plans and consequently cause detriment to the environment and people's health. Therefore, there is an immediate need to ensure that health and environment concerns are incorporated in the development plans of all sectors.

Country context

Geography:

The islands of Maldives, (all 1190 of them with a combined area of 90,000 sq. km), are built of bioclastic sediments, and vary in shape and size from small sandbanks to elongated strip islands. Many have storm ridges at the seaward edges with swampy depressions in the center. Islands vary in size from 0.5 to several square kilometres. Maximum height above sea level within the Maldives is around 3 m and in excess of 80 percent of the land area is less than 1 m above the mean high tide level.

The hydro-geology of the Maldives poses a particular difficulty on access to drinking water. Being small islands surrounded by large expanses of seawater, the freshwater aquifer lying beneath the islands is a shallow lens, no more than a few meters thick, formed by the percolation of rainwater through the porous sand and coral. The aquifers change in volume with season and rise and fall with the tide. Such aquifers form the only source of water for human consumption and agricultural purposes. Increased extraction, exceeding natural

recharge through rainfall has depleted the freshwater lens in Malé and other populated islands, and poor sewage disposal has resulted in contamination of groundwater aquifers.

The Maldives has a tropical climate, which is warm and humid. The weather is dominated by two monsoon periods, and the average annual rainfall of approximately 1980mm is evenly distributed throughout the year. The annual mean temperature is 28°C, with a relative humidity range from 73% to 85%.

Economy:

The Maldives with a per capita Gross Domestic Product (GDP) of US\$ 4900 in 2014 (PPP 11300), economic life in the Maldives is now dominated by income from the tourism, hotel and transport sectors. Fisheries have taken a much more backseat from what it was in the 1960 -1980. Rapid economic growth is traceable to the quick growth of tourism which has increased living standards yet hastened an increased cost of living. The impressive annual growth in the economy since the latter part of the 70's due largely to the increased receipts from tourism and fishing as well as government investment in infrastructure, has been met with lethargy in the decades since the 1990s. But the new Century has brought about a much faster growth as is evidenced by the GDP's expansion in 2014 to double what it was in 2000 (from 1 to 2.3 billion (World Bank 2014)).

During the early period of independence, the Maldives has a typical small island economy limited by natural and human resources, an acute shortage of raw materials, heavy imports of most requirements and an ever increasing demand on government revenue to cater for the basic needs of an expanding population.

Fishing had always been a central activity in Maldivian society and the fisheries sector was extremely important for the economy providing around 80% of export income then. Tourism began in the early 1970s and was quickly the second largest contributor to the economy of the Maldives and showed increasing importance year by year. The tourist-resorts, confined to the uninhabited islands, still rely heavily on imported equipment, facilities, food stuffs and skilled labor for their development.

Population and demographics:

The population of the Maldives increased from 180,000 in 1985 to 330,000 in 2013. The population growth rate between 1977 and 2005 appears to have fluctuated between 3.4 – 1.80 percent, the latter being the most recently reported value in 2005 census (MPHRE, 2005). The high rate of growth of population is due to a reduction in the crude death rate that has resulted from improvements in primary health care (IMR reduced from 128 – 20 per 1000 during the period, 1978-2005). Thus, the Maldives has a relatively young

population with about half the population being under 15 years of age. Presently the IMR has still shrunk to just 8 by 2012.

Disease dynamics:

The communicable disease picture of Maldives has improved phenomenally over the past four decades or so. This is evident in the plummeting of the infant mortality rate from 128 in 1978 to just 8 in 2012. This has been attributed to the gains in controlling the major communicable disease. Elimination of Malaria, high coverage of immunization, safe water supply, better management of diarrheal disease, and a better general, and referral health services all contribute to this improved picture. From 1978 to 2012, crude death rate also declined from 14 per thousand to 3 per thousand by 2011 (MoHW, 2012), and life expectancy has significantly increased from 47 in 1978 to 71 years by 2012.

The picture of health has however changed over these years as NCDs have slowly taken over both morbidity and mortality. The data available from MOH in 2012 shows the cause specific death rates to be pointing towards hypertension and other heart diseases as the prime cause. Cerebro-vascular diseases, cancers, diabetes, renal failures, chronic respiratory diseases and accidents and injuries follow in the list.

Environmental health status:

It is difficult at this stage to get an accurate and full picture of the health issues in Maldives that are related to poor environmental conditions. This is because of lack of data and research that specifically links environmental improvements to health gains. However, available data show that there has been a decline in communicable diseases, which conventional wisdom in public health attributes to better management of the environment with respect to water and sanitation, food availability, better life-styles, the absence of vectors such as malaria carrying mosquitoes, etc. While most communicable diseases have been brought under control, some diseases such as tuberculosis, diarrhoea and nutrition-related conditions continue to be health problems of concern to the country. The environment/development linkage of these health issues is unassailable, and equally so is the fact that the health sector cannot handle these complex issues unilaterally. Thus, for meaningful action, this need to be communicated very effectively to related sectors without whose support productive outcomes would not be possible.

Vector borne diseases:

The biggest achievement in the health sector has been in the area of malaria control. **Malaria** used to be the major public health problem in the 1950s, and so in 1951 with WHO assistance a vector borne disease control programme, specifically malaria control was initiated. This

programme has been very successfully implemented and since 1984, Maldives has remained malaria free and after 1990 the malaria vector has not been detected. However, there is a constant threat of re-introduction of malaria vector via sea transportation and air transportation, especially considering the fact that all of our neighboring countries are endemic of Malaria. Filariasis transmission has been controlled in the country for almost 7 years and we are at the stage of elimination of Filariasis in Maldives.

Vector-borne disease is a major public health concern in Maldives, with dengue fever and chikungunya continuing to be a public health concern due to the increasing morbidity and mortality. The first cases of dengue were identified in 1979. **Dengue fever** is endemic in the country since 2004 with seasonal outbreaks in 2006 reporting 2836 cases, and 2011 reporting 2909 cases and 12 deaths, the highest recorded in history. The first recorded chikungunya outbreak was in December 2006, and after that no outbreaks were recorded. No clear-cut epidemic pattern has been observed with respect to dengue and now has become an annual occurrence. During the outbreak of 1988, nine deaths were reported.

Since then after a lull on mortality, the 21st century has brought a recurrence of morbidity and mortality.

Acute respiratory infection (ARI) is one of the major problems among children and adults. There is no reliable data to show the exact extent of the disease in terms of the morbidity and mortality profile. However, it has been estimated that about 18% (?) of the deaths in children aged 0 - 4 years of age are due to pneumonia (UNICEF, 1994{?}).. In some regions estimates indicate that as much as 60% {?} of the children attending the hospitals are diagnosed with acute respiratory infections. Ministry of Health records indicate from apparently well maintained data that there were a total of 156000 reported episodes of ARI in 2012 yet no deaths. It also indicates that there was some lapse in the pneumonia surveillance by the Health Protection Agency (HPA).

Diarrhea and worm infestation:

Morbidity and mortality from diarrhoea has been one of the major concerns in the past, and morbidity still continues to be. With the construction of rainwater catchment tanks both in Malé and the atolls and the introduction of a comprehensive sewerage scheme in Malé and intensive health education on the use of oral rehydration, the situation had improved tremendously. Deaths from diarrhoea have dropped considerably, although the morbidity situation has not improved significantly. Serious epidemics of diarrhoea occurred in 1978 (Cholera) and in 1982 (Shigella) claiming several lives. The cholera epidemic affected 50% of the islands with more than 15000 cases reported and 200 deaths. Between 1992 to the present, there has been a reduction in the

reported cases of diarrhoea in the country as a whole. Malé island's comprehensive desalinated water distribution system has also shown success in reducing diarrheal diseases in Malé. With Malé as a buffer, the islands are also now much better protected from the spread of communicable diseases.

While intestinal worm infestation is no more a pervasive public health problem of today, a survey conducted in 1992, however, showed that in Laamu atoll, 68% of children under-3 years of age were suffering from worm infestations. This is in contrast to what was shown in the 2007 micronutrient survey to be just about 4 percent for those under 5 years. This indicates that the habit of drinking chlorinated or rain water was still an issue and open defecation also may have been contributing factor. The present day situation is the result of good health awareness on addressing both the above.

AIDS and sexually transmitted diseases:

Maldives is a very low HIV prevalence country. From 1991-2011, 15 cases of HIV were reported for Maldivians and 289 cases reported for expatriate workers. Among the reported cases in Maldives 13 were male and 2 were female, all the infections were believed to be acquired through the route of sexual contact. 4 People are alive and 2 of them are on Anti Retroviral Treatment (ART) and also 1 expatriate worker is under ART treatment. (Annual communicable disease report 2011). (www.health.gov.mv/PDF/Annual%20Communicable%20Disease%20Report_2011.pdf)

Non-communicable diseases:

According to the morbidity and mortality data available, non-communicable diseases seem to be on the increase. The life expectancy at birth has increased from 70.0 to 73.0 for males while it has increased from 70.1 to 74.8 for females from year 2000 to 2012 respectively. Several factors may have contribute to the increase in life expectancy such as improved accessibility to health care, improved diagnostic and other health services, and increased awareness within the population leading to increased healthcare seeking behavior and healthy lifestyles.

With the emerging lifestyle changes associated with development; chronic non-communicable diseases have emerged as the main cause of morbidity and mortality in the country. Cardiovascular diseases, chronic respiratory diseases, accidents and injuries and cancers are the leading causes of death in the country. The Ministry of Health is working towards strengthening of the provision of health services for early detection and treatment of non-communicable diseases.

Country report indicated prevalence of diabetes 4.0 per 1000 population, whereas the estimate of International Diabetes Federation (IDF) 2010 showed

the prevalence at 7.4 per 1000 population. IDF has also indicated relatively high (12.7 per cent) prevalence of impaired glucose tolerance in Maldives. Comparable estimates of prevalence of raised blood glucose (age-standardized adjusted estimates – WHO 2008) shows that 7.8 percent of males and 7.5 percent of females have had the raised fasting blood glucose.

The country reports cancer mortality 17 per 100,000 in females and 34 per 100,000 in males, whereas WHO 2008 estimates indicate the figure 116.7 and 155.0, respectively. WHO estimates 2008, suggest that percentage of cancer deaths out of all country's deaths have exceeded the percentage of cardiovascular diseases deaths. Cancer of stomach is the leading cause of deaths among cancers in both sexes (in males 7.5 percent of all deaths, in females 6.4 percent), followed in males by trachea/bronchus/lung and liver cancers, and in females by liver and colon cancers. However, since the total numbers are small, some caution may be considered in the data interpretation.

Besides the major NCDs Maldives has highest prevalence of thalassemia in the world with a carrier rate of 18 percent of the population¹. Although National Thalassemia Centre of Maldives screens all persons seeking marriage and also offers medical termination of pregnancy when both partners are carriers, the prevalence is still high. Maldives National Thalassemia Programme includes thalassemia into the school curriculum; the legal requirement for screening prior to marriage; legalization of prenatal diagnosis and medical termination of pregnancy; and the commencement of prenatal diagnostic services².

Neuropsychiatric conditions (disease burden - DALYs lost is highest among SEAR countries – 3,938 per 100,000 population) is another public health problem in Maldives.

National Development Context

Development planning:

The Government of Maldives recognizes the importance of planning for sustainable development and accepts the role it must play in achieving sustainable development. It defines this role as one of guiding the nation's development in directions compatible with the shared interests and values of all Maldivians, the full and effective utilization of human resources and the conservation of the natural environment.

¹ UNODC. South Asia Regional Profile Sept. 2005. Maldives

(http://www.unodc.org/pdf/india/publications/south_Asia_Regional_Profile_Sept_2005/11_maldives.pdf)

² Firdous N. Prevention of thalassemia and haemoglobinopathies in remote and isolated communities – the Maldives experience. Ann Hum Biol 2005; 32:131-7 (<http://www.ncbi.nlm.nih.gov/pubmed/16096208>)

The first plan for the socioeconomic development of Maldives covered the period 1950-52. This was more of a policy statement than an integrated development plan. This document identified development objectives and outlined strategies and the policy framework for their achievement. Following this, overall strategic planning was not pursued, and economic management relied on an ad-hoc approach to resolving problems as they arose.

Later, with the establishment of the National Planning Agency (NPA) in 1978, the government intended to return to strategic development planning and the preparation of three-year national development plans. The first National Development Plan (NDP) covered the period 1985-87. Since then three more NDPs have been prepared covering the periods 1988-90, 91-93 and 94-96. National Planning Agency was upgraded to the Ministry of Planning and Development (MPD) in 1982, which later became the Ministry of Planning, Human Resources and Environment. Consequently, national development planning was given more central focus when the Ministry of Planning and National Development was formed on 11 November 1998. In the past decade or so, this trend continued and since 2008-2009 with the establishment of a new democratic government system and the coming to power of a new government, the structure of the government has undergone significant change and now the national planning function has been transferred to the ministry of finance and treasury.

The **National Development Plan** formalizes the planning process by reviewing the current economic situation, medium-term prospects and constraints on development; describing recent sectoral developments, establishing development objectives, priorities and strategies; identifying and prioritizing development projects and identifying financing sources for the projects. Detailed sector analysis forms the basis for identifying projects that are included in the plan. The Plan also provides the basis for discussions with foreign donors relating to the financing of priority projects.

