



Enhancing Environmental  
Sustainability through Green  
Growth





## Introduction

Sustainable development is the overarching principle underpinned by green growth initiatives to enhance environmental sustainability, while achieving higher economic growth and increasing resilience of the nation against climate change and disasters. Green growth will continue to be pursued to achieve a resilient, low-carbon and resource-efficient economy. The green growth initiatives will be intensified to safeguard natural endowment for present and future generations, reduce greenhouse gas (GHG) emissions and improve environmental quality for better wellbeing. Despite various initiatives undertaken during the review period, there are issues and challenges that still need to be addressed. These among others, include fragmented governance, limited green technology and products, degradation of natural resources and environment-related issues such as pollution, climate change and disaster risks.

In the remaining Plan period, 2018-2020, measures to advance green growth will be undertaken by strengthening governance, improving conservation of natural resources and biodiversity as well as enhancing resilience against climate change and natural disasters. In this regard, policies and legislations will be reviewed accordingly, while institutional capability is enhanced to ensure greater compliance and better enforcement. In addition, more focus will be given to conserve existing protected areas and rehabilitate degraded ecosystems as well as enhance the livelihood of indigenous and local communities (ILCs). Meanwhile, priority will be given on climate change mitigation and adaptation actions as well as disaster risk reduction (DRR). These measures are in line with the various multilateral environmental agreements ratified by Malaysia, which reflects commitment in addressing environmental issues while pursuing development objectives.



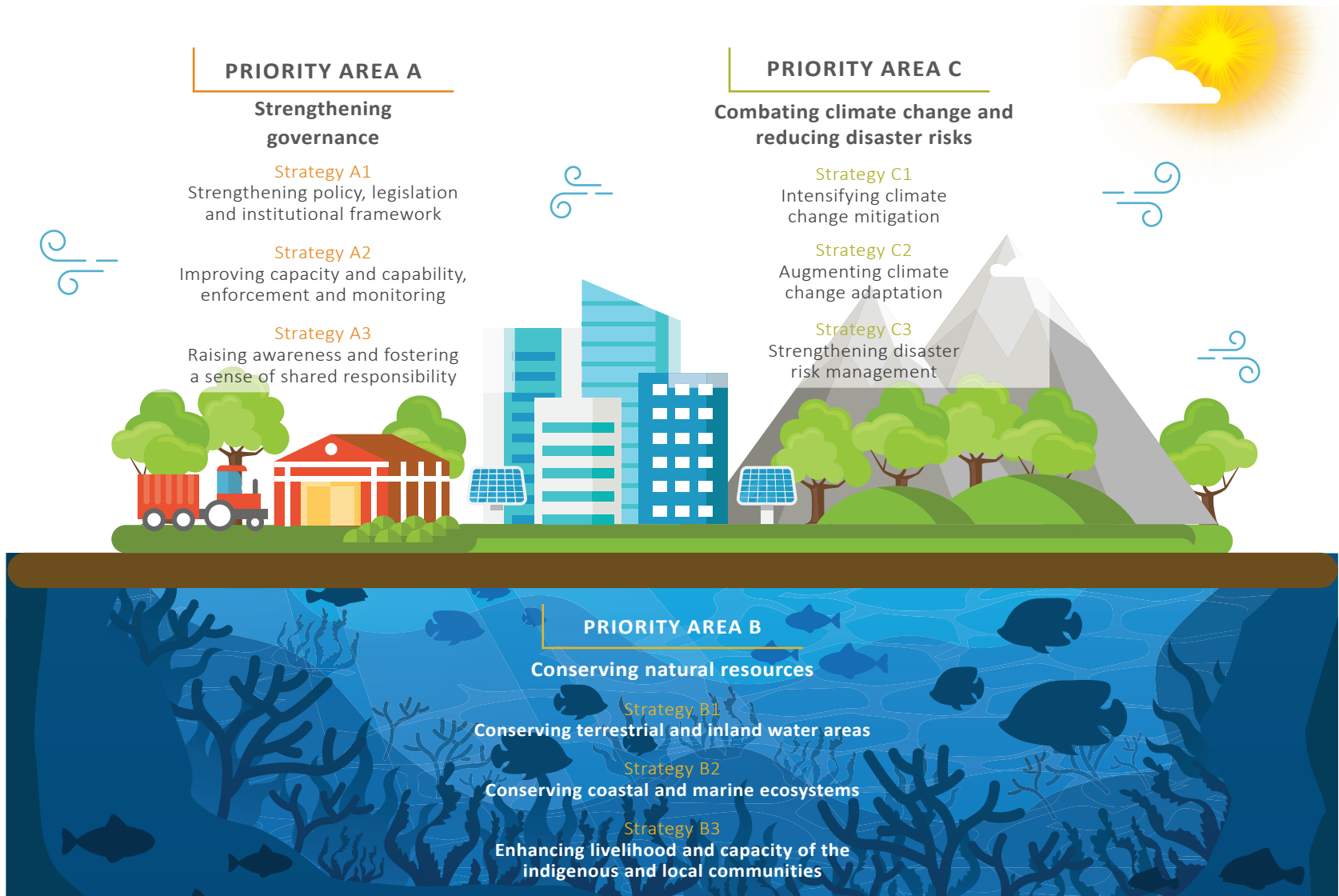
## New Priorities and Emphases, 2018-2020

Efforts towards green growth will continue to be pursued to enhance environmental sustainability. In this regard, economic growth will be harmonised with environmental sustainability, including improving resource efficiency and minimising pollution. In

the remaining Plan period, the priority areas and strategies towards enhancing environmental sustainability through green growth are as shown in *Exhibit 14-1*.

