

# **STRATEGY PAPER**

## **Mainstreaming Environmental and Natural Resources Management**

Technical Working Group on Biodiversity and  
Environmental Management

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## MAINSTREAMING ENVIRONMENTAL AND NATURAL RESOURCES MANAGEMENT

### 1.0 INTRODUCTION / BACKGROUND

**This strategic paper constitutes mainstreaming environment and natural resources management on three (3) major sectors – Biodiversity and Forestry, Environment and Waste**

Species richness in flora and fauna validates Malaysia's place in the world as one of the seventeen mega diverse countries. Forests play an important role in providing social benefits, ecosystem services and environmental stability, including its contribution towards economic development and poverty eradication. Management of forestry and biodiversity in Malaysia has embraced a balance approach where it takes into account the country's aspiration to become a developed nation and at the same time observing the need to maintain forests cover and biodiversity intactness. Under the 11<sup>th</sup> Malaysia Plan (11<sup>th</sup> MP), the management, conservation and sustainable utilisation of forestry and biodiversity resources will be strengthened and enhanced through Strengthening Biodiversity Conservation and Management, Enhancing Implementation of Sustainable Forest Management, Achieving Sustainable Use of Natural Capital, ~~and operationalising the National Biodiversity Centre, Protection of Ecosystem Health and Resilience and Enhancing Socio-Economic Benefits and Livelihood.~~ These strategies will be supported with continuing efforts towards mainstreaming environmental and natural resources management in pursuit of the country's vision to achieve high income advanced nation status by the year 2020.

In addition, ~~The~~ the changing landscape in environmental management provides impetus for mainstreaming in environmental management and pollution prevention in the country. ~~In the 11<sup>th</sup> MPAs such,~~ Malaysia will intensify environmental management through mainstreaming initiatives and programs in all sectors of economic and social development. The 11<sup>th</sup> MP will focus on new prospective strategies and leveraging the continuing existing strategies which include Intensifying Environmental Quality Management and Enriching Environmental Stewardship, ~~establishing and operationalising Strategic Environmental Assessment (SEA),~~ Integrating Environmentally Sound Chemical Management, ~~and Managing Contaminated Land~~ and Establishing and Operationalising Strategic Environmental Assessment (SEA) as well as Greening of Industry. The continuation strategies still need to be pursued aggressively to fortify mainstreaming of environmental management agenda.

With waste being one of the major environmental problems in Malaysia, it is envisaged that ~~E~~environmentally sound waste management must go beyond the mere safe disposal or recovery of wastes and seek to address the root cause of the problem by attempting to change unsustainable patterns of production and consumption. This implies the application of the integrated life cycle management concept which presents a unique opportunity to reconcile development with environmental protection. In the 11<sup>th</sup> MP, waste sector need to be managed in a holistic manner, encompassing seven (7) types of waste including solid waste,

agricultural waste, electric and electronic waste, schedule waste (focusing on clinical waste), radioactive waste, mining waste and sewage. Integrated Waste Management Programmes will be introduced as a game-changing national programme for the forthcoming 11<sup>th</sup> MP, due to its inclusiveness, extremely high multiplier effect and strategic platform/tool to align policy implementation in multiples strategic areas of 11<sup>th</sup> MP.

All these strategies are geared towards mainstreaming environmental and natural resources management in pursuit of the country's vision to achieve high income advanced nation status by the year 2020.

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## 2.0 STOCK TAKE/PROGRESS

**Under the 10<sup>th</sup> Malaysia Plan (10<sup>th</sup> MP), the nation embarked on various efforts to build an environment that enhances quality of life. During the Plan period, the notable achievements through forestry and biodiversity, environment and waste management are as follows:**

### 2.1 Biodiversity and Forestry

To ensure that our forests and biodiversity are conserved, reviews were made to the related policies, acts, ordinances and enactments to reflect the changes that are taking place in forest management - from one which was focused towards forest production to one with a broader scope that encompasses its multiple uses. During the 10<sup>th</sup> MP, reviews were also made to the related policies, acts, ordinances and enactments to further strengthen enforcement activities and conservation efforts. The revision of the National Policy on Biological Diversity 1998 serves dual purpose - as the main policy document that guide biodiversity management and as a tool for Malaysia to implement the Strategic Plan for Biodiversity 2011-2020 and its Aichi Biodiversity Targets under the auspices of the United Nations Convention of Biodiversity (CBD). A resource mobilisation plan was adopted to provide financing framework to support the implementation of the Policy. The bill on the access to biological resources and benefit sharing (ABS) is now at the final drafting stage. It aims to ensure fair and equitable sharing of benefits arising from the utilisation of Malaysia's rich biological resources and ensure that research and development on biological resources is conducted observing the need for prior informed consent (PIC) as a mean to curb biopiracy. Once in force, this law will also recognise the rights of indigenous and local communities with respect to traditional knowledge associated with biological resources.

To date Malaysia has 61.04% of its total land area as forest compared to 56.4% in 2010. To increase forest area and tree cover, Malaysia has embarked on several restoration and reforestation programmes. A total of 53 million trees have been planted from 2009 to 2013, surpassing the initial target of 26 Million Tree Planting Campaign. In addition to that, 2,461.66 hectares of mangrove trees and other suitable species were planted along coastal areas to protect coastlines against wave actions and coastal winds, prevent salt water intrusion into rivers and serves as breeding grounds for fish and other marine organisms.

Recognition is also given to the concept of High Conservation Value Forests as well as the protection of critical ecosystem such as water catchments. Malaysia also established various networks of protected areas (both terrestrial and marine) such as Wildlife Sanctuaries/Reserves, National Parks and State Parks, Nature Reserves, and Protection Forests within Permanent Reserves Forests and other state to secure biodiversity protection. Three management plans for Pulau Redang Marine Park, Pulau Tioman Marine Park and Pulau Sibu-Pulau Tinggi Marine Park were developed to enhance and improve the management of these parks and its resources. The management plans also encompass Marine Park Management Information System (MPMIS) database which incorporate spatial data and zoning plans.

To address the issues of uncoordinated land-use and infrastructure development that had caused forests fragmentation and fragmentation of wildlife population, the Central Forest Spine (CFS) initiatives has led to the gazettelement of 8,866 hectares as Permanent Forests Reserves in Peninsular Malaysia and the creation of 1 viaduct in Grik, Perak. The Heart of Borneo (HoB) Initiative contributes to biodiversity conservation through the implementation of scientific expedition in Ulu Mentawai, Miri and roadshows on environmental education in Sabah. Various goals and programmes under the HoB initiative are implemented by the states of Sabah and Sarawak through State level Strategic and Development Plans.

During the Plan period, application of advance technologies in forestry and biodiversity such as remote sensing, Geographical Information System (GIS), Radio Frequency Identification (RFID), hyperspectral airborne sensing, Compact Airborne Tactical System (CATs), Real-time Telemetry Processing System (RTPS), Unmanned Aerial Vehicle (UAV) and Global Positioning System (GPS) were pursued. These technologies were applied in Forest Monitoring using Remote Sensing (FMRS), *Sistem Pengurusan Penanaman Spesies Pesisiran Pantai Negara* (ePesisir) and Integrated Coral Reef Monitoring System (ICoMS). Regular updating has been conducted for biological and geospatial data that currently reside in platforms such as Malaysian Centralize Geospatial Biodiversity Database (MyGeoBiod), Geo-information for Natural Resources and Environment (G4NRE) and Malaysian Biological Diversity Clearing House Mechanism (MyCHM). In addition, relevant agencies also maintain their own databases.

In line with SFM practices, 8 forest management units in Peninsular Malaysia, 2 in Sabah and 1 in Sarawak have been successfully certified. 4.58 million hectares of Permanent Reserve Forests in Peninsular Malaysia have successfully maintained the Forest Management Certification for Forest Management in accordance with the Malaysian Criteria, Indicators, Activities and Standards of Performance (MC&I) whereas in Sabah and Sarawak, 927,563 and 88,000 hectares of forest have been certified respectively.

Social forestry elements are also incorporated into the current policies to promote participation of indigenous and local communities in the social forestry programmes. Various activities have been carried out such as planting of indigenous trees, handicraft training, crop cultivation and nursery training, fish culture project, construction of houses, suspension bridge and ecotourism project. In recognition of the roles and responsibilities of indigenous and local communities in managing

forest, indigenous and local communities adjacent to permanent reserve forest and protected area are given privileges to use, hunt, roam and carry out traditional or cultural activities adhering to forest laws. Capacity building programmes were also conducted for local communities residing at the marine parks areas to improve their socio-economic and divert their dependency from fishing activities in marine park areas.