In order to evaluate the longer term development prospects, the Government of Maldives prepared a **Perspective Plan** for the ten years 1996-2006 with the assistance of the Asian Development Bank. The Perspective Plan 2005 covering the period 1996-2005 sets out a vision of life in Maldives in the year 2005 and what is required to achieve the vision. The Perspective Plan also provided a framework for the preparation of the next four national development plans.

Regional development was a priority objective of the Perspective Plan. Regional development was fostered to ensure equal opportunity for regions to participate in and benefit from national development. Limited government and national resources required that urban regional growth centers be developed sequentially. It was envisaged that these would grow naturally once constraints to private sector investment had been removed but also as a result of selective complementary public investment in physical infrastructure and social services. The hope was that these growth centers would encourage inward migration

similar to that in Malé. It was purported to be necessary to ensure that the faults in Malé's development were not repeated.

Environment Sector Management

In Maldives, the present environmental policy emphasis is predominantly on the protection of the physical environment. This is particularly relevant considering the country's precarious marine ecology and related issues of survival in an era of environmental degradation and change.

The approach to environmental management adopted in the National Environment Action Plans (NEAPs) was through: continuous assessment of the environmental conditions, the development and implementation of management methods, the development and implementation of comprehensive national environmental legislation, and the strengthening of national capabilities and institutional arrangement.

The principal aim of the National Environment Action Plan was to help the Government of Maldives maintain and improve the environment of the country, which included the marine and ocean area contained within the Exclusive Economic Zone (EEZ). It was also to manage the resources contained therein for the collective benefit and enjoyment of present and future generations.

As regards legislative action, The National Environment Protection and Preservation Act was approved in 1993 and so Environmental Impact Assessment was made mandatory for all projects with potentially adverse environmental impacts. Through its adoption of the NEAP, the Government also affirmed its commitment to the concept of sustainable development. NEAP has been quite successful in fulfilling the first phase requirements. Environmental education and awareness has been given high priority. The Government also provides considerable support for the training and expansion of the environment sector.

While in 1996-7, the initial effort of preparing a NEHAP was attempted to address the health issues/concerns arising out the national development process (the pollution of water and air, the poisoning exposure to people working in agriculture and industry, and the chemical and biological risk from food production, storage and preparation etc.), this 2010 and 2014 attempts to revise the NEHAP bring to the fore an additionally heavy focus on addressing the detriments of climate change. For integrating the health concerns of the environment under the overall national environmental concerns umbrella, the NEAP3 was taken as the basic platform on which to locate the relevant health action. Thus, the attempt here is to link health action to the targeted objectives of the six key Results that NEAP3 hopes to achieve by addressing the downside of the climate change consequences.

Tourism, fisheries, coral reefs, and the need for more green cover in Maldives still continue to be priority environmental concerns.

Particularly, the **coral reefs** of the Maldives are a resource for our tourism and our fisheries. These are also renowned for their aesthetic beauty and species diversity and the reefs support stocks of endangered species such as green and hawksbill turtles, giant clams and black coral. Recognizing the importance of protecting marine ecosystems in the Maldives and obligations under article 8 of the Convention Biological Diversity, 15 sites were designated by the Government on 5 June 1995 as protected areas. Combined with this, an integrated reef resources management programme was also initiated by the Ministry of Fisheries and Agriculture. This programme is designed to assist in the sustainable exploitation of reef resources in the Maldives. An agenda for sustainable reef resource development was developed in March 1996 through consultation and participation of various resource users, community groups and government departments.

A **million-tree** programme was also initiated in January 1996. Under this three-year programme, one million more trees were added to our islands. Special emphasis was to be given to restoring threatened habitats and re-introducing certain locally threatened species. However, the December 2004 Asian tsunami wreaked havoc to this achievement as it swept away or burnt out much of this and the already existing vegetation.

Health Sector Management

The government of Maldives recognizes that sustainable development in the Maldives will not be possible without the maintenance of health and well being, and in particular a quality environment conducive to life. Health is a basic right of every Maldivian; this has been the guiding principle, which has shaped health policy development in the Maldives. The Maldives had made a firm commitment to the achievement of the goals of "Health for All by the Year 2000" and that all strategies were aimed towards the adequate provision of equitably distributed essential health services based on Primary Health Care (PHC).

According to the draft Perspective Plan 2005, the national priorities for health development were to improve the accessibility, affordability and quality of care to meet the increasing demand for health services by the rapidly growing population in line with their social and economic uplift (MPHRE, 1996b).

The Ministry of Health is responsible for the provision of all health and health-related services in the Maldives. The Department of Public Health was restructured to being responsible for three main programmes: family health, disease control and environmental health. The Atoll Health Centres and the Island Health Posts staffed by Community Health Workers (CHWs) and Family Health Workers (FHWs) which provided basic preventive and simple curative

health care to the rural population come under the Department of Public Health. There were also specialized units such as the Skin Clinic, the Chest Clinic and the Malaria Unit that function under the DPH.

Since 2008, the DPH has been transformed into CCHDC (Center for Community Health and Disease Control) doing practically the same functions as before. And by now, this function, with add on health promotion tasks is carried out by this same unit with a different nomenclature - the Health Protection Agency (HPA) and coordinated by the Health Services Division of the Ministry of Health.

The Central Hospital established in 1966 offered a wide range of medical care services to the population and also acted as the referral centre for tertiary care in the Maldives. Since 1995, the Indira Gandhi Memorial Hospital (IGMH) had taken over these functions, phase by phase, during late 1994 and early 1995. The existing four Regional Hospitals also report directly to the Ministry of Health. In 2010, Malé's health delivery system witnessed a sea change by way of Regional Hospitals and health centers in several atolls coming into the fold of a corporate structure and nomenclature changed to regional health corporations. and the corporatization of health care to national health corporations. In 2014 it's yet another reversal - a comeback to the previous version where the Health Services Division coordinates the Regional Health system.

The MWSA: The Maldives Water and Sanitation Authority (MWSA) was established in 1973 to provide safe drinking water and hygienic sanitation facilities in the country. It was then the sole agency responsible for the implementation of water and sanitation programmes. The responsibility included operation and maintenance of water supply schemes in the islands, and monitoring of water quality in Malé and other islands of Maldives.

Later, Government of Maldives has transferred the water supply and sewerage management of the city of Malé from MWSA to a new private entity, Malé Water and Sewerage Company. MWSC is a joint venture company with government majority shareholding. In order to protect the interests of consumers as well as the environment, the Maldives Water and Sanitation Authority was given mandate to act as a regulatory body for the company. The regulatory body is responsible for setting standards and regulations for water quality in Maldives and to monitor and enforce them. In 2008, the MWSA was merged with the Ministry of Environment, and the Health Sector then left without a dedicated environmental health function. Now in 2014, with an Environmental Protection Agency (EPA) within the Environment Ministry, there is increased responsibility for the two ministries to cooperate,

The Institute of Health Sciences (IHS), established in 1973 as the Allied Health Services Training Center (AHSTC), provides both pre-service and in-service training for health care personnel in nursing, paramedics and primary health care. Later, IHS was brought under the College of Higher Education as

FHS and is the only institute in the Maldives for the development of human resources for health, and it provides training for community health workers, family health workers, nurse aides, nurses, traditional trained birth attendants and pharmacy assistants.

The School Health Education Programme of the Ministry of Education also serves to increase awareness among the school-age population. Students are educated on basic health issues, such as promotion of personal hygiene and healthy life styles, as well as specific issues such as thalassaemia and HIV/AIDS.

Legislative provisions in the sector are very limited and mostly confined to the area of food safety and restaurant sanitation.

The Initiative on Health and Environment

The National Health and Environment Initiative began in 1995 as a collaborative exercise between the Government of Maldives and the World Health Organization. For the Government, this exercise signified a step ahead towards the preparation a national Agenda 21, and for the WHO, it was a step towards implementing the global mandate it received from UNCED for operationalizing Chapter 6 of Agenda 21. After initial policy level consultations between the two parties, preliminary endorsement of intent and a simple work-plan, the process of collaboration began. It is in this regard that on 18 December 1995, an inter-sectoral consultation was organized, jointly by the Ministry of Health and Welfare, Ministry of Planning, Human Resources and Environment, and the WHO.

The objective of this first health and environment action plan was to facilitate and effect the incorporation of health concerns into the national sustainable development policies and plans. Consequently, throughout this initial phase of action relating to the preparation of the plan document, MPND, MHHE and the MOH have worked consistently together as co-sponsors of this effort.

A New Initiative and a Revised NEHAP

On 29-30 September 2010, a multi-stakeholder group got together to review the old NEHAP and aligned it with enunciation of the NEAP 3 so as to streamline related health actions and synergize the action that could follow as an integrated and collaborative effort among participating parties (sectors). However, even after four years, a systematic implementation of this plan had not happened and so here was another attempt made in November 2014 to carry forth from the planning stage that was arrived at in December 2010. This was important to keep the continuity and to have the same stakeholders review it and revise as needed.

The Tsunami of 2004 December was a defining event that transformed national thinking on the lines of giving high priority to environmental concerns (environmental health including) and the climate change agenda also as a priority of national concern. In that fateful event, at least a third of the islands of Maldives were devastated environmentally and emotionally. Scores of island communities were relocated resulting in social disruption and mental agony. The government also faced tremendous challenges in coordinating the social and economic rehabilitation process. Thus, the new effort of national planning has brought into high focus the concerns of such environmental vulnerabilities and builds in mitigation and adaptive safeguards.

Health as a pervasive concern in all walks of human development, finds a good anchor in the national environmental action plans such that health is made mainstream. The ministry of health would be a partner in the implementation process, providing the plank of technical expertise to the health dimension of this environmental mitigation work.

Since the conversion of the HIS to a Faculty of Health Sciences (FHS) under the Maldives National University, there has also been graduate programs on public health added to the curriculum to focus on the emerging concern of public health that still needs to be carried forwards even as the country has the control of the major communicable diseases that were the scourge of yesteryears.

Priority Health and Environment Concerns

Even in 2014, the following continue to be priority health concerns in Maldives.

Water supply: One of the main environmental problems in the Maldives is the lack of access to safe drinking water. In Malé and the other islands the rapidly expanding population has exacerbated the problems associated with the supply of water. In the other islands people depended on rainwater and groundwater for drinking, cooking, washing and other purposes. The groundwater in most of these islands was contaminated due to improper disposal of sewage. Therefore, worm infestations and frequent bouts of diarrhoea and other water-borne diseases were quite common. But now in 2014 this picture is very different. Post Tsunami action brought in better sewerage systems in the atolls and even desalinated water to the masses there in addition to the rainwater harvesting systems that had developed over the past thirty years or so. Thus, worm infestations and diarrheal diseases in general is no more a priority. The present need is to keep accessibility in tune and the water provided safe.

Solid wastes management: The problem of solid waste has been escalating in the Maldives where there is literally no place to hide them. Limited land area

makes the option of landfill disposal unsustainable in the long run. Other means such as incineration, disinfection, using the 3R process, composting, are means to be attempted. The method used for dealing with the garbage of Male has been the land filling in a nearby lagoon for the past 3 decades or so, and in the process, the dump has now become an island. The issue of final disposal still remains as there is still open burning and the resorting to good incineration still not pursued nationally as a viable option, This needs urgent attention even in 2014.

Liquid wastes management: Inadequate disposal of liquid wastes is a problem almost in all the islands, which otherwise result in the contamination of groundwater and lagoon areas of the coastal zone by pathogens, including faecal coli forms. The disposal in lagoons also has the additional problems of nutrient enrichment and the flushing out of scarce freshwater from the islands. In most of the islands sewage disposal facilities are inappropriately sited and poorly managed. And no more in sewage is the issue of bacterial contamination of ground water, but also that of chemical contamination. With increasing chemical imports into Maldives for industrial, household and agricultural purposes, hospitals, badly managed use and disposal create environmental concerns that ultimately result in human health concerns.

Agriculture: Agriculture has remained a secondary undertaking in the Maldives based mainly on subsistence cultivation of a small number of crops. Agriculture's share in GDP fell from 8.9 percent in 1990 to an estimated 7.7 percent in 1995 and just to 2 per cent in 2009, and congruently, employment in agriculture fell from just over 3,000 (5.9% of total employment) in 1985 to just 3 per cent in 2009 (MOH Najath).

Human health issues in the Maldives linked to food and agriculture are caused by lack of development rather than inappropriate development. Traditional dietary habits are slow to change and consumption of fruits and vegetables has been low. As a result certain nutritional deficiencies are commonplace.

Use of chemical fertilizer was low in the early part of 1990s because of the fear of contaminating small freshwater wells that are used for bathing and drinking. However by 2010, chemical fertilizer use has risen exponentially and now poses a very great threat to human health. Excluding organic fertilizers and cow dung, imports of chemical fertilizers and pesticides in 2000 amounted to MRF 8.5 million, and in 2008 this figure was MRF 17.3 million - a 100 per cent increase.

The main reason for the increase of pests and diseases each year is believed to be due to the unregulated import of plants, plant parts and fruits and vegetables. Now there is attempt at regulation by the Ministry of Agriculture through the enforcement of plant and animal quarantine

Energy: Due to the small size of the islands, electricity generation was quite limited. There were few, small generators in the atolls and even in the capital Malé' in the early days of electrification, and it might be safe to say that health impacts from air pollution was minimal even in the circumstances of 1990s.