*Exhibit 14-1*

### Enhancing Environmental Sustainability through Green Growth





## Selected Targets, 2020

### Strengthening governance



Formulation of an act to enhance environmental governance

### Conserving natural resources

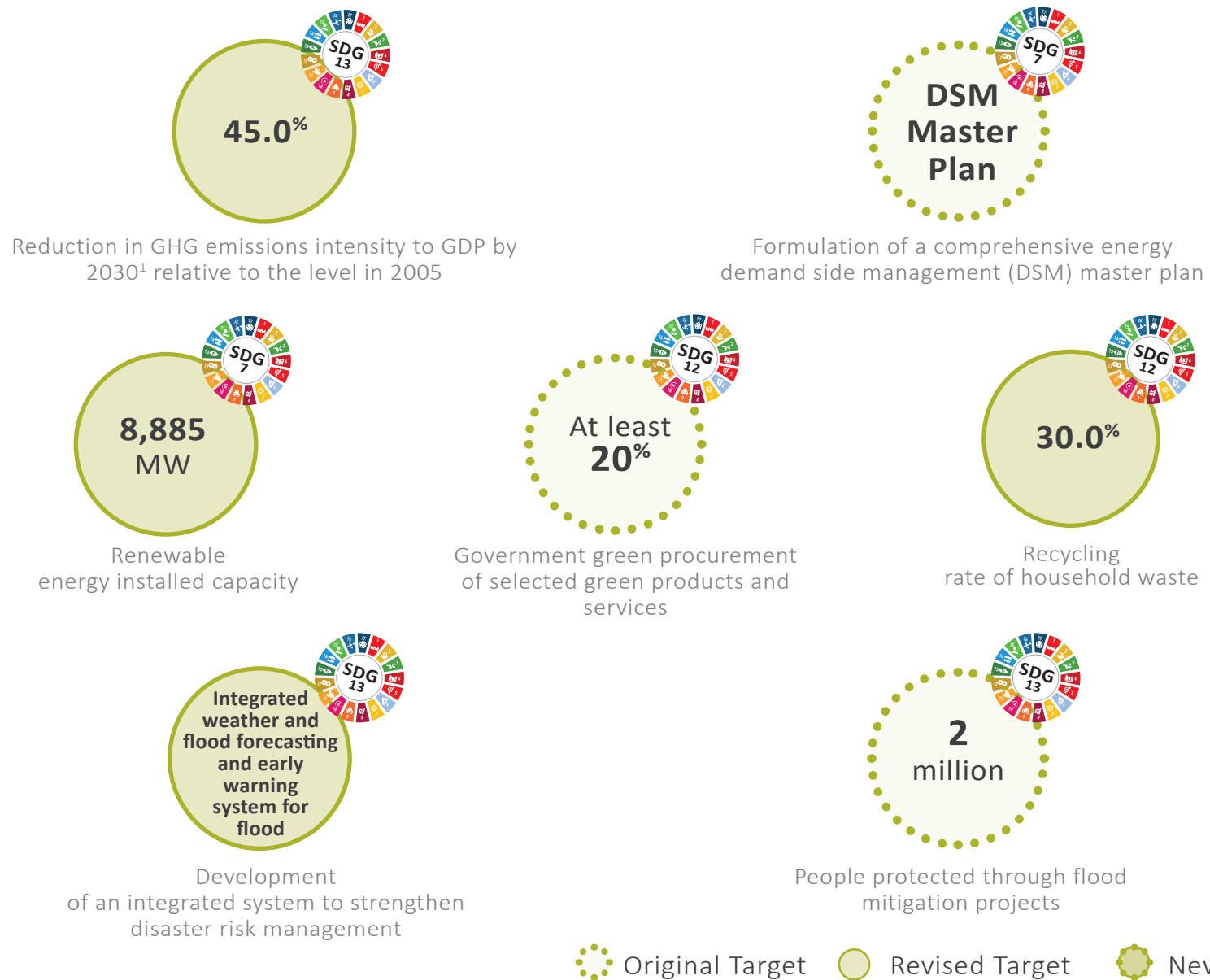


Coastal and marine areas gazetted as protected areas



Terrestrial and inland water areas gazetted as protected areas

## Combating climate change and reducing disaster risks



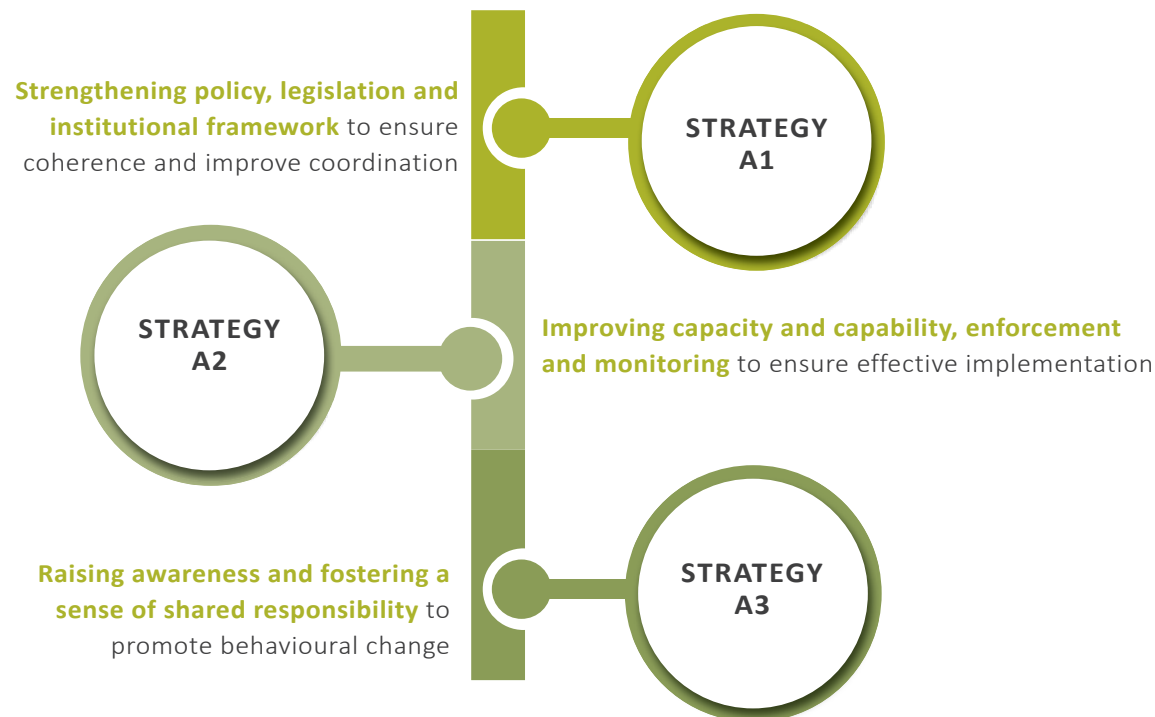
Notes: <sup>1</sup> In line with Malaysia's commitment to the Paris Agreement under the United Nations Framework Convention on Climate Change (UNFCCC) to reduce 45% of GHG emissions intensity to gross domestic product (GDP) by 2030 relative to the level in 2005.