The total export earnings from timber and timber products in 2012 amounted to US\$6.16 billion. The forestry sector contributed US\$2.93 billion or 1 percent to Malaysia's Gross Domestic Products (GDP) of US\$286.96 billion in 2012. In 2012, the forestry sector in Peninsular Malaysia provided direct employment to 37,443 persons in various industries.

Inventory and assessment of biodiversity are crucial to establish and measure trends in biodiversity, monitor their condition and changes. Under the Flora of Malaysia project (includes Tree Flora of Sabah and Sarawak and Flora of Peninsular Malaysia), over 1,300 plant species have been assessed for their conservation status for Peninsular Malaysia using the Malaysian Red List Categories and Criteria. About 36.6% of these plants were assessed as threatened. The assessment provides conservation prioritisation and allows Malaysia to actively conduct conservation action plans for many of our most endangered plant species. National Forest Inventory (NFI) provided large amount of data and materials for the checklists on plants and improvement of referral collections. The assessment of marine biodiversity was implemented through inventory and the creation of the Systematic Marine Biodiversity Information System (SyMBiosIS) database. Efforts were also made to monitor marine ecosystem health in populated and non-populated areas through Annual Reef Check Survey. An economic assessment was also conducted in Pulau Payar, Pulau Redang, Pulau Kuraman in Labuan and Pulau Tioman with an estimated economic value of RM10.1 million/year, RM174 million/year, RM39.6 million/year and RM3.44 billion/year respectively.

In Sarawak, the Wildlife Monitoring and Rescue Operation (WiMOR) was carried out in areas that were affected by development. A total of 33,715 seedlings of tree species were successfully raised at WiMOR nursery and replanted at selected areas.

Commitment to species conservation is further strengthened during the 10<sup>th</sup> MP through various action plans, namely the National Tiger Conservation Action Plan (NTCAP), The National Elephant Conservation Action Plan (NECAP) for Peninsular Malaysia and the Orang Utan Action Plan, the Elephant Action Plan and the Rhinoceros Action Plan for Sabah. These actions plans are expected to halt the decline and further loss of the species, recover species populations and prevent habitat degradation as well as reconnecting fragmented forest. Long-term ecological monitoring is also conducted on these species, together with other wildlife including proboscis monkey, Banteng, tapir and the Malayan gaur (seladang). In-situ and ex-situ species conservation were implemented through the above species action plan and establishment of the National Wildlife Rescue Center (NWRS). Four turtle hatcheries were established within the compound of marine park centres. Efforts were carried out to translocate Giant Clams which are listed under IUCN Red List into marine parks to afford better protection of these species. The conservation of wildlife also focused on managing its habitat through habitat restoration including maintenance of grazing fields, creating and maintenance of saltlicks and acquiring

land for wildlife corridors. Wildlife Release Programs were also conducted in selected Protected Areas such as Krau Wildlife Reserve, Taman Negara National Park, Sungkai Wildlife Reserve, Sungai Dusun Wildlife Reserve. The species involved includes mammals and birds such as Gaur, Banteng, Tapir and Milky Stork. In addition, post release monitoring programme for Orang Utan has been conducted in Tabin Wildlife Reserve. Coral reef rehabilitation programme were carried out to restore areas affected by development and natural disasters. Artificial reef were also deployed within marine parks to enhance existing habitat and create new dive sites and for recreational fishing activities in areas adjacent to marine parks.

At the regional level, Malaysia is a member country to the Coral Triangle Initiative (CTI) since 2009 and involved in Bay of Bengal Large Marine Ecosystem (BoBLME) Project, which had contributed in the improvement of overall coral reef health whereby, life coral cover has increased from 45.57% in 2007 to 48.33% in 2013 despite experiencing coral bleaching phenomenon in 2010. Malaysia also plays an active role in conservation that is trans-boundary in nature. This is reflected with the acceptance of Bako Buntal Bay in Sarawak as Malaysia's first East Asian-Australasian Flyway Partnership (EAAFP) that is an important habitat for migratory birds. In the name of supporting conservation, the Sabah State Government was also putting effort for the Crocker Range Park, an area of 139,919 hectares to be declared as Malaysia's second UNESCO's Man and Biosphere reserve.

To overcome human-wildlife conflicts, Elephant Translocation Programs were conducted at Sungai Ketiar Elephant Sanctuary, Terengganu; Royal Belum State Park, Perak; Endau Rompin National Park, Johor as well as Borneo Elephant Sanctuary, Lower Segama Conservation Area and Tabin Forest Reserve in Sabah. A total of 12 electric fencing were also erected in the states of Perak, Terengganu, Pahang, Johor and Kelantan for the said purpose. For conflict with crocodile, various crocodile free zones were established at major population centres like Kuching, Miri, Sibul, Bintulu, Sri Aman, Limbang and Niah in Sarawak whilst, in Sabah, crocodile translocation programme is conducted. With regards to the human-long-tailed macaque conflict (HMC), culling approaches, inventories and sterilization programmes on selected conflict populations were initiated.

A total of 1,617 cases of violation of Act 716 and Act 686 were recorded from 2011 to 2013. In 2011, 61 cases were charged in court, with 62 people arrested. In 2012, 41 cases have been charged in court and 23 people arrested. While in 2013, 47 cases were charged in court and 15 people arrested. In addition, a total of 120 illegal immigrants from Cambodia, Thailand and Vietnam has been arrested for encroaching Taman Negara in period of 2001 to 2013. Surveillance and enforcement capacity were also strengthened in marine protected areas to achieve greater compliance of the law with increase of patrolling assets and human resources. In addition, the implementation of the National Blue Ocean Strategies (NBOS) by strengthening the 1Malaysia Biodiversity Enforcement Operation Network (1MBEON) enforcement programme included full time patrolling in hotspot areas in Taman Negara. In Sabah and Sarawak, Honorary Wildlife Wardens/Rangers conduct regular enforcement activities together with staff of relevant departments. Standard Operating Procedure (SOP) has been reviewed for several enforcement agencies in Malaysia. In addition, collaboration with other enforcement agencies such as Malaysia Maritime Enforcement Agency (MMEA), Malaysian Royal Police

and Malaysia Anti-Corruption Commission (MACC) to curb illegal activities has taken placed. The programs and activities implemented under the 10<sup>th</sup> MP and their achievements are as stated in **Annex I-1 (Table A)**.

## 2.2 Environmental Management

Reducing environmental pollution is mutually dependent on sustainable use of natural resources, economic and social development. Many environmental initiatives were achieved in the 10<sup>th</sup> MP. In responding to the challenges of sustainable development, EIA practice and mechanism has been strengthened on having specific guidelines and guidance documents especially in addressing the practical and cost effective of Best Management Practices (BMPs) on erosion and sedimentation control for highland development. The BMPs at Lojing, Kelantan was carried out as successful demonstration site. A comprehensive monitoring to address the environmental baseline in Straits of Johor was also carried out successfully. Special study on Strategic Environmental Assessment (SEA) has been carried out under Malaysian-DANIDA assistance.

A study on the strategic direction on policy, legal and institutional framework for chemical and contaminated land management were also carried out. Concerted efforts in strengthening enforcement compliances, and establishment a Task Force, in enforcing erosion and sediment control for EIA projects, in urban and highland development were implemented. In addition, regulation on fuel quality *EURO4M* has been gazetted to be enforced in 2015. Human capital development through certification program had been implemented to include in the area of managing hazardous waste, Environmental Noise and Vibration Measurement, Erosion and Soil Control Plan Reviewer and Inspector, and Air Pollution Control Engineering. A total of 810 certified industry personnels were generated including DOE officers. Audit Competency for Greening Industry Program to be qualified Subject Matter Expert (SME) and ICT/GIS capability were implemented for DOE officers. Meanwhile Friends of environment (Rakan Alam Sekitar) programs were implemented in 222 parliamentary constituencies to raise education and environmental awareness.

Air Pollution control from motor vehicles has been implemented based on the Vehicle Type Approval (VTA) before registration process and retesting of diesel driven motor vehicle was outsourced to PUSPAKOM. Peat lands project has demonstrated the response time of controlling the fire was reduced from 7 days to 3 days. Despite of getting financial assistance from Montreal Protocol Convention, there is uncertainty of sustaining funding after 2015. The Malaysian marine water quality Standards has been established based on classes use of water bodies such as marine parks, recreation, Marine aquaculture, ports and others. Cleaner Production for Batik industry and Green Industry Awards were successfully implemented.

The programs and activities implemented under the 10<sup>th</sup> MP and their achievements are as stated in **Annex I-2 (Table A)**.

## 2.3 Waste Management

Under the 10<sup>th</sup> MP, a holistic management of solid waste through sanitary landfills will help to recover the methane produced from waste and use it to generate energy.