Residential requirements have been the bigger chunk of growth. From 2007 to 2012 this category records a growth of 50 percent due to many new constructions and many families living separately. The second is the business sector showing a growth of about 30 percent. Now every atoll is centrally electrified and energy consumption has risen from in 1995 to in 2014.

Firewood was the major form of energy in around 20% of households in Male in the 1970s. And this was the dominant form of energy used for cooking in the other islands too. The health consideration in this case was indoor pollution, especially in ill-ventilated homes and kitchens. This situation has changed drastically – to the use of gas for cooking.

Since the 1990s, there has been a remarkable decline in the use of firewood. According to the 1990 census, 79 per cent of the households used firewood for cooking. The switch from firewood to kerosene and gas is particularly pronounced. in Male' and Seenu Atoll. In Male' only 2 per cent of the households used firewood in 2000 (MDG report).

Transport: In the past, most of the dhonis used for inter-island transport did not have adequate facilities and passengers often had to wait over 24 hours before they could get access to a toilet. Thus, inland harbours were subject to direct contamination from those living on boats or sojourning in an island lagoon for the night. This contamination is of particular concern in islands where the inner harbour had been dredged and well enclosed, as were becoming increasingly more common. These manmade harbours faced a greater threat of eutrophication of harbour water. In congested harbours such as the one in Malé at that time, some boat people irresponsibly wash their bilges too, leading to oil pollution in the harbour waters. Now there is a further issue cropping up in the decade of 2010 and beyond, which is the littering and pollution of the inner-harbour in Male. In addition to bilge from the moored boats, there is indiscriminate disposal of solid wastes too into the lagoon, that accumulate and stink up the premises.

While much of these environmental concerns still dominate the health aspect of the transport sector, there have been good interventions into safety during sea transport through the requirements of various personal safety measures for permitting the transport of persons. Space and safety devices both personal and nautical are required.

On land however, there is more chaos as road traffic regulations leave much to be desired as the next paragraph explains. Motor cycles dominate the traffic

population and unruly behavior of both drivers and pedestrians always pose physical risk. No helmets, no speed limits, no checks for emission levels, no good pavements for pedestrians all add to a risky environment to health and wellbeing.

Road traffic in Malé is experiencing huge traffic problems. Between 1982 and 2012 the number of registered vehicles rose from 18000 to 55,808. While a big chunk of this were bicycles, there were 6,300 motor vehicles, a mix of cars, pick-ups trucks and motorcycles. This contributed to significant compaction of the road surface and consequent reduction in natural aquifer recharge. The main health issues emanating from this sector is the vehicular emissions, noise, and some road accidents. In 2014, the situation is grave, in respect of the content of the types of vehicles. Of the 55000 or so registered vehicles, there were 2500 heavy trucks, 6000 cars, and a whopping increase of motorcycles to 41000.

Industry: From the mid-1970s, when industry was in its infancy in the Maldives included mainly garment production outfits and some initial fish canning for export. Since then some small scale industries have developed, mainly in Malé atoll, and Thilafushi, that includes production of soft drinks and mineralized water, manufacture of PVC pipes, fibre glass boats, and cement blocks, detergents, bleaching agents, toilet soap, furniture and a number of food products. The traditional sector is geographically dispersed and includes boat building, thatch and rope making, carpentry, tailoring, blacksmithing and the production of jewellery, curios and souvenirs.

Over the 3 decades or so into the present, the building construction industry has gained higher prominence. They fuel the housing in Male and the atolls, and the development of the tourist resorts. Then comes the service industry, with tourism being a prime example, those that cater to it such as groceries, supply chain stores for building material and home and office supplies have made big strides into the market. The restaurant business also has gained good ground with an expanding dining out urban culture. Catering to the expanding youth population with resources to spend, coffee shops and diners have proliferated in Male and in the atolls. Now with the tourism industry growing to allow guest houses in the inhabited islands of Maldives, this industry will still grow and the waste generated by this industry will also grow into the future. Now, arising from this industrial progress, there are considerable health-and-environment concerns that need immediate attention. Besides the solid waste issues, others such as unsafe working conditions, congested housing, chemical and food safety, sewage disposal and groundwater contamination of waste oils are salient examples.

The Urban Context: In 2010, the capital city of Malé was the only urban center in the country although some other islands were rapidly approaching an urbanized state. In 2014, Addu is also with city status. Following the closure of the air base at Gan and simultaneous tourism development centered around

Malé, the capital underwent extremely rapid population expansion. The fast pace of urban development in Malé had led to a number of risks to human health. These included land shortage, over-crowding, deteriorating housing conditions, high economic cost of urban infrastructure, and declining freshwater quantity and quality. These problems were exacerbated due to poor zoning that could have ordered the physical settlement of Male as the exodus from the islands began to pour into Male. For instance, oil pollution due to major leaks or long-term leakage from oil storage tanks in petrol stations came to be scattered all over Malé and the old powerhouse of Male island was also of serious concern due to its acrid emission, and the ambient noise that it produced. By now in 2014, the issues of infrastructure, traffic congestion, solid waste disposal, all have reached serious proportions. Health concerns from these and others as regards physical safety and the breeding of vermin that can have grave consequences to the public's health are real and present concerns. A hopeful opportunity for better housing lies in a new building code that was adopted; however, its proper enforcement will be the key to the solutions expected.

As development and urbanization makes its mark in other parts of the Maldives also, such physical issues and the growing social problems in Malé need to be given serious attention. Crime, drug abuse, and delinquency become addition to the burdens of law enforcement and public education in the newly emerging urban milieu.

Communication: Both tele and transport communication have improved hugely over the past couple of decades. Air base at Seenu Gan, Laamu Kadhoo, Gdh. Kaandehdhoo, HDh. Hanimaadhoo, Hulhule - Ibrahim Nasir International Airport have transformed unimaginably the physical mobility of the local population as never before, and contributed to the continuing expansion of the local and national economy. Telecommunication, with two very good provider hubs, has made talking to family and friends within the country like every day face-to-face conversation. Yet, this valuable medium for social awareness and such development remains very basic. Health education, medical and health care, basic and secondary education and even professional work environments can be creatively redesigned to provide greater efficiency and effectiveness to the work of making the population more aware, healthy and productive.

Occupational safety: Accidents and injuries in the work place are quite common. Occupational health and safety plans need to be introduced in the Maldives. With the development of the National Building Code and related regulations, standards and guidelines on occupational health by the Ministry of Health, health concerns of the workplace will be adequately dealt with. However, a sound regulatory mechanism needs to be established.

Chemical safety: The use of various chemicals is on the increase. At present there are no guidelines on the safe handling, use and disposal of chemicals in the Maldives and databases on chemicals are very weak. This area also lacks

trained people in related subjects such as Environmental Chemistry. Some activities under SAICM is being initiated with WHO support. This too needs follow up and national implementation on a multi-sectoral footing.

New concerns: These are mainly related to the consequences of climate change and the extreme weather events. In the case of Maldives these are mainly experienced as physical environmental damage and devastation. Nevertheless the consequent collateral damage that emerge in the aftermath of these devastations lay bare the potential for diseases and the forfeiting of national wellbeing of the present and future generations. Other issues will be also of breeding of vermin, mosquitoes that are vectors to lurking diseases such as dengue, chikungunya and the like. Emerging infections such as the likes of SARS, Avian Flu, and Ebola are issues to be vigilant about.

Part II

A Revised NEHAP

1. Introduction

The first exercise on preparing a National Environmental Health Action Plan (NEHAP) for Maldives took place in 1997 as the part of a global effort coming to all countries of the world from the 1992 UNCED in Rio de Janeiro, of making the link of health with the concern of the environment. It was at this Rio conference that the Agenda 21 was also promulgated and enunciated the prominence of health as the centre of concerns for sustainable development.

The World Health Organization being given by the Global Commission on Sustainable Development (CSD) the task-master mantle of implementing the Chapter 6 of this agenda 21 which was on human health, quickly undertook the task of facilitating the preparation of national agenda 21s termed as NEHAPs.

The main purpose behind this exercise was to assist countries to incorporate health concerns in sustainable development. Hitherto, the health promotion and health development was mostly understood as the business of the health sector. However, while the idea of health at the deeper level related to how we maintained our bodies and environment in "clean" condition, the UNCED in 1992 ushered in a paradigm shift towards the position that health was "everybody's business". Thus, the idea of "healthy public policy" (as different from "public health policy") was also freshly invoked even though this concept had languished since the Ottawa conference when the idea was first mooted.

The initial effort in 1997 in Maldives in regards to formulating a NEHAP was to operationalize the Health-and-Environment aspects of this Agenda (Chapter 6: Protection and Promotion of Human Health). Thus this first initiative was undertaken as a combined effort of the Ministry of Planning and National Development, the Ministry of Home Affairs, Housing and Environment, and the Ministry of Health to muster the support of other related Ministries and Agencies that have critical relevance to the Development-Health-Environment triad of concerns

This entailed intensive discussion with these ministries and the collecting and collating of national health and other statistics to finally culminate in an inter-sectoral workshop that delineated the environmental health priorities of the country. It was also an effort of harmonizing with these health concerns the national environmental concerns that were in the purview of the ministry of planning and environment.

The final document NEHAP was shared with the Ministry of Environment which used some of the concerns expressed in the formulation of their first environmental action plan. However, unfortunately, the NEHAP itself did not pass the final hurdles of national clearance to become a national policy document. But a significant part of the content of this document was included into subsequent national health plans and it also provided the framework for the Ministry of Health's and the Department of Public health's working agenda. In that regards, while the document lay in waiting for national level approval, its material was gist to the health-and-environment programs that drove the health system action for the past 10 years or so in this first decade of the new millennium.

2. This New Revision

A bit more than two decades down the road on global NEHAP program implementation and several milestones in the global agenda of environment and health since that historic Agenda 21 in Rio, much has happened in promoting partnerships, the most essential element in the implementation process of this multi-stakeholder process. While this has been a painfully slow process overall globally, the levels differ however on the national scales – some being quick takers while others mired in lethargy.

Since then, the World Summit for Social Development (WSSD) in 2002, and the MDGs and the Climate Change agenda have still widened the scope of health and environment action and new approaches needed to be incorporated. In 2002, the World Summit for Sustainable Development (WSSD) in South Africa highlighted once again the call for partnerships that the Agenda 21 had done ten years before that, and the events of this WSSD ushered in an era of looking at every environmental action as needing partnerships. Underdeveloped though this process of creating partnership may have been for several years since, the concept of partnership began to

take more currency, opening up a new agenda in international and local policy, an open acceptance to having team work leading the environmental agenda at international, national and local level actions.

The healthy settings approach further invoked opportunities to use the local Agents 21 process at the local level. The "Healthy Settings", as many in the health and environment sector would recall is an accommodation of the concept of "Healthy Cities" idea that was coined at the Ottawa conference on Health Promotion in 1986. The ideas behind Agenda 21 found an immediate home in the healthy settings idea and process for mayors of cities and other local level leadership and energized civil service organizations to use this approach to build partnerships and collaborative programs to implement health as a part of the development and modernization process.

This interim period also outlined the historic Millennium Development Goal (MDGs) that set a list of goals for all countries of the world to attain before the year 2015. With the time almost up, Maldives have achieve much of what was expected. However, the NEHAP has an agenda broader than these goals and the specificity of national concerns close to home makes the NEHAP revisions a necessary on-going iterative process that can address any health and environment related concern.

The basic principle under which this revised NEHAP is guided is still the same; that Human Health is the centre of concerns for sustainable development. And that every sector engaged in the national development process has an integral responsibility to enable human health to prevail.

Now, after just about two decades in Maldives, this new effort of revision is also the effort of a multi-stakeholder group consisting of the ministries of housing and environment, health, agriculture/fisheries, tourism, etc. Technical support was provided by World Health Organization on all three occasions. This document outlines the Maldives' multi-stakeholder review and the decisions it outlined in a two day workshop to review and revise the attempt of 2010.

3. Progress / achievements of NEHAP 1997 objectives.

The main success of the NEHAP, even though it did pass into formal approval was that the content of this was used in subsequent health planning exercises and the use of the "healthy settings" idea as bases from which community development and inter-sectoral efforts were germinated. In several atolls and islands, the ideas of community development as are coherent and collaborative have also been undertaken.

Although these have not been documented in any serious way, much information on community based efforts initiated by committed community

members and groups are anecdotally available. One that was clearly described and documented is the Healthy Villingili program in Gaaf Alif Atoll that was attempted from 2002 with WHO assistance in its initiation. Elements of poignancy also elaborate this effort for all the hard work that was put up by the community in the first two years, being shattered by the vagaries of nature that came as the devastating tsunami of December 2004.

Reviewing the old NEHAP concern areas for continued relevance: The list of ten areas of health concerns in the NEHAP 1997 were: sustainable water resource management; safe disposal of solid and liquid wastes; chemical and hazardous wastes; urban issues; food safety; occupational health; vector control; noise; atmospheric pollution; health of coastal environment. As notable, these were purely based on the classic environmental health concerns with only urban issues being of a different type. The urban issues were taken as inter-sectoral issues because these concerns had tool in the "healthy city" idea that could accommodate addressing. Otherwise, the other nine areas were discipline based issues that would have technical solutions but not an administrative or governance structure to place the process of addressing these issues in.