## Priority Area A: Strengthening Governance

The current environmental governance is fragmented and lacks coordination, thus hindering efforts to achieve sustainable development. Towards this end, the Government is committed to facilitate the shift towards green growth and enable better

resource management. In the remaining Plan period, three main strategies to strengthen environmental governance will be implemented as follows:



### Strategy A1: Strengthening Policy, Legislation and Institutional Framework

The implementation of national environment-related policies as well as international environment goals and treaty obligations is contingent upon effective governance. Matters pertaining to environmental management is under the purview of various ministries and agencies, resulting in uncoordinated planning and ineffective implementation. In the remaining Plan period, focus will be given to enhance environment-related policies and legislations as well as strengthen institutional framework to ensure policy coherence and better coordination.

#### ***Enhancing environment-related policies and legislations***

The review of existing policies, legislations, standards and guidelines will be continuously undertaken and benchmarked against international standards and best practices to align with latest development and future needs. Meanwhile, new policies, legislations, regulations, guidelines and action plans will be formulated to enable a comprehensive management of the environment, natural resources and disaster risks. This will include the review and formulation of the following:

## Review of Policy and Legislation

- **National Forestry Policy 1978 (Revised 1992) and National Forestry Act 1984 to include protection of forest resources for the preservation of biodiversity and environmental stability**
- **National Policy on the Environment 2002 to include a comprehensive action plan, covering emerging environmental issues**
- **National Water Resources Policy 2012 to streamline and strengthen water resources management**

## Formulation of Policy and Legislation

- Policy on geospatial information management
- Policy on coastal zone development
- Policy on disaster risk management
- Legislation on environmental protection to replace existing Environmental Quality Act 1974
- Legislation on sustainable marine parks management
- Regulation on scheduled electrical and electronic equipment waste
- Regulation on land pollution control
- Regulations on enforcement of solid waste and public cleansing management:
  - Construction waste
  - Commercial, industrial and institutional waste
  - Licensing for provision of collection services for construction waste
  - Licensing for provision of collection services for commercial, industrial and institutional waste
- Guidelines on end of life strategy for scheduled waste management on abandoned vehicles
- Guidelines on collection and recycling of scheduled electrical and electronic equipment waste
- Guidelines in accordance to the Environmental Quality (Prescribed Activities) Order 2015 to enhance the Environmental Impact Assessment (EIA)
- Action plans on climate change mitigation and adaptation



### ***Strengthening institutional framework***

Institutional framework will be strengthened to improve coordination on the management of environment and natural resources at the Federal, state and local levels. In this regard, the Ministry of Energy, Science, Technology, Environment and Climate Change was established to ensure better coordination of energy, environment, climate change and green technology-related matters. In addition, the structure and functions of the National Green Technology and Climate Change Council will be reviewed to improve coordination on climate change actions at all levels. Meanwhile, establishment of the Ministry of Water, Land and Natural Resources will ensure a more comprehensive management of natural resources and water-related matters. The structure and functions of the National Water Resources Council will also be reviewed and state level councils will be established to ensure a more integrated approach to water resources and river basin management. The review will also look into ways to optimise water-related infrastructure, which will be supported by spatial water services database.

## **Strategy A2: Improving Capacity and Capability, Enforcement and Monitoring**

Limited capacity and capability of agencies has constrained efforts to enable a more efficient and effective environmental management. In the remaining Plan period, focus will be given to enhance capacity and capability, intensify enforcement and compliance as well as improve monitoring, evaluation and reporting. These initiatives will improve environmental quality through effective implementation in pursuit of green growth.

### ***Enhancing capacity and capability***

The effectiveness of institutions will be strengthened by developing competencies, research and technical expertise as well as new and scientific knowledge in environment-related areas. These areas include, among others, climate and water resource modelling and forecasting; disaster risk management; sustainable natural resource management; environmental assessment; and spatial information of water catchments and river systems. Expertise

in these areas is critical in ensuring a more holistic approach in planning and implementation of initiatives towards achieving sustainable development. Meanwhile, capacity and capability of institutions will also be enhanced through transfer of knowledge and skills among agencies to empower personnel at all levels as well as optimise resources in ensuring effective implementation of the national agenda. Furthermore, collaboration with international agencies will be strengthened to foster capacity building in relevant areas including sustainable consumption and production (SCP), disaster risk management as well as chemical substances and waste management.

### ***Intensifying enforcement and compliance***

Enforcement efforts will be intensified to ensure compliance with legislation and regulations. Joint enforcement efforts between environmental agencies and other relevant authorities will be further strengthened to ensure effective enforcement as well as to address issues of limited manpower and equipment. In addition, guided self-regulation among industries will be expanded to other areas such as noise and land pollution, apart from the existing air, water and hazardous waste pollution to ensure wider compliance to environmental standards. In this regard, related penalty and tariff mechanisms will be reviewed to provide an effective deterrent against environmental offences.