Renewable energy has increase from less than 1% in 2009 to 5.5% (985MW) of Malaysia's total electricity generated by 2015 with 200MW from solid waste sector. Recycling is also possible to be a part of green business as recycling rate has been targeted for household recovery of waste at national level to be increased from 15% to 25% by 2015 (10MP). The recycling target has been further emphasised in Malaysia's EPP 9 Developing An Efficient Solid Waste Management Ecosystem, whereby one of its strategies in creating a recycling ecosystem including composting to stimulate waste disposal reduction targeting a recycling rate of 40% by 2020.

The agriculture sector had contributed 7.3% to national GDP. This sector is all about production of food through farming including cultivation of food crops, husbandry of domesticated livestock and fisheries. The supply chain in agriculture involves all aspects from upstream to downstream, encompassing all activities such as input supply, production system, processing and manufacturing and distribution and marketing until it reaches the consumers. But, during all previous MPs, there are not much that is being touch regarding the management of agricultural waste in Malaysia.

Electric and Electronic Waste (E-waste) is listed as one of the Scheduled Waste Regulations under the Environmental Quality (Scheduled Wastes) Regulations 2005 under the code SW110 and under the purview of Department of Environment (DOE) Malaysia. To date there are a total of 159 recovery facility licensed E-waste in Malaysia with a total capacity of handling more than 24,000 metric tons per month. Of the 159 licensed facilities, 135 are E-waste recovery facility partially involved in the work of physical separation or manual E-waste for further processing facility and 24 full acquisition of e-waste that can process e-waste to recover precious metals.

In order to tackle the issues of collection, transportation and disposal of clinical waste from government hospitals, three (3) concessionaires has been appointed and licensed by the Ministry of Health Malaysia and the DOE. However, these concessionaires are unable to keep up with incineration of clinical waste due to increasing production of this waste by government and private hospitals. Thus, in 2013 DOE has given license to Kualiti Alam Sdn. Bhd. incinerator facility for the disposal of clinical waste and its' waste backlog problem.

To assist in the implementation of radioactive waste management, the current authorities have adopted few interim policies by which to return radioactive waste to original sources, to temporary store NORM at the premises of the licensee and to establish Waste Management Store Centre in the Malaysian Nuclear Agency (ANM) compound. Under the 10<sup>th</sup> MP government has also approved the allocation of RM2 million to ANM to build a radioactive waste disposal facility (Borehole). ANM has started the process of siting a disposal facility for this Borehole, as well as expertise and technical assistance from the International Atomic Energy Agency (IAEA). This Borehole is specifically for the disposal of radioactive waste categories 3-5.

The Mineral and Geoscience Department Malaysia (JMG) through its Mineral Research Centre has carried out R&D activities on mine wastes. The studies were carried out mostly for initial stages which include preliminary study on sustainable mining involving Acid Mine Drainage (AMD) and some heavy metals. On rehabilitation and sustainable activities, JMG carried out studies on active and

passive treatments of Acid Mine Drainage (AMD) discharge from ex Mamut Copper Mine, Ranau, Sabah. The study on mine waste dumps in the ex-Mamut Copper Mine in Sabah was done because, after closure, it was alleged that effluent from mine pit had high content of acid and polluting downstream river with heavy metals. The study was aimed to find safe and environmentally friendly rehabilitated waste land suitable for other land use. The programs and activities implemented under the 10th MP and their achievements are as stated in **Annex I-3 (Table A)**.

### 3.0 ISSUES AND GAP ANALYSIS

**Although significant progress were made in programs and activities planned on biodiversity and forestry, environment, and waste sectors under the 10<sup>th</sup> MP, there were issues and gaps that needed to be addressed for a better implementation of the abovementioned sectors as follows:**

#### 3.1 Biodiversity and Forestry

Forests are continuously at risk of being cleared for other land use purposes. Some areas which have been designated as Environmentally Sensitive Areas (ESA) are still earmarked for development. Lower priority and weak implementation are seen as part of the root cause of competing land use. Due to habitat conversion and infrastructure development, the remaining pristine forests in the country have become highly fragmented. This has resulted in the loss of ecological connectivity, preventing and impeding movement of animals. These barriers limit the amount of resources available to them and cause their genetic isolation and the sustenance of fewer species in these ecological islands.

Habitat degradation occurs in terrestrial as well as coastal and marine ecosystems due to pollution, resource extraction and unsustainable coastal development resulting in the loss of biodiversity. Increasingly, there is also major concern over the quality of biodiversity in these degraded habitats. Species composition changes significantly. Furthermore, these habitats have poor provision of ecological services such as clean air and water, food provision, coastal protection and soil protection. Massive development in coastal areas has resulted in the degradation of coastal marine habitats which affects the health of marine ecosystems. Invasive alien species (IAS) prey upon, or out-compete native species or modify the natural ecosystem, causing the extinction of native wildlife population. Although efforts to identify IAS have been undertaken, much still need to be done to ensure that they do not damage the country's biodiversity. The ecosystem that is of major concern is our freshwater habitats.

The degradation and loss of natural habitats often resulted in wildlife seeking out new areas to forage and breed, at areas which are now inhabited by human, resulting in human-wildlife conflict. The loss of human life and damage to property is usually traumatic for the victims and is often followed by retaliation which threatens wildlife.

Poaching still occurs in Malaysia where a wide range of species are being hunted for a range of purposes. In Malaysia, the Malayan tiger, Malayan Sun Bear, turtle, pangolins and elephants are among the animals that are still being poached and traded illegally. Collection of turtle eggs also resulted in the depletion turtle populations. Whereas, wild orchids, pitcher plants, timber and agarwood are example of plants commonly harvested and traded illegally. Illegal activities in protected areas and forested land occur due to high demand of natural resources and ease of accessibility also led to loss of biodiversity richness. Illegal, unregulated and unreported (IUU) fisheries activities through cyanide fishing, fish bombing, ghost net, and spear gun are still occurring and threatening all marine ecosystems if not curbed. Trawling has been identified as one of the main causes of habitat destruction and resource depletion especially within 5 nautical miles from shoreline and marine protected areas.

Societal involvement in issues related to forestry and biodiversity is weak at all levels – there is poor appreciation, engagement and contribution. Lack of awareness on conservation laws and policies result in unsustainable use of natural resources. Communication, Education and Public Awareness (CEPA) has been ongoing but often conducted in silo by agencies. Their impact especially in triggering behavioural changes is also difficult to measure. There is also a lack of constructive engagement between various stakeholders especially policy makers to address conservation and sustainable use of natural resources. The challenge lies in formulating the effective and holistic way to engage the relevant sectors to mainstream biodiversity considerations. Inadequate coordination between various agencies dealing with forestry management and biodiversity conservation causes inefficiencies, overlapping and conflicting responsibilities. For example, there is no dedicated institution that provides technical advice and policy support for biodiversity management. Furthermore, the division between federal and state jurisdictions proves a challenge for forestry management and biodiversity conservation as States rely heavily on revenue from land and associated resources to maintain state coffers and socio-economic development.

Planning and managing forests and biodiversity conservation efforts, as well as enforcing legislation is restricted due to insufficient financial support, understaffing, inadequate technical expertise, management tools, new technologies, equipment and incentives. There are inadequate knowledge and information of Malaysia's biodiversity richness in terms of baseline data on biodiversity components, particularly at species and genetic levels. There is limited number of credible programme that supports inventorying work and development of human capital in this area. Insufficient knowledge and information makes it difficult to design and develop appropriate conservation measures for species and habitats. The issues and gap are as detailed in **Annex I-1 (Table A)**.

### 3.2 Environmental Management

To date, there are fragmented policies and related legislations, overlapping of jurisdiction and unclear areas governing environmental concerns such as the chemical and contaminated land management. In mainstreaming the environmental management, concerted efforts to formulate an integrated chemical and contaminated land management, and land use plan and policy is still a major gap

and challenges ahead that need to be institutionalized. The current environmental strategies and control practices still would provide support and synergy for enhancing the wellbeing and quality of life of the present and future generation. The issues and gap are as detailed in **Annex I-2 (Table A)**.

### **3.3 Waste Management**

#### **3.3.1 Legislation**

Currently, in spite of the existing methods, procedures and policies towards reuse and recycle, there is still a gap when it comes to its reality. Hence solid waste minimization is a major priority to be addressed in Malaysia. The inadequate waste minimization practices have led to a quantum jump in solid waste generation and subsequently tremendous environmental problems. It is estimated that in 2012, solid waste generated in Malaysia has already reached 33,000 tonnes per day and from it only 22% ends up in secure landfills. The disposal of raw Municipal Solid Waste (MSW) into non-sanitary landfills and open dumps will continuously emits Methane and would cause effects to the environment.