However, difficult as these were during this time in the mid 1990s when the structures of the health sector was getting used to the idea of partnerships, the message was accepted and various ministries assisted (even though in informal and unstructured ways) addressing the issues.

For example, **water resource management** was assisted by the establishment of the MWSA and the MWSC for universal access to drinking water to Malé community through catchments and desalinated water. By now Malé's ground water table was unstable for the salt intrusion resulting from the mushrooming of modern toilets in every home in Malé. The Ministry of atolls administration also helped in with the access to water tanks and the management of ferro cement and HDP tanks and the atolls. On hazardous wastes issues, the ministry of agriculture and the ministry of industry were not able to help but make the issue worse by the expansion of the import of chemical without requisite safeguards for household and industrial use, and also the expansion in the use of pesticides and chemical fertilizers into the burgeoning agricultural industry in the islands. The potential damages to the aquifer, the soil and the bio-diversity in our fragile island eco-system is yet to be measured.

In the area of **chemical safety**, really very little has happened towards a reduced import regime. A chemical profiling of the imported goods has been made a couple of years ago with the help of WHO. But actual on the ground attempts at awareness and actions to reduce or bring caution into the use of household use chemicals, and the use of chemicals in agriculture and in food stuffs have not happened to the degree needed and thus constitute areas that need very urgent attention.

Urban issues expand as such centres increase in the country. With every third person in Maldives living in urban like settings, the urban municipal machinery needs very good capacity to keep us with civic needs. In Malé, congestion was the issue back then ten years ago and still continues to be so, perhaps doubling in the past 15 yrs or so.

There was a growth centre policy of the government back then but later was given a back-seat as the reclamation of Hulhu-Malé for relocating the island-populations, or give more housing to the homeless of Malé took the political priority. One can look at this as a reversal of a policy that first attempted to depopulate Malé and its vicinity, but later undertook to concentrate the country's **population** around Malé. Even now, this policy is being continued with HulhuMalé being given the big funds for its development and Malé too being ever more congested with additional housing schemes coming into to the fray of government programs.

Motor vehicles in Malé also have increased by leaps and bounds. By 2012, motorcycles comprised 80 per cent of the motor vehicles on Male's streets; 46500 motorbikes, as compared with 7 per cent cars. The other 10 per cent or so were heavy vehicles like pick-ups and heavier trucks that are used for commercial purposes. The fastest increasing category is the motorcycle with about 4000 new ones coming into the streets every year. We may surmise that all these motorcycles are not used for income generation related purposes and much of it for fun and entertainment. Thus, a big part of our fossil fuel consumption may be said to go for personal entertainment. Given that Male is getting highly urbanized, the high rises and the narrow streets may show a case for concern for outdoor air pollution too from these expanding fleet of urban vehicles. Road fatalities are low perhaps due to the impossibility of high speed driving in Male even though there are some exceptions. But accidents and injuries occur frequently even though many are not reported.

Safe water: Drinking water access in Malé is a good success with the establishment of the MWSC and the MWSA. However, the swell in the use of bottled water has two facets to consider. It's both a testimony to the people awareness of the need for safe water (even though to some degree a false sense of security) and also the captivating media push for the bottled product, as is for other sweet fizzy and energy drinks. The water industry's ingenuity and success to entice the masses to want something that they may not need has been phenomenal. Even MWSC, the company that should be promoting the quality of drinking water at the tap (and it is fit for drinking as per the WHO assessments specify) is engaged in bottling water (thaazaa) perhaps reflective of a conflict of interest (they should be promoting drinking water from the tap rather than implying its inadequacy by producing bottled water for sale). Plastic bottles that store packaged

water is not without its risks. Firstly, market research on bottled water finds that about 40 per cent of that packaged is just tap water – giving people the feeling that if it is packaged it must be better; secondly there is enough evidence to show that there is the leaching from the plastic of harmful chemicals (Bisphenol-A BPA, dioxin, phthalates) in the plastic that can lead to many types of health effects such as learning and behaviour problems, altered immune system dysfunctions, early puberty in girls, diabetes, obesity, decreased sperm count, prostate and breast cancer. On the environmental pollution front, recycling can only deal with just 15-20 per cent of the waste while the rest of the 85 per cent constituting billions of bottles world-wide go to landfills and for the moment out of our sight. As with other solid waste concerns, here too the best way to deal is with the 3R method. (reuse, reduce, recycle). We can also add to this a 4th – REFUSE.

Civic responsibility: The objective relating to promoting **social attitudes in the urban setting** to address the lack of civic wellbeing has been a sad failure. Except some good efforts at promoting avenues for sports (soccer and cricket mainly) as avenues for recreation, the arts and intellectual endeavours have not kept up with this very necessary objective. So has also been the failure of action on drugs which has continuously deteriorated with about 5 per cent of Maldives population using drugs or have tried it at some time in their life; and issues of child abuse and stressful marriage and home conditions also continue to increase. Civic responsibility seems at very low ebb and needs very serious efforts of boosting.

Food safety: Since the cholera epidemic of 1978, in the area of **food safety**, good work had been done to address the quality of serving establishments and the check on imported foods. But as time progressed, the awareness of local foods and their nutritive value has taken a back seat to the enticement of imported foods. Particularly, baby and children's foods have gained popularity incommensurate with value for money. Market enticements may have won here too. A food act is also in the making but needs to be put on a faster mode. Since the 1990s, as affluence of the Maldivian nation began the upward turn, and packaged foods began appearing into the Maldives market, this early enforcement for preventive behaviour became increasingly lax and enforcement of such regulation relaxed. Thus at the present moment, there is increasing need to focus into this area of urban health concerns as Male becomes the centre of increasing business and the exposure to public food serving establishments, groceries and expanding local open markets become the exposure points for scores of locals and visitors become more evident. The import of global food varieties to Maldives also become reason for more robust food quality checks also thus becomes paramount.

On the **occupational health** front, although there has been recently the promulgation of a rights bill protecting rights of workers in the workplace – with respect to hiring / firing, and rights work time, the health of the work

force needs more emphasis in more concrete terms. And there has not been adequate awareness on safety at the workplace. With many small scale industries such as garages, plating and finishing works, carpentry, boatbuilding, fishing, diving, health care, and food and agriculture etc, the varying health needs to these groups may require different skills to serve and different methods of access to be planned for. The larger industries such as tourism, fisheries, transport and construction have some safeguards stipulated, but enforcement seems lukewarm.

Noise as an environmental issue that needs addressing is totally neglected. Much needs to be done to locate schools away from high decibel locations and ways to curb the noise from motor vehicles and electric generators and motors. As Male grows in population and high rises stud the landscape of Male, better zoning and timings for allowing noisy work can help to curb some of the rising concerns of the urban population.

Much gain in the area of **indoor air pollution** since the availability of CNG for cooking in most homes now. This is being available more widely in the islands also. Thus, the days of the wood stoves and the smoke filled kitchens are a thing of the past. However, still with the smoked fish local industry still needing such smoking places, better use of chimneys and learning to spend less time in the smoke maybe educational strategies to undertake. Added concern for indoor air quality in Maldives is the increase of smokers. Close to 50 percent of males smoking, the indoor air quality is something to be concerned about as regards second-hand smoke and its risk to the health of women and children particularly in addition to that of the smokers themselves.

Ambient air pollution is perhaps not an issue that is too high on the agenda because of the wind swept nature of small islands. But traffic congested times in Malé that is becoming the norm in Male, can be a source of concern especially for the young and infants.

Coastal pollution reduction has had its successes with the atolls ministry and the island offices taking effective action on preventing defecation on the beach, and the restrictions on the disposal of wastes into the sea. But solid waste disposal per se on the islands has continued to be a problem that is yet to see island-based solutions. Many beach fronts are dumping grounds for the cans, plastic bottles, modern packaging and wrappings that accrete unabated on the islands' face. However, many more people are aware of the dangers of uncollected garbage and litter as breeding grounds for insect and rodent vectors and the resulting diseases such as diarrheal diseases, dengue, nuisance of rodents and the potential for rodent linked diseases. The lack of a systematic and regularized/enforced approach to solid waste disposal perhaps is clearly visible, but will meet with positive response from the people if serious government effort is undertaken in a way that is technically and socially practical. That is a crafting that environmental health planners

and engineers must undertake in urgency. At present Thilafushi island that is the urban solid wastes dumping ground needs better regulation and better disposal methods (using many global models that are easily usable by Maldives) need to be instituted. Presently, Thilafushi is truly an environmental eye-sore that seem in total contradiction to what we in this fragile eco-environment should be nurturing – that of being the true example of preserving the environment.

1. The new planning process

3.1. Workshop to get stakeholder views

The NEHAP revision was undertaken by the Ministry of Health and Family with the collaborative support of the Ministry of Housing and Environment. The meeting took place at the Conference Hall of STELCO in Malé on 22-23 October, 2014. About 30 participants were present from at least half a dozen sectors (MoHF, CCHDC, MoHE, MoFA, MoED, MoE, MoT, MoHRY, DNP, MoFA, Municipality, MoTC, FDA, NGO's, UNDP, UNICEF, WHO, MDP, DRP, With the blessings of both the ministers (health, and housing and environment), the two day meeting reviewed thoroughly on two documents that were the working papers for this meeting, namely the old NEHAP of 1997 and the new NEAP3 of the Ministry of Environment (2009-2013).

The approach was to seek a compromise on the health and environment concerns of Maldives without any one of these two ministries having to seem to be doing something that is beyond their respective plans of actions. For the Health sector, the NEAP was their technical focal content as all the environmental concerns of Maldives as enunciated in 1997 was also somewhat still relevant. However, many of the actions planned ten years ago had achieved desired objectives, and many still needed prodding.

3.2. Using the NEAP3 as basis

The NEAP3 of 2009 was essentially a blue print of the new Government's objectives for an energy-efficient country in the throes of the climate change debate and thick in the midst of being a healthy advocate for this by its proclamation of Maldives being a carbon-neutral country by the year 2020.

Thus, the attempt was to tweak or tease out the health concerns in the objectives and targets specified in the NEAP3 so that there was no need to do a separate health plan. Since the 6 Strategic Results of the NEAP3 implied or embodied many health concerns, a good listing of these was all that was needed to understand the map of concerns from which to craft solutions. Furthermore, as the health issues were within the domain of the goals and objectives already in the NEAP3, there did not arise a debate as to whether that health concerns were something that was outside of their

planned efforts and thus cumbersome or difficult to accommodate. For example, in the concern of coastal erosion within the Strategic Result 1 termed "Resilient Islands" in NEAP3, the health concerns that arise would be loss of homes, contamination of drinking water supplies or damage to the sewage disposal systems etc that are also not outside the domain of undertaking the issues related to coastal erosion from tidal or storm surges, or extreme weather events. Similarly "Rich Ecosystems" Result 2, embodies the health effects of reef bio-diversity loss, translated into reduction in sources of protein consumption and loss in raw material for traditional medicine, or loss of potential for rich discoveries in the future in the domain of medical research in the pharmaceutical industry.

So this way of looking at health needs within the NEAP3 helps nurture a feeling of togetherness already inherent between the environment and the health sector without trying too hard to be doing someone else work but each seeing that doing the collaborative work amounts to a win-win inter-sectoral relationship.

Of course the next part of the exercise was to look at the NEHAP of 1997 and see what still remained as relevant to be continued, that can be integrated into the above list of activities. Here too, the group work in the meeting attempted to make the health link to the six Results areas of NEAP3. The outcome was encouraging. Without much reticence or debate, these left-overs from NEAP were also fitted into the NEAP3 framework. The result of the group work is presented in the Annex matrix to this document.

4. NEAP3's health relevance

The Third National Environment Action Plan (NEAP3) of Maldives was taken as the base from which the new NEHAP of 2011 would be formulated. This was decided by the program and policy staff of the Ministry of Health and Family, and the Ministry of Housing, Transport and Environment in their preliminary preparatory discussions for setting up this review process for formulating a new revised NEHAP. The reason was very plausible. The environmental protection program of the government was the bigger umbrella under which any national environment related action should fall. Rightly so, the health concerns too, being of environmental origin was very logically placed to come under this umbrella. From the implementation point of view too, this provided a perfect vantage as the infrastructure already existed to implement the NEAP3 and so, introducing the health dimensions within its Results areas would constitute a technical detail rather than a structural change as might a totally detached program would entail. However, it would necessitate a very vigorous technical input from the health sector to work with and be a part of an operational team comprising several other sectoral players to be facilitated by the Ministry of Housing, Transport and Environment.

In this exercise of 2014, the participating agencies felt we keep to the same perspective of looking at the health intersection of the NEHAP and NEAP3 documents.

The strategic results in the NEAP3 are the following, and each will be described in respect to the health dimensions implied by them. This way, without disrupting the structure of the NEAP3, the health aspects can also be juxtaposed along with what still remains to be implemented from the objectives of the past set in the NEAP of 1997. Even these latter will be streamlined into the six results areas of the NEAP3 to make the final product ready for implementation as comprehensive and simplified as possible within one document for the ease of use by the operational teams. The operational teams would however, need to work very coherently to prepare the operational plans that will outline the allocation of operational responsibilities.