### ***Improving environment-related data for reporting, monitoring and evaluation***

Reporting, monitoring and evaluation will be improved with the development of appropriate mechanisms as well as enhancement of relevant indicators. The availability of data will enable better monitoring and evaluation of initiatives, subsequently enhancing decision-making on matters related to the environment. In this regard, a centralised data repository on natural resources, environment, disaster and Sustainable Development Goals (SDGs) will be established to improve data availability and accessibility. Thus, all relevant agencies and authorities will be required to regularly update and share data. Meanwhile, country specific GHG emission factors for the key emission sectors will be developed to improve GHG inventory estimations.



### Strategy A3: Raising Awareness and Fostering a Sense of Shared Responsibility

Efforts towards increasing awareness regarding environmental conservation and subsequently, translating awareness into action will be further intensified. Community involvement and a sense of shared responsibility towards the environment is still lacking despite the implementation of various awareness programmes. In the remaining Plan period, measures will be undertaken to enhance communications, education and public awareness (CEPA) as well as stakeholder involvement in promoting behavioural changes towards environmental preservation.

#### *Enhancing communications, education and public awareness*

Programmes on CEPA will be intensified to increase awareness on natural resources, environment-related issues and natural disasters among the various stakeholders. Awareness programmes will also educate the public on the preservation of the environment, especially in natural areas such as waterfalls, beaches and forests. Meanwhile, education on sustainable development will continue to be implemented in schools, institutions of higher education and teacher training centres to promote better understanding on environmental issues towards inculcating sustainable lifestyle.

#### *Encouraging stakeholder involvement*

Stakeholder involvement plays an important role in disaster risk management as well as environmental planning and governance. Greater involvement of private sector, academia, civil society and local communities will lead to better decision-making and increased support for effective project implementation. In this regard, collaborative efforts in monitoring and reporting detrimental activities on the environment will be undertaken more efficiently and effectively. Meanwhile, mechanisms to encourage active stakeholder involvement, particularly in resource management will be explored.

## Priority Area B: Conserving Natural Resources

Natural resources conservation aims to protect, preserve, manage and restore natural resources to ensure the sustainability of ecosystem services<sup>1</sup>. This conservation is also important to ensure current and future generations continue to have access to the natural resources. In the remaining Plan period, three strategies to conserve natural resources will be implemented as follows:



### Strategy B1: Conserving Terrestrial and Inland Water Areas

Contradictory priorities between socioeconomic development and environmental protection have led to degradation of natural resources and human-wildlife conflict. Environmental protection requires sustainable funding and innovative mechanisms to

<sup>1</sup> Based on the United Nations Environment Programme (UNEP), ecosystem services are the benefits people obtain from ecosystems. These benefits include provisioning services such as food and water; regulating services such as flood and disease control; cultural services such as spiritual, recreational, and cultural benefits; and supporting services such as nutrient cycling that maintain the conditions for life on Earth.



meet the increasing cost of conserving natural resources. In the remaining Plan period, initiatives will be undertaken to protect terrestrial and inland water areas, conserve and rehabilitate strategic national endowment as well as reduce human-wildlife conflict to ensure sustainability of ecosystem services.

### **Protecting terrestrial and inland water areas**

In safeguarding terrestrial and inland water areas for conservation and sustainable utilisation of natural resources, the government will gazette more areas as protected areas. The expansion of protected areas is as recommended in the National Physical Plan for Peninsular Malaysia, Sabah Structure Plan, Sabah Biodiversity Strategy and Sarawak Wildlife Master Plan. The protected areas will include buffer zones, dams, rivers, aquifers and water catchments throughout the country. In addition, efforts will be undertaken to strengthen cooperation with Brunei and Indonesia as well as establishing cooperation with Thailand on transboundary terrestrial protected areas. Meanwhile, action plans will be formulated in strengthening the network of national protected areas, particularly wetlands and environmentally sensitive areas.

Enforcement through the Malaysia Biodiversity Enforcement Operation Network (MBEON<sup>2</sup>) programme will be intensified to curb encroachment and poaching in protected areas. In this regard, legislations will be streamlined to enable resources from related agencies are mobilised in the enforcement activity. In addition, environmental forensics investigation, site remediation, legal support and resources will be strengthened to ensure successful convictions against illegal activities.

Sustainable financing mechanisms for terrestrial and inland water protected areas will be explored to fund biodiversity conservation. Preliminary findings from the biodiversity financing initiative study estimated a total of RM19 billion required for the implementation of the National Policy on Biological Diversity, 2016-2025 for

the period of 2018 to 2025. In this regard, a financial resource mobilisation plan will be developed to identify suitable financing mechanisms for biodiversity conservation. Meanwhile, the payment mechanisms for ecosystem services will be enhanced and expanded nationwide to recognise the natural resources as an asset to the state. In this regard, state government will be encouraged to adopt the mechanism that involves payment for the utilisation of natural resources, for instance, payment by utility provider<sup>3</sup> to the state government in micro hydro project for conservation.

Charges and fees associated with the utilisation of natural resources such as entrance fees to national parks will be reviewed for better conservation and management of natural resources and ecosystem services. This initiative is also expected to heighten public appreciation for the environment. Meanwhile, programmes and activities under the National Conservation Trust Fund will be repackaged based on the interests of the donors to attract more contributions.

### **Conserving and rehabilitating strategic national endowment**

Reforestation efforts will be expanded to rehabilitate degraded forest areas, among others, through 1,640 hectares of tree plantation programme. In addition, forest enrichment programmes will be pursued in ecological corridors<sup>4</sup> to increase and improve the connection of wildlife passages in the Central Forest Spine and Heart of Borneo projects. Wild flora and fauna will continue to be protected by increasing conservation efforts in the natural habitat (*in situ*) and outside the natural habitat (*ex situ*). These conservation efforts will be implemented, among others, through forest enrichment programmes as well as breeding and restocking of selected endangered species<sup>5</sup> for flora and fauna. Meanwhile, appropriate technology such as advanced reproductive technology to better manage wildlife population will be utilised. In addition, the national red list index for endangered species as well as wildlife database will continue to be updated.