Currently also, there is no one act that regulates the management of agricultural waste as a whole. There is also a lack of regulations/legislation specifically in controlling emissions from agricultural waste. However, management of waste from oil palm based industry is much organised than the food crops owing to its enormous role as nation's cash crop and constant supply as by-products' feedstock. Current related policy that can be related to agricultural waste is the National Biomass Strategy 2020, mostly complying with the palm oil industry since it is the largest producer of biomass in Malaysia.

The latest situation reports that there is still no suitable management and environmentally friendly system in dealing with the management of electrical and electronic waste (E-waste) from households. Furthermore the absence of specific legislation to enforce and regulate the management of E-waste from households is also a major factor as currently the existing law is now more focused on E-waste from the industrial sector.

Current situation also finds that there's no formal policy that requires all radioactive materials that are purchased from manufacturers abroad to be sent back to its original source. It brought fears that Malaysia could be used as a radioactive waste disposal sites within the Asean region and others countries. Furthermore, the enforcement of the Atomic Energy Licensing Act 1984 (Act 304) is inconsistent as it is done in a case-to-case basis and would vary according to political change.

In the mining industry, there is also the issue pertaining to inadequate guidelines and best practices in the mine waste management. Malaysia needs to develop Sustainable Development Indicators (SDIs) as per required under RIO+20 agreement. Mining and quarry industries including small scaled miners or quarry operators need to improve the sustainability level of operation with implementation of best practices.

#### **3.3.2 Technologies & Facilities**

Malaysia cannot carry on with its Business-As-Usual (BAU) in the waste sector. It is important to comprehend that, while the waste sector is achieving some progress on waste diversion, Malaysia lacks the necessary infrastructure to sustain and further improve diversion performance towards progress in the waste management. Though Malaysia has existing assets in the form of approved landfill capacity and other waste treatment facilities, they are insufficient to address the disposal needs in the near term. Malaysia also appears to lack sufficient long-term capacity to manage the residual waste remaining after diversion, particularly given the potential growth and demand for waste services over the next 20 years. The current situation of dumping waste into landfills or straight to final disposal measures cannot continue into the next 15 to 20 years. Further actions are also in place to change the management of waste, with emphasis on recycling activities at the household levels and waste recovery before dumping.

There are also gaps in agricultural waste management especially in the absence of appropriate agricultural waste management system and the lack of special facilities to treat agricultural wastes, such as treatment pond or Anaerobic Digester Plant.

Among the technological and facilities issues and challenges faced in the effective management of clinical waste are incineration facilities owned by the concessionaire is not operating at optimum capacity for incineration age above 10 years, limited treatment and disposal facilities, small amount and distance of the source (hospitals and clinics) with treatment and disposal facilities are far led operation not economical to transport prepared especially for rural areas. Thus it is vital that treatment technology and disposal of clinical waste should be enhanced to meet the growing need in Malaysia.

The irresponsible approach by the licensee to dispose of radioactive waste in the ANM compound when having failed to contact the original supplier has also caused several problems. First, there are lack of space/place of storage in the Malaysian Nuclear Agency (ANM) and this temporary/permanent storing in ANM has led to problems of safety and security of radioactive waste because currently there is no secure and recognised national radioactive waste disposal facility.

The management of sewage infrastructure must look towards the improvement in concerns pertaining to lack of building control, lack of civic sense, trends of quick impact projects, lack of technological data, scarcity of funds and trends of urbanization.

### **3.3.3 CEPA and Data**

All seven (7) waste sectors needs to focus more on programs and public awareness campaigns to increase the level of public awareness on the importance of waste minimization, waste segregation, proper handling and proper disposal of each types of waste. The absence and lack of statistical data on each types of waste and a data base source also have made it harder to plan and build new facilities that is economically feasible.

The issues and gap are as detailed in **Annex I-3 (Table A)**.

## 4.0 MOVING FORWARD

**In mainstreaming the environment and natural resources new and bold strategies and continuation strategies have been identified for the purposes of achieving high income advanced nation.**

### 4.1 Prospective Strategies for Biodiversity and Forestry

In the 11<sup>th</sup> MP period, mainstreaming environmental and natural resources management will be one of the main thrust in line with the country's vision to achieve high income advanced nation status by the year 2020. The management, conservation and sustainable utilization of biodiversity and forestry resources will be strengthened and enhanced under the following strategies namely, Strengthening Biodiversity Conservation and Management; Enhancing Implementation of Sustainable Forest Management; Achieving Sustainable Use of Natural Capital; Protection of Ecosystem Health and Resilience; ~~and~~ Enhancing Socio-Economic Benefits and Livelihoods; ~~and Operationalizing National Biodiversity Centre~~. These agendas will be tackled with all relevant cross-cutting issues to address the issues and gaps during the implementation of the 10<sup>th</sup> MP - legislation and policy; institutional framework; sustainable financing and partnership; technological development; Communication, Education and Public Awareness (CEPA); Research, Development and Commercialisation (R,D&C); baseline data and inventory; capacity building and human resource development; and stakeholder consultation and coordination.

#### 4.1.1 Prospective Strategy 1: Strengthening Biodiversity Conservation and Management

Efforts will be made to improve policy/ legislation and institutional framework for biodiversity conservation and sustainable use of natural resources; implementation of biodiversity strategies and action plans; expansion of national inventory and assessment on flora, fauna and marine biodiversity; enhance collaborative research with relevant stakeholders; develop Invasive Alien Species (IAS) List for forest species and wildlife scientific database; develop and implement action plans for iconic species; research and development; review and improve management plans for protected areas; development of protocol for Important Plant Areas (IPA); habitat rehabilitation and enrichment; prioritization of corridors under the CFS Master Plan; implementation of Strategic Plan of Action for Heart of Borneo initiative;

implementation of conservation action plan for threatened habitats; research on impacts of human activities in ecotourism sites and marine protected areas; purchasing land on identified areas for green corridor and riparian reserves; establishment and maintenance of centres, hatcheries or sanctuaries for iconic species; human-wildlife conflict management, carrying out status monitoring on endangered species, changes in demographic patterns of threatened plant, wildlife and marine species, translocation for captured wildlife including establishing wildlife and marine biodiversity rescue and rehabilitation centres.

In addition, efforts will be made to strengthen the integrated marine protected areas (MPA) management including continued efforts to rehabilitate and restore degraded areas, conserve marine endangered species, protecting the connectivity areas between MPAs, development and implementation of marine parks management plans, monitoring and assessment of marine ecosystem health and marine resources and intensify efforts for best management practices adoption in fishery resource conservation and management and aquaculture industry. In view of Malaysia's commitments under various Multilateral Environmental Agreements, Conventions and Forums, efforts will be made to ensure that the implementation of action measures, resolution and decisions are executed.

To support the effort to strengthen biodiversity conservation and management, National Biodiversity Centre (NBC) will be established and operationalised. Its core functions include conducting periodical biodiversity assessment, serves as a collection centre for Malaysia's biodiversity knowledge and information, and engaging stakeholders and communicating its findings to be taken up in policy and decision making as well as capacity building processes. The NBC will also act as a National Competent Authority for the ABS legislation, which functions include, among others, to coordinate the implementation and enforcement of the ABS law by competent authorities, implement treaty, agreement, convention or protocol relating to ABS in relation to a biological resource to which Malaysia is a party, create awareness and provide training, education and information relating to ABS in relation to a biological resource and support customary laws and practices of indigenous and local communities, and the development of community protocols and procedures by the indigenous and local communities.

#### **4.1.2 Prospective Strategy 2: Enhancing Implementation of Sustainable Forest Management**

To ensure our forests is sustainably managed, efforts to rehabilitate, restore, conserve and monitor forest areas will be further strengthened by enhancing implementation of sustainable forest management. A national forest inventory will be conducted as well as the review and improvement of existing Forest Management Plans. Forest linkages and connectivity will be enhanced through establishment of ecological corridors. Other efforts include gazettment and demarcation of PRF/TPAs; enhancing trans-boundary management; application of new and advanced technologies; research and development on Sustainable Forest Management; forest certification and compliance; international collaborations; enhancement of nature centres and recreation forests; enhancement of urban forestry and forest plantation management.

