

Master Plan for Integrated Biodiversity Management

B.E. 2558 – 2564 (2015-2021)



Office of Natural Resources and Environmental Policy and Planning
Ministry of Natural Resources and Environment, Thailand

Master Plan for Integrated Biodiversity Management

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Preface

The Master Plan for Integrated Biodiversity Management B.E. 2558-2564 (2015-2021) is the principal biological diversity plan of Thailand, developed in compliance with Article 6 of the Convention on Biological Diversity, under which it states that each Contracting Party shall develop national strategies, plans or programmes for the conservation and sustainable use of biological diversity. Since 1998, Thailand has developed the national policies, measures, and plans for conservation and sustainable use of biodiversity and this Master Plan is the fourth one. In line with the Strategic Plan for Biodiversity 2011-2020 and the Aichi Biodiversity Targets, which were adopted by the Conference of the Parties to the Convention of Biological Diversity at its tenth meeting, this Master Plan was formulated to address the underlying causes of biodiversity loss by aiming at conserving, restoring and protecting biodiversity and ecosystem services, as well as enhancing the benefits from them, along with raising public awareness and understanding of the roles and importance of biodiversity to human well-being, and collaborating with all relevant sectors in integrated management.

The Office of Natural Resources and Environmental Policy and Planning has worked in close collaboration with the Office of the National Economic and Social Development Board and the Biodiversity-Based Economy Development Office (Public Organization) in formulating this Master Plan in terms of its subject matter, strategies, measures, goals and indicators, including mechanisms and processes for implementation and monitoring, through public consultation of relevant sectors.

The Master Plan for Integrated Biodiversity Management B.E. 2558-2564 (2015-2021) was adopted by the Cabinet on 10 March 2015 along with the National Biodiversity Targets and the Action Plan on Biodiversity Management B.E. 2558-2559 (2015-2016). In this regard, the Cabinet assigned relevant agencies to expedite the implementation of the said Action Plan to achieve the endorsed national biodiversity targets.

The Office of Natural Resources and Environmental Policy and Planning would like to express our gratitude to experts and representatives from relevant public and private sectors, non-governmental organizations, academic institutions, research communities and local communities for their participation and support in developing and implementing this Master Plan, and wish that all parties collaborate in pushing forward with effective implementation of the Master Plan to reduce biodiversity loss, maintain ecosystem services, which are crucial to livelihood of the people, and pass the richness of nature and biodiversity on to future generations.

Office of Natural Resources and Environmental Policy and Planning

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1. Introduction

Biodiversity supports and strengthens ecosystems functions and services necessary for human well-being, food security, sanitation, communities' way of life, economy development, as well as poverty eradication.

All aspects of biodiversity--genetic, species, and ecosystem diversity—have been in decline while the pressures on biodiversity still remain and tend to become greater as a result of human activities. Continuous habitat loss, increasing extinction rates, unsustainable overutilization, pollution, and invasive alien species have been persisted as threats to terrestrial and aquatic biodiversity. These may lead to serious risks and impacts to human society, as well as ecosystem services failure without urgent responses.

Valuation and protection of biodiversity are of service to humans in various aspects; such as, good health, increasing in food security and poverty mitigation, assisting human adaptability to climate change, including carbon sequestration for climate change mitigation.

In order to globally achieve the same targets at all levels, the Conference of the Parties to the Convention of Biological Diversity at its tenth meetings in October 2010 adopted the Strategic Plan for Biodiversity 2011-2020 and the Aichi Biodiversity Targets, with the vision that by 2050 biodiversity is valued, conserved, restored and wisely used, maintaining ecosystem services, sustaining a healthy planet and delivering benefits essential for all people, and urged Parties to implement the Strategic Plan and develop national biodiversity strategies and action plans, using the Strategic Plan and its Aichi Targets, as well as review and monitor their national biodiversity strategies and action plans, report thereon to the Conference of the Parties at its meetings and include them in national reports.

Thailand as a Party to the Convention on Biological Diversity has continued its implementation of the Convention's aforesaid obligations, consecutively developing three of the national policies, measures, and plans for conservation and sustainable utilization of biodiversity for year 1998- 2002, 2003-2007, and 2008-2012, as the national biodiversity implementation frameworks, in line with the Convention's strategic implementation.

2. State and Threats to Biodiversity

2.1 State of Biodiversity

Thailand has plenty of biodiversity, contributing to Thais' way of living since the past, resulting in a variety of food, medicines and tools necessary for living, as well as being foundation for economic and social development. Further, biodiversity has also been admired in Thai customs from generation to generation till present.

Thailand has all aspects of biodiversity-- species, genetic and ecosystem diversity. There are not less than 200,000 species of microorganisms, not less than 14,000 species of vascular and non-vascular plants or 4% of globally identified plants, not less than 4,000 species of vertebrates or 8% of all vertebrates in the world, not less than 80,000 species of invertebrates or 6 % of all invertebrates in the world, and not less than 2,000 species of fish or 10% of globally identified fish.

In a realm of diverse cultures and long history, Thais have continued to make use of biodiversity. Their way of living may differ or resemble, depending on climate, geographical features, perspective, belief and livelihood. Thai traditional values and knowledge have been applied in cooking, herbal medicine, cosmetics, health care and communities' products. With modern technology, Thai herbs application is gradually increasing in terms of medicines, supplements, cosmetics, drinks and spa treatment businesses, generating not less than 30,000-40,000 million baht annually, with an average 10-20% annual growth rate, as a result of richness of herbal plants in Thailand.

Thailand has continually exported biodiversity-related merchandise in terms of agricultural commodities and forest products. In 2012, goods exported were the followings; forest products (shellac, damar gum, bamboo, natural gum, olibanum, rattan, and catechu, etc.) 32,210 metric tons, valued at 2.06 billion baht; fruits (pineapple, longan, durian, mango, banana, rambutan, tamarind, mangosteen, coconut, and lime, etc.) 2,650,625 metric tons, valued at 84.37 billion baht; spices (dried chilli, black or white pepper, cardamom, and bastard cardamom, etc.) 3,716 metric tons, valued at 0.38 billion baht; aquatic products (fish, prawn, cuttlefish, shellfish, crab, and marine algae, etc.) valued at 256.39 billion baht; livestock (cattle, pig, and chicken, etc) 3,973,506 livestock, valued at 3.72 billion baht. (Office of Agricultural Economics, 2012)

2.2 Threats to Biodiversity

Thailand's biodiversity has long been threatened from exploitation of natural resources without contemplating their limitation and resilience capacity. Natural habitat loss from urbanization, development projects, illegal wild plant poaching, hunting for consumption and trade, wetland fill, invasive alien species, and pollution, are still major threats to biodiversity in Thailand, resulting in progressive decrease in numbers of wild flora and fauna or even leading to extinction. In Thailand, 11.9% of vertebrates are threatened. Schomburgk's Deer (*Rucervus schomburgki*), Siamese flat-barbelled catfish (*Platytrapius siamensis*) is extinct from the world. Giant Ibis (*Pseudibis gigantea*), Large Grass-warbler (*Graminicola striatus*), Siamese Tiger Perch (*Datnioides pulcher*), Silver Shark, (*Balantiocheilos cf. melanopterus*) are extinct in Thailand. Kouprey (*Bos sauveli*), Eld's Deer (*Cervus eldii*), Rhinoceros (*Rhinoceros sondaicus*), Sumatran Rhinoceros (*Dicerorhinus sumatrensis*), Sarus Crane (*Grus antigone*), White-Shouldered Ibis (*Pseudibis davisoni*) False Gaviel (*Tomistoma schlegelii*), are extinct in the wild. (Office of Natural Resources and Environmental Policy and Planning, 2004). Of vascular plants in Thailand, 11.6 % or not less than 517 species are threatened. Amherstia (*Amherstia nobilis* Wall) is extinct in the wild. (Office of Natural Resources and Environmental Policy and Planning, 2005).

Thailand is an important genetic source of flora and fauna. It is expected that there are not less than 10,000 varieties of native rice in Thailand. According to rice variety collection of Pathum Thani Rice Research Center during 1937-2001, it found not less than 5,000 varieties of native rice. Thai rice varieties are facing genetic erosion due to seed deterioration, land use changed from rice paddies to urban areas, and farmers' preference for new rice varieties promising high production, along with their neglect of local rice varieties. In addition, a large number of native cultivated plants no longer exist in the site as a result of natural disasters, urbanization, industrialization, dam construction, and farmers' failure to preserve unutilized crop wild relatives. Similarly, in livestock sector, a variety of non-native breeds are imported for animal husbandry because of their good yields. Thailand; however, has possessed native animal varieties which are suitable for its geographical features and environment for centuries. Those varieties have disease resistance and high potential for breed development in the future. Import of such non-native livestock causes failure to care for nearly extinct native varieties which are gradually decreased in number or cross-bred with the exotic ones, leading to genetic loss or erosion.

Invasive alien species are also a threat to biodiversity. In Thailand, numbers of species considered as alien species are not less than 3,500 species, of which numbers are increasing by importing for agricultural use, breeding, aquaculture, pets and aquarium, ornamental plants, and collection in zoological parks and botanical gardens. Some species can establish, spread and become invasive alien species, bringing about adverse effects on biodiversity, leading to loss in economy, society and human well-being. According to Thailand's Inventory on Alien Species to be Prevented, Controlled and Eradicated, at least 80 species of flora, fauna and microorganisms are considered to be in invasive state: such as, water hyacinth, giant sensitive plant, apple snail and Annour sucker catfish, and not less than 50 species are classified to have tendency for invasion. (Office of Natural Resources and Environmental Policy and Planning, 2009)

3. Biodiversity Issues

1) **Lack of awareness, knowledge and understanding on the importance and benefits arising from biodiversity including methods for conservation and sustainable use of biodiversity.** Despite Biodiversity Clearing-House Mechanisms of Thailand extending knowledge about biodiversity to all sectors in the country, some people, including policy makers still lack knowledge, understanding and attention to biodiversity loss or urgency in biodiversity conservation. Therefore, plan and target implementation cannot be accomplished in a timely manner, especially legislative enactment.

2) **Taxonomic works in Thailand, underpinning research and development on biodiversity, still encounters difficulties in lacking of personnel and financial support.** Although biodiversity-related information has been managed in different ways, profound lack of taxonomic researchers remains. In addition, budget support for research and development on biodiversity is limited and discontinuous. Biodiversity research has not been conducted in response to national biodiversity policies and measures. Moreover, agencies undertaking biodiversity research are scattered among various ministries or owned by private sectors, resulting in lack of integrity in management. Consequently, efficient management mechanisms may be the solution to such difficulties, along with establishing biodiversity research fund with a view to enhancing researchers' capability of doing research, especially in taxonomy. Producing expertise in taxonomy needs more investment in time and resources than any other areas.

3) **Access to genetic resources, biological resources, and traditional knowledge and the sharing of benefits arising from their utilization.** Existing regulations pertaining to access and benefit sharing do not cover all concerning sectors, especially those of research and development on biological resources and traditional knowledge, and the sharing of benefits arising during stages of utilization despite imposing the National Committee on Conservation and Sustainable Use of Biodiversity's Regulation on Criteria and Methods for Access to and Sharing of Benefits from Biological Resources B.E. 2554 (2011). In addition, local communities relying on biodiversity lack knowledge and awareness of their roles in biodiversity conservation. Thailand also lacks skilled personnel for benefit sharing negotiation, promotion of systematic commercialization of biodiversity research and development, and mechanisms leading to conservation and sustainable use of biodiversity.

4. Issues and Difficulties in Implementation of the National Policies, Measures and Plans on Conservation and Sustainable Utilization of Biodiversity B.E. 2551-2555 (2008-2012)

1) Targets are broadly defined and have no reference figures. Indicators do not identify principal responsible agencies and lack basic information or reference figures for comparison; therefore, overall outcomes of implementation cannot be reflected. It is advisable that quantitative targets should be specified in order to be more measurable.

2) The National Policies is non-legally binding. Some agencies have no knowledge of this document or not aware of their responsibility according to the action plans under this National Policies. Such action plans are not flexible in many ways. For instance, they comprise unduly specific details; unclearly specify responsible agencies which are not in line with the missions of the agencies. Consequently, those agencies were unable to integrate the action plans into their implementation frameworks or activities under the National Policies were allocated no budget or less budget than planned, resulting in failure to implement such activities.

3) The National Policies have not been integrated into local level plans; such as, provincial development plan, local administration development plan and provincial natural resources and environmental action plan. As a result, it was rarely implemented at local level.

According to assessment of indicators and overall implementation of the National Policies, Measures and Plans on Conservation and Sustainable Utilization of Biodiversity B.E. 2551-2555 (2008-2012), it is found that most indicators (16 indicators) are met and only 1 indicator was unable to be assessed; namely, “at least 20% of marine and coastal areas of Thai waters are declared protected areas.” Four indicators are not met; namely, 1) at least 1 dugong and seagrass site is declared protected area, 2) at least 5 more designation of Wetlands of International Importance, 3) long-term national policies pertaining to adaptation and mitigation of climate change impacts on biodiversity are in place, 4) all biodiversity-related agencies establish their biodiversity committees.

5. Biodiversity-Related Implementation During 2013-2014

According to the monitoring of biodiversity-related implementation during 2013-2014, it is found that most of the projects or activities implemented are those relevant to biodiversity conservation and restoration, and reduction of threats to biodiversity (38.16%), awareness raising and participation in biodiversity management (30.92%), and biodiversity knowledge and database development (22.37%) respectively, whereas activities aiming at capacity building and access to biological resources and the sharing of benefits arising from their utilization are least implemented (8.55%). There are two main issues which have no reports on implementation; namely, 1) implementation focusing on sustainable management of agricultural area, aquaculture and forestry, and 2) promotion of curriculum development and revising in schools and academic institutions to incorporate biodiversity issues.