Notably, with the exception of two of the NEAP3 results (healthy communities (3), and safe water (4)), the other four results are steeped in the tone of the climate change agenda. This is evidently so due to Maldives vulnerability in this newly emerging climate of change.

Result 1. Resilient Islands

This is the backbone of an island nation such as the Maldives. It is a truism that our islands, in order to survive the vagaries of the uncertain environmental futures such as was shown by the devastation of the 2004 December Tsunami, must create conditions of resilience. Vulnerabilities need to be reduced to the utmost possible extent where the loss of lives because of such vulnerabilities can be totally eliminated – or reduced to a bare minimum.

Goals relating to protecting human settlements, increasing the resilience of coral reef systems to climate change; risks to the tourism sector; protecting human health from climate change related vector borne diseases; building resilience of fisheries and food production to climate change; and disaster preparedness.

Result 2. Rich Ecosystems

Island ecosystems provide critical services for human survival. The food we eat, the air we breathe, the water we consume, the degradation of our wastes, and the aesthetics of nature we enjoy are all services that the ecosystem provides us as a fair share of our gains as both a part and parcel of this system and as the player of the main stewardship function to protect this system. It is as the latter that we have failed badly in the last 200 years or so with our unmindful and devastating action of taking from nature, more than we need to. This unsustainable human action needs a reversal for the richness of ecosystems to survive.

Goal that are health relevant here are those relating to bio-diversity conservation; protecting and restoring coral reefs, protecting and restoring vegetation, terrestrial ecosystems and islands; protecting and restoring wetlands and mangrove ecosystems; and controlling invasive disease causing species.

Result 3. Healthy Communities.

Communities being the agglomerations that humans have lived from time immemorial, the protection of communities have been the backbone of health services for centuries. Villages have grown to towns, towns to cities, and cities to metropolitan agglomerates. As the aggregations grow the potential for the spread of disease become ever greater. The common water, food, and air and homes we all share in such close proximity to each other, subject us to the quick passage of disease organisms from person to person. Urban settings are thus the cradles of epidemics and the location of much poverty also, even as cities are proclaimed to be the engines of economic growth.

The NEAP3 objectives that imply health concerns with this result are total. Solid waste management; hazardous waste management; safe use and disposal of chemicals; clean air are all full of health implications. While the environmental action on these may seem mechanical and restorative, as in disposal of wastes, prudent import, use and disposal of chemical, or ensuring well cared for motor vehicles, all have attendant co-health benefits that may have been opportunity costs had these actions not been taken. Thus the health sector's involvement in operationalizing these activities together within the NEAP3 process would be a cost and energy saved option for the health sector.

Result 4. Safe Water

Water is life! Thus, safe water is the basic element of any health protection program. Contaminated water is a by-product of our living processes. How we can preserve, conserve, and minimize the use of water as well reuse it to the fullest would be the goal of future public health programs too. This topic gets special favour in being a strategic result in the NEAP3 perhaps just because of this importance, and health implications are just inherent. For Maldives, ground water, a very precious yet depletable resource needs special emphasis. The tale of Malé should always wake up from the notion that ground water is limitlessly abundant.

All the goals are relevant here in its health implications. Providing safe drinking water (quality is paramount here); protecting ground water; operationalizing waste water treatment; protecting the seas are all relevant and with ease link any of these to health concerns.

Result 5. Environmental Stewardship.

Protecting our commons is our own responsibility. Thus, environmental stewardship becomes paramount for us who live on such precarious environments. This is about the coordination amongst the partners, and bringing stakeholders together to plan and share responsibilities; and periodically monitor outcomes of their collective responsibilities. High performance need to be maintained, through energized governance, backed by organizational technical capacity to plan and execute, rational and tangible legislations that lay out processes and penalties, and enforcement mechanisms that have teeth.

Health related goals here are about strengthening coordination and cooperation among partners and improving organizational performance; framing and enforcing environmental legislations; strengthening environmental impact assessment; environmental education and public awareness; and environmental research; and environmental information.

Result 6. Carbon Neutral Country

Maldives, being one of the most vulnerable of countries to the effect of global warming and climate change, it has proved to be a clear leader in the voice that calls for action on mitigation action. For this it has to be an example and thus this clear strategic enunciation of being a carbon neutral country. Maldives proclamation to be a carbon neutral country by 2020, behoves it to make this item a seminal action in the NEAP3. The use of renewable energy and cutting down on energy consumption thorough innovative social, educational and economic approaches will be necessary.

The health related goals are on awareness creation on the need for carbon neutrality; establishing an efficient transport network that will focus on reducing carbon footprint. This will in effect reduce human the exposure to emissions as in working in engine rooms, and crowded mooring settings in the inner harbours, etc.

Actions may take the form of using the sail more often, especially during windy days and getting used to the feel of sailing, and learning to accept the little longer duration that takes to reach destinations. Given that the mindsets can be so nurtured and reoriented, the time factor may not be such a hindrance to get used to and enjoy the pleasure of sailing vessels again. On land, the use of low energy bulbs, using vegetables that are grown closer to home, and learning to conserve energy in various innovative ways can help cut down of the national carbon footprint.

For the health sector per se, there are avenues for adaptation such as more resilient health care providing health centres and hospitals through retrofitting, and the use of renewable energy sources for powering the machinery and electrification of these establishment.

As a continuation of the 2010 process, the participants felt that the new NEHAP should maintain the 6 results areas delineated in the NEAP3; they also felt strongly that **Solid Waste Disposal as a dedicated area of concern should be included into these top headings, thus making for seven issue areas to be considered by the new NEHAP revision.** This made sense because this topic SWD has occupied the pole position of woes related to the local physical environment. Given that the attraction of Maldives as a highly sought after tourist destination, behoves the Nation to take special care to protect this island nation's pristine physical environment and the ecosystem that it is a part of, being so blemished by this scourge of solid waste proliferation.

The health issues here cannot be overemphasized. This topic has been explained in the healthy community topic, but the objectives can be placed in this dedicated section as the participants felt it so important for it to be mentioned deserving a specific title in the plan. Good segregation is needed with separation and volume reduction objective included. The three R approach can be used here. A good dose of community awareness will be required to enforce a house-hold level segregation method before taken away by the municipal authorities. A good legal framework will be needed to effectively enforce this activity. Bio-hazard management needs to be incorporated and Thilafushi needs a major overhaul of its waste management strategy.

Guiding principles for NEHAP 2015-2020

A program plan leaning on a set of principles makes for greater rationality and acceptability and from the strength of these arise the possibility of carrying the actions forward. Thus the need for and the basis of implementing a national plan of action must be guided by such rationalities. We note the following -- a subset of those mentioned in the NEAP3:

1. **Environmental protection is the responsibility of every individual:** Health is everybody's business. And since health is the product of the healthy environment we live in, this principle of everyone's responsibility becomes paramount.
2. **Promote and practice sustainable development:** Since Rio 1992, the world has taken steps to follow this paradigm, and so it is appropriate that we take this path too seriously.
3. **Subsidiarity:** this is the principle that says that things are best done at the level that makes sense best to the recipients of the service. Given that environmental concerns are felt most visibly at the local levels in atolls and islands, this responsibility of implementation is best given to them with facilitation support from the central government.

4. **Inter-sectoral cooperation and coordination;** Health and environmental concerns just as all development work is a confluence of the effort of many sectors. Even though for planning purposes and programmatic efficiency, the bureaucratic model has taken place, at the stage of implementation, only an inter-sectoral approach can make progress and success possible.
5. **Informed decision making:** research needs to be invoked and the information from it turned into program intelligence that will make decisions relevant and acceptable to the recipient population.
6. **Precautionary principle;** in the case of environment there is enough evidence that action needs to be taken. Even though there might still be uncertainty several aspects of its outcome, we must err on the needs to the environment, for without its health, the dangers of the disaster we face will be irrevocable.
7. **Environmental protection complements development;** the environment gives us the resources for development, thus it becomes the necessary complement.

Structure of the Plan – an intersection of the NEAP3 and the National Health Master Plan (NHMP)

This is a subset of the two programs. The Venn diagram shows this intersection where health and environment concern become the responsibility of both ministries and several other ministries too; it becomes everybody's business.

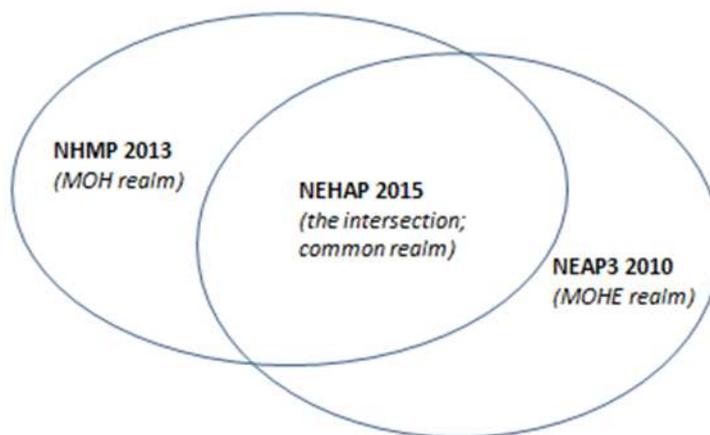
In 2010, the exercise was to include into the NEAP3 the environmental health dimensions of the National Health Master Plan, related to NEAP3 objectives. The common ground or intersection area was accepted by both Ministries to be the areas where cooperative work can be meaningful to both parties, without the feeling that one party is doing the work of the other. This arrangement was considered by the participants of the 2010 meeting to be rational common ground that was a win-win or the points of synergy for both.

This 2014 exercise is to review once more the relevance of the actions suggested in 2010, given that four years have passed and government structures, regime, and stakeholders have had turnovers that require a sound updating. This attempt will update this plan to be seen as current and acceptable to both technical and policy makers at this point in time.

Implementing this joint program will be a model for the nation and a blueprint for others sectors also to embark on problem reduction in a more rational and holistic way that is issue-based, rather than resource-based.

With this basic structure of the plan, the attempt was to enunciate problem reduction objectives with the attendant aspect of knowing the indicators of achievement as operationalized output constructs and work time-frames and potential team members to both work on operational planning and be responsible for program implementation and follow up.

“NEAP3”-“NHMP” Common agenda of environmental concerns



Areas of concerns in this Plan

The areas of concerns in this plan follow the same areas mentioned in the NEAP3. The new review done still keeps the following as focus areas:

1. Resilient islands,
2. Rich ecosystems,
3. Safe water,
4. Healthy Communities,
5. Environmental stewardship,
6. Low emission strategies, and a seventh,
7. Solid waste disposal

Fortunately, this has allowed the incorporation of most of the environmental health concerns into the common text and program process. The healthy communities and safe water and solid waste disposal seem to cover much of the present priorities for the program in the present social context.

The communicable disease focus of the past has given way addressing the emerging concerns of non-communicable disease such as cancers, CVD, hyper-tension, obesity, stress related disorders, diabetes, etc. all which have a chain of environmental determinants and most of which lie in the domain of other developmental sectors than health. But health has the prime task of advocacy and creating the rallying force or critical mass of partners to help in this effort. Nevertheless this effort of creating healthy communities would be a responsibility of all development sectors together with the community's participation.

Financing for implementation

Government financing still remains the prime method of resource mobilization for the program. But through invoking the multi-sectoral approach, there would be shared resources even though there may not have to be a dedicated budget for the health activities of this per se. By having joint planning and the resources that the individual sectors spend for their work responsibilities will be counted as money spent on health too. For example, while safe waste is promoted by the city council, it is a proxy for health work done. And while this may not be from the budget of the health sector, it will be resources spent on health if such a composite accounting system can be devised for monitoring and evaluation purposes. Other fund raising approaches should also be used for cases of direct health sector intervention such as for health promotion campaigns and publication and internet based promotion etc.

The tourist market also can be used to generate funds in ways that health concerns can be the prime receiver of these benefits if such policy initiatives can be taken by the Ministry of Health and partner ministries to lobby for such approaches.

Tax money channelling can also be done by way of getting a percentage of tax receipt for such items as cigarettes and certain food import levies go to addressing the issues of cancer, obesity, and diabetes prevention.

The matrix in the Annex provides the health content for implementation in relation to the Results areas of the NEAP3.

2015 Plan Objectives

The objectives listed below are those structured by the partners of the workshop of October 2014. They did so by going through a mental assessment, in group review sessions, of the many factors or causes that underlie the given issue (those salient ones laid out in the problem identification section of this paper), and then selecting the most relevant factors that need addressing and formulating these as problem reduction objectives (PRO). Some PROs are more specific than others and thus the same level of action may not carry through in all the 7 issue areas of this plan. Thus at the operational planning phase these need to be reviewed and structured better if seen as deficient by the senior policy makers who would clear this draft plan for the go-ahead.