#### **4.1.3 Prospective Strategy 3: Achieving Sustainable Use of Natural Capital**

To achieve Sustainable Use of Natural Capital, focus will be made to ensure sustainable financing in forestry and biodiversity conservation from wide source of funds; increase potential sites of biological importance for domestic, regional and international recognition; intensify study on total economic valuation on natural resources; intensify efforts to establish new protected areas and potential sites for ecotourism; expand research and development on lesser known species and habitats and develop and operationalise economic instrument and other ecological market. Development of concrete mechanism for payment of ecosystem services (PES) will also be implemented in order to capture and recognise the contribution of natural capital to our national income. Fiscal measures shall be introduced to enable state governments to offset potential revenue loss as a result of biodiversity conservation initiatives in environmentally sensitive areas and such studies shall be carried out to formulate the most appropriate mechanisms.

#### **4.1.4 Prospective Strategy 4: Protection of Ecosystem Health and Resilience**

Efforts to protect ecosystem health and resilience will continue to be the agenda under the 11<sup>th</sup> MP. In this regard, the assessment, evaluation and monitoring of terrestrial and marine biodiversity will be conducted in view of adverse impacts on the ecosystem from climate change, pollution and development including threats of pest and zoonotic diseases to and from our environment or wildlife; identify resilient areas to afford better protection of these areas; assessment of economic and environmental cost of IAS and the implementation of the National Action Plan for Prevention, Eradication, Containment and Controls of IAS in Malaysia.

With regards to biosafety issues, efforts will be made to strengthen biosafety management through legislation, enforcement, risk and socio-economic assessment and capacity building including performing post environmental release study on approved living modified organisms (LMOs), enforcing law on liability and redress, developing procedures for handling and identification of LMOs and forming strategic cooperation on LMOs detection and identification.

#### **4.1.5 Prospective Strategy 5: Enhancing Socio-Economic Benefits and Livelihood**

Protected areas are an extremely important part of programmes to conserve biodiversity and ecosystems. However, there are people who are dependent on natural resources within the protected areas that have traditionally supported their well-being. In this regard, issues such as impacts of human settlement within protected areas, illegal harvesting of plants and animals, land-use conflicts and overexploitation of natural resources. Collaboration with other ministries and agencies will be focused on efforts to improve the socio-economic benefits and livelihood of biodiversity and forestry dependent communities through local community conflict management; restoration and rehabilitation of degraded communal forests; promotion of sustainable use and benefit sharing and developing documentation for biological resources and associated traditional knowledge; development of potential areas especially trans-border ecotourism programme; enhance opportunity for community participation in ecotourism; social works and

community services; alternative livelihood for biodiversity and forestry dependent community and eventually increase active participation of community members in managing terrestrial and marine protected areas.

#### **4.2 Prospective Strategies for Environmental Management**

In the 11<sup>th</sup> MP, to continue to develop sustainably and progress towards becoming a high income nation, Malaysia will intensify her environmental management through mainstreaming initiatives and programs in all sectors of economic development. Environmental dimension which is integrated into decision making process either at the policy or project level will ensure continued progress of the Nation without compromising the environmental quality. Pragmatic cost effective pollution control approaches and strategies will be introduced to prevent and control pollution from various sources resulting in the protection and enhancement of the wellbeing and quality of life of Malaysians.

Preventive approach to environmental management and pollution control by the use of Strategic Environmental Assessment (SEA) at the policy level will be introduced, which will be reinforced at the project level by the environmental impact assessment. The growing concerns over the adverse effects on human health and environment due to unsatisfactory management of chemicals and contaminated land will be addressed by through the formulation of a new Act and regulation respectively, Chemical Management Commission or board to be setup including strengthening of the chemical notification and registration scheme. For managing contaminated land, economic instrument, standard and data inventory will be established. Green industry practices using Carbon Footprint (CFP) and Water Footprint (WFP) as quantifiable measurements will be introduced and implemented to reduce the intensity of carbon emission in Malaysia.

Environmental management and pollution control through self-regulation approach will be aggressively implemented. The certification program, which is one of the main tools in the self-regulation approach currently being executed by the DOE, will be expanded and strengthened to encompass a bigger spectrum of activities which fall under the DOE's jurisdiction. Sector specific guidance documents for the control of pollution and mitigation of environmental impacts will be made available to priority economic sectors to assist them to take the necessary preventive and corrective measures. Regulatory framework will give emphasis on self-demonstration of compliance through scheduled reporting requirements through on-line systems.

The monitoring of environmental quality, pollutant emission, compliance status and control of pollution through the use of advanced measurement technologies, and information and communication technologies (ICT) will be further explored and expanded. This will take the form of on-line monitoring of ambient air and water quality, air emissions, effluent discharges, and scheduled waste movement resulting in reduced cost of enforcement, and availability of environmental quality and compliance status information of sources on real time basis. Prompt corrective and enforcement actions can then be taken to control pollution and protect public health which will in turn help improve government delivery services to the public.

Air quality control program to maintain clean air and protect public health will be enhanced to address emerging concerns such as emission of benzene, toluene, ethyl benzene and xylene (BTEX) and to reduce ground-level ozone pollution through the establishment of motor vehicle emission testing centre, the requirement of installation of vapour recovery system and compulsory roadworthiness test for the private vehicles. Feasibility of using Remote Sensing Devices will be examined for implementation. The enforcement on illegal entry and indiscriminate release of ozone depleting substances (ODS) to the environment will be stepped up and destruction of unwanted ODS will be managed accordingly. Awareness will be enhanced on public and industries in phasing out ODS.

A new integrated approach to water pollution control and water quality management commonly referred to as total maximum daily load (TMDL) will be introduced. The approach which is based on assimilative capacity of the receiving water course is aimed at improving the quality of river water and restoring its beneficial uses to be enjoyed by the public. For enhancing the human capital development of DOE personnel criteria and profiling towards career path progress and recruitment of strategic position in DOE will be established. Enhancing CEPA to decision makers, personnel and stakeholders, and strengthening capacity building in developing subject matter expert and competent personnel is very important in view of the proposed both new and bold, continuation strategies initiatives to institutionalise the mainstreaming of environmental management. The prospect for moving forward in the 11<sup>th</sup> MP as summarise in **Annex I-2 (Table B)**.

#### **4.2.1 Prospective Strategy 1: Intensifying Environmental Quality Management and Enriching Environmental Stewardship**

Efforts will be made to strengthen institutional arrangement for management of air and water quality. For air quality management, number of automatic air quality monitoring stations (CAQM) will be increase in critical areas and apply technologies & explore their potential to control & prevent pollutants to include private owned vehicle to conform to Vehicle Type Approval (VTA) and Road Worthiness Certification (RWC) under the Road Transport Act; Conformity of Production (COP) by setting up Motor Vehicle Emission Test Laboratory. There is also a need to strengthens regional cooperation on managing trans boundary haze pollution resulting from land and forest fires; emphasis on long term solutions in preventing haze episodes at national and regional level such as establishing integrated peat lands management particularly in identified peat land areas with high risk of fires, as well as continuously building manpower capabilities to manage such areas in a sustainable manner; enhance haze action plan by increasing the number of check dams, tube well etc. and procure equipment for enforcement of new Clean Air Regulation 2014 for air quality. For water quality management, the 11<sup>th</sup> MP will see the establishment of a "Centre of Excellence for Marine & Water Pollution Control"; enhancement of ground water quality management by establishing a National Ground Water Quality Standard and National Ground Water Quality Index; enhancement of marine water quality management by rationalizing monitoring network based on sources; establish the feasibility of implementing the Total Maximum Daily Load (TMDL) in inland water quality assessment; application of equipment and advance systems to carry out monitoring and control of water resources from potential pollution of designated rivers; installation of more

continuous (automatic) river water quality monitoring stations; implementation of marine water quality monitoring using remote and continuous detection vessel i.e. wave glider; and the upgrade of oil spills monitoring by means of aerial support i.e. unmanned aerial vessel. Plans are made to establish National Environmental (water) quality databank and clearing house mechanism.

For effective enforcement & compliance, efforts will be made to increase enforcement assets; enhance enforcement team with latest equipment for effective enforcement; develop standard operating procedure (SOP) for environmental forensic investigation; conduct rationalisation of enforcement approach based on sectors, sources and polluted area; set up joint committee to review environmental provisions that are overlapping, as well as review existing regulation to institutionalise self-regulatory principle; promote self-regulation to industries through incentives and facilitative approach; promote enforcement programs to increase number of competent person to operate pollution control systems and its instrumentations; apply remote monitoring & enforcement and enhance self-reporting of compliance on environmental regulations including the new Clean Air Regulation 2014.

The existing EIA guidelines will be reviewed /revised for the purposes of enhancing EIA procedures and decision making process. Furthermore, efforts will be made to develop technical guidance document for performance monitoring on EIA projects; formulate and implement a regulation for the registration of qualified person in managing EIA; establish the feasibility of setting up a professional environmental board in regulating environmental practitioners and developers; establish Post EIA enforcement taskforce under NRE and establish an on-line alert system for monitoring of pollution impact from EIA activities.