6. Policies and Development Directions

6.1 Global Policies and Development Directions

The global economy is turning to knowledge-based economy and become environmentally friendly. According to the United Nations Conference on Sustainable Development (Rio+20) in 2012, **green economy policies** were adopted as one of the important tools available for achieving sustainable development. The conference stressed the importance of **biodiversity and ecosystem services, which are the foundation of sustainable development and human well-being**, and the importance of achieving the Convention on Biological Diversity's objectives to conserve and sustainably utilize biodiversity by adopting the following tools and mechanisms within frameworks of the United Nations and other international organizations.

1) Strategic Plan for Biodiversity 2011-2020 and the Aichi Biodiversity Targets. The vision of this Strategic Plan is "By 2050, biodiversity is valued, conserved, restored and wisely used, maintaining ecosystem services, sustaining a healthy planet and delivering benefits essential for all people." The Strategic Plan includes 20 targets to be achieved by 2015 and 2020, aiming at addressing the underlying causes of biodiversity loss, conservation, restoration and safeguarding of biodiversity, and enhancing the benefits to all

from biodiversity and ecosystem services. The targets are organized under five strategic goals as follows:

- Strategic goal A: Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society
- Strategic goal B: Reduce the direct pressures on biodiversity and promote sustainable use
- Strategic goal C: Improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity
- Strategic goal D: Enhance the benefits to all from biodiversity and ecosystem services
- Strategic goal E: Enhance implementation through participatory planning, knowledge management and capacity building

2) Declaring the period 2011–2020 to be the United Nations Decade on Biodiversity according to the United Nations General Assembly’s resolution 65/161 at its 65th session in 2010 with a view to urging participation and contributing to the implementation of the Strategic Plan for Biodiversity 2011–2020 and the Aichi Biodiversity Targets at national, regional and international levels, including awareness raising on values and importance of biodiversity.

3) Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES). According to the United Nations General Assembly’s resolution 65/162 at its 65th session, the Assembly requested the United Nations Environment Programme to convene a meeting to determine modalities and institutional arrangements for the Platform at the earliest opportunity in order to fully operationalize the Platform to provide scientific information for biodiversity-related policy formulation. In this regard, Thailand and the other 93 member states adopted the resolution and automatically became members of the Platform at its meeting held in Panama in 2012.

In addition, Thailand, as Party to other international agreements, has to fulfil its contracting obligations and needs preparation for existing and forthcoming obligations as the followings.

1) Biodiversity-related international obligations Thailand are parties to

- Implementation of conservation and sustainable utilization of biodiversity and the sharing of benefits arising from genetic resources utilization in a fair and equitable way in compliance with the **Convention on Biological Diversity** to which Thailand has become a Party since 29 January 2004.
- Co-operation on protection of international trade in wild flora, fauna and their products according to the **Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)** to which Thailand has become a Party since 21 January 1983.
- Wise management of wetlands according to the **Ramsar Convention on Wetlands** to which Thailand has become a Party since 13 September 1998.
- Creating mechanisms for regulating living modified organisms according to the **Cartagena Protocol on Biosafety** to which Thailand has become a Party since 8 February 2006.

2) Existing and ongoing International biodiversity-related obligations and agreements

- The International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGR): Thailand has signed (4 November 2003) but not ratified the Treaty.
- The Convention on the Conservation of Migratory Species of Wild Animals (CMS) Thailand has signed (1 August 2004) but not ratified the Convention.
- The Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization: Thailand has signed the Protocol on 31 January 2012 and is currently on the process of becoming a Party to the Protocol.
- The Nagoya – Kuala Lumpur Supplementary Protocol on Liability and Redress to the Cartagena Protocol on Biosafety: Thailand has signed the Supplementary Protocol on 6 March 2012 and is currently on the process of becoming a Party to the Protocol.
- The development of international mechanisms and legal frameworks for protection of traditional knowledge, genetic resources, and traditional cultural expressions under the frameworks of the Food and Agricultural Organization of the United Nations (FAO) and the World Intellectual Property Organization (WIPO)

Although above-mentioned obligations are still not legally binding to Thailand, preparation for this global developing instrument will strengthen and extend knowledge of forthcoming conditions and regulations for all sectors in the country.

6.2 Thailand's Policies and Development Directions

1) **The Tenth National Economic and Social Development Plan B.E.2555-2559 (2012-2016)** set strategies on biodiversity development as follows:

- **Strategy 4: Restructuring the Economy Toward Quality Growth and Sustainability** by using scientific knowledge, technology, and creativity, in order to create creativity-based and environmentally friendly industry, which is to be further developed, transferred and applied to commercial use, societies and communities, and to create value added to manufacturing sectors.

- **Strategy 6: Sustainable Managing Natural Resources and Environment** in order to conserve, restore and secure natural resources and environment, effectively manage natural resources and environment through communities' participation in a balanced and sustainable way, encourage conservative approach to natural resources utilization and biodiversity-based economy development in line with way of living and traditional knowledge, and promote economy development from genetic resources and biodiversity to create innovation for manufacturing and services with value added and uniqueness.

2) Government Policies

In the policy statement delivered by General Prayut Chan-o-cha, Prime Minister, on 12 September 2014, biodiversity issues are specified under the area of **Maintaining the Security of the Natural Resources Base by Creating Balance between Conservation and Sustainable Use**, as follows:

2.1) The immediate phase will be to expedite the protection and restoration of conservation areas, forestry resources and wildlife by giving importance to solving public land encroachment; revising outdated laws and creating norms for efficient and fair law enforcement, particularly in watershed and conservation areas of ecological significance; and encouraging the planting of economically viable trees on private land so as to decrease logging of natural forests; as well as pushing for ways to assess the economic value of ecosystems and income creation from conservation.

2.2) Promote conservation and sustainable use of biological resources and biodiversity, bearing in mind the constraints and potential for recovery; create opportunities to access and share benefits arising from the use of genetic resources in a fair and equal manner in order to create people's well-being, food security, sanitation, and support community's way of life, as well as the development of economic value; and provide protection for biosafety.

3) National Policies, Measures and Plans on Conservation and Sustainable Utilization of Biodiversity in line with the strategies for implementation of the Convention on Biological Diversity have been developed and implemented from 1998 to 2012. During the mentioned period there were three of such National Policies aiming at providing knowledge and awareness to the public, creating biodiversity conservation networks, conducting research on biodiversity, capacity building for researchers and academic institutions, and reducing biodiversity loss rate according to sustainable development concepts.

4) National Policies and Plans for Enhancement and Conservation of Environmental Quality (1997-2016), establishing policies and plans on protection, preservation and conservation of organisms, appropriate preservation and restoration of ecosystems, and utilization of resources taking into account conservation and resource production capacity.

5) Environmental Quality Management Plan (2012-2016) specified biodiversity development issues in the respective strategies as follows:

- **Strategy 1 Shifting Towards environmental-friendly production and consumption** focuses on creating and encouraging an enabling policy environment to facilitate a shift towards environmental-friendly production and consumption, and more creative and value-added practices to enhance and sustain the use of natural resource base, as well as preparing key parties to effectively respond to trade and investment related natural resources and environmental measures.

- **Strategy 2 Sustainable conservation and restoration of natural resources** focuses on promoting communities' participation in reducing threats to biodiversity, encouraging *in situ* and *ex situ* species conservation, research and database development, and formulating biosafety-related regulations, as well as promoting activities relevant to restoration and utilization of biodiversity

- **Strategy 3 Natural resources and environmental management for the good governance** focuses on expediting the study and establishing mechanisms and regulations for access and sharing benefits in a fair and sustainable manner, and formulating strategies and action plans that support management of biological resources and biological resource base creative economy.

6) National Forest Resources Protection Master Plan

- **Strategy 2 Raising awareness on forest conservation** stipulates that solving deforestation and encroachment of forest and natural resources is a “national agenda” in order to raise public awareness of this issue through participation of public and private sectors. Awareness of this issue is to be integrated into education at all levels. Payment for Environmental Services mechanism should be applied so as to economically incentivize parties involved in conservation and utilization of forest, and those affected by forest ecosystem change, to participate in conservation and management of forest resources.

- **Strategy 4 Restoration and sustainable conservation of forests** establishes systems of sustainable forest conservation with public participation, systems of planting of economically viable trees so as to decrease logging of natural forests, and promote research and development in forest resources management, as well as transfer knowledge from research to relevant parties.

7) The Eighth National Policies and Strategies on Research B.E. 2555-2559 (2012-2016): Research Strategy 3 on Conservation, Strengthening and Development of Natural Resources and Environmental Capital aims to develop knowledge and database for systematically effective management and development of natural resources and environmental capital with public participation at local and community levels. This strategy stipulates the management and sustainable utilization of natural resources, which cover biodiversity in terms of conservation, sustainable utilization, restoration, knowledge management, public participation with good governing and reduction of biodiversity threats, which reflect in the following strategies.

- **Research Strategy of Thailand: Development of Values of Biodiversity B.E. 2555-2559 (2012-2016)** stresses needs of science and technology to increase values of biodiversity, and enhancing knowledge and information in formulation of policies on biodiversity management.

- **Research Strategy on Biodiversity B.E. 2556-2559 (2013-2016)** aims to significantly reduce biodiversity loss rate and maintain ecosystems, species and important genetic sources, and sustainably protect related components of biodiversity, increase sustainable utilization of biodiversity, enhancing biodiversity values by creating intellectual properties and innovations, and conduct research on utilization of biodiversity according to the principles of access to biological resources and the fair and equitable sharing of benefits arising from their utilization.

8) The Second National Strategy on Development of Thai Wisdom and Health B.E. 2555-2559 (2012-2016) stipulates policy frameworks for development, management and protection of Thai tradition medicines wisdom, and development of herbal medicines and products in order to encourage protection and further utilizing of technical and traditional knowledge, as well as herbs in a systematic manner.

7. Concepts and Principles

The Master Plan for Integrated Biodiversity Management B.E. 2558 -2564 (2015-2021) has been formulated on the foundation of “**Sufficiency Economy Philosophy**” which was used as the principal concept for combing dimensions of economy, society, natural resources and environment under the processes that connect to each other; using existing opportunities, capacities and circumstances to create solid foundation of development; gradually enhancing and qualitatively changing to the extent that it is capable of **being self-dependent, having wisdom and having self-immunity**, ready to encounter changes and threatening factors, as well as **creating a balance** between conservation and utilization of biodiversity in short and long terms. In addition, the Master Plan also brought His Majesty the King’s principles of work; namely, “**Planting a Tree in People’s Heart**” which was used as the principal concept for enhancing mentality of Thai people so as to be aware of the importance and processes in conservation, restoration and sustainable utilization of biodiversity, and “**Let Nature Heal Itself**”--the principle for addressing degraded forests by “planting three kinds of trees and receiving four benefits”, which are usable, edible and economic trees and soil moisture preservation—which was used as a principal concept for conservation and restoration of biodiversity with participation of sectors and communities, allowing sustainable coexistence of communities and forests.

Furthermore, this Master Plan also represents concepts and principles of biodiversity-related conventions and agreements and fulfills a principal obligation under Article 6 of the Convention on Biological Diversity stipulating that “each Contracting Party shall develop national strategies, plans or programmes for the conservation and sustainable use of biological diversity”. Green Economy concepts, resulting from the United Nations Conference on Sustainable Development (Rio+20) in 2012, were also applied along with national policies and implementation directions, government policies, the Eleventh Economic and Social Development Plan, and sectoral national policies, including environmental quality management, research, and Thai wisdom development. The strategies and measures under the Master Plan were developed on the basis of four important principles as follows:

7.1 Ecosystem Approach Management and Ecosystem Services are principles of natural resources and environmental management in a holistic manner, aiming at maintaining of ecosystems in a balanced way and responding to human needs for sustainable utilization of natural resources and environment by relying on services from ecosystems to provide connection between ecosystems and economy.

7.2 Sustainable Development on the basis of Green Economy is a principle that places importance on the development of economy, society and the environment, in a reciprocal and balanced manner by expanding economy development with quality growth and competitiveness while taking account of carrying capacity of natural resources and environment; maximizing efficient and economical use of resources; and do no harm to society's needs both at present and in the future. The development focuses on management of natural capital and biodiversity in terms of conservation and efficient utilization, as a basis for economic development.

7.3 Conservation and Sustainable Use of Biodiversity, and the Fair and Equitable Sharing of Benefits Arising from Genetic Resources Utilization are the principles and objectives of the Convention on Biological Diversity, aiming to encourage Parties to cooperate with each other on implementation of *in-situ* and *ex-situ* conservation of biodiversity, to promote sustainable utilization of biodiversity components in terms of genetic resources, species and ecosystems, and to encourage the sharing of benefits arising from genetic resources in a fair and equitable manner. Thailand, as a Party to the Convention, has commitment to comply with the principles and obligations of the Convention.

7.4 Good Governance is a principle that focuses on sustainability of management of natural resources and environment, comprising **participation** of all sectors, **decentralization** based on area-function-participation approach, fair and effective **enforcement of laws**, **transparency** in decision-making processes, **public information disclosure**, and **accountability**.

8. Master Plan for Integrated Biodiversity Management B.E. 2558-2564 (2015-2021)

8.1 Vision

By 2021, people live in harmony with nature, and the government along with all sectors promotes and supports the protection, conservation and sustainable utilization of biodiversity.

8.2 Mission

1) Integrate the management for protection, restoration and utilization of biodiversity in an efficient way so as to halt biodiversity loss through participation at all levels.

2) Increase policy and management importance, raise social awareness on roles and importance of biodiversity to sustainable development and green economy, including livelihood and way of life of the people.

8.3 Objectives

1) Address the underlying causes of biodiversity loss by mainstreaming biodiversity across public and civil society sectors.