SAFE WATER

1. To provide access to safe water supply (in compliance with WHO water quality guidelines) to all through networks at households level , schools and health facilities (according to access definition in Maldives) to priority islands by 2017. In 2014 it was 39 per cent HH with network; by 2017 to have 69 per cent). Safe water is mentioned in several of the other items below as it relates to the specific results areas in this plan.
2. To provide access to adequate sanitation to all. Adequate means sewer network with HH connections (52 per cent in 2014; to 77 per cent by 2017
3. To utilize sustainable and affordable technology (with integrated models)

ENVIRONMENTAL STEWARDSHIP

- 1, Incorporate health assessment component into EIA
2. To make informed decisions on environmental health issues
3. To conduct awareness programs on WASH (incorporation of WASH module into education curriculum (pre and post-test need to be done)
4. To strengthen the legal framework for water and sanitation

HEALTHY COMMUNITIES

1. To reduce by 2020, air pollution levels across the country by 20 per cent of 2014 level (.....); specifically:
 - to reduce respiratory infections by 50 per cent by 2020 (2014 level is.....);
 - To dispose 50 per cent of the community waste through the implementation of the 3Rs approach to minimizing waste that goes to landfills. by 2020 (2014 level is
2. To have established an efficient and reliable public transportation system in Male by 2016 (what about the present bus system in Male or should it be some other model of service?) also, need to review needs beyond Male? The

- roadworthiness regulations, have air monitoring stations in all regional airports and Male and Gulhi-falhu and Thilafushi etc?)
3. To establish a legal framework for monitoring and enforcement of this whole problem reduction objective by 2020
 4. To reduce life-style diseases (NCDs) by 20 per cent by 2020: obesity, cancers, CVD, diabetes, depression, stress, injuries etc.)
 5. To reduce malnutrition in under 5 year olds by 80 per cent of 2014 level; reduce stunting and wasting by 80 per cent
 6. To create awareness on healthy eating and exercise to reach 90 per cent of the population by 2020
 7. To integrate a "health and well-being" program in 50 per cent of the schools by 2018,
 8. To significantly reduce health effects resulting from exposure to chemicals by 2020, (by establishing regulatory measures for import and use of pesticides, fertilizers and that for industrial and household use; by having standards established for food additives; by having a legal framework for industrial management of chemicals and household use;
 9. To conduct a strong awareness program that will reach 90 per cent of the population by 2017;

(What about smoking reduction? This NEHAP operational planning teams may like to consider the targets and process for addressing the high incidence of smoking in Maldives)

10. To reduce congestion in crowded Male: by – establishing 3 hubs in the country with socio-economic services laid-out by 2020-25? (by relocating Male population to Gulhi-falhu and HulhuMale; --relocating people from islands with less than 100 people to other islands; --to establish a more efficient public transport system for Male and the cities in the country
11. To reduce anxiety and stress in Male significantly by 2018; by reducing the motorcycle population of Male by at least 30 per cent; making stress free walk-able side-walks (8-foot wide) along all streets in Male by 2017; enforce strict traffic violation measures for reckless drivers; providing well illuminated street lighting in Male streets; doubling the public garden space in the city (city lungs) by 2017; requiring for covered up construction sites in Male.

in the atolls.

RESILIENT ISLANDS

1. To establish integrated water management systems at the household levels (HHs to have integrated water management systems --IWMS – ie RO connections, rain-water harvesting) raised from the present 39 per cent coverage to 50 coverage (about 25 per cent increase) by 2020
2. To ensure safe housing for all the citizens of Maldives by 2020; by decreasing vulnerability of home through better design and building

requirements – building code; resilient hospitals and health facilities to respond in times of emergencies (standards and methods are available from WHO norms online), etc

RICH ECOSYSTEMS

1. To significantly reduce negative impacts on coral reefs through human action by 2020 through;
2. Ensuring sustainable island and community social ecosystems that provide for essential services including water systems management, sustainable livelihoods, and environmentally friendly well-being (recreational and leisure facilities) that don't degrade the island ecosystem. (so that the water system in the ground and the coral environment surrounding the islands is preserved)
3. To have by 2020, identified pathways of IAS and priority species are controlled, prevented, or eradicated.

SOLID WASTE DISPOSAL

1. To establish effective and sustainable solid waste management mechanisms in Addu, fuvahmulah, GDh, GALif by 2020
2. To have solid wastes segregated at 80 per cent of HHs in three locations by 2020;
3. To reduce waste generation in these three locations by 20 per cent
5. To establish a legal framework for solid waste management in the country by 2020
6. To create awareness among people on the need for waste management,
7. To establish strict monitoring and enforcing penalties for littering pedestrians who throw trash on the streets and into the water front inner harbour of Male and the islands,
8. To establish a safe mechanism for health care waste segregation and disposal in Regional waste management centres in the country and in Thilafushi.

LOW-EMISSION STRATEGIES (for carbon foot-print reduction)

1. To reduce nationwide carbon emission by 20 per cent of the 2014 level, by 2020 (from the 2014 level of)
Promote bicycling and walking in ... Islands by 2020
2. To establish quarterly extreme weather events monitoring in the country by doing energy audits and related research done to quantify (floods, rainfall excesses, land erosion, high waves etc.)
3. To reduce imports of motor-cycles by 50 per cent of 2014 level by 2020 (by increasing and/or making efficient public transport system in Male and HulhuMale on the Villingili model or its variations)

4. To make 99 per cent of Maldives population (ie population of every island) aware of environmental friendly low emission activities by 2020 (have a pre and post-test assessment process planned for this)
5. To reduce by 90 per cent of the 2014 level, the amount of hospital visits by those with ARI related complaints by 2020 (why not clinic visits too??)
This will be done through a well-established monitoring system.

The implementation phase

This is by definition the beginning of the action to make things happen. Once the plan is on paper, and the endorsement by the policy makers have been received, the plan is ready for implementation.

Implementation thus begins with the detailed planning or operational planning, because this is the stage at which the mind moves from the reflective to the practical. What kinds of rationalities of the outcome we should reframe the output indicators in, what kinds of resources are immediately available, or where are the contexts where implementation is most promising, where are the people complement the teams and what kinds of people do we need to have in them, their attitudes, their skills and abilities and what kind of remunerations will be most cost beneficial given the resources available, what kind of work procedures will we structure, and what time frames should we set for implementation deadlines; what is going to be the monitoring mechanism (collective brainstorming reviews, survey, and interviews with clients and peers etc, or just by management visiting and looking around)?

Institutional arrangements for implementation

Decisions on environmental action for whatever purpose involve strong interactions with a number of other sectors. In addition to industry, public works and agriculture, even actions in fields of conservation of biological diversity and preservation of aesthetic beauty have sometimes adverse health consequences that will require trade-offs between competing demands. For example, the conservation of freshwater lakes, in certain islands, conflict with the control of dengue, chickungunya, scrub typhus and other vector borne diseases. Such interactions cannot be improvised. Hence, a strong consultative and organizational process, formal and flexible, must be established at government level to sustain systematically a continued dialogue among the concerned.

These projects and policies for sustainable development should be subjected to systematic appraisal. Where there are inter-sectoral conflicts strategic

environmental assessment at the appropriate level needs to be conducted. A mechanism for strategic environmental assessment needs to be instituted at the highest policy formulation level. Furthermore, all related Ministries and Departments need to be strengthened in order to efficiently implement these programmes.

The lead role of Ministry of Housing and Environment:

The Ministry of Housing and Environment would take the lead role as program with several other sectors being partners in implementation. There would need to be a strong initial effort of preparing the operational plans for the NEAP what would also include strategizing for the relevant health action and budgeting for such action. This way, the team members can assume their roles and the plan will provide a road-map for program assessment and resource management and mobilization. The team members are given (tentatively) in the annexed matrix of activities that was developed at the NEHAP inter-sectoral workshop that was held at the STELCO premises in Malé, in October 2014.

Operational Planning: The Agency Teams designated in this Plan of Action will have to undertake detailed planning as specified in this document for each issue and develop sectoral work plans and ensure that they are implemented by the respective Implementing Agencies. The detailed planning will define targets prescribed in this document under each issue with respect to what is to be achieved, giving the timeframe, specific intended output, and the target group to which the intervention would be focused. At the same time, the indicators (measurable parameters) for evaluation of these targets or intended outcomes would also be identified and adopted

Monitoring and reporting: In order to ensure the timely implementation of this Plan of Action a strong and well-coordinated institutional setup would be necessary. A national oversight committee with wide inter-sectoral complement and working groups, and review mechanism with mandates (clear terms of reference) and time frames will need to be established for systematic program implementation and performance to happen. Technical committees with concrete TORs will also have to be designed for unequivocal program implementation and management.

The Ministry of Housing and Environment will be responsible for all aspects of environmental policy and enforcement of Environmental Protection and Preservation Act, 1993. The Ministry of Health and the departments under it will be responsible for developing health policy and enforcement of public health and other health related regulations.

Relevant government ministries and departments that figure in this PoA will setup their environmental health units or contact/focal points for the purpose of

liaison and coordination. It is expected that the sectoral focal points will ensure the timely implementation of respective activities in sectoral work plans.

To have the above systematically considered requires that there is:

1. **A high level coordinating team or High Level Board at the level of the President's office** - for in the Maldives context, this is the level at which inter-sectoral policies can be guided and line ministries will listen without fuss. While the lead may be the President himself, or alternatively ministers of the various ministries taking turns to be the leader would help everyone take ownership of this collaborative process.
2. Next it would requires **planning out the operational activities for each area of focus (the seven issue areas)**, and the lead Ministry spearheading the operational planning process (inter-alia outlining the sub-activities needed to get to the product described as the final result to happen; outlining the procedures by which each activity will be carried out; defining the types of manpower needed for each job; what resources are needed to execute each activity, assigning responsibilities to relevant ministries; and the monitoring mechanism that would be employed to assess progress, and the team reporting arrangements)
3. To **prepare a schedule of work** that includes periodic review of the program progress at which time, responsible agencies will have to report.
4. **A clear commitment (an MOU among the ministries concerned)** to the implementation of this work as specific sectoral responsibilities with the understanding that this is clearly the work of a team that will help the participating parties both individually to achieve sectoral program goals, and collectively to achieve national goals.
5. **An annual public reporting event** that is open to the public and the media that will describe the achievement made in program implementation.

Constraints to project implementation

Every program or project faces risks in implementation. Some call these constraints often both external to the program and internal to the program. For this program too in the national context, there are seeming constraints that need adjusting to or working around these, for without doing so, the possibilities of failure accumulate. The following several constraints to program implementation were noted during the course of the stakeholder meeting of October 2014: The following is a listing of these with no priorities attached to this listing:

Political encumbrances:

Every activity in our lives is laced with political sensibilities, and is work of any public program fraught with such caveats of inconveniences or barriers of varying degrees. In Maldives this is evidenced by the centralized mechanisms prevalent in the past where the senior policy official made all decisions related to financing and staffing even at the phase of implementation. There was little delegation of authority so that work could move efficiently. Even in the post 2008 era of multi-party democracy, the added burden of clearing the hurdle of the party barrier adds to the earlier bottlenecks.

Lack of LGA support – presently there is a negative attitude.

This needs to change to positive and proactive behaviour towards the work of the city and island councils so that the cooperation can happen in island governance in the true spirit of decentralization. Thus LGA's involvement is needed from the very beginning of the program or project. This negligence is further demonstrated by the fact that, in the preparation of this important national program, the neither LGA nor the Council participated.

Role confusion:

The predominant approach to program implementation is sectoral. It is only now with the idea of sustainable development catching, that inter-sectoral cooperation and collaboration is being attempted. Thus sectoral mandates have been formulated without the mind for cooperating with another such that when we do have to, the roles are not clear and often overlapping. In this context of confusion, team work is not quite possible for in such situations, role clarity is a necessity. With mind-sets still crystalized in the past model of top-down and uni-sectoral programming, there are several difficulties to overcome before cooperative programming can happen. This NEHAP exercise is a good opportunity for understanding the skills and value of partnering across sectors. But the true proof of this will be in the resilience or not of the program implementation process.

Funding constraints –

Reticence to sharing of resources: This issue too is mired in the past planning process based on sectors, and money being allocated to sectors as earmarked amounts to fit activities into. From this very beginning, cooperation with other sectors seems a distant possibility for the earmarked amount would be protected for that dedicated sector. Furthermore, with little experience of cooperation across sectors, this approach may even be felt intimidating and so the reticence to give turf to anyone else. Without an awareness of the advantages of synergy that cooperative planning brings, sectors will continue to harbour mind-sets that lean towards sector protectionism.

Lack of technical knowledge - both scientific and managerial:

Many sectors don't have a culture of in-service training. And so in the development culture in the world that is defined by unprecedented change in technical, communication, managerial and leadership areas, those who don't keep abreast of this are deemed to be stagnant. This can make program progress inefficient, and ineffective.

High turnover of staff in Ministries – administrative, technical and especially as it relates to political posts:

As the private sector expands, the competitiveness with public programs becomes more apparent. There will be the flow of technically and managerially competent people to the private sector, leaving the public sector always wanting for more stability in which effective programming can take place. High turnover burdens the public sector with having to retrain and reorient new staff all the time and be all the time in the threat of losing trained or experienced staff.

Frequent policy changes -- too quick to assimilate and processes to be established and staff oriented;

Frequent regime changes in the past 6 years or so has left the public sector in Maldives in disarray. With each regime bringing with it their party manifestoes to bear on the formal work of the sector, any technical mismatch is often taken to be advantageous to the Manifesto. The health sector has seen this turmoil and confusion create irrevocable damages to the smooth working of the sector. While structural change may have been thought of in good spirit, the prematurity and speed of roll-out may have been the issue here. Thus a program that is going on smoothly will inevitably come to a halt, as much of it did, in the midst of these programmatic impediments.