Policies and legal framework will also be formulated through the development of regulation on noise pollution control; Road Worthiness Certification (RWC) for private owned vehicle under the Road Transport Act; Benzene Recovery from Petrol Station; guidelines on proper handling and disposal of CFC or any unwanted ODS; as well as formulate policies on recycle and recovery equipment from ODS servicing premises for air quality. For water quality, regulations to mitigate and control Groundwater Pollution; regulation and standard for marine pollution control and enhancement of inventory of pollution sources and predicting pollution loads will be carried out. In formulating policies and legal framework for enforcement and compliance, efforts will be made to review existing law and develop new regulations for the new approach in conducting enforcement; formulate regulations on pig rearing and its effluent discharge as well as restaurant discharge; develop self-regulation criteria and implement according to types of industries and implement the new Clean Air Regulation 2014 including Notification and Guidance documents. Under the purview of green industry, plans are made to review the Environmental Quality Act 1974 by introducing specific provision on Green Industry and Cleaner Production and develop regulations and guidelines on green industry practices. Plans are also made to formulate guideline and standard to integrate the environmental dimension in the National Highlands Policy; formulate and implement requirements for Erosion and Sediment Control Plan (ESCP) to be made mandatory for development activities on hill slopes, highlands and catchment area for the purposes of EIA.

For effective enforcement & compliance, efforts will be made to implement third audit party and procure equipment to enforce EQA 1974. For the purposes of EIA, efforts will be made to develop specific EIA Guidelines for prescribed activities of the new amendments of EIA Order 1987; develop EIA specific guideline on forestry and agriculture sectors; develop manual for stakeholder participation process in EIA project and formulate the National Environmental Strategy (NES) and actions. In addition, efforts will be made to develop new application systems; enhance existing application system; enhance existing ICT/GIS infrastructure and replace obsolete ICT/GIS infrastructure to ensure that environmental management are well supported through its application.

Policies and legal framework will also be formulated through a study to identify background and current level of BTEX in ambient air and by conducting feasibility assessment before introducing Remote Sensing Devices (RSD) to detect smoke emission from vehicles for air quality, whereas regulations for marine and groundwater pollution control and the review National Water Quality Standards and Water Quality Index will be made for water quality.

#### **4.2.2 Prospective Strategy 2: Integrating Environmentally sound chemical Management, Managing Contaminated land and Establishing & Operationalizing Strategic Environmental Assessment (SEA)**

Efforts to integrate environmentally-sound chemical management are through developing National Implementation Plan for implementation and obligation of relevant conventions; identify, enhance and expand the scope of the existing testing facilities and upgrading the existing facilities; establishing database on chemicals; developing National Chemical Inventory; developing an interface link notification and registration system between agencies and all chemical stakeholders; developing chemicals risk assessment guidelines; develop roadmap for risk management measures including phasing out planning for hazardous substance and developing incentives for promoting of industry's participation in chemical management. In managing contaminated land, efforts will be made to establish special unit/task force in DOE handling contaminated land issues; reviewing appropriate economic instrument for addressing contaminated land management issues in a proposed regulation; studying appropriate assisting standard on contaminated land issues that has practises in various country and to propose Malaysian Standard; tabling the propose regulation for endorsement and gazettelement; establishing demonstration project for ten (10) categories of contaminated land; establishing a computerised Contaminated Land Inventory System (e-CLIS) which is integrated with DOE's databank intelligent system and establishing certification program to qualify those eligible to be competent in land management. For the purposes of implementing the abovementioned strategy, efforts will be made to strengthen institutional arrangement through development of technical guidance on procedural requirements and scoping of SEA and establishment of a regulating body.

Policies and legal framework will also be formulated through formulation of legislation on regulating and prescription for SEA document; formulation of chemical management legislation, drafting new regulation on management of contaminated

land in Malaysia and to prepare instruments for ratification of Stockholm and Minamata Convention in Mercury.

#### **4.2.3 Prospective Strategy 3: Greening of Industries**

For the purposes of implementing the abovementioned strategy, efforts will be made to strengthen institutional arrangement by establishing a Green Industry Division for DOE as well as reviewing relevant SOPs to incorporate Green Industry concept and application. In addition, in promoting green industry, efforts will be made to establish post Audit and Monitoring sub-unit to carry out Green Industry auditor registration scheme to provide technical assistance to industry. Furthermore, plans are also made to establish the Green Industry unit in 14 DOE state offices. Efforts will also be made to upgrade Malaysia Green Industry Databases (MGID) and Cleaner Production Implementation Tools (CPIT) which is user friendly.

### **4.3 Prospective Strategies for Waste Management**

There is a growing understanding on the negative impacts that solid waste can have on the local environment (air, water, land, human health etc.) and also on climate change. It is also being recognized that valuable habitats and biodiversity are being threatened by improper management of these waste. The Government are also realizing that the increasing complexity, costs and coordination for solid waste management require multi-stakeholder involvement at every stage of the waste management value chain.

Waste management still remains one of the costliest public services as conventional waste management systems are not well suited to deal with increased waste generation rates and new and special waste streams. In most cases, the revenues from waste management activities are not large enough to compensate for the expenditures.

The approach to waste management in many developing countries has been rather piecemeal – concentrating on certain aspects of waste management, e.g. collection or disposal. However, in many developing countries, authorities have realized that waste contains valuable components, which can be recovered as materials for recycling and as a resource to generate energy and thus applied as a substitute for fossil fuels. Waste is now being looked upon as a resource.

There is a clear need for strategies to redesign conventional waste generation systems in such a way that they can effectively and efficiently handle growing amounts of waste with diversified waste streams. To respond to this need, the work plan for the focal area on integrated waste management proposes to promote an integrated approach to solid waste management, which will enable Governments to reduce the overall amount of waste generated and to recover valuable materials for recycling as well as for the generation of energy. This has the potential to augment the revenue streams of waste management activities, which will, in turn, help to compensate the expenditures for the overall costs of solid waste management.

The proposed Integrated Waste Management Programme has 5 key objectives as follows:

- (i) To create an Integrated Waste Management platform for Solid Waste Management;
- (ii) To create a Business Model to meet the supply and demand from waste industries and catalytic projects;
- (iii) To strengthen Institutional Framework and Human Capital Development;
- (iv) To promote Waste minimization and maximum waste diversion from landfill; and
- (v) To promote CEPA.

Meanwhile, the contribution of the agricultural sector to the nation's growth is undeniable. The sector is constantly under pressure to increase agriculture productions to feed a rapidly increasing population and to discover an economic engine to encourage economic growth and shrink social poverty. More production means more wastes to be created. Hence, management of agricultural waste is highly essential under the 11<sup>th</sup> MP in order to create an appropriate managing system including collection and utilisation of agricultural wastes in reducing illegal dumping and environmental impact while removing organic wastes from being placed into landfill areas. A related policy to this is shaping up with the drafting of Green Technology Foresight 2030 - Volume 2 Agricultural Sector.

There are a number of measures put forward proposals to ensure proper management of waste electrical and electronic household more efficiently and can be managed in a holistic comparable developed countries to another. Clear direction and strategy with specific action plans to ensure that the management of waste electrical and electronic household becomes effective. The main direction is to integrate the collection system and E-waste collection from households through the existing collection 2 +1 system is carried out by the National Solid Waste Management Department (JPSPN). A coordinated schedule collection from residential areas as well as from the shops of electrical and electronic products including hyper / supermarket must be done by a licensed contractor under the supervision of JPSPN/Solid Waste and Public Cleansing Management Corporation (PPSPPA). A strategic plan need to be established for the upgrading of these E-waste centres collection in each local authority area to encourage the public to make waste segregation at home and dispose it properly.

The next direction is to create specific legislation for the management of E-waste from households. In the preparation of the relevant laws in both the public and private sectors will be introduced to the concept of Extended Producer Responsibility and Polluter Pay Principle and also to create a Recycling Fund. Also, the next direction will be to increase public awareness programs and campaigns on the importance of managing E-waste from households through strategies and programs such as publicity through electronic media and print media. The government also need to ensure the participation of the State Assembly in the program, recommend and engage civilians in the program organized by Friends of Environment, provides information through screening a documentary about the impact of E-waste management business from households and the effects on health and the environment if E-waste is not properly managed.