<sup>2</sup> The MBEON programme adopts a cost optimisation approach through the collaboration and sharing of resources to conduct joint patrols in national parks to control poaching of wildlife and preserve biodiversity. The ministries and agencies involved include the Ministry of Water, Land and Natural Resources, the Forestry Department Peninsular Malaysia, the Malaysia Armed Forces, the Malaysia Civil Defence Force, the Johor National Parks Corporation and the Perak State Parks Corporation.

<sup>3</sup> Tenaga Nasional Berhad pays the state government of Perak for the use of water in micro hydro projects to finance conservation efforts in that area.

<sup>4</sup> Ecological corridor is an area of habitat connecting wildlife populations separated by human activities or logging or structures such as roads and development.

<sup>5</sup> Selected endangered species of flora include *keruing layang*, *asam batu* and slipper orchid, whereas fauna include elephant, tiger and gaur.

Sustainable forest management will be intensified by strengthening capacity building on forestry certification, as well as quality management system and standards. In addition, advanced technologies will be adopted to increase effectiveness of monitoring and enforcement to reduce illegal logging. Furthermore, engagements between Federal and state governments will also be intensified to enhance adherence to the logging quota set by the National Land Council.

Collaboration between related parties will be enhanced to promote more natural parks to be listed as the World Heritage Sites under the United Nations Educational, Scientific and Cultural Organization (UNESCO). Meanwhile, efforts will be undertaken to increase conservation and restoration of water catchment through Integrated Water Resources Management and Integrated River Basin Management initiatives to better manage water resources and river basins. Additionally, the design of water infrastructures such as dams, barrages and flood mitigation structures as well as water and sewerage treatment plants will be revised to optimise benefits to related sectors.

### **Reducing human-wildlife conflict**

Forest fragmentation<sup>6</sup> creates potential human-wildlife conflict due to encroachment into natural habitat of the wildlife. In this regard, species conflict management plans will be formulated to provide a holistic framework for the related agencies. Meanwhile, more wildlife sanctuaries will be established and *in situ* forest enrichment programmes to increase food resources will be implemented towards conserving wildlife in natural habitats. In addition, more ecological corridors will be established to ensure protected areas are well connected, forming integrated contiguous areas. Other measures to mitigate human-wildlife conflict include securing animal passages, such as adjusting road alignment and constructing viaduct or tunnel. Furthermore, the management of transboundary forest, advisory services and awareness campaigns as well as community-based wildlife translocation and electric fencing programmes, will be improved.

<sup>6</sup> Forest fragmentation is the breaking of large and contiguous forested areas into smaller parts due to roads, agriculture, utility corridors, subdivisions or other developments.

## **Strategy B2: Conserving Coastal and Marine Ecosystems**

Coastal and marine ecosystems have contributed to the socioeconomic development and provided environmental security as natural buffer against coastal erosion, big wave and rising sea level. However, unsustainable practices, insufficient enforcement and uncontrolled development activities over the years have resulted in the degradation of coastal and marine ecosystems. In the remaining Plan period, efforts will be undertaken to strengthen governance as well as protect and conserve coastal and marine ecosystems to ensure sustainable utilisation of ocean resources.

### **Strengthening coastal and marine ecosystems governance**

Sustainable management of coastal and marine ecosystems requires an integrated approach in development planning and decision-making between ministries and agencies, as well as state and local governments. Stakeholder engagement programmes will be intensified to facilitate and coordinate all ocean-related issues. In addition, a national ocean policy to ensure the conservation of sustainable ocean resources will be explored. Meanwhile, the development of a marine spatial plan will also be explored to take into account the development needs of various sectors comprehensively in ensuring sustainable marine resources usage.

An assessment on the carrying capacity of selected resort islands and marine parks, such as Pulau Tenggol in Terengganu, Pulau Besar in Melaka and Pulau Payar in Kedah will be implemented to ensure sustainable development of the islands. In addition, enforcement activities will be strengthened through intensifying joint programmes among relevant agencies as well as improving capacity and capability of the enforcement personnel. Penalties will be reviewed to reduce illegal and detrimental activities that will endanger coastal and marine areas. Furthermore, awareness campaigns will be intensified to educate tourists and local communities on the importance of conserving coastal and marine ecosystems.



### ***Protecting and conserving coastal and marine ecosystems***

Efforts to gazette marine protected areas (MPAs) will be intensified through continuous consultations with state governments. Management plans for fisheries prohibited areas and new MPAs will be formulated to ensure sustainable population growth of targeted species. Meanwhile, ecosystem-based approach for fisheries management will be promoted to ensure sustainability of fish stock. Research and development (R&D) on marine life will also be intensified to increase the yield of marine biodiversity. In addition, migratory pathways of selected marine life will be identified, mapped and protected to ensure survival of the species. In this regard, an action plan will be formulated to strengthen the network of MPAs focusing on expanding the under-represented ecosystems such as coral reefs, seagrass beds and turtle nesting beaches. Meanwhile, implementation of Coral Triangle Initiative (CTI) will be intensified to strengthen transboundary MPAs cooperation with participating countries<sup>7</sup>.

### **Strategy B3:**

#### **Enhancing Livelihood and Capacity of the Indigenous and Local Communities**

Most of the ILCs that live near the forest, water catchments, rivers and marine areas are highly dependent on natural resources for the livelihood, exerting pressure on these resources. Meanwhile, ILCs who are actively involved in the conservation of natural resources, need support from the public, private and international organisations. In the remaining Plan period, initiatives will be implemented to promote alternative livelihood for ILCs to reduce dependency on natural resources as well as encourage conservation efforts among the ILCs.

#### ***Promoting alternative livelihood for indigenous and local communities***

Alternative livelihood for the ILCs will be promoted to reduce dependency on natural resources by providing new sources of income. As part of the efforts to empower ILCs in generating additional income, the ongoing nature tourist guide course and

the entrepreneur cooperative development programmes will be expanded to involve more ILCs. In addition, the enforcement of the Access to Biological Resources and Benefit Sharing Act 2017<sup>8</sup> will be strengthened to ensure profits generated from commercialisation of natural resources and traditional knowledge are shared with ILCs.