2) Reduce direct pressures on biodiversity and promote sustainable utilization of biodiversity

3) Improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity.

4) Enable management to enhance the benefits from biodiversity and ecosystem services.

5) Enhance management and implementation of biodiversity-related obligations through participatory planning, knowledge management and capacity building

8.4 Overall Targets

By 2021, to implement the management of biodiversity through participation at all levels

8.5 Indicators

1) Increase in proportion of allocation from nation budget for implementation of the Master Plan.

2) Numbers of policies, plans and measures at national, provincial and local levels that address issues related to biodiversity.

8.6 Strategies for Integrated Biodiversity Management

The strategies for integrated biodiversity management comprises 4 strategies and 11 measures (**figure 1**) as follows:

Strategy 1 Integrate biodiversity values and management with participation at all levels

Measure 1 Raise awareness and knowledge on the importance of biodiversity

1.1) Promote education and learning, transfer of knowledge, and raising awareness on the importance of biodiversity across all sectors so as to be aware of the importance and values of biodiversity and processes that leads to conservation, restoration and sustainable utilization of biodiversity.

1.2) Promote and encourage incorporating biodiversity-related issues into the core curriculum for basic education and curricula of academic institutes at all levels, as well as revise and update existing curricula in line with current situation.

1.3) Raise awareness of importance and roles of local communities and traditional knowledge, especially women's roles in conservation and sustainable utilization of biodiversity.

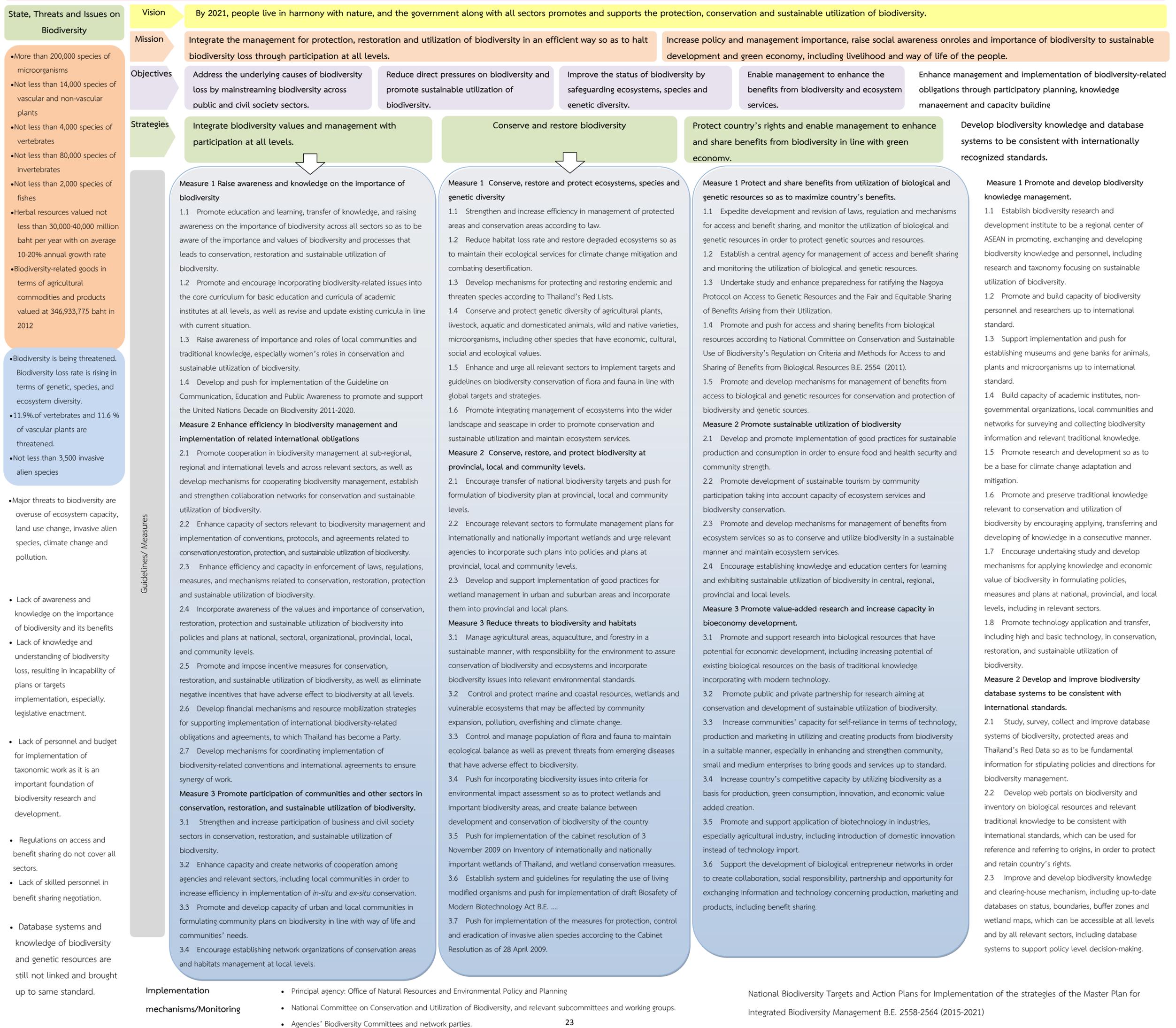
1.4) Develop and push for implementation of the Guideline on Communication, Education and Public Awareness to promote and support the United Nations Decade on Biodiversity 2011-2020.

Measure 2 Enhance efficiency in biodiversity management and implementation of related international obligations

2.1) Promote cooperation in biodiversity management at sub-regional, regional and international levels and across relevant sectors, as well as develop mechanisms for cooperating biodiversity management, establish and strengthen collaboration networks for conservation and sustainable utilization of biodiversity.

2.2) Enhance capacity of sectors relevant to biodiversity management and implementation of conventions, protocols, and agreements related to conservation, restoration, protection, and sustainable utilization of biodiversity.

Figure 1 Master Plan for Integrated Biodiversity Management B.E. 2558-2564 (2015-2021)



2.3) Enhance efficiency and capacity in enforcement of laws, regulations, measures, and mechanisms related to conservation, restoration, protection, and sustainable utilization of biodiversity.

2.4) Incorporate awareness of the values and importance of conservation, restoration, protection, and sustainable utilization of biodiversity into policies and plans at national, sectoral, organizational, provincial, local, and community levels.

2.5) Promote and impose incentive measures for conservation, restoration, and sustainable utilization of biodiversity, as well as eliminate negative incentives that have adverse effect to biodiversity at all levels.

2.6) Develop financial mechanisms and resource mobilization strategies for supporting implementation of international biodiversity-related obligations and agreements, to which Thailand has become a Party.

2.7) Develop mechanisms for coordinating implementation of biodiversity-related conventions and international agreements to ensure synergy of work.

Measure 3 Promote participation of communities and other sectors in conservation, restoration, and sustainable utilization of biodiversity.

3.1) Strengthen and increase participation of business and civil society sectors in conservation, restoration, and sustainable utilization of biodiversity.

3.2) Enhance capacity and create networks of cooperation among agencies and relevant sectors, including local communities, in order to increase efficiency in implementation of *in-situ* and *ex-situ* conservation.

3.3) Promote and develop capacity of urban and local communities in formulating community plans on biodiversity in line with way of life and communities' needs.

3.4) Encourage establishing network organizations of conservation areas and habitats management at local levels.

Strategy 2 Conserve and restore biodiversity

Measure 1 Conserve, restore and protect ecosystems, species and genetic diversity.

1.1) Strengthen and increase efficiency in management of protected areas and conservation areas according to law.

1.2) Reduce habitat loss rate and restore degraded ecosystems so as to maintain their ecological services for climate change mitigation and combating desertification.

1.3) Develop mechanisms for protecting and restoring endemic and threaten species according to Thailand's Red Lists.

1.4) Conserve and protect genetic diversity of agricultural plants, livestock, aquatic and domesticated animals, wild and native varieties, microorganisms, including other species that have economic, cultural, social and ecological values.

1.5) Enhance and urge all relevant sectors to implement targets and guidelines on biodiversity conservation of flora and fauna in line with global targets and strategies.

1.6) Promote integrating management of ecosystems into the wider landscape and seascape in order to promote conservation and sustainable utilization and maintain ecosystem services.

Measure 2 Conserve, restore, and protect biodiversity at provincial, local and community levels.

2.1) Encourage transfer of national biodiversity targets and push for formulation of biodiversity plan at provincial, local and community levels.

2.2) Encourage relevant sectors to formulate management plans for internationally and nationally important wetlands, and urge relevant agencies to incorporate such plans into policies and plans at provincial, local and community levels.

2.3) Develop and support implementation of good practices for wetland management in urban and suburban areas and incorporate them into provincial and local plans.

Measure 3 Reduce threats to biodiversity and habitats

3.1) Manage agricultural areas, aquaculture, and forestry in a sustainable manner, with responsibility for the environment to assure conservation of biodiversity and ecosystems and incorporate biodiversity issues into relevant environmental standards.

3.2) Control and protect marine and coastal resources, wetlands and vulnerable ecosystems that may be affected by community expansion, pollution, overfishing and climate change.

3.3) Control and manage population of flora and fauna to maintain ecological balance, as well as prevent threats from emerging diseases that have adverse effect to biodiversity.

3.4) Push for incorporating biodiversity issues into criteria for environmental impact assessment so as to protect wetlands and important biodiversity areas, and create balance between development and conservation of biodiversity of the country

3.5) Push for implementation of the Cabinet Resolution of 3 November 2009 on Inventory of Internationally and Nationally Important Wetlands of Thailand, and Wetland Conservation Measures.

3.6) Establish system and guidelines for regulating the use of living modified organisms and push for implementation of draft Biosafety of Modern Biotechnology Act B.E.

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3.7) Push for implementation of the Measures for Protection, Control and Eradication of Invasive Alien Species according to the Cabinet Resolution of 28 April 2009.

Strategy 3 Protect country's rights and enable management to enhance and share benefits from biodiversity in line with green economy

Measure 1 Protect and share benefits from utilization of biological and genetic resources so as to maximize country's benefits.

1.1) Expedite development and revision of laws, regulation and mechanisms for access and benefit sharing, and monitor the utilization of biological and genetic resources in order to protect genetic sources and resources.

1.2) Establish a central agency for management of access and benefit sharing and monitoring the utilization of biological and genetic resources.

1.3) Undertake study and enhance preparedness for ratifying the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization.

1.4) Promote and push for access and benefit sharing from biological resources according to the National Committee on Conservation and Sustainable Use of Biodiversity's Regulation on Criteria and Methods for Access to and Sharing of Benefits from Biological Resources B.E. 2554 (2011).

1.5) Promote and develop mechanisms for management of benefits from access to biological and genetic resources for conservation and protection of biodiversity and genetic sources.

Measure 2 Promote sustainable utilization of biodiversity

2.1) Develop and promote implementation of good practices for sustainable production and consumption in order to ensure food and health security and community strength.

2.2) Promote development of sustainable tourism by community participation taking into account capacity of ecosystem services and biodiversity conservation.

2.3) Promote and develop mechanisms for management of benefits from ecosystem services so as to conserve and utilize biodiversity in a sustainable manner and maintain ecosystem services.

2.4) Encourage establishing knowledge and education centers for learning and exhibiting sustainable utilization of biodiversity in central, regional, provincial and local levels.

Measure 3 Promote value-added research and increase capacity in bioeconomy development.

3.1) Promote and support research into biological resources that have potential for economic development, including increasing potential of existing biological resources on the basis of traditional knowledge incorporating with modern technology.

3.2) Promote public and private partnership for research aiming at conservation and development of sustainable utilization of biodiversity.

3.3) Increase communities' capacity for self-reliance in terms of technology, production and marketing in utilizing and creating products from biodiversity in a suitable manner, especially in enhancing and strengthen community, small and medium enterprises to bring goods and services up to standard.

3.4) Increase country's competitive capacity by utilizing biodiversity as a basis for production, green consumption, innovation, and economic value added creation.

3.5) Promote and support application of biotechnology in industries, especially agricultural industry, including introduction of domestic innovation instead of technology import.

3.6) Support the development of biological entrepreneur networks in order to create collaboration, social responsibility, partnership and opportunity for exchanging information and technology concerning production, marketing and products, including benefit sharing.

Strategy 4 Develop biodiversity knowledge and database systems to be consistent with internationally recognized standards

Measure 1 Promote and develop biodiversity knowledge management.

1.1) Establish biodiversity research and development institute to be a regional center of ASEAN in promoting, exchanging and developing biodiversity knowledge and personnel, including research and taxonomy focusing on sustainable utilization of biodiversity.

1.2) Promote and build capacity of biodiversity personnel and researchers up to international standard.

1.3) Support implementation and push for establishing museums and gene banks for animals, plants and microorganisms up to international standard.

1.4) Build capacity of academic institutes, non-governmental organizations, local communities and networks for surveying and collecting biodiversity information and relevant traditional knowledge.

1.5) Promote research and development so as to be a base for climate change adaptation and mitigation

1.6) Promote and preserve traditional knowledge relevant to conservation and utilization of biodiversity by encouraging applying, transferring and developing of knowledge in a consecutive manner.

1.7) Encourage undertaking study and develop mechanisms for applying knowledge and economic value of biodiversity in formulating policies, measures and plans at national, provincial, and local levels, including in relevant sectors.

1.8) Promote technology application and transfer, including high and basic technology, in conservation, restoration, and sustainable utilization of biodiversity.

Measure 2 Develop and improve biodiversity database systems to be consistent with international standards.

2.1) Study, survey, collect and improve database systems of biodiversity, protected areas and Thailand's Red Data so as to be fundamental information for stipulating policies and directions for biodiversity management.