To ensure that the collection and disposal of clinical waste generated by hospitals / clinics and private well managed and did not cause adverse effects to public health and the environment, then the direction of clinical waste management will involve the effective and efficient management of clinical waste, the usage of efficient treatment and disposal technology, the establishment of effective enforcement program and the effective and appropriate actions to address the case of an accident during the transport of clinical waste And lastly, the National Mineral Policy 2 (NMP2) has outlined nine (9) objectives and among them is to ensure that the environmental stewardship needs to be incorporated throughout the mine development process (mine for closure). This can be achieved through several measures such as the implementation of effective mine waste management and the progressive and post mining rehabilitation. The objectives of the mine waste management plan are to prevent or reduce waste production and its harmfulness, to encourage the recovery by means of recycling, reusing or reclaiming such waste, and to ensure short and long-term safe disposal of it.

Holistically, in the 11<sup>th</sup> MP we proposed for Malaysia to move towards an Integrated Waste Management system, whereby all waste generated in Malaysia is managed in a sustainable and holistic manner while ensuring that it is not solely dependent on the government funding. Waste management should endeavour to have more PFI based models promoting RE and sales of waste products.

#### **4.3.1 Prospective Strategy 1: Establishing Integrated Waste Management**

For the purposes of implementing the abovementioned strategy, efforts will be made to strengthen institutional arrangement in relation to specific waste. For solid waste, efforts to move towards an Integrated Solid Waste Management is proposed through Public-Private Partnership (PPP) or PFI for specific and related waste; creating integrated comprehensive, efficient and economically viable system; creating systematic waste flow and collections and facilities for remote / rural areas. For agriculture waste, efforts will be made to create an appropriate system including collection and utilisation of agricultural wastes in reducing illegal dumping and environmental impact and removal of organic wastes from placed into landfill areas through methane trapping from oil palm mill and livestock waste for energy or fuel and development of composting plant to process agricultural waste. For electric and electronic waste, plans will be made to integrate the collection system of household electrical and electronic waste collection under system 2+1 by JPSPN through the collection from household by the solid waste collection concessionaire; implementation of segregation and E-waste transfer as well as processing and recycling. With regards to scheduled waste, efforts will be made to ensuring the efficient and effective management of clinical waste through preparation of inventory data generation integrated waste; preparation or update SOPs handling clinical waste; construction of facilities for safe transit at each hospital; ensuring the Use of Environmental Friendly Technology by conducting review of "Best Technology Available" and according to clinical waste management in Malaysia; as well as conduct research clinical use waste as fuel for energy production of heat or electricity. For radioactive waste, efforts will be to manage radioactive waste safely for the protection of public safety and the environment in the present and future without burdening future generation by developing national radioactive waste disposal facilities.

Policies and legal framework will also be formulated to promote or enforce segregation at source, promote the uptake of raw materials from recycled materials and develop products utilizing recycle packaging, increase the number of environmentally friendly technologies and create One Stop Centre (OSC) at national level to implement waste minimisation and ensure maximum waste diversion from landfill for solid waste; creating a specific Regulations for E-waste from households to ensure legislation is empowered for electric and electronic waste; strengthen enforcement by implementation of an integrated enforcement and increase readiness to deal with environmental accidents through preparation of the ERP to transport clinical waste for scheduled waste and establishing policies include management of NORM and radioactive spent fuels for radioactive waste.

To manage radioactive waste safely for the protection of public safety and the environment in the present and future without burdening future generations, efforts will also be made to develop a national inventory of radioactive waste.

#### **4.3.2 Prospective Strategy 2: Creating New Business Model**

For the purposes of implementing the abovementioned strategy, efforts will be made to strengthen institutional arrangement for solid waste through the creation of a Business Model to meet the supply and demand from waste industries and catalytic projects by developing pioneer projects through PPP, PFI or FDI initiatives and strengthen enforcement by PPSPPA or local authorities. Policies and the appropriate legal framework will be formulated for the said purpose by introducing and implementing Buy Back Policy; develop incentives to the Industry as well as introduce and implement policies that required to buy local feedstock generated from waste.

#### **4.3.3 Prospective Strategy 3: Adapt and Adopt New Technology**

The implementation of the abovementioned strategy will be geared towards strengthening capacity building by developing the ability to analyse the system and advanced technology for radioactive waste as well as mining waste.

#### **4.3.4 Prospective Strategy 4: Continuing On-Going Strategy on Waste (merged with 4.3.1)**

For the purposes of implementing the abovementioned strategy, efforts will be made to move towards an Integrated Solid Waste Management by implementation and application of Act 672 throughout Malaysia for solid waste, as well as strengthen existing law and guidelines on radioactive waste.

### **4.4 Cross- Cutting Issues (MERGED ALL)**

#### **4.4.1 Communication, Education and Public Awareness (CEPA)**

Under biodiversity and forestry sector, a focused national CEPA communication and engagement plan will be developed. The plan is envisaged to include activities such as establishing mechanisms for sharing of knowledge, expertise and experiences and forming strategic alliances to promote, encourage participation in biodiversity and forestry conservation and evaluation of CEPA's programs. This plan will be operationalised in a strategic, coordinated and consistent manner. Strategy on mainstreaming biodiversity will include engaging and collaborating with politicians, policy makers, local communities and industry in the mainstreaming process especially in incorporating better management practices and balancing the need to development in various sectors (agriculture/ plantations/ transportation/ housing development) and biodiversity conservation.

~~Efforts to enhance CEPA For environmental management, the implementation of Prospective Strategies 1 to 4 shall be supported by efforts to enhance CEPA will be implemented for all prospective strategies. Under Prospective Strategy 21, efforts will be made to enhance dissemination of effective environmental information through publicity. RAS promotional programs and collaboration with other ministries, agencies, local authorities and NGOs; promote Public Outreach Programme on air and water quality; coordinate river appraisal and public assessment programme, carry out the Green Industry demonstration project, promote program on performance monitoring and third party auditing as self-regulation; establish commitment of the Local Community Leader to ensure the environmental education and awareness programs reached the community; enhance CEPA Program and expand networking mechanism with government agencies and NGOs; and promote relevant Environment Institute of Malaysia (EiMAS) training modules to 1Malaysia Training Center (1MTC).~~

For **Prospective Strategy 12**, efforts will be made to promote SEA to public sector, private initiators and relevant stakeholders; establish strategic alliances with private sector, NGOs, research institutions and universities in enhancing public awareness and participation in creating insight understanding and pragmatic of SEA; develop chemical management syllabus for formal education in school and universities; promote awareness and education on hazardous substances; conduct stakeholders engagement and consultation process for strengthening the proposed regulations as well as promote a holistic approach of contaminated land management system in Malaysia. ~~CEPA efforts under Prospective Strategy 32 will also focus on creating friend of environment (Rakan Alam Sekitar-RAS) Center for the whole nation (Pusat RAS 1Malaysia) and leaders (RAS Captains) within 222 parliamentary constituency; imparting environmental knowledge to community leaders in instilling environmental awareness and commitment, promoting awareness to stakeholders, decision makers, and practitioners on air and water quality; promoting the new Clean Air Regulation 2014; promoting Public Outreach Programs for local driven initiatives and commitment towards appraisal and assessment of a river within the community; organizing the Government appraisal event to support local initiatives; enhance and encourage stakeholder's consultation in environmental management; conducting Green Industry promotion and awareness program through exhibition, seminar, dialogue and mass media; hosting dialogues/forums with various stakeholder groups (project proponents, government agencies, NGOs, consultants, etc) to disseminate information about upcoming regulations, guidelines and standards, solicit feedback and build support; continuing recognition program by developing Local~~

Environmental Figures (Tokoh Alam Sekitar); evaluating local communities' commitment based on awareness indicator and ongoing engagement and participation in enhancing community based programmes.

~~Under **Prospective Strategy 2**, efforts will be made to enhance dissemination of effective environmental information through publicity, RAS promotional programs and collaboration with other ministries, agencies, local authorities and NGOs; promote Public Outreach Programme on air and water quality; coordinate river appraisal and public assessment programme, carry out the Green Industry demonstration project, promote program on performance monitoring and third party auditing as self-regulation; establish commitment of the Local Community Leader to ensure the environmental education and awareness programs reached the community; enhance CEPA Program and expand networking mechanism with government agencies and NGOs; and promote relevant Environment Institute of Malaysia (EiMAS) training modules to 1Malaysia Training Center (1MTC).~~

~~CEPA efforts under **Prospective Strategy 3** will focus on creating friend of environment (Rakan Alam Sekitar RAS) Center for the whole nation (*Pusat RAS 1Malaysia*) and leaders (RAS Captains) within 222 parliamentary constituency; imparting environmental knowledge to community leaders in instilling environmental awareness and commitment, promoting awareness to stakeholders, decision makers, and practitioners on air and water quality; promoting the new Clean Air Regulation 2014; promoting Public Outreach Programs for local driven initiatives and commitment towards appraisal and assessment of a river within the community; organizing the Government appraisal event to support local initiatives; enhance and encourage stakeholder's consultation in environmental management; conducting Green Industry promotion and awareness program through exhibition, seminar, dialogue and mass media; hosting dialogues/forums with various stakeholder groups (project proponents, government agencies, NGOs, consultants, etc) to disseminate information about upcoming regulations, guidelines and standards, solicit feedback and build support; continuing recognition program by developing Local Environmental Figures (Tokoh Alam Sekitar); evaluating local communities' commitment based on awareness indicator and ongoing engagement and participation in enhancing community based programmes.~~

Under **Prospective Strategy 43**, efforts will be made to enhance the usage of Green Industry Virtual Centre (GIVC) to promote and share Green Industry initiatives or CP and other relevant information; To promote SMEs to adopts green industry and to have dialogue or meeting with the relevant stakeholders regarding the incentives and financial support; To have dialogue or meeting with the relevant stakeholders regarding the incentives and financial support; To share information on Green Industry with visitors from all over the world; To establish Green Industry awards or recognition scheme for successful industry implementing Green Industry practices; To hold meetings or discussions at national level on Green Industry and local stakeholders such as industry associations and government agencies.