Lack of follow-up:

The culture of preparing the plan and then putting this on the shelf may be one that needs to be abandoned. This can happen when follow-up mechanisms are set up along with the planning process. This in turn requires that the managerial system is flattened considerably for program managers to be given more responsibility and accountability.

Leadership deficiencies:

The top-down leadership process generally practiced in government offices, which is more akin to micro-managing, needs to be abandoned. Leadership needs to take on the role of inspiration and scenario-building and energizing the workforce leaving day-to-day management to the line managers who in turn need to brush up regularly on the necessary skills of management. Mid-level managers are not versed in the PR approaches to coax and convince staff, and systematic follow-up mechanisms that make management more effective.

Lack of inter-sectoral cooperation and coordination:

In the present context of sectoral planning and program implementation, there is little scope for inter-sectoral cooperation and coordination. Programs have to be formulated in the model of inter-sectoral entities for that cooperation to happen. The NEHAP is a good opportunity to revive this approach so that it can be a model for other development sectors to come together.

Lack of ownership – and so sustainability:

When one is not involved in an activity from the beginning, there is little possibility that one will see it as one's own. So getting all stakeholders to be engaged from the beginning makes for sustainability.

Inefficient implementation due to lack of relevance of problem reduction strategies:

In most plans the focus of outputs are on staffing, funding and supplies and equipment. Perhaps due to difficulties of measuring the outcome, those outcomes of a soft nature such as knowledge gained, or awareness created are not given much attention. Sometime this in turn results in selecting problem reduction objective that are not relevant or appropriate. This thinking process to be very systematic is often time consuming, and so adequate attention may not be given to doing this thinking through.

Sectoral priorities changing too quickly – political manifestoes take precedence to real needs of the community (technical vs. popular – as in Preventive vs. curative; social vs. economic; local skills vs. imported skills etc.)

Not enough policy level engagement in program planning – just left to technical people whose thinking will be different to the policy and political:

Thus, real changes are not possible because these would be moves away from the status quo and so often not acceptable unless the policy maker is involved in the inception process and in which unfortunately they are often not.

National development seen as game between competing political administrations:

Technical programs are sandwiched between the needs of the politics of the prevailing administration and the needs of the people. While there is talk of the manifestos being the expressed needs of the public, there is no public accountability or consumer protection mechanisms to tweak out the real needs to the people. The political polarization veers the ordinary public to the side of the prevailing governance and all effort is to implement the respective party manifesto. In this process, the incumbent's efforts to discredit the outgoing

administration takes up the critical space of the intervening period before elections would stall all efforts of sector program implementation for all efforts of the incumbent government and the public would all be fully engaged in the electoral process.

Fire-fighting approach rather than systematic planning for problem solving:

This too is a symptom of lack of systematic and serious program planning where program leadership is only weakly accountable, and often this leads to doing predominantly the urgent things of the day rather than systematic work according to scheduled program work.

Lack of inter-ministerial coordination:

This is the result of the prevailing sectoral planning and financing approach in government. A very drastic change needs to happen in financing and plan acceptance criteria here to make inter-sectoral coordination in programming and implementing mandatory.

It is felt that the above constraints are in themselves multi-causal issues that make the context of implementation difficult and action on addressing these needs to be taken on a dedicated government-wide basis – not only just on implementing this program but for all government programs implementation. This will create a more enabling environment for all public programs to function more efficiently and effectively.

But there are opportunities also. Such opportunities are listed:

The right people out there:

In the past decade or so, people in Maldives seem too politically polarized to the extent that their passion for national service is subordinated to their vested or party passions. Yet, even in this milieu, we can still find dedicated persons without these vested interests or party passion. This is encouraging; we need to seek them out and have them involved. At present they are observers at the margin waiting to be shown a way to be involved. But they need motivation too.

Big opportunity for research;

So, there is need to energize the takers with skills and opportunities. Charting the future with the help of quantifiable evidence will be more technically valid and socially acceptable than mere hunches or anecdotes being the bases of planning and programming.

Access to modern technology:

Information technology (IT) and scientific material that are open sourced and available on the internet need to be used for to learn and knowledge updating for program efficiency and effectiveness.

Seek out the silent hopefuls:

Need lobbies; political common ground from within the ministries/government offices need to be sought out, so that islands of innovations can happen within sectors and for these to be rewarded. Leaders must make the effort to reward islands of innovation and creativity within our public and private institutions. For this leaders must be broadminded and not bound by personal insecurities that don't allow others to flower. This requires courage both ways. – by leaders and their team members.

Democratic environment:

Looked at in a positive way, the democratic environment we have in Maldives is one in which voices can be raised, and the diversity of opinions shared. Need to promote demands from the public to ensure pledges by the government are kept – not just for party gains but for national gain. Need to balance our talk by voicing more about responsibilities rather than just only about rights; both are mandates of the democratic process.

Budding environment of NGOs:

NGO strength to be harnessed: Actually NGOs are the most proximate to the public. They know the public's needs more than those in public sector offices, or even political organizations because they are often motivated less by public service passion than by the appeal of personal gain.

Emerging health and environment issues:

Trans-boundary issues in management.

The health and environment managers to speak directly to each other in ways they can relate; resilient commitments are possible when both can speak of common objectives

Government programs are increasingly irresponsible.

There is little policy oversight down the line, and political party divisions even in the workplace make for favouritism, intimidation, and insecurity. In such situations, team work is hard to implement. A divide is also seen in public vs. private interests in program implementation and related responsibilities.

Child anxiety increasing:

Due to pressure of a throng of school related activities that leave them little time for play and sharing time with the family

Elderly issues:

Are increasing as the LEB increases to 75 years and related infirmities accumulate and care-giver opportunities for the emerging smaller families become ever more difficult. The relocation of families to Male into constrained living spaces leave little room for grandparents to be accommodated and are left in the islands or even in Male, for the want of better care. So the elderly, while plans must be made for the future care of this expanding population group the efforts of making their lives more healthful remains a priority; its not about life expectancy alone, but of health expectancy; their ability to live a healthy life well into their old age.

Emerging issue of garbage and waste disposal

The participants felt that even as we discussed the main headings of our plan of action (NEHAP), there was clear priority that needed to be given to this topic as this has become the most pressing issue of our time. As the population of our country grows, and perhaps 90 per cent of our daily needs are now supported by imports, the trash and garbage generated increases by the year, and devoid of an effective waste disposal method, we will be doing a great injustice to the idea of protecting our environment. At present the land fill and open burning on Thilafushi island is an environmental monstrosity and national shame. In a country that boasts of tourism and the pristine environment, this site is a total anomaly to this view and advocacy, where stinking garbage of every mix is subject to open burning and the plume that emanates from this man-made island of garbage seems an eternal hovering that the wind carries inexorably to Male City, contaminating it continuously with poisonous dioxin and its other myriad toxic content.

Next immediate steps before implementation can begin

- Get this NEHAP draft out for review by stakeholders (*task to be done by MOH*)
- Present this NEHAP to the policy makers of both Ministries for their endorsement (*task to be done as joint effort by MOH and MOEE*)

- Prepare the operational plan of action by the specified stakeholder teams. Some of the objectives maybe more cogently defined and indicators and even time frames maybe changed by the project team as it deems fit but let's not change the objectives overall except if the policy makers have made such a requirement only. The major part of the operational planning will be to chart out the procedure and figure out ways to carry out the activities in a cost effective way *(by the multi-sectoral team; that the policy makers should decide on once they give clearance for this plan to go ahead)*
- Prepare and chart the means of implementation as an inter-ministerial and inter-sectoral initiative that can be a model for other areas of work of national sustainable development. This will include meting out responsibilities, leadership and accountability structures, staff training and orientation, devising operating procedures (SOPs), monitoring and evaluation and reporting time frame and criteria and resource use protocols *(the operational planning team)*

Problem Reduction Objectives Matrix, by issue areas

Problem-reduction objectives (SMART)	Indicator of achievement	Time frame	Resources	Team leader
SAFE WATER 1. To provide access to safe water supply to all through networks at households level (access is defined differently in Maldives) to priority islands by 2017. In 2014 it was 39 per cent HH with network; by 2017 to have 69 per cent)	--percentage of access to safe water supply through networks at HH connections --number of islands affected by water shortage during dry periods (this will mean larger islands close by to have supply excess to provide the small islands nearby) --percentage of population with access to safe water with WHO/EPA standards	2020 2020		MEE/EPA/HPA
2. To provide access to	--percentage of	2020		MEE/EPA/HPA

adequate sanitation to all. Adequate means sewer network with HH connections (52 per cent in 2014; to 77 per cent by 2017)	access to adequate sanitation through network of HH connections			
3. To utilize sustainable and affordable technology (with integrated models)	--number of islands with IWRM model --number of island with integrated utility model --number of islands with renewable energy technology (for greater efficiency by region same provider support is to be sought – STELCO, FENAKA, MWSC)	2020		MEE/EPA/HPA
ENVIRONMENTAL STEWARDSHIP 1, Incorporate health assessment component into EIA	--number of EIAs with health components assessed --policy change from requiring EIA to requiring EHIA	2016		EPA/HPA
2. To make informed decisions on environmental health issues	--number of research conducted --number of institutional mechanisms established for environmental health research	2020		EPA/HPA
3. To conduct awareness programs on WASH -- incorporation of WASH module into education curriculum (pre and post-test need to be done)	-No of schools that conducted WASH program -percentage of students attended WASH program -number of IEC material developed on WASH for expat	2017 2017		HPA/MOE Supporting NGOs MRC/UNICEF

<p>cent of 2014 level; reduce stunting and wasting by 80 per cent</p> <p>--To created awareness on healthy eating and exercise to reach 90 per cent of the population by 2020</p> <p>--To integrate a “health and well-being” program in 50 per cent of the schools by 2018</p> <p>(what about smoking, exposure to chemicals, lack of exercise, injury, stress, eating habits by adults??)</p>	<p>survey of this in population</p> <p>Schools having such programs</p> <p>Import volume of cigarettes, actual smoker survey stats; evidence of increasing gyms in Male, people walking or riding bicycling; motor cycle imports, injury statistics from various; obesity survey findings, numbers of eating out places, restaurants, ice cream serving establishments, food items sales from groceries, pizza, burger, fizzy and energy drink sales, cigarette sales, schools selling chocolates and fizzy drinks in their tuck shops, parents provide lunch packet contents, breakfast habits of school going children, or diet habits at home, spending on eating out rather than at home; proportion of pedestrians smoking at any given time span of the day.</p>			<p>Economic Development</p>
<p>--To significantly reduce health effects resulting from</p>	<p>--Regulatory measures use of</p>	<p>2020</p>		<p>MEE MoH MOE</p>

<p>exposure to chemicals by 2020, by establishing regulatory measures for import and use of pesticides, fertilizers and that for industrial and household use;</p> <p>--having standards established for food additives</p> <p>--having a legal framework for industrial management of chemicals and household use</p> <p>--having a strong awareness program that will reach 90 per cent of the population by 2017</p>	<p>fertilizers and pesticides in agriculture and at household level rolled out and in actual operation ;</p> <p>--Food additive standards established as a regulatory requirement</p> <p>--Legal framework for use of chemicals in industry in actual operation</p> <p>--business owners aware of the dangers of chemicals in society</p> <p>--Most lay people are aware of the dangers of chemicals in society</p>	<p>2020</p> <p>2017</p>		<p>Media AGO Civil Society MED</p> <p>MoFT MOFA Housing City councils and island councils Private sector NGOs</p>
<p>--To reduce congestion in crowded Male: --To establish 3 hubs in the country with socio economic services laid-out by 2020-25? (by relocating Male population to Gulhi falhu and HulhuMale; --relocating people from islands with less than 100 people to other islands --to establish a more efficient public transport system for Male and the cities in the country</p>	<p>--Hubs established --Population relocation happening --Efficient transport in operation</p>	<p>2020</p>		<p>MoEE MOH HulhuMale corporation Thilafushi corporation Transport Local councils Media Civil Society MOD</p>
<p>--to reduce anxiety and stress in Male significantly by 2018; by reducing the motorcycle population of</p>	<p>--Motor cycle volume decreasing --Improved side-</p>			