2.2) Develop web portals on biodiversity and inventory on biological resources and relevant traditional knowledge to be consistent with international standards, which can be used for reference and referring to origins, in order to protect and retain country's rights

2.3) Improve and develop biodiversity knowledge and clearing-house mechanism, including up-to-date databases on status, boundaries, buffer zones and wetland maps, which can be accessible at all levels and by all relevant sectors, including database systems to support policy level decision-making.

9. Plan Implementation

The Master Plan for Integrated Biodiversity Management B.E. 2558-2564 (2015-2021) is a 7-year biodiversity plan of Thailand ranging from 2015 to 2021. The Master Plan aims to carry out biodiversity implementation during the United Nations Decade on Biodiversity (2011-2020) and in accordance with the Aichi Biodiversity Targets which focus on addressing the underlying causes of biodiversity loss by conservation, restoration, surveillance and enhancement of benefits from biodiversity and ecosystem service by 2020. The Master Plan's duration covers the Twelfth National Economic and Social Development Plan B.E. 2560-2564 (2017-2021).

Implementation of the Master Plan at all levels; therefore, needs clear implementation mechanisms in terms of responsible agencies, targets, direction, coordination across all sectors, monitoring and evaluation, including relevant agencies that will efficiently cooperate in implementation and integration of the Master Plan to achieve its objectives. (Figure 2 and 3)

9.1 Mechanisms and Guidelines for Implementation

9.1.1 Implementation mechanisms

The Office of Natural Resources and Environmental Policy and Planning under the Ministry of Natural Resources and Environment is the principal agency for mobilizing implementation for the strategies under the Master Plan. The strategies comprise mechanisms at national, provincial and local levels as follows:

1) National Committee on Conservation and Utilization of Biodiversity (NCB), established in response to the Office of the Prime Minister's Regulation on Conservation and Utilization of Biodiversity B.E. 2543 (2000) and B.E. 2548 (2005), is responsible for mobilizing implementation of the Master Plan at national level, and providing policy advice and suggestions in coordinating and integrating implementation of the strategies under the Master Plan in order to achieve its targets.

2) Subcommittees and Working Groups under the NCB, such as the Subcommittee on the Convention on Biological Diversity, the Subcommittee on the Cartagena Protocol on Biosafety, the Multilateral Advisory Subcommittee on Protected Areas and the Subcommittee on Promotion of Business Sectors' Biodiversity Conservation and Sustainable Utilization, have roles in coordinating and integrating implementation of the

Figure 2 Mechanisms and Guidelines for Implementation, Monitoring and Evaluation of the Master Plan for Integrated Biodiversity Management B.E. 2558-2564 (2015-2021)

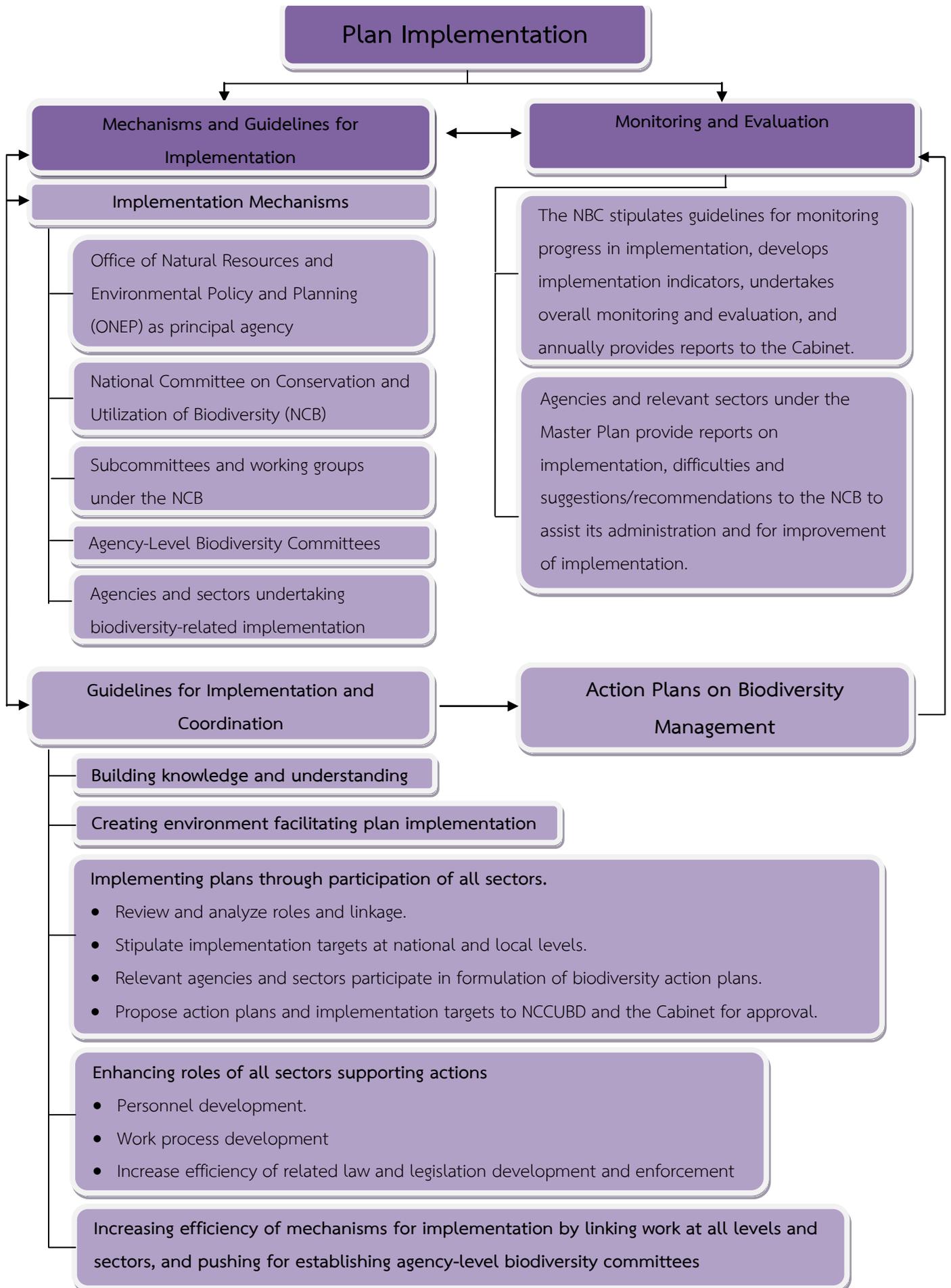
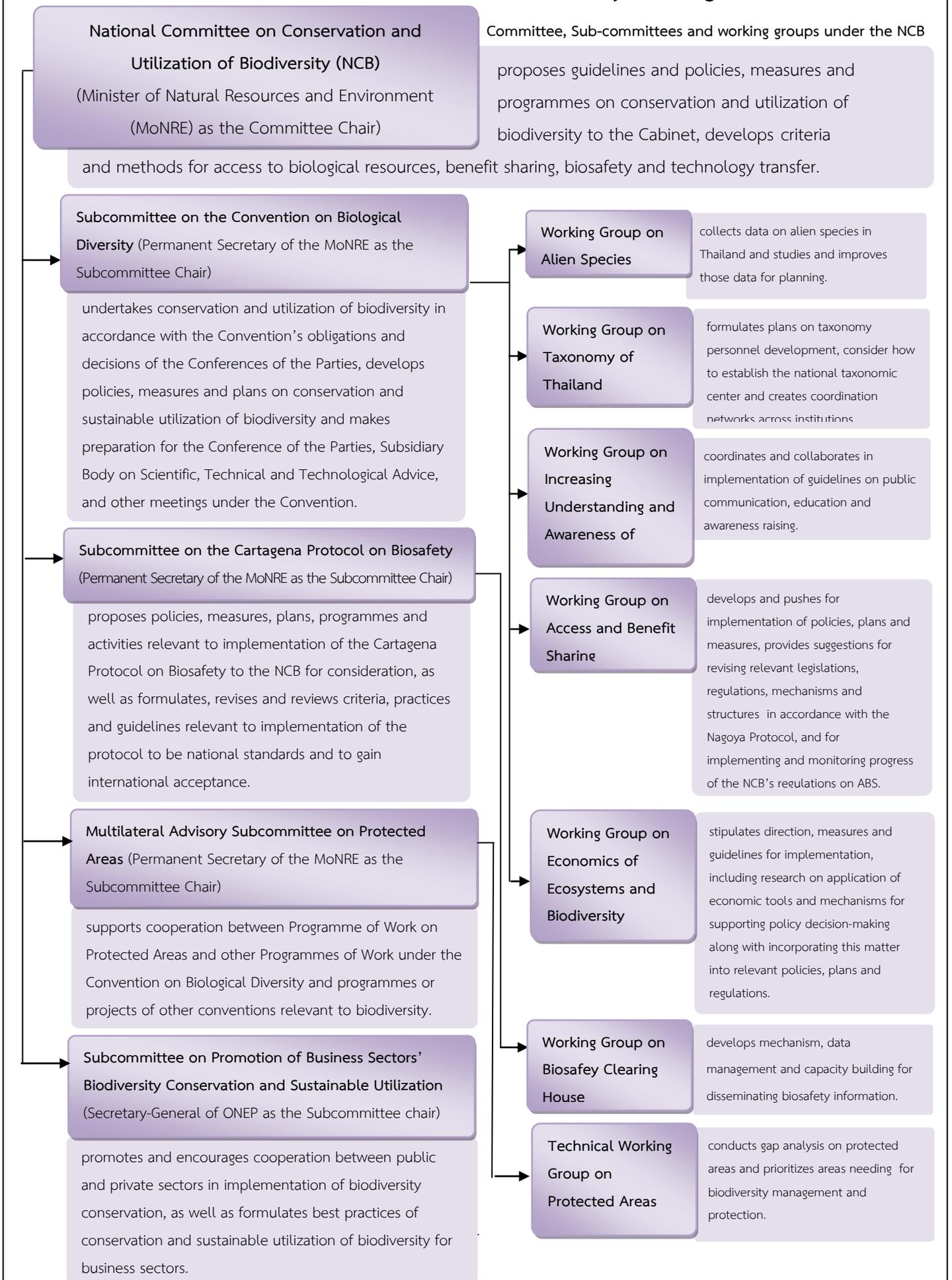


Figure 3 Mechanisms for Implementation of the Strategies and the Action Plans on Biodiversity Management



strategies in relation to their responsibilities by integrating and pushing for implementation across stakeholders from public, private societal and local sectors, including research communities and academic institutes.

3) Agency-Level Biodiversity Committees According to the resolution of the NCB at its 1/2009 meeting on 22 July 2009, the NCB agreed that all agencies undertaking biodiversity works should establish their biodiversity committees. The committees have roles in coordinating annual action plan formulation in accordance with the Master Plan and in pushing forward with implementation of agency level plan.

4) Agencies and Sectors Undertaking Biodiversity Works at national, provincial and local levels collaborate and network to push for implementation of the Master Plan through participation at all levels. Main implementing agencies comprise agencies from 4 Ministries; namely, Ministry of Natural Resources and Environment, Ministry of Agriculture and Cooperatives, Ministry of Science and Technology and Ministry of Public Health. The other relevant agencies include Ministry of Education, Ministry of Tourism and Sports, Ministry of Energy, Ministry of Foreign Affairs, Ministry of Interior, as well as the Bureau of the Budget, the Office of the National Economic and Social Development Board, along with participation of supporting agencies and stakeholders undertaking works on management, education and research relevant to biodiversity and any biodiversity-related implementation at international, national, provincial and local levels by public and private sector, civil society, academic institutes and local communities.

9.1.2 Guidelines for Implementation and Coordination

Implementation of the Master Plan shall take account of coherence and linkage among measures under each strategy and conform to the procedures and processes as follows:

1) Building knowledge and understanding of essence of the Master Plan, comprising vision, mission, objectives, targets and measures of its four strategies, by developing appropriate dissemination media and building this knowledge and understanding to executives and stakeholders at all levels to accept and be aware of importance and intense cooperation in implementation of the plan.

2) Creating environment suitable for implementation of the plan by encouraging agencies and stakeholders to cooperate through networking, to use information technology for developing publicly accessible database systems, and to create channels for

civil society participation such as people forums, seminars and online media to exchange knowledge and information and undertake activities.

3) Implementing of the plan through participation of all sectors The principal implementing agencies encourage relevant agencies and sectors to formulate their annual action plans comprising plans, programmes and activities in accordance with the strategies of the Master Plan and the obligations of the Convention on Biological Diversity by conforming to the following procedures.

3.1) Reviewing and analyzing roles and linkage among related sectors (Annex I) by inspecting linkage between guidelines and measures of the strategies of the Master Plan and those of any national strategies or policies, including missions and roles of relevant agencies and sectors, as well as relevant global policies and obligations **(Annex II)** so as to stipulate plans, programmes and activities for resource mobilization and to formulate guidelines for efficient cooperation of all sectors, by taking account of capacity and needs of stakeholders.

3.2) Stipulating targets for national and local implementation in accordance with the objectives and targets of the Master Plan and global biodiversity targets such as the Aichi Biodiversity Targets 2020 of the Convention on Biological Diversity, by setting implementation targets and indicators for important issues, prioritizing implementation in each period and identifying agencies, organizations or sectors responsible for pushing forward to achieve the targets.

3.3) Relevant agencies and sectors collaborating in formulation of action plans on biodiversity management, comprising plans, programmes, activities, budget, duration, and responsible and supporting agencies, to comply with missions and roles of relevant agencies, and national targets resulting from of the tasks in 3.1) and 3.2). These action plans have to cover implementation at all levels and by all sectors. **(Annex III)**

3.4) Proposing action plans on biodiversity management and national biodiversity targets. The Office of Natural Resources and Environmental Policy and Planning, as secretary of the NCB submits the action plans to the NCB and the Cabinet, respectively, for endorsement and approval for implementation and budget.