For waste management, the implementation of Prospective Strategies 1 and 2 shall be supported by efforts to enhance CEPA. ~~For-Under~~ **Prospective Strategy 1**,

efforts ~~will be made~~ to enhance CEPA for solid waste will be made through public education at young level on the “*Not-In-My-Backyard*” (NIMBY) syndrome; conducting effective awareness and public and community engagement programs; conducting new and effective media programs and obtaining CSR expenditure from private companies for educational and awareness programs and conducting effective. For electric and electronic waste, CEPA will be enhanced through increased promotional programs and public awareness through electronic media and print media; participation in programs organized by RAS; conveying information about the impacts of E-waste management and its effects on environmental health and creating an attractive incentive for each item of E-waste collected and recycled. Public awareness programs relating to radioactive waste management as well as Acid Mine Drainage (AMD) and heavy metals management will also be conducted.

Under **Prospective Strategy 2**, the creation of the Business Model to meet the supply and demand from waste industries and catalytic projects by utilising CSR expenditure will also require CEPA.

#### 4.4.2 Strengthening Capacity Building

Biodiversity and forestry management require sufficient manpower and expert training. Under the 11th MP, efforts will be made to strengthen capacity building and human resource development through intensification of these two aspects, developing expert exchange programs, building capacity of government agencies to manage biodiversity and forestry, building capacity for negotiators of biodiversity and forestry related MEAs and forums and strengthening the capacity of stakeholder groups in managing forests and biodiversity and organizing CEPA related programs.

For environmental management, the implementation of Prospective Strategies 1 to ~~43~~ shall also be supported by efforts to strengthen capacity building. For Prospective Strategy ~~21~~, efforts will be made to enhance the human capital of DOE on research capabilities and special studies on emerging environmental issues for appropriate action and formulate and implement regulation on requirement for Competent Person to handle environmental deliverables for DOE’s approval, intensify capacity building & exploring new environmental control strategies; enhance certification program for competency in implementing new Clean Air Regulation 2014, strengthen training exercise on National Oil Spill Response & Preparedness, train enforcement officers to handle equipment professionally; develop Subject Matter Expert in DOE in all environmental related issues; review and incorporate Corruption Risk Management (CRM) into DOE’s code of conduct and ethics of enforcement officers; carry out competency programme for Green Industry Auditor for DOE officers, industries / consultants and government agencies and local authorities; enhance competency through training, knowledge sharing, attachment programme with relevant public and private sectors on EIA; develop technical communication and negotiation skills on EIA; develop training operation plan for specific stakeholders on EIA; strengthening the competency program for EIA project on self-monitoring of environmental quality, ESCP sampling and environmental officers, enhance human capital on National Registry of Certified Environmental Professional (NRCEP) on monitoring of self-regulation activities and for on-line

submission of Continuous Professional Development (CPD) Hour; enhance human capital for evaluation / accrediting training courses offered by training provider with CPD hour; enhance certification training programs for consultants, and service providers handling environmental requirements, enhance human capital on the competency of assessing greening of industries as well as to enhance dissemination of environmental information, through publicity, RAS promotional programs and collaboration with other agencies for CEPA purposes.

~~For Prospective Strategy 3~~Furthermore, efforts will be made to enhance training facilities and infrastructure including pilot plant, pollution control equipment and hands-on demonstration project; intensify capacity building and exploring new environmental control strategies; enhance capacity building of service technicians in ODS related industries; enhance human capital on implementation of the new Clean Air Regulation 2014, train and certifies competent personnel and dedicated team in the field of monitoring and environmental forensic; train personnel using water quality assessment tools; train participants from government agencies for continuous alert and preparedness to mobilise Oil Spill Combat and Contingencies; create Water Quality Monitoring Taskforce unit to enable special and emergency expert mobilisation to tackle fast and quick action response to complaints, chemical and hazard spills into rivers, water resource area as well as sensitive water bodies, address human civil rights in enforcement and compliance, carry out training attachment programme in Green Industry for DOE office as well as enhance competency through training, knowledge sharing, development of subject matter expert for EIA purposes. Efforts will also be made to enhance human capital on specific industrial training and Certification Programme through certified agencies; collaborate with international or national institutions to generate Subject Matter Experts and post graduate studies and develop specific training modules.

For Prospective Strategy 2, it will be done through implementation of capacity building on a regulatory body in managing SEA; development of modules with National Institute of Occupational Safety and Health (NIOSH) and EiMAS training modules on life cycle management of chemicals for stakeholders; collaboration with international organization for technical assistance in relation to chemical management; share of knowledge and experience in chemicals management in international and regional setting; conduct training, workshops and seminars to build capacity on topics include toxicology, hazard assessment, exposure assessment and risk assessment; develop plan for cross sectorial training, workshops and seminar in good chemical management and to conduct seminars, demonstration project and data information sharing to agencies, private and relevant stakeholders.

Under Prospective Strategy 3, efforts will be made to carry out training attachment programme in Green Industry for DOE office; carry out Green Industry training and advisory program for SMEs and encourage the implementation of green industry practices for small and medium enterprises through scheduled training program.

For waste management, the implementation of Prospective Strategy 1 shall also be supported by efforts to strengthen capacity building for solid waste management by strengthening the Institutional Framework and Human Capital Development through the creation of a centralized database; developing a competent training program; creating a Solid Waste Management Training Centre; establishing a Centre of

Excellence (COE); and conducting a feasibility study on integrated facility. To manage radioactive waste safely, capacity building towards the development of Malaysia's ability to meet the requirements of agreements, treaties and international conventions on radioactive waste and spent fuel will be a focus under the 11<sup>th</sup> MP. Efforts will also be made to strengthen capacity building by establishing programs for the enforcement competence in the management of AMD and heavy metal in relation to mining waste.

#### **4.4.3 Legislation and Institutional Framework**

In order for the abovementioned strategies to materialise, there will be a need to review, revise and amend the existing policy, legislation and guidelines pertaining to biodiversity and forestry management. Formulation of new legislation and guidelines pertaining to forestry management and biodiversity will also be emphasised.

#### **4.4.4 Enforcement and Compliance**

To ensure compliance to our legislation and regulations pertaining to the utilization of biodiversity and forest resources, efforts will be made to develop procedures and guidelines and infrastructure for effective enforcement to strengthen enforcement institutions. Coordination between enforcement agencies will be strengthened to prevent encroachment in PRF/TPA and MPAs, poaching and illegal harvesting of biodiversity; establish and transboundary networking will be enhanced. The establishment of environmental forensics and intelligence networking in investigation, intensive and systematic surveillance using the latest technology available will assist enforcement units in curbing illegal activities.

#### **4.4.5 Research, Development and Commercialization (R,D&C)**

Efforts will be made towards intensification of R,D&C in the fields of biodiversity and forestry management and conservation for the purposes of improving scientific knowledge base, exploring new technologies for biodiversity and forestry related areas and enhancing sustainable utilization of the components of biodiversity, as well as to provide incentives for researches to ensure that all the above mentioned strategies is soundly supported.

### **5.0 CONCLUSION**

The 11<sup>th</sup> MP is a crucial phase in Malaysia's development plan in pursuit of the country's vision to achieve high income advanced nation status by the year 2020. To achieve this outcome, activities must also be in line with the country's commitment to promote sustainable development, which take into account economic, social and environmental aspects that had been articulated in previous development plans. It is therefore important to internalise the goals of environmental stewardship into all sectors of development to ensure that the benefits of development are not undermined by unsustainable practices. The proposed strategies in this strategy paper are necessary to fortify mainstreaming of environmental and natural resources management agenda in the country's development.