Male by at least 30 per cent; making stress free walk-able side-walks (8-foot wide) along all streets in Male by 2017; enforce strict traffic violation measures for reckless drivers; providing well illuminated street lighting in Male streets; doubling the public garden space in the city (city lungs) by 2017; requiring for covered up construction sites in Male.	walks available in all streets of Male --enforcement for reckless driving happening at a matter of regular operation --green space in city increasing --construction sites complying with regulations			
--To provide safe water for all by 2020 by ; increasing rain water catchments in the communities so as to have 90 per cent of population with safe water (rain water harvesting or RO plants or HH level connections) (2014 coverage is 39 per cent – defined as HHs provided with HH connections)	--Safe water available to the public --WHO standards achieved and followed --RO plants, HH connections, water harvesting systems seen to be in operation			
RESILIENT ISLANDS --To establish integrated water management systems at HHs (IWMS – ie RO connections, rain-water harvesting) from the present 39 per cent coverage to 50 coverage (about 25 per cent increase) by 2020	--IWMS operating in the islands	2020	Donor agencies/ PSIP Service providers and public payments CSR of businesses	MEE/MWSA EPA MoH MoHousing LGA NDMC
--To ensure safe housing for all the citizens of Maldives by 2020; by decreasing vulnerability of home through better design and building requirements – building code;	--building codes being followed by builders --damages to buildings occurring during extreme weather events (storms, flooding, wave action, etc)	2020	Research and development program funding	
RICH ECOSYSTEMS -To significantly reduce negative impacts on coral	--ocean health index --management plans for coral reef	2020	Donor agencies Research Civil society	MEE LGA MOFA MRC

reefs through human action by 2020 through; Ensuring sustainable island and community social ecosystems that provide for essential services including water systems management, sustainable livelihoods, and environmentally friendly well-being (recreational and leisure facilities) that don't degrade the island ecosystem. (so that the water system in the ground and the coral environment surrounding the islands is preserved)	based fishery (CRMF) being implemented --number of families dependant on coral reef based livelihoods --practice of sustainable livelihoods --practice of environment-friendly leisure and well-being activities --water systems that don't deplete the ground water aquifer or degrade the coral environment --solid waste disposal practices that degrade the coral environment		CRS PPP	MoT MNU MOI
--To have by 2020, identified pathways of IAS and priority species are controlled, prevented, or eradicated.	--Numbers of species identified --species prevented, controlled or eradicated	2020		
SOLID WASTE DISPOSAL --To establish effective and sustainable solid waste management mechanisms in Addu, fuvahmulah, GDh, GALif by 2020 --to have solid wastes segregated at 80 per cent of HHs in three locations by 2020 --To reduce waste generation in these three locations by 20 per cent --to establish HH level waste segregation method to separate bio-degradable,	--solid waste management centres in operation in three major locations (FM, Addu, GALif and GDh) --actual segregation happening at HH level --reduction of waste actually happening	2020		LGA/atoll councils AG office, parliament MED MOH/MOFT Private sector Judiciary MOE/Media Civil society City and island councils

<p>glass/metal, and plastics -- to establish a legal framework for solid waste management in the country by 2020 -- to create awareness among people on the need for waste management --to establish strict monitoring and enforcing penalties for littering pedestrians who throw trash on the streets and into the water front inner harbour of Male and the islands</p>	<p>--legal framework for SWD rolled out -- health promotion and awareness provided to 90 per cent of the population of the country --cleaner streets, and responsible pedestrians who follow public regulations</p>			
<p>--To establish a safe mechanism for bio-hazard waste segregation and disposal in Regional waste management centres in the country and in Thilafushi</p>	<p>--segregation actually happening for bio-hazards wastes for 80 per cent of the waste --People are aware of the dangers of bio-hazards --safe disposal happening in 90 per cent of the centres --water table readings show safe readings in the islands</p>	<p>2020 2018</p>		<p>MEE Thilafushi/ Male City Council MOE/MED Private sector Island councils LGA/Media Civil society</p>
<p>CARBON FOOT-PRINT REDUCTION (Low emission strategies) --To reduce nationwide carbon emission by 20 per cent of the 2014 level, by 2020 (in what ways?) --To establish quarterly extreme weather events monitoring in the country by doing energy audits and related research done to quantify (floods, rainfall excesses, land erosion, high waves etc.) --To reduce imports of motor-cycles by 50 per cent of 2014 level by 2020 (by</p>	<p>--frequency of extreme weather events happening in the country --frequency of motor-cycle imports into the country</p>	<p>2017 2020</p>		<p>MOEE/HPA MED MOH Supporting stakeholders: LGA Local and atoll councils AG office Parliament MOEE Private sector MOE MoFT Civil society</p>

increasing and/or making efficient public transport system in Male and HulhuMale on the Villingili model or its variations)				MoH Community
--To make 99 per cent of Maldives population (ie population of every island) aware of environmental friendly low emission activities by 2020 (have a pre and post-test assessment process planned for this)	--awareness of the population on low emission activities	2017		
--To reduce by 90 per cent of the 2014 level, the amount of hospital visits by those with ARI related complaints by 2020 (why not clinic visits too??) This will be done through a well-established monitoring system	--hospital OPD visits (all hospitals in the country)	2020		

Annex. NEAP3 and NEHAP3 intersections (from Dec 2010 exercise)

NEAP3 Results	Health Concerns embodies in the NEAP3 goals, objectives and targets	Relevant objectives/actions from old NEHAP of 1997 that still needs to be retained	Team Sectors and Team Leader
1. Resilient Islands	<p>2.1. Loss of homes 2.1. pollution of water systems</p> <p>2.2. Necessity to include health vulnerabilities also in the environmental vulnerabilities</p> <p>2.2. Address new emerging diseases due to climate change 2.2. food security related health issues from consequences of climate change 2.3. Need for health adaptation measures knowledge and requisite funds</p>	<p>5.1 establish an effective larval control and surveillance programme in Malé and in the islands; effect better case detection and case management for malaria, dengue and filariasis; and maintain the management strength of the national vector control team.</p>	<p>Housing and Environment Health</p> <p>Planning Disaster preparedness and management</p> <p>Agriculture</p> <p>Transport</p>

	<p>3.1. Need for better knowledge of relationship of coral reef biodiversity and health</p> <p>4.1. Climate related health risk profiles</p> <p>5.1. Vector borne disease increase</p> <p>6.2. Nutritional concerns</p> <p>6.2. loss of medicinal plants due to biodiversity loss</p> <p>7.1. Lack of health preparedness - not just environmental preparedness</p>		<p>Local Government Authorities</p> <p>Education</p>
2. Rich Ecosystems	<p>10.3. Psychological health concerns from loss of homes due to erosion of land</p> <p>10.4. loss of reef based organisms of medicinal values lost due to climate change</p> <p>11.1. loss of medicinal plants due to loss of terrestrial biodiversity</p> <p>12.1. vector borne disease increase due to wetlands ecosystems flooding and destruction</p> <p>12.2. health effects from wetland ecosystem destruction food chain effects and imbalances</p> <p>13.1. health risks of invasive species from threats to food security and disease spread</p>	<p>Integrated vector control</p>	<p>Housing and Environment</p> <p>Tourism Education and Health</p> <p>National Disaster Management Center</p> <p>FDA</p> <p>Fisheries and Agriculture</p>
3. Healthy Communities	<p>14.1. Lack of solid wastes management</p> <p>14.1. Increase in rodents</p> <p>14.2. Low health focus in regional solid waste management activities</p> <p>15.1. Diseases from mismanagement of bio-hazardous wastes</p> <p>15.1. Health effects from the contamination of ground water from hazardous waste leachate</p> <p>16.1. Health effects from bio-magnification resulting from food chain exposure to chemicals</p> <p>16.2. Health effects from increased ultra-violet radiation</p> <p>17.3. Air pollution related respiratory and cardio-vascular diseases</p>	<p>Chemical Safety:</p> <p>14.1 incorporate a vector control objective and strategy in the national solid waste disposal programme; effectively implement rat control through solid waste disposal programme; increased access to safe disposal of human waste in the country, through appropriate disposal methods, and recruit staff to manage such systems, and educating island communities on how to use the system (being well implemented); establish more efficient means of solid waste disposal in Malé, Islands and resorts, through waste management strategies, enforcements, mobilizing private industry for reuse and recycle and composting in various settings, and educating households in country (being implemented)</p>	<p>Home Affairs Health; FDA; MWSA</p> <p>Municipality Housing and Environment</p> <p>Local Government Bodies</p> <p>Maldives Energy Authority Economic Development</p> <p>Customs (Finance)</p>

		<p>NOISE: 1. Reduce hearing loss and ergonomic damage to workers - reduce noise levels in industry (powerhouses, carpentries, and other work settings); provide measures to protect workers; locate noise sources away from households; and educate public on the effect of noise and what can be done to avoid intense exposure, 2. provide effective regulatory mechanisms for enforcement - enact new legislation, and enforcement mechanisms; establish national standards on noise for various settings, and 3. provide access to treatment of noise related ailments - strengthen national medical service to be able to address noise related issues.</p> <p>Occupational Health: All activities are still relevant. (NEAP3 should have this as an addition to the "Healthy Communities" Result as a new objective under a "Healthy Workplace Environment". To deal with protecting the health of the worker by ensuring a healthy work environment that ensures physical and mental health safety such as injuries, poisonings, hearing loss, predisposition to cancers and cardiovascular diseases, ergonomic disorders, etc. (healthy community function), and through establishing legislations (reviewing worker conditions in Maldives and establishing worker safety protocols, and rules and enforcing), and improving awareness for public and school children also (stewardship functions)</p>	
<p>4. Safe Water</p>	<p>18.1 Spread of water borne diseases through inappropriate rainwater harvesting 18.1. Mosquito breeding caused by overflowing storm water systems and stagnating water 19.1. Health effects of depleting ground water aquifer from high salinity and skin irritants 20.1. Diarrhea and other health effects from lack of adequate sewage treatment 21.1. Health effects from sea contamination from oil spills and sewage disposed from ships</p>	<p>18.1 Increased access to safe and adequate drinking water to all households. 19.1 Control indiscriminate pumping of ground water by commercial parties and households, through establishment of a centralized authority for managing and regulating national water resources (somewhat implemented by needs more institutionalization), establishing rules and regulations, and stronger enforcement. Promote sustainable agricultural practices through more controlled use of irrigation, through guidance to farmers for prudent use, and rules and regulations. Prevent or reduce contamination of groundwater due to human and industrial practices, through implementing planned water distribution systems in Malé; and in islands, strengthening MWSA rules and operations, and promoting</p>	<p>Housing and Environment MWSA and EPA</p> <p>FDA and Local Government Authorities</p> <p>Health Transpost</p>

		public awareness (being implemented).	
5. Environmental Stewardship	<p>24.1. Include health impact assessment into the EIA</p> <p>25.1. Include environmental health information into making environment policy in future</p> <p>25.1. Include environmental health in school curriculums in a stronger way</p> <p>26.1. Promote environmental health research</p>	<p>23.1. establish prudent food policy directions, through new legislations, and food security aspect of availability and good monitoring of vending establishments, and ensuring imports quality, through establishing strict quality standards of packaging and labeling and storage conditions.</p> <p>23.1. Establish responsive monitoring and enforcement mechanisms for solid waste management, through assigning a lead agency, reviewing and formulating legislations, and promoting participatory responsibilities (being implemented but very slowly)</p> <p>23.1. ensure reduction of motor vehicle emissions through good enforcement mechanisms, and increased public awareness of traffic rules and road safety.</p> <p>25.1. promote effective larval control in potential breeding sites and in the outside environment.</p> <p>25.1. promote vector control in agricultural irrigation management.</p> <p>25.1. Strengthen the use of media in promoting community awareness.</p> <p>25.2. create greater public awareness on the precious nature of fresh water resources, through use of mass media, and use in class room studies (partially implemented)</p> <p>25.2. population advocacy for more responsible management of water resource, through introducing greater accountability and responsibility for protecting water resources and managing mangroves as sinks and protective barriers.</p> <p>25.2. Make public aware of the concept of good nutrition, through consumer education and enabling access to nutritious foods.</p>	<p>Health, Education, Planning (Finance)</p> <p>Transport; Tourism</p> <p>MHRYS Housing and Environment</p>

<p style="writing-mode: vertical-rl; transform: rotate(180deg);">6. Carbon Neutral Country</p>	<p>28.1. Lack of health related issues in awareness campaigns on carbon neutrality</p> <p>28.1. Health sector policies to be "green" through emission reduction and adaptation action</p> <p>28.2. Health concerns to be included in legal aspects of carbon neutrality policy</p> <p>30.1. Health benefits from ARI and injuries reduction in a motor vehicle reduction policy</p>	<p>30.1 Reduce motor vehicle congestion in Malé' and in lands to reduce carbon footprint and reduce congestion in Malé'.</p>	<p>President's Office; Local Govt Authorities Transport; Health; Education; Energy Authority</p> <p>Customs/Finance</p> <p>Housing and Environment</p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Notes:</p>	<p>1. If not included in the NEAP3 (as goals/objectives/targets) then mention this as "new"</p> <p>2. Health, Education and Finance Ministries should be participants to be pervasively involved</p> <p>3. Local stakeholders must be invited when preparing the operational plans as next phase</p> <p>4. Eg are: religious leaders, NGOs, business leaders, pressure group leaders, media, police</p>		
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Next Steps</p>	<p>1. Ministry of Health and Ministry of Housing and Environment to figure out what to do next</p> <p>2. WHO will also go to MOH to see what they would like it to do next to help with NEHAP</p> <p>3. Housing and Environment to define collaborative NEAP3 operational planning and monitoring process</p> <p>4. Who will be responsible for monitoring and evaluation of NEAP3</p> <p>5. Need for reviewing the mandates of the ministries in the new political context and seek relevance</p> <p>6. The challenge of mainstreaming this action plan into the MDP Strategic Action Plan</p> <p>7. High level policy level leaders to be made well familiar with the NEAP3 and output of this workshop</p>		<p>Housing and Environment</p>