4) Enhancing roles of all relevant sectors to ensure efficient implementation of the plan. This activity focuses on strengthening capacity of relevant parties to the extent that they are capable of pushing for and implementing the plan appropriately. The relevant sectors should comply with the followings.

4.1) Develops biodiversity personnel's capacity by promoting and supporting trainings, further studies and skill enhancement, and formulating a succession plan, as well as raising awareness, instilling values, morals and ethics, and tightening discipline in biodiversity management.

4.2) Develop work processes of biodiversity agencies, including creating widely accepted good governance in order to enable agencies to do planning for system and work process development and manpower suitable for implementation, and to prepare themselves for the future by urging restructuring of organizations to reduce duplication, doing analysis for efficient budget allocation, and making a study to increase private sector engagement and participation in implementation, including exchanging of knowledge and technology.

4.3) Develop biodiversity-related legislations suitable for and inclusive of all management dimensions, and enforce relevant legislations more efficiently. Improve and urge the process of making and passing laws and regulations related to the international obligations Thailand has to fulfill as a party, in accordance with the context of the country, e.g. the draft Biosafety of Modern Biotechnology Act B.E., the draft Act on Protection of Threatened and Endangered Species and Habitats, the draft Act on Promotion and Conservation of Native Animals, and the draft Act on Promotion of Marine and Coastal Resources Management B.E.

5) Increase efficiency of implementation mechanisms by engaging committees, subcommittees and working groups in developing action plans for biodiversity management and in pushing forward with implementation of strategies or policies at national and other levels in a concrete manner by means of urging establishment of biodiversity committees in all agencies undertaking biodiversity works, and promoting participation of network parties, private sectors, civil society and local communities in the implementation of the plan.

9.2 Monitoring and Evaluation

Monitoring and evaluation attach importance to monitoring of progress and evaluation of outcomes and impact of implementation of the key issues and strategies of the plan. Monitoring and evaluation are used as a tool to manage and improve guidelines for implementation of the plan in accordance with the present situation and change. The monitoring and evaluation of the plan are required during implementation in order to review measures and set implementation priorities.

Guidelines for monitoring and evaluation are set out as follows:

1) The NCB formulates guidelines for monitoring progress in administering for implementation of the Master Plan, develops indicators for plan implementation and achievement by means of using appropriate monitoring and evaluation methods, carry out overall monitoring and evaluation of impact, and annually reports implementation results to the Cabinet.

2) Agencies and sectors related to the plan report their relevant implementation results, problems, difficulties, recommendations and suggestions to the NCB. The information reported will be used to improve plan implementation in the future.

10. National Biodiversity Targets

In order to implement the Master Plan for Integrated Biodiversity Management B.E. 2558-2564 (2015-2021) in accordance with its targets and objectives, as well as the Strategic Plan on Biodiversity 2011-2020 and the Aichi Targets; therefore, the national biodiversity targets are set and divided into 3 phases as follows:

| Issue | National Biodiversity Targets | | |
|-----------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|
| | By 2016 | By 2020 | By 2021 |
| Awareness Raising and Education | 1. Central, regional and local authorities have knowledge, understanding and awareness on values and importance of biodiversity. | 1. All sectors, especially people and local communities, have basic knowledge on biodiversity, understand and are aware of importance of conservation and sustainable utilization of biodiversity. | - |
| | - | - | 1. Biodiversity issues are incorporated into curricula of schools and academic institutes at all levels. |
| Integration and Promotion of Participation in Biodiversity Management | 2. Participation in protection, conservation, restoration and sustainable utilization of biodiversity of relevant sectors, especially local communities and related networks, significantly increases. | 2. Biodiversity issues are incorporated into relevant policies and plans at all levels. | 2. Biodiversity management is implemented with participation at all levels. |
| | 3. Guidelines for reducing and eliminating harmful incentives that have adverse effects on biodiversity and promoting positive incentives that support conservation and sustainable utilization of biodiversity are in place in relevant sectors. | 3. Financial mechanisms for implementation on protection, conservation, restoration and sustainable utilization of biodiversity are in place. | - |

| Issue | National Biodiversity Targets | | |
|----------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | By 2016 | By 2020 | By 2021 |
| | | 4. Regulations and legislations hindering participation in biodiversity management are amended. | - |
| Conservation, Restoration and Protection of Biodiversity | 4. Reduce rate of natural habitat loss, including forests and coastal ecosystems. | 5. Rate of natural habitat loss, including forests and coastal ecosystems, is reduced by 50%. | - |
| | 5. Efficiency of protected areas and ecosystems management is increased so as to maintain capability of ecological services. | - | 3. Protected area networks and ecological representatives are connected, and management measures for critical areas and important areas for biodiversity and ecosystem service are in place. |
| | 6. Conservation status and management of threatened and endemic species are improved. | 6. Conservation status and management of threatened and endemic species are improved, and measures for conservation and protection of their habitats are in place. | - |
| | - | - | 4. Management, policy and legislative mechanisms and measures for conservation and protection of genetic diversity are in place. |
| Threat Reduction and Sustainable | 7. Reduce threats from human activities to species and natural habitats, especially coral reefs and vulnerable ecosystems affected by climate change. | 7. Control pollution to level that does not damaged ecosystem functions and biodiversity. | - |

| Issue | National Biodiversity Targets | | |
|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | By 2016 | By 2020 | By 2021 |
| | 8. Guidelines for Integrating biodiversity into relevant standards and criteria are in place. | 8. Tools/mechanisms/guidelines for sustainable utilization of biodiversity are applied in all relevant sectors. | - |
| Wetland Management | 9. Efficiency of wetland management is increased at all levels. | - | 5. Significantly reduce wetland ecosystem loss so as to maintain the use of ecosystem service and support climate change adaptation. |
| Alien Species Management | 10. Invasive alien species in each particular ecosystem and major pathways are identified and inventories are in place. | 9. Measures for managing priority invasive alien species and major pathways are in place. | - |
| Biosafety Management | 11. Enforce legislations and regulations relevant to controlling and preventing adverse effects on biodiversity from the use of modern biotechnology. | - | 6. Regulations in accordance with precautionary approach to governing biosafety are in place, and relevant agencies apply such regulations to improving and developing regulations and mechanisms for regulating transboundary movement of living modified organisms in accordance with the obligations of the Cartagena Protocol. |

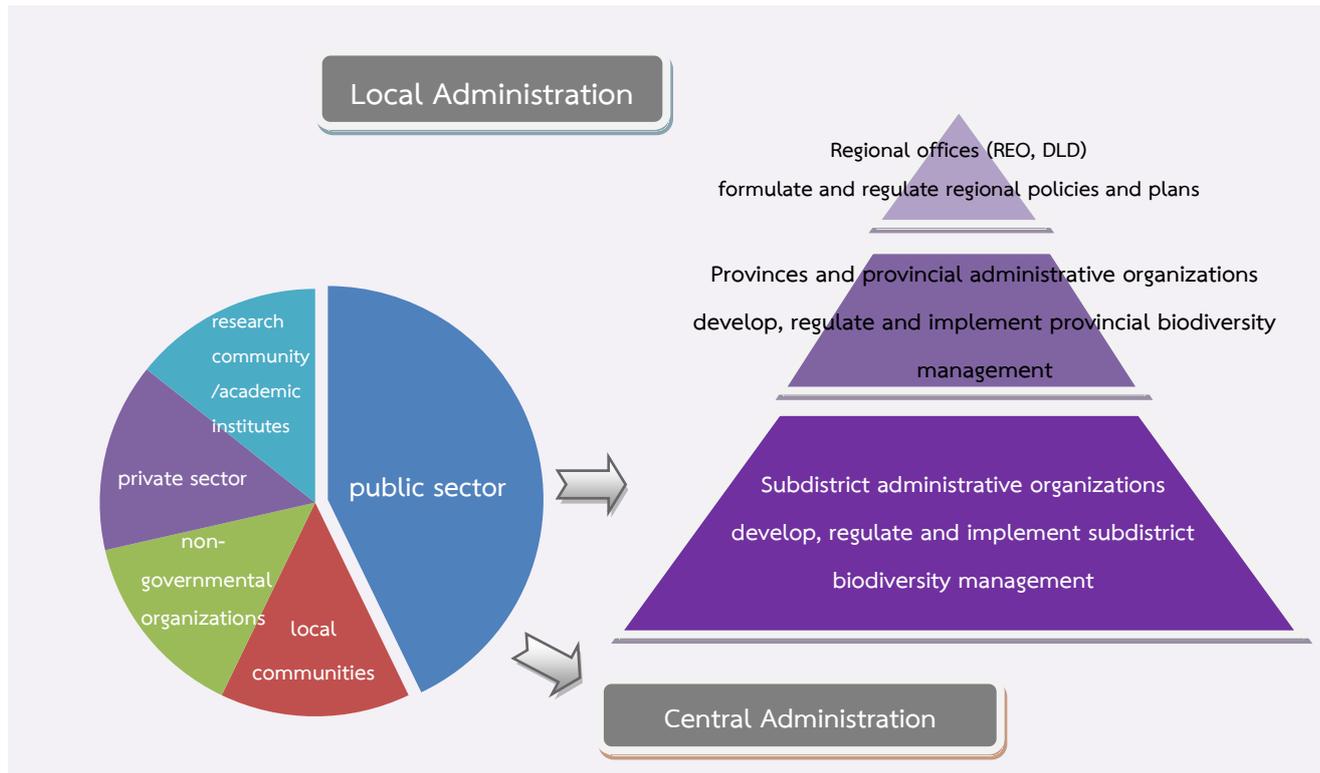
| Issue | National Biodiversity Targets | | |
|----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | By 2016 | By 2020 | By 2021 |
| Protection of Genetic Resources | 12. Mechanisms and regulations relevant to access and benefit sharing are in place in the principal agencies governing access and benefit sharing from genetic resources in accordance with the Nagoya Protocol. | 10. Central agency for managing access and benefit sharing and monitoring utilization of genetic resources is established. | 7. Research and local communities developed mechanisms and regulations relevant to access and benefit sharing from genetic resources. |
| | 13. Develop legislation relevant to access and benefit sharing so as to cover biological resources and related traditional knowledge. | - | - |
| Research and Development on Bioeconomy | 14. National competitiveness based on biodiversity is increased. | - | 8. Measures and mechanisms are in place for returning economic benefits from biological products to their origins in order to support conservation and sustainable utilization of biodiversity. |
| Knowledge and Database Management | 15. Scientific knowledge is managed in the manner that contributes to the formulation of policies and plans on biodiversity. | 11. Mechanisms for applying scientific knowledge to formulation of policies and plans on biodiversity are in place. | 9. Databases on priority biodiversity are in place. |
| | 16. Mechanisms for integrating and linking existing biodiversity databases are in place to enable their efficient use. | - | 10. Link and expand biodiversity clearing-house mechanisms across relevant agencies. |

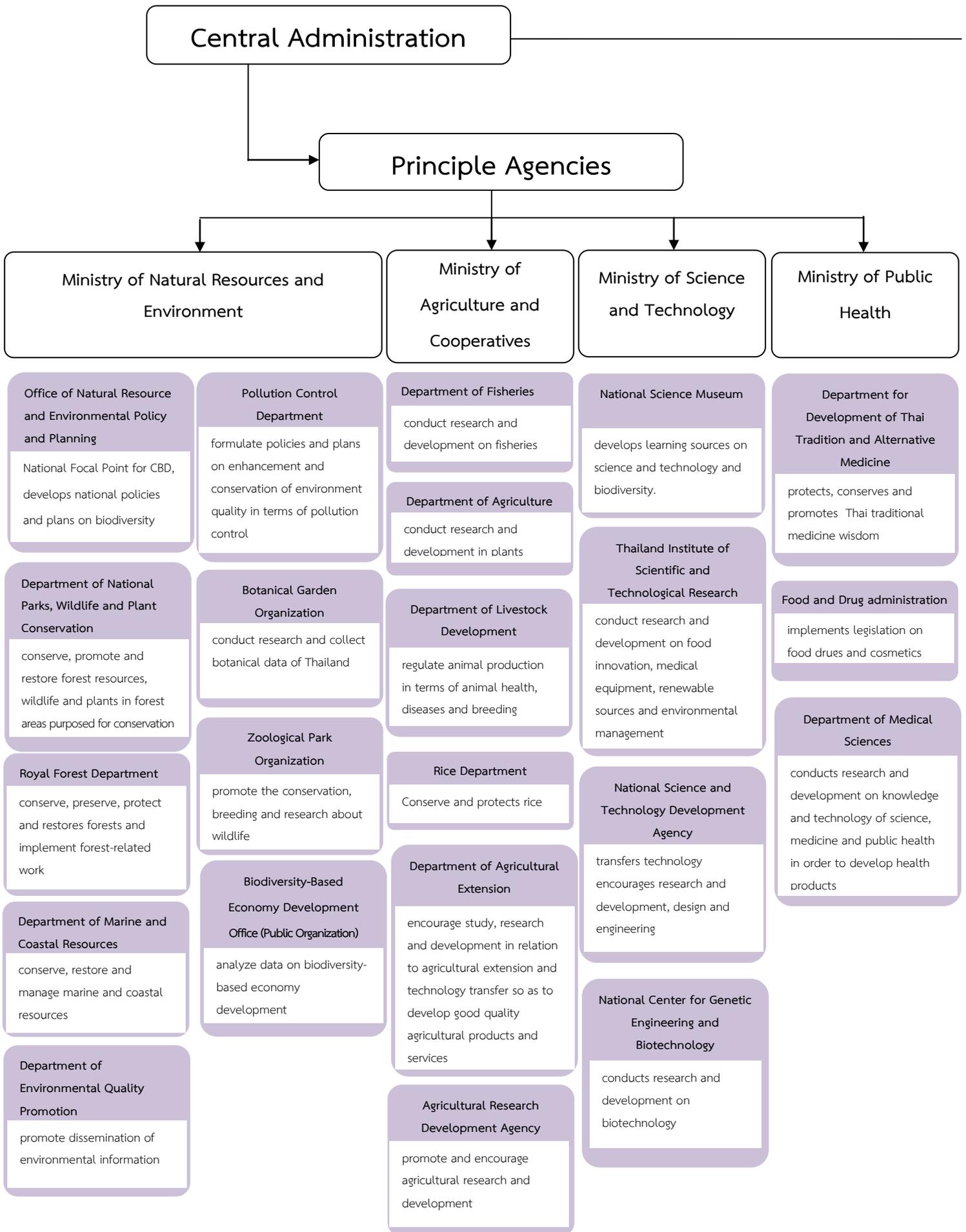
| Issue | National Biodiversity Targets | | |
|---------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|----------------------------------------------------------------------------------------------------------------------------------------------|
| | By 2016 | By 2020 | By 2021 |
| | 17. Central agency is in place for implementing and utilizing existing databases to ensure contribution to conservation and sustainable utilization of biodiversity. | - | 11. Municipalities at all levels collect information relevant to city biodiversity in a systematic manner. |
| Preservation of Traditional Knowledge Related to Biodiversity | 18. National data and register on traditional knowledge and local wisdom that support conservation and sustainable utilization of biodiversity are in place. | - | 12. Biodiversity-related traditional knowledge databases that can be used to protect the rights of the country and communities are in place. |