#### ***Promoting conservation of natural resources among the indigenous and local communities***

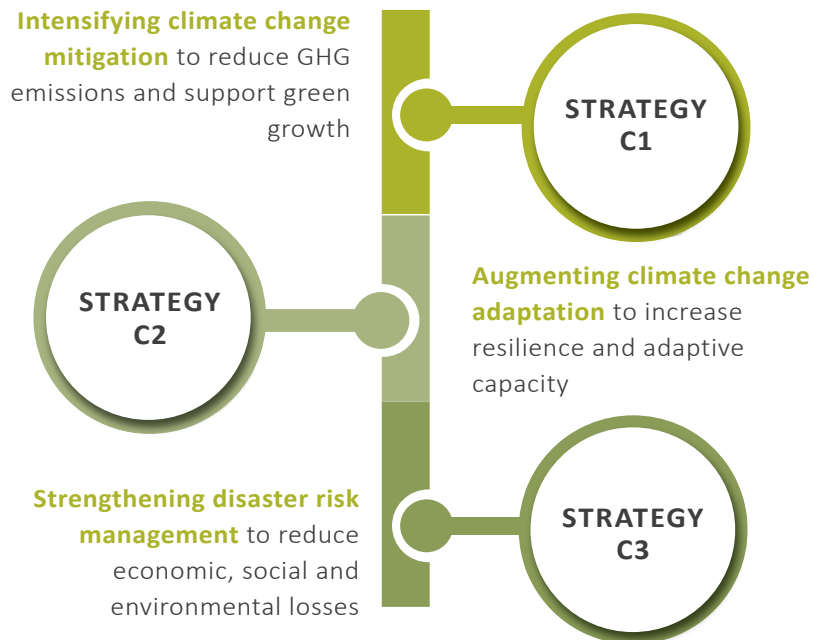
Capacity building and awareness programmes by public, private and international organisations will be further encouraged to support ILCs who are actively involved in the conservation of natural resources. In addition, local champions within ILCs will be identified to spearhead conservation efforts. Meanwhile, ILCs will also act as informers, appointed as honorary wildlife wardens and rangers to complement enforcement efforts in protecting wild flora and fauna. Furthermore, awards to recognise the contributions of ILCs in protecting the wild flora and fauna species will be explored.

## **Priority Area C: Combating Climate Change and Reducing Disaster Risk**

Malaysia continues to place great emphasis on actions to mitigate and adapt to climate change. Malaysia commits to reduce GHG emissions intensity to gross domestic product (GDP) by 45% by 2030 relative to the level in 2005 with the ratification of the Paris Agreement under the United Nations Framework Convention on Climate Change. Additionally, the Sendai Framework for Disaster Risk Reduction, 2015-2030 (Sendai Framework) under the United Nations, which was ratified, will be adopted as a strategic guidance for disaster risk management. Meanwhile, measures to increase resilience and adaptive capacity to climate change will complement measures to reduce disaster risks. Implementation of these measures will reduce economic and social losses as well as provide multidisciplinary approaches to combat climate change and reduce disaster risks holistically. In the remaining Plan period, three key strategies will be undertaken as follows:

<sup>7</sup> The participating countries are Indonesia, Papua New Guinea, Philippines, Solomon Islands and Timor Leste.

<sup>8</sup> Under the Access to Biological Resources and Benefit Sharing Act 2017, a permit is required to access biological resources or traditional knowledge associated with biological resources for the purpose of research and development. If the biological resource or traditional knowledge is used for commercial purpose, a benefit sharing agreement must be signed between the resource provider and resource user.



## Strategy C1: Intensifying Climate Change Mitigation

In the remaining Plan period, mitigation measures to address climate change will be further intensified through reduction of GHG emissions in the key emitting sectors, namely energy, transport, waste, industrial processes and product use as well as agriculture, forestry and other land use (AFOLU). These measures will include greater use of renewable energy (RE), optimise demand side management (DSM) for energy, encourage low-carbon mobility and promote construction of green buildings. The adoption of SCP concept in expanding green market and better waste management towards circular economy<sup>9</sup> will contribute to the reduction of GHG emissions. In ensuring a more coordinated implementation of mitigation actions across various sectors, a national mitigation action plan will be developed.

### **Increasing contribution of renewable energy in power generation**

The electricity subsector relies heavily on fossil fuel sources, particularly coal and gas, resulting in over 50% of carbon emission

in the national GHG emissions profile. In this regard, new RE sources will be explored to reduce the dependency on fossil fuels, apart from current sources, namely biomass, biogas, mini hydro and solar photovoltaic (PV). The exploration will include study on technical viability and potential commercial application of new RE technologies such as micro grids and energy storage.

The implementation of large scale solar and net energy metering programmes will be continued to increase RE contribution in the grid system. Meanwhile, efforts will be undertaken to promote the generation of electricity from biomass and biogas, especially from oil palm waste and municipal solid waste. The emphasis on RE is in tandem with the national commitment to reduce GHG emissions intensity to GDP by 45% by 2030.

Competent and skilled workers are imperative to support the growth of the RE industry. In this regard, efforts will be geared towards enhancing collaboration between public and private training institutions to produce 28,000 skilled and semi-skilled workers by the end of 2020. In addition, the Government will continue to provide training to more than 1,000 personnel that will produce experts in the field of biomass, biogas, mini hydro and solar PV. The participants will be from industry, such as RE project developers, financial institutions and potential service providers.

### **Optimising energy use through demand side management practices**

A comprehensive energy DSM master plan, which covers the entire energy spectrum including electrical and thermal energy as well as transport sector energy use will be formulated. The master plan will include the legislation on energy efficiency and conservation to efficiently manage the use of energy resources. This legislation is currently being drafted and scheduled to be completed in 2019. In addition, existing DSM programmes for buildings, industries and commercials will be continued. Initiatives to improve energy efficiency in buildings will include promoting the implementation of energy performance contracting to reduce energy consumption. Meanwhile, the adoption of energy-efficient designs will be made mandatory for all Government buildings that will be built. At the

<sup>9</sup> In a circular economy, the value of products and materials is maintained for as long as possible. Waste and resource use are minimised, and when a product reaches the end of its life, it is used again to create further value.



same time, state governments will be encouraged to incorporate the Malaysian Standard: Code of Practice on Energy Efficiency and Renewable Energy for Non-Residential Buildings (MS1525) as part of into the respective state Uniform Building By-Law (UBBL).

The implementation of the Enhanced Time of Use (EToU) tariff for industry will be continued to substitute the Special Industrial Tariff (SIT<sup>10</sup>), which will be gradually reduced at 2% per annum and abolished in 2020. The EToU offers competitive tariffs for three time zones, namely peak, mid-peak and off-peak as an option to the medium voltage commercial users and high voltage industrial users. Meanwhile, the enforcement of Minimum Energy Performance Standard and energy labelling of electrical appliances for households will be strengthened.

### **Encouraging low-carbon mobility**

In encouraging low-carbon mobility, efforts will focus on improving public transport system across the nation to reduce air pollution, GHG emission and traffic congestion. In reducing pollution, the usage of energy-efficient transport such as hybrid and electric buses will be encouraged, apart from enhancing public transport efficiency. Measures to promote non-motorised mobility, such as cycling and walking will be intensified through provision of safer pedestrian and cycling lanes. Simultaneously, transit-oriented development will be further encouraged to reduce urban sprawl and traffic congestion as well as facilitate connectivity and mobility.

Measures to increase air quality will be continued with the enforcement of better fuel standards for the transport sector. The EURO 5 standard for diesel is scheduled to be rolled out in 2020. This will enable tailpipe emissions to contain not more than 10 parts per million (ppm) sulphur content, which is in line with the Environmental Quality (Control of Petrol and Diesel Properties) (Amendment) Regulations, 2015. Meanwhile, the current utilisation of bio-diesel based on B7, consisting of 7% palm-based methyl ester with 93% diesel, will be enhanced through migration to B10, consisting of 10% palm-based methyl ester with 90% diesel, by 2020. These initiatives will provide a more sustainable and environment-friendly source of energy.

### **Promoting green buildings**

Construction of green buildings through adoption of the Malaysian Carbon Reduction and Environmental Sustainability Tool (MyCREST) for new buildings including residential and commercial buildings will be further encouraged to support green city development. These new buildings will be constructed with green features and designs as well as using green materials. The performance of these buildings will be monitored to account for the GHG emissions as well as electricity and water consumption savings. Meanwhile, the establishment of green lungs and conservation of urban forests will continue to be encouraged to support green city development.

### **Strengthening waste management**

The implementation of reduce, reuse and recycle (3R) programme and enforcement of waste separation at source will be intensified to reduce waste at source and to prevent indiscriminate waste disposal. This programme includes reduction in the utilisation of single-use plastics such as plastic bags, food packaging and straws. These measures will ensure pollution-free land, rivers and seas as well as scale-up waste-to-wealth and waste-to-energy initiatives. These efforts will support the achievement of the household waste recycling target, which is set at 30% in 2020.

The research, development, commercialisation and innovation (R&D&C&I) for recyclable products will be increased to support expansion of the recyclable market. Moreover, the private sector will be encouraged to reduce, reuse and recycle wastes through enforcement of regulation for commercial, industrial and institutional as well as regulation for solid waste from construction activities. The location of recycling facilities and source of waste generation will also be mapped to provide information on feedstock availability. Meanwhile, implementation of financing instruments, which supports waste management, such as extended producer responsibility<sup>11</sup> and take-back system as well as user-pay and polluter-pay principles will be expanded.

<sup>10</sup> SIT was introduced by the Energy Commission in 1996 for industries. Any company that consumes electricity more than 5% of the annual operating costs will be eligible for a lower electricity tariff rate.

<sup>11</sup> Based on the Organisation for Economic Co-operation and Development (OECD), extended producer responsibility is a policy approach under which producers are given a significant responsibility, financial and/or physical, for the treatment or disposal of post-consumer products.

Recycling of bio-sludge, bio-effluent and biogas from sewerage treatment plants, as part of waste-to-wealth initiative, will be further promoted as a non-tariff revenue sources for the operators. For instance, treated wastewater can be used in non-food related industry, sewage sludge for RE generation and as fertilisers, and biogas for electricity source. The waste-to-wealth initiative will create business opportunities across the water supply chain and resource recovery avenue as well as encourage R&D activities.

A mechanism and new guidelines pertaining to scheduled electrical and electronic equipment wastes (e-waste) from household will be developed to enhance the management of e-waste. This will institutionalise a complete and environmentally sound management system that comprises collection, reporting, recycling and disposal of e-waste. A regulation on household e-waste will be formulated to enable a proper and comprehensive implementation of e-waste management in reducing risks to human health and environment. Meanwhile, to enhance public health and safety, existing clinical waste treatment technology will be improved with new technology that is able to inactivate infectious microorganisms.

### **Expanding green market**

In the remaining Plan period, Government green procurement (GGP) initiative at the Federal level will be continued to spur the green market. In this regard, environmental criteria and life-cycle costing analysis will be emphasised in the procurement process. The GGP of selected green products and services is targeted at 20% by 2020. The initiative will be expanded to state and local governments as well as state-owned enterprises in line with the GGP long term action plan that is being formulated. Meanwhile, the number of selected green products and services for GGP will be increased in stages.

Green standards and rating systems that are aligned to international standards will be strengthened to support the green market and facilitate the penetration of local industries into the global market. In addition, the MyHijau portal will be upgraded as a platform for both suppliers and customers to register interest and needs towards green products and services. Furthermore, industries will be encouraged to undertake energy audit and measure GHG emissions as well as carbon and water footprints.

A wider selection of green technology in the market will encourage greater utilisation of green technology, subsequently driving the shift of industries towards cleaner production and green growth. Thus, the development of indigenous green technology will be intensified by undertaking more R&D&C&I. This effort is supported by the Green Technology Master Plan (GTMP), which facilitates the mainstreaming of green technology development into six key sectors, namely energy, manufacturing, transport, building, waste and water. A green technology action plan will be developed to support the implementation of GTMP.