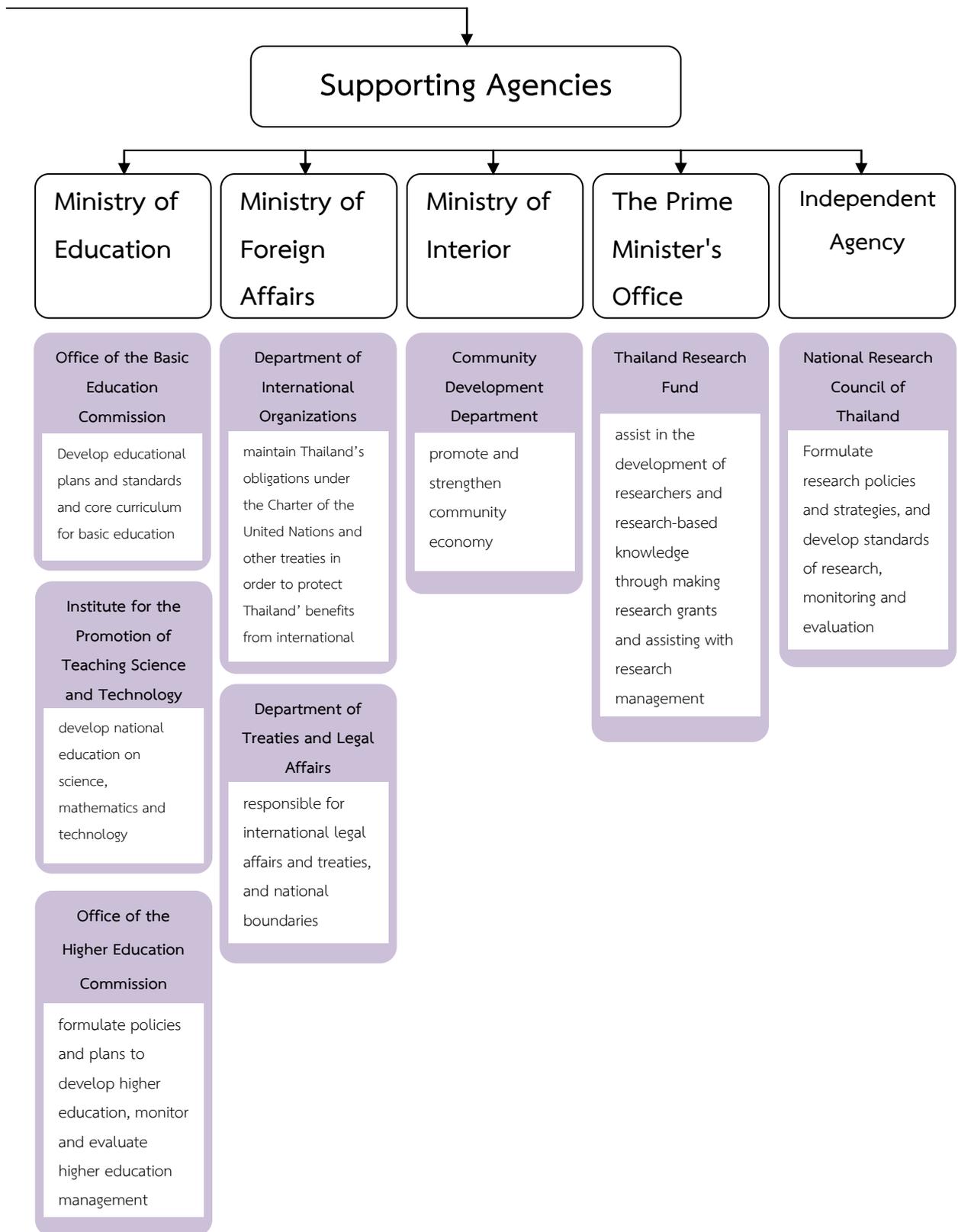
Annex I

Agencies and Sectors Relevant to Biodiversity Management

Roles of Agencies and Sectors Relevant to Biodiversity Management







Agencies and Sectors Relevant to Biodiversity Management

Agencies relevant to Thailand's biodiversity management come from 5 principal sectors; namely, public sector, research community, private sector, non-governmental organizations and local communities. The public sector includes 30 central agencies from 8 ministries, comprising policy, research and development, awareness raising and participation, and funding agencies, the local agencies comprising 3 groups; namely, regional agencies, provincial agencies, and local administration organizations.

| Agencies | Roles and Responsibilities |
|-------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Central Administration | |
| Ministry of Natural Resources and Environment | |
| Office of Natural Resources and Environmental Policy and Planning | <ul style="list-style-type: none"> Develop policies and integrated plans; propose measures and mechanisms for management of natural resources and environment; as well as coordinate actions in response to its duty according to the constitution, government policies and strategic plans, the Enhancement and Conservation of the National Environmental Quality Act, national strategies and the strategies of Ministry of Natural Resources and Environment. |
| Department of National Parks, Wildlife and Plant Conservation | <ul style="list-style-type: none"> Conserve, promote and restore forests, wildlife and plants in conservation forests through protecting existing forest reserves and restoring degraded forests by means of strategies on raising communities' awareness and senses of belonging and participation in overseeing local resources to maintain balance of ecosystems and the environment, including biodiversity, in order to serve as watersheds, wildlife habitats, food sources, and recreation and tourism sites for the people. |
| Royal Forest Department | <ul style="list-style-type: none"> Conserve, preserve, protect, restore and maintain forests and promote forest work, logging, forest products collection, land use in forest areas and other work related to forests and forest industry in accordance with laws and regulations mainly through people's participation in order to increase economic values and enhance people's quality of life. |
| Department of Marine and Coastal Resources | <ul style="list-style-type: none"> Conserve, restore and manage marine and coastal resources, including mangrove forests to maintain abundance of the Thai seas in a balanced and sustainable manner in order to increase social and economic security of the country. |

| Agencies | Roles and Responsibilities |
|---------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Department of Environment Quality Promotion | <ul style="list-style-type: none"> Promote and disseminate environmental information; provide, as the environmental information center, services on environmental information and technology; promote public participation in preservation and utilization of natural resources, the environment and biodiversity in a balanced and sustainable manner, including research, development, transfer and promotion of environmental management technology; and provide coordination and suggestions for plans and measures on promotion of natural resources and environment conservation at national level. |
| Pollution Control Department | <ul style="list-style-type: none"> Provide suggestions for development of policies and plans concerning pollution control; make recommendations on establishment of standards for environment quality and point source pollution control; formulate environmental quality management plans and measures for controlling, protecting and addressing environmental problems; monitor and inspect environmental quality; and prepare reports on pollution situation. |
| Botanical Garden Organization | <ul style="list-style-type: none"> Undertake botanical garden work, conduct research and compile data on plants of Thailand, biodiversity and environmental conservation. |
| Zoological Park Organization | <ul style="list-style-type: none"> Promote the conservation, breeding and research about wildlife and develop the zoos to be the ecological tourist attractions for the public. |
| Biodiversity-Based Economy Development Office (Public Organization) | <ul style="list-style-type: none"> Collate information, conduct studies, analyze data and assess needs for the development of biodiversity-based economy in order to make policy recommendations and propose measures; compile information and develop inventory on plants, animals and microorganisms, originated or found in the country, including community and local knowledge, in order to be used as databases and for economic utilization; promote and support researches which make use of the existing knowledge on utilization of biodiversity and local wisdom; encourage making use of biodiversity resources for economic purposes along with sustainable conservation in order to create research processes, develop goods and service; and create business opportunities and incomes at community and commercial enterprise levels |

| Agencies | Roles and Responsibilities |
|----------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Ministry of Agriculture and Cooperatives | |
| Department of Fisheries | <ul style="list-style-type: none"> • Conduct studies, research and development in fisheries in order to manage fisheries resources; control fishing, production and fisheries products up to standard to ensure sufficient domestic consumption and country's capabilities to compete in the global marketplace; and make use of fisheries and other related resources in a sustainable manner. |
| Department of Agriculture | <ul style="list-style-type: none"> • Conduct studies, research and development in plants; transfer plant production technology to public and private sectors and farmers; and provide services on analysis, inspection, certification and advice concerning soil, water, fertilizer, plants, agricultural materials and products in order to increase quality of agricultural products for exportation. |
| Department of Livestock Development (DLD) | <ul style="list-style-type: none"> • Regulate and control animal production in terms of health, disease control, breeding, animal feed quality, animal clinics, livestock and animal processing and products. |
| Rice Department | <ul style="list-style-type: none"> • Conduct studies, research and development in rice production, protection, harvesting and processing technology and rice standards; undertake rice genetic conservation and protection; promote and encourage value-added creation, rice product and processing management development; encourage rice marketing and technology transfer; and conserve and promote local culture and traditional knowledge related to rice. |
| Department of Agricultural Extension | <ul style="list-style-type: none"> • Conduct studies and research on agricultural extension and technology transfer to provide agricultural products, merchandise and services which are of good quality. |
| Agricultural Research Development Agency (Public Organization) | <ul style="list-style-type: none"> • Promote and support agricultural research and agricultural personnel development, including research, development and dissemination of agricultural research information. |
| Ministry of Science and Technology | |
| National Science Museum | <ul style="list-style-type: none"> • Develop learning center of science, technology and biodiversity through scientific communication, activities, research and development, and any management that aims to increase knowledge, understanding, attitude and scientific minds for Thai society, including raising awareness of |

| Agencies | Roles and Responsibilities |
|-------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | science, technology and biodiversity. |
| Thailand Institute of Scientific and Technological Research | <ul style="list-style-type: none"> • Conduct and integrate applied research and development in food innovation, health products, medical equipment, renewable energy, and environmental management; provide scientific and technological services on analysis, testing, calibration, quality system certification and consultation according international standards and; push ahead with research, innovation and services, responding to demand of target groups in manufacturing and service sectors, to increase self-reliance and to get into ASEAN Community by means of business management and effective marketing. |
| National Science and Technology Development Agency | <ul style="list-style-type: none"> • Develop scientific and technological capacity through implementing activities concerning technology transfer, strengthening research, development, design and engineering, to translate them to practical use; develop personnel competencies and enhance necessary scientific and technological infrastructure in order to create competitiveness and sustainable development through efficient internal management. |
| National Center for Genetic Engineering and Biotechnology | <ul style="list-style-type: none"> • Conduct research and development in biotechnology; create national infrastructure for biotechnology; promote cooperation among network institutes, private sectors and foreign organizations; and transfer appropriate technology to public and industrial sectors. |
| Ministry of Public Health | |
| Department for Development of Thai Traditional and Alternative Medicine | <ul style="list-style-type: none"> • Develop Thai traditional and alternative medicine by means of protecting, conserving and promoting traditional medicine wisdom; develop knowledge management system; bring standard of Thai traditional and alternative medicine up to standard of modern medicine; and promote the use of such medicine in health systems as alternative ways for people's health care. |
| Food and Drug Administration | <ul style="list-style-type: none"> • Enforce legislation on food, drugs, cosmetics, hazardous substances, psychotropic substances, narcotics, medical equipment, inhalants and related laws; monitor, regulate and inspect quality standards of product entrepreneurs and advertisement, including adverse effect of products; and monitor foreign and domestic information concerning health products. |

| Agencies | Roles and Responsibilities |
|----------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Department of Medical Sciences | <ul style="list-style-type: none"> • Develop and standardize analysis systems and methods for health products, food, drugs, narcotics, psychotropic substances, inhalants, cosmetics, medical equipment, public health hazardous substances, biological substances, herbs, and disease diagnosis; and conduct studies and research on medical sciences and public health in order to develop health products, conduct risk assessment and issue health warning. |
| Ministry of Education | |
| Office of the Basic Education Commission | <ul style="list-style-type: none"> • Develop proposal on education development policies and plans, education standards and core curricula for basic education; establish guidelines and implement tasks concerning resource allocation and support, and budget management for basic education; and develop management systems and promote information network coordination and information technology application to education, including educational supervision and management. |
| Institute for the Promotion of Teaching Science and Technology | <ul style="list-style-type: none"> • Develop national education on science, mathematics, and technology by means of conducting studies, developing manuscripts and delivering them to users in order to increase quality levels of science, mathematics and technology education. |
| Office of the Higher Education Commission | <ul style="list-style-type: none"> • Propose policies, plans and standards for higher education in accordance with national economic and social development plan, national education plans, resource support, and monitoring and evaluation of higher education according to related laws. |
| Ministry of Foreign Affairs | |
| Department of International Organizations | <ul style="list-style-type: none"> • Cooperate with international communities on prevention and addressing problems that may effects on regional and global security; maintain Thailand's obligations under Charter of the United Nations and other Treaties in order to protect Thailand' benefits in international forums. |
| Department of Treaties and Legal Affairs | <ul style="list-style-type: none"> • Implement tasks concerning international laws and other legislation related to treaties and boundaries of the country, including studies and follow up on trends and development of international laws under frameworks of the United Nations and other international |

| Agencies | Roles and Responsibilities |
|-----------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | organizations. |
| Ministry of Interior | |
| Community Development Department | <ul style="list-style-type: none"> Promote learning processes and people’s participation; promote and develop community-based economy by means of encouraging information development and utilization; study, analyze, research and formulate community strategies; and provide training and development for personnel relevant to community development in order to build strong and sustainable communities. |
| The Prime Minister's Office | |
| Thailand Research Fund | <ul style="list-style-type: none"> Provide complete management to support creating and developing manpower and professional researchers for societies that use knowledge in addressing problems; urge utilization of researches in the field of agriculture, industry and services; push ahead with development of life quality and environment; and strengthen local communities and form joint ventures with private sectors, as well as domestic and foreign agencies. |
| Independent Agency | |
| Office of the National Research Council of Thailand | <ul style="list-style-type: none"> Formulate national research policies and strategies; develop standards for research systems and monitoring and evaluation; serve as a research information center with networks across the country; promote research cooperation with domestic and foreign agencies; and promote and facilitate research innovation, transfer innovation and technology to social, industrial and commercial sectors. |
| Local Administration | |
| Regional Environmental Office (REO) | <ul style="list-style-type: none"> Formulate regional environment quality management plan; coordinate, monitor and evaluate implementation of the plan; prepare state of environment reports; develop information system; provide technical and environmental measures advice; and enhance capacity of local agencies and local administration in environmental management implementation. |
| Regional Bureau of Animal Health and Sanitary | <ul style="list-style-type: none"> Conduct studies and research to develop work concerning sanitary and animal health; inspect quality of livestock products and promote |

| Agencies | Roles and Responsibilities |
|----------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | <p>environment quality related to livestock development; conduct research and transfer technology to develop animal production, feed, animal health and sanitary; integrated implement such plan at regional and provincial level; and formulate regional livestock strategies and plans.</p> |
| <p>Provincial Offices for Natural Resources and Environment</p> | <ul style="list-style-type: none"> • Formulate provincial environmental management plans, provincial environmental action plans; monitor and inspect state of environment of provinces; undertake tasks according to laws concerning forests, national reserved forests, wildlife protection and preservation; monitor and maintain provincial water warning systems; coordinate formulation of action plans and monitoring of relevant agencies' implementation; and promote public participation in conservation and restoration of natural resources and environment at provincial level. |
| <p>Provincial Livestock Office</p> | <ul style="list-style-type: none"> • Enforce laws on animal diseases, animal breeding, animal feed control, animal clinics, rabies, animal slaughter control and meat sale and related legislation; undertake work on animal health, artificial insemination, livestock sanitation and environment; study, analyze, research, develop, apply, promote and transfer livestock technology; and regulate, advise and support operations of District Livestock Office. |
| <p>Provincial Agricultural Office</p> | <ul style="list-style-type: none"> • Promote and develop farmers, farmer organizations and community enterprises; coordinate production knowledge transfer, crop, fisheries and livestock management; and oversee District Agricultural Office. |
| <p>Provincial Public Health Office</p> | <ul style="list-style-type: none"> • Develop provincial health strategy systems and coordinate provincial public health work; and oversee, evaluate and support provincial public health units to ensure their work according to the law. Provide health services and consumer protection. |
| <p>Local Administration (Provincial Administrative Organization and Subdistrict Administration Organization)</p> | <ul style="list-style-type: none"> • Formulate local development plans;. protect, restore, maintain and utilize natural resources and environment in the area; maintain public areas, waterway, and drainage systems; prevent and address pollution problems; undertake environmental monitoring and surveillance; and promote public participation in local development and natural resources and environment management, including environmental knowledge. |

| Agencies | Roles and Responsibilities |
|--------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Research Community | |
| Academic Institutes and Research Units | <ul style="list-style-type: none"> • Conduct studies, provide integrated education and develop curricula. Formulate education development policies and plans in accordance with policies of the Ministry of Education. |
| Private Sector | |
| e.g. Electricity Generating Authority of Thailand, PTT Public Company Limited, The Charoen Pokphand Group, Chevron (Thailand). | <ul style="list-style-type: none"> • Promote and support conservation and sustainable utilization of biodiversity; raise awareness and increase knowledge of value and importance of biodiversity by means of exhibition and projects or activities to disseminate biodiversity implementation; and support protection and restoration of environment quality along with raising awareness on natural resources and biodiversity conservation. |
| Non-Governmental Organizations | |
| e.g. Green World Foundation, Bird Conservation Society of Thailand, WWF Thailand, Thailand Environment Institute, etc. | <ul style="list-style-type: none"> • Cooperate with civil society in developing and addressing problems in parallel with government agencies in order to monitor and inspect government agencies implementation; and coordinate public and private sectors, individual and any organization in promoting conservation and sustainable utilization of biodiversity by organizing activities such as exhibition, projects or activities to disseminate biodiversity implementation etc. |
| Local Communities | |
| | <ul style="list-style-type: none"> • Participate in protection, conservation, restoration and utilization of biodiversity in their areas. |

Annex II

Linkage between the Master Plan for Integrated Biodiversity Management B.E. 2558-2564 (2015-2021) and the Strategic Plan for Biodiversity 2011-2020 and the Aichi Biodiversity Targets

Linkage between the Master Plan for Integrated Biodiversity Management B.E. 2558-2564 (2015-2021) and the Strategic Plan for Biodiversity 2011-2020 and the Aichi Biodiversity Targets

| The Strategic Plan for Biodiversity 2011-2020 and the Aichi Biodiversity Targets | | Master Plan for Integrated Biodiversity Management B.E. 2558-2564 (2015-2021) |
|----------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
| Strategic goal A: Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society | | |
| By 2020 | 1. People are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably. | Strategy 1 Measure 1.1-1.4 |
| | 2. Biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems. | Strategy 1 Measure 2.4 Strategy 2 Measure 2.1-2.3 |
| | 3. Incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio-economic conditions. | Strategy 1 Measure 2.5 Strategy 4 Measure 1.7 |
| | 4. Governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production and consumption and have kept the impacts of | Strategy 1 Measure 2.1,2.2 Measure 3.1-3.4 Strategy 3 Measure 2.1,2.2 Measure 3.2 |

| The Strategic Plan for Biodiversity 2011-2020 and the Aichi Biodiversity Targets | | Master Plan for Integrated Biodiversity Management B.E. 2558-2564 (2015-2021) |
|--------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|
| | use of natural resources well within safe ecological limits. | |
| Strategic goal B: Reduce the direct pressures on biodiversity and promote sustainable use | | |
| By 2020 | 5. The rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced. | Strategy 2 Measure 1.1,1.2 Measure 3.2 |
| | 6. All fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches, so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits. | Strategy 2 Measure 3.1,3.2 Strategy 3 Measure 2.1 |
| | 7. Areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity. | Strategy 2 Measure 3.1,3.2 Strategy 3 Measure 2.1 |
| | 8. Pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity. | Strategy 2 Measure 3.2 |
| | 9. Invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in | Strategy 2 Measure 3.7 |

| The Strategic Plan for Biodiversity 2011-2020 and the Aichi Biodiversity Targets | | Master Plan for Integrated Biodiversity Management B.E. 2558-2564 (2015-2021) |
|-----------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|
| | place to manage pathways to prevent their introduction and establishment. | |
| | 10. The multiple anthropogenic pressures on coral reefs, and other vulnerable ecosystems impacted by climate change or ocean acidification are minimized, so as to maintain their integrity and functioning. | Strategy 2 Measure 3.2 |
| Strategic goal C: Improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity | | |
| By 2020 | 11. At least 17 per cent of terrestrial and inland water areas, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes. | Strategy 2 Measure 1.1, 1.6 Measure 2.3 Measure 3.2, 3.5 |
| | 12. The extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained. | Strategy 2 Measure 1.3, 1.5 |
| | 13. The genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable | Strategy 2 Measure 1.4 |

| The Strategic Plan for Biodiversity 2011-2020 and the Aichi Biodiversity Targets | | Master Plan for Integrated Biodiversity Management B.E. 2558-2564 (2015-2021) |
|-----------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|
| | species, is maintained, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity. | |
| Strategic goal D: Enhance the benefits to all from biodiversity and ecosystem services | | |
| By 2020 | 14. Ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable. | Strategy 2 Measure 1.1, 1.2 Measure 2.2, 2.3 |
| | 15. ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and to combating desertification. | Strategy 2 Measure 1.2 Measure 3.2 |
| | 16. The Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization is in force and operational, consistent with national legislation. | Strategy 3 Measure 1.1-1.5 Strategy 4 Measure 2.2, 2.3 |

| | | |
|---------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|
| The Strategic Plan for Biodiversity 2011-2020 and the Aichi Biodiversity Targets | | Master Plan for Integrated Biodiversity Management B.E. 2558-2564 (2015-2021) |
| Strategic goal E: Enhance implementation through participatory planning, knowledge management and capacity building | | (Capacity Building) Strategy 1 Measure 2.2, 2.3 Measure 3.1-3.3 Strategy 4 Measure 1.2, 1.4, 1.5 |
| | 17. Each Party has developed, adopted as a policy instrument, and has commenced implementing an effective, participatory and updated national biodiversity strategy and action plan. | Strategy 1 Measure 2.2 |
| By 2020 | 18. The traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels. | Strategy 1 Measure 3.3 Strategy 3 Measure 3.1, 3.3 Strategy 4 Measure 1.6, 1.8 |
| | 19 Knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied. | Strategy 3 Measure 2.4 Measure 3.1 Strategy 4 Measure 1.3, 1.5, 1.7, 1.8, Measure 2.1-2.3 |

| The Strategic Plan for Biodiversity 2011-2020 and the Aichi Biodiversity Targets | | Master Plan for Integrated Biodiversity Management B.E. 2558-2564 (2015-2021) |
|----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|
| | <p>20. The mobilization of financial resources for effectively implementing the Strategic Plan for Biodiversity 2011-2020 from all sources, and in accordance with the consolidated and agreed process in the Strategy for Resource Mobilization, should increase substantially from the current levels. This target will be subject to changes contingent to resource needs assessments to be developed and reported by Parties.</p> | Strategy 1 Measure 2.6 |

Annex III

Prioritization of measures under the Master Plan for Integrated
Biodiversity Management B.E. 2558-2564 (2015-2021)

**Prioritization of Measures under the Master Plan for Integrated Biodiversity
Management B.E. 2558-2564 (2015-2021)**

| National Biodiversity Targets | Measures under the Master Plan for Integrated Biodiversity Management B.E. 2558-2564 (2015-2021) in response to national biodiversity targets |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| Immediate phase (by 2016) | |
| Awareness Raising and Education | |
| 1. Central, regional and local authorities have knowledge, understanding and awareness on values and importance of biodiversity. | Strategy 1 Measure 1.1-1.4 |
| Integration and Promotion of Participation in Biodiversity Management | |
| 2. Participation in protection, conservation, restoration and sustainable utilization of biodiversity of relevant sectors especially local communities and related networks, significantly increases. | Strategy 1 Measure 2.1, 2.2 and Measure 3.1-3.4 |
| 3. Guidelines for reducing and eliminating harmful incentives that have adverse effects on biodiversity and promoting positive incentives that support conservation and sustainable utilization of biodiversity are in place in relevant sectors. | Strategy 1 Measure 2.5 Strategy 4 Measure 1.7 |
| Conservation, Restoration and Protection of Biodiversity | |
| 4. Reduce rate of natural habitat loss, including forests and coastal ecosystems. | Strategy 1 Measure 2.4 Strategy 2 Measure 1.1, 1.2 |

| National Biodiversity Targets | Measures under the Master Plan for Integrated Biodiversity Management B.E. 2558-2564 (2015-2021) in response to national biodiversity targets |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| | Measure 2.1-2.3 and Measure 3.2 |
| 5. Efficiency of protected areas and ecosystems management is increased so as to maintain capability of ecological services. | Strategy 2 Measure 1.1 and Strategy 4 Measure 1.8 |
| 6. Conservation status and management of threatened and endemic species are improved. | Strategy 2 Measure 1.3, 1.5 and Measure 3.3 |
| Threat Reduction and Sustainable Utilization of Biodiversity | |
| 7. Reduce threats from human activities to species and natural habitats, especially coral reefs and vulnerable ecosystems affected by climate change. | Strategy 2 Measure 3.1-3.3, 3.6, 3.7 |
| 8. Guidelines for Integrating biodiversity into relevant standards and criteria are in place. | Strategy 2 Measure 3.1, 3.4 |
| Wetland Management | |
| 9. Efficiency of wetland management is increased at all levels. | Strategy 2 Measure 2.2, 2.3 and Measure 3.2, 3.5 |
| Alien species management | |
| 10. Invasive alien species in each particular ecosystem and major pathways are identified | Strategy 2 Measure 3.7 |

| | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| National Biodiversity Targets | Measures under the Master Plan for Integrated Biodiversity Management B.E. 2558-2564 (2015-2021) in response to national biodiversity targets |
| and inventories are in place. | |
| Biosafety Management | |
| 11. Enforce legislation and regulations relevant to controlling and preventing adverse effects on biodiversity from the use of modern technology. | Strategy 2 Measure 3.6 |
| Protection of Genetic Resources | |
| 12. Mechanisms and regulations relevant to access and benefit sharing are in place in the principal agencies governing access and benefit sharing from genetic resources in accordance with the Nagoya Protocol. | Strategy 3 Measure 1.1, 1.3-1.5 |
| 13. Develop legislation relevant to access and benefit sharing so as to cover biological resources and related traditional knowledge. | Strategy 3 Measure 1.1, 1.2, 1.5 |
| Research and Development on Bioeconomy | |
| 14. National competitiveness based on biodiversity is increased. | Strategy 3 Measure 3.1-3.6 |
| Knowledge and database management | |
| 15. Scientific knowledge is managed in the manner that contributes to the formulation | Strategy 4 Measure 1.5, 1.7 and Measure 2.1 -2.3 |

| National Biodiversity Targets | Measures under the Master Plan for Integrated Biodiversity Management B.E. 2558-2564 (2015-2021) in response to national biodiversity targets |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| of policies and plans on biodiversity. | |
| 16. Mechanisms for integrating and linking existing biodiversity databases are in place to enable their efficient use. | Strategy 4 Measure 2.3 |
| 17. Central agency is in place for implementing and utilizing existing databases to ensure contribution to conservation and sustainable utilization of biodiversity. | Strategy 4 Measure 1.1 and Measure 2.3 |
| Preservation of Traditional Knowledge Related to Biodiversity | |
| 18. National data and register on traditional knowledge and local wisdom that support conservation and sustainable utilization of biodiversity are in place. | Strategy 4 Measure 1.6, 1.8 and Measure 2.2, 2.3 |
| Long-Term Phase (by 2020) –in response to Global Biodiversity Targets | |
| Awareness Raising and Education | |
| 1. All sectors, especially people and local communities have basic knowledge on biodiversity, understand and are aware of importance of conservation and sustainable utilization of biodiversity. | Strategy 1 Measure 1.1-1.4 |

| National Biodiversity Targets | Measures under the Master Plan for Integrated Biodiversity Management B.E. 2558-2564 (2015-2021) in response to national biodiversity targets |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| Integration and Promotion of Participation in Biodiversity Management | |
| 2. Biodiversity issues are incorporated into relevant policies and plans at all levels. | Strategy 1 Measure 2.4 and Strategy 2 Measure 2.1-2.3 |
| 3. Financial mechanisms for implementation on protection, conservation, restoration and sustainable utilization of biodiversity are in place. | Strategy 1 Measure 2.6 |
| 4. Regulations and legislation hindering participation in biodiversity management are amended. | Strategy 1 Measure 2.1, 2.3 |
| Conservation, Restoration and Protection of Biodiversity | |
| 5. Rate of natural habitat loss, including forests and coastal ecosystems, is reduced by 50%. | Strategy 1 Measure 2.4 Strategy 2 Measure 1.1 1.2 Measure 2.1-2.3 and Measure 3.2 |
| 6. Conservation status and management of threatened and endemic species are improved and measures for conservation and protection of their habitats are in place. | Strategy 2 Measure 1.3, 1.5 and Measure 3.3 |

| National Biodiversity Targets | Measures under the Master Plan for Integrated Biodiversity Management B.E. 2558-2564 (2015-2021) in response to national biodiversity targets |
|----------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| Threat Reduction and Sustainable Utilization of Biodiversity | |
| 7. Control pollution to level that does not damaged ecosystem functions and biodiversity. | Strategy 2 Measure 3.2 |
| 8. Tools/mechanisms/guidelines for sustainable utilization of biodiversity are applied in all relevant sectors. | Strategy 2 Measure 3.1 Strategy 3 Measure 2.1,2.2, 2.4 and Strategy 4 Measure 1.8 |
| Wetland Management | |
| - | |
| Alien Species Management | |
| 9. Measures for managing priority invasive alien species and major pathways are in place. | Strategy 2 Measure 3.7 |
| Biosafety Management | |
| - | |
| Protection of Genetic Resources | |
| 10. Central agency for managing access and benefit sharing and monitoring utilization of genetic resources is established. | Strategy 3 Measure 1.1, 1.2 |

| National Biodiversity Targets | Measures under the Master Plan for Integrated Biodiversity Management B.E. 2558-2564 (2015-2021) in response to national biodiversity targets |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| Research and Development on Bioeconomy | |
| - | |
| Knowledge and Database Management | |
| 11. Mechanisms for applying scientific knowledge to formulation of policies and plans on biodiversity are in place. | Strategy 4 Measure 1.7 and Measure 2.1-2.3 |
| Preservation of Traditional Knowledge Related to Biodiversity | |
| - | |
| Long-Term Phase (by 2021) | |
| Awareness Raising and Education | |
| 1. Biodiversity issues are incorporated into curricula of schools and academic institutes at all levels. | Strategy 1 Measure 1.2 |
| Integration and Promotion of Participation in Biodiversity Management | |
| 2. Biodiversity management is implemented with participation at all levels. | Strategy 1 Measure 2.1-2.4, 2.7 Measure 3.1-3.4 and Strategy 2 Measure 2.1-2.3 |
| Conservation, Restoration and Protection of Biodiversity | |
| 3. Protected area networks and ecological representatives are connected and management measures for critical areas and | Strategy 2 Measure 1.1, 1.2, 1.6 |

| National Biodiversity Targets | Measures under the Master Plan for Integrated Biodiversity Management B.E. 2558-2564 (2015-2021) in response to national biodiversity targets |
|------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| important areas for biodiversity and ecosystem service are in place. | |
| 4. Management, policy and legislative mechanisms and measures for conservation and protection of genetic diversity are in place. | Strategy 2 Measure 1.4 and Strategy 4 Measure 1.3 |
| Threat Reduction and Sustainable Utilization of Biodiversity | |
| - | |
| Wetland Management | |
| 5. Significantly reduce wetland ecosystem loss so as to maintain the use of ecosystem service and support climate change adaptation. | Strategy 2 Measure 2.2, 2.3 and Measure 3.2, 3.5 |
| Alien Species Management | |
| - | |
| Biosafety Mangement | |
| 6. Regulations in accordance with precautionary approach to governing biosafety are in place and relevant agencies apply such regulations to improving and | Strategy 2 Measure 3.6 |

| National Biodiversity Targets | Measures under the Master Plan for Integrated Biodiversity Management B.E. 2558-2564 (2015-2021) in response to national biodiversity targets |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| developing regulations and mechanisms for regulating transboundary movement of living modified organisms in accordance with the obligations of the Cartagena Protocol. | |
| Protection of Genetic Resources | |
| 7. Research and local communities developed mechanisms and regulations relevant to access and benefit sharing from genetic resources. | Strategy 3 Measure 1.1, 1.3-1.5 |
| Research and Development on Bioeconomy | |
| 8. Measures and mechanisms are in place for returning economic benefits from biological products to their origins in order to support conservation and sustainable utilization of biodiversity. | Strategy 3 Measure 1.4 and Measure 2.3 |
| Knowledge and Database Management | |
| 9. Databases on priority biodiversity are in place. | Strategy 4 Measure 2.1-2.3 |
| 10. Link and expand biodiversity clearing-house mechanisms across relevant agencies. | Strategy 4 Measure 2.3 |

| National Biodiversity Targets | Measures under the Master Plan for Integrated Biodiversity Management B.E. 2558-2564 (2015-2021) in response to national biodiversity targets |
|----------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| 11. Municipalities at all levels collect information relevant to city biodiversity in a systematic manner. | Strategy 4 Measure 1.4 |
| Preservation of Traditional Knowledge Related to Biodiversity | |
| 12. Biodiversity-related traditional knowledge databases that can be used to protect the rights of the country and communities are in place. | Strategy 4 Measure 1.6 and Measure 2.2, 2.3 |

Annex IV

Rationale and Development of the Master Plan for Integrated
Biodiversity Management B.E. 2558-2564 (2015-2021)

Rationale and Development of the Master Plan for Integrated Biodiversity Management B.E. 2558-2564 (2015-2021)

1

Article 6 of the Convention on Biological Diversity states that each Contracting Party shall develop national strategies, plans or programmes for the conservation and sustainable use of biological diversity

The Third National, Measures and Plans for Conservation and Sustainable Utilization of Biodiversity

The Conference of the Parties to the Convention on Biological Diversity at its tenth meeting in October 2010, in Japan, adopted the Strategic Plan for Biodiversity 2011-2020 and the Aichi Biodiversity Targets and urged Parties to implement the Strategic Plan.

2

Development of the Fourth National, Measures and Plans for Conservation and Sustainable Utilization of Biodiversity B.E. 2556-2560 (2013-2017)

The Subcommittee on the Convention on Biological Diversity (SBD), at its 3/2011 meeting on 1 June 2011, agreed in principle with the Strategic Frameworks for Biodiversity during year 2013-2017.

Four regional consultation meetings were organized, and consultation was also made available through the website of the Office of Natural Resources and Environmental Policy and Planning and Biodiversity Clearing-House Mechanism during June – August 2011, in order to identify strategies, measures and guidelines in accordance with the Strategic Plan of the Convention and formulate elements of the policies.

The SBD, at its 3/2012 meeting on 27 April 2012, agreed with the draft National, Measures, and Plans for Conservation and Sustainable Utilization of Biodiversity B.E. 2556-2560 (2013-2017) to submit to the National Committee on Conservation and Utilization of Biodiversity (NCB) for consideration.

The NCB, at its 3/2012 meeting on 28 September 2012, agreed with the draft National, Measures, and Plans for Conservation and Sustainable Utilization of Biodiversity B.E. 2556-2560 (2013-2017) to submit to the Cabinet for endorsement.

3

Development of the Master Plan for Integrated Biodiversity Management B.E. 2558-2564 (2015–2021)

According to the Cabinet Resolution of 4 September 2012, the Cabinet assigned the Ministry of Natural Resources and Environment, the Bureau of the Budget, the Office of the National Economic and Social Development Board, the Office of Natural Resources and Environmental Policy and Planning, and the Biodiversity-Based Economy Development Office (Public Organization) along with agencies, committees and relevant sectors to collaborate in reviewing and developing biodiversity-related strategic plans.

The Office of Natural Resources and Environmental Policy and Planning in collaboration with the Office of the National Economic and Social Development Board and the Biodiversity-Based Economy Development Office (Public Organization) formulated the draft Integrated Biodiversity Management Plan B.E. 2556-2564 (2013-2021) by collecting information from and organizing a consultation meeting with relevant agencies mainly from 4 ministries—the Ministry of Natural Resources and Environment, the Ministry of Agriculture and Cooperatives, the Ministry of Public Health, and the Ministry of Science and Technology--during December 2012 – May 2013.

The Deputy Prime Minister (Mr. Plodprasop Suraswadi) agreed in principle with the draft Integrated Biodiversity Management Plan B.E. 2556-2564 (2013-2021) on 25 June 2556.

A consultation meeting on the draft Integrated Biodiversity Management Master Plan B.E. 2556-2564 (2013-2021) was organized on 22 August 2013.

The SBD, at its 1/2013 on 2 October 2013, agreed in principle with the draft Integrated Biodiversity Management Plan B.E. 2556-2564 (2013-2021) with minor change to its title to the draft Master Plan for Integrated Biodiversity Management B.E. 2556-2564 (2013-2021).

The draft Master Plan for Integrated Biodiversity Management B.E. 2556-2564 (2013-2021) was presented to the Minister of Natural Resources and Environment in order to submit to the NCB for consideration on 23 December 2013. Due to dissolution of the Parliament, the Minister gave the order to postpone consideration of the Master Plan until the new Cabinet.

4

Development of the National Biodiversity Targets and the Action Plan on Biodiversity Management B.E. 2558-2559 (2015-2016)

The SBD, at its 3/2014 meeting on 13 June 2014, agreed to initiate implementation for the draft Master Plan for Integrated Biodiversity Management B.E. 2556-2564 (2013-2021).

. The Office of Natural Resources and Environmental Policy and Planning formulated the draft Action Plan on Biodiversity Management B.E. 2556-2557 (2013-2016), circulated it to relevant agencies, and organized a brainstorming workshop to develop the national biodiversity targets and the Action Plan on 16 July 2104

The SBD, at its 4/2014 meeting on 1 September 2014, agreed in principle with the draft Master Plan for Integrated Biodiversity Management B.E. 2556-2564 (2013-2021) and changed implementation duration of the Master Plan to be 2015-2021 and that of the draft Action Plan to be 2015-2016.

The Ministry of Natural Resources and Environment submitted the draft Master Plan for Integrated Biodiversity Management B.E. 2558-2564 (2015-2021) to the Secretariat of the Cabinet on 28 January 2015. The Secretariat of the Cabinet informed the Ministry requesting for additional information provision according to the Cabinet Resolution as of 6 January 2015 on proposing policies, plans and programmes to the Cabinet stated that such proposal must be accompanied by additional information as follows:

- 1) Action plans for implementation for the period of 3 months, 6 months, 9 months and 1 year.
- 2) Benefits people gain by specifying clear targets, outcomes and indicators that can be efficiently monitored and evaluated.
- 3) Budget plans or other financial sources in accordance with the action plans.

A consultative meeting was organized to formulate 1 year action plan according to the Master Plan on 2 March 2015 in compliance with the Cabinet Resolution of 6 January 2015 and the relevant additional information was submitted to the Secretariat of the Cabinet on 9 March 2015.

The Cabinet endorsed the draft Master Plan for Integrated Biodiversity Management B.E. 2558-2564 (2015-2021) on 10 March 2015.

Natural Resources and Environmental Management Division
Office of Natural Resources and Environmental Policy and Planning
60/1 Soi Phiboonwattana 7, Rama VI Road
Bangkok 10400, Thailand