Financing mechanisms to support development of green projects, green technologies and green industries will continue to be enhanced. The green *sukuk* financing will be further encouraged as an innovative way to fund development of green projects. The Green Technology Financing Scheme (GTFS) 2.0 will be continued to provide financing for development of green technologies and green industries.

### **Intensifying sustainable agriculture, forestry and other land use**

In the remaining Plan period, efforts will be continued to reduce GHG emissions from AFOLU activities. This will be done by, among others, improving nitrogenous fertiliser management, developing agricultural low-carbon system for crops and livestock as well as analysing carbon sequestration of crops. In addition, the approach on reducing emissions from deforestation and forest degradation and enhance the role of conservation, sustainable management of forests and enhancement of forest carbon stocks (REDD+) will be implemented. These efforts will contribute towards a sustainable AFOLU activities, thus combating climate change.

## **Strategy C2:**

### **Augmenting Climate Change Adaptation**

Over the last decade, more extreme weather had been experienced in Malaysia. Major floods occurred in 2010, 2012, 2014 and 2017, with the 2014 northeast monsoon floods being one of the worst in history. In addition, the impact of the 2016 El-Nino has resulted in prolonged dry periods and heat waves. In this regard, adaptation measures, especially in vulnerable sectors, will be enhanced and expanded to increase resilience against climate change impacts and minimise the damages.



### **Enhancing adaptation measures**

Adaptation measures will be undertaken in the vulnerable sectors, such as water, agriculture, infrastructure, cities and settlements, as well as public health, to enhance the resilience and adaptive capacity to climate change impacts. In this regard, R&D activities will continue to be undertaken to identify suitable mechanisms that are able to enhance the resilience and adaptive capacity of these sectors. Meanwhile, the development of predicted coastal and inland flood inundation maps as well as predicted seasonal dry spells and precipitation maps will facilitate efforts in coping with future climate change impacts.

Alternative sources of water, such as recycled water, groundwater, lake and reservoir, will be explored through the National Water Balance Management System. In addition, R&D for utilising rainwater, storm water runoff and wastewater will be intensified. These efforts contribute in enhancing resilience and sustainability of the water sector. Concurrently, a national adaptation action plan will be developed to guide planning and coordination of adaptation measures, while an adaptation index will be established to measure vulnerability levels of the country against climate change impacts.

## **Strategy C3: Strengthening Disaster Risk Management**

Incomplete information and lack of knowledge on disaster risks have hampered efforts to identify the vulnerability of the nation against various disasters. In this regard, less emphasis has been given to pre-disaster measures as compared to post-disaster, even though measures to increase resilience and protect development gains are more important. Therefore, disaster risk management, including risk reduction efforts, will be intensified by enhancing the integration of DRR initiatives, strengthening disaster preparedness and increasing capacity in disaster response in the remaining Plan period.

### **Enhancing integration of disaster risk reduction**

Communities will be better protected from natural hazards through measures that minimise disaster risks. In order to enhance pre-disaster efforts, DRR elements will continue to be integrated within development planning, design and implementation across all sectors. Building standards and codes will also be reviewed to enable risk reduction to be accounted for in future development. In addition, a policy will be formulated as a guidance to support and strengthen disaster risk management, including risk reduction,

towards ensuring a disaster resilient nation. In facilitating decision-making and national reporting on disaster management, disaster-related indicators will be developed based on the indicators adopted under the Sendai Framework. Meanwhile, the National Platform on DRR will be strengthened as a multi-sectoral coordination committee in monitoring, reviewing and updating the implementation of the Sendai Framework.

### **Enhancing disaster preparedness**

An integrated weather and flood forecasting and early warning system is being developed. Meanwhile, the early warning system for tsunami and earthquake monitoring will be enhanced. These systems will enable dissemination of information in a more systematic and timely manner to disaster-related agencies and affected people. In addition, disaster risk profiling will be prepared to identify disaster-prone areas. This profile will enable the risks reduction and adaptation programmes to be better designed, more targeted and localised.

Hazard and risk mapping for disaster-prone areas will continue to be undertaken to facilitate decision-making for future development. A seasonal climate forecasting system will be established to generate long-term weather forecasts for one to six months in advance. Furthermore, DRR measures will incorporate a balanced approach between physical structural measures, such as construction of retention walls and dams, and non-physical structural measures, such as development of flood hazard maps and early warnings. In terms of managing storm water runoff for control at source and peak flow control, the implementation of sustainable drainage systems will be enhanced in line with the *Manual Saliran Mesra Alam* (MSMA).

### **Increasing capacity in disaster response**

In strengthening disaster risk management at community levels, regular disaster drills and other community-based disaster risk management exercises will be conducted for the people living in disaster-prone areas. These exercises will empower affected communities to undertake initial response when disaster strikes. Meanwhile, in enhancing the response capability of the local disaster-related personnel, tabletop exercises and field training exercises on flood, landslide, earthquake and tsunami will be continued through simulations with national, regional and international responders. In addition, existing standard operating procedures for natural disaster management, namely drought, earthquake, flood, haze and tsunami will be reviewed to improve response measures for disasters.



## Conclusion

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Green growth will not only ensure achievement of sustainable development objectives but also sustain economic growth, enhance environmental sustainability and promote better wellbeing. Stronger governance will allow the expansion of green growth in all economic sectors, including green market. A resource- and energy-efficient economy will be able to minimise GHG emissions, pollution and waste as well as enhance water, food and energy security. Moreover, conservation of the marine and terrestrial habitats guarantees continuous ecosystem services for the present and future generations. Meanwhile, intensified mitigation and adaptation as well as DRR measures will increase resilience of the nation against climate change impacts and natural disasters. Additionally, a sense of ownership among all levels of society is imperative in nurturing shared responsibility in sustaining the national natural endowment.

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C H A P T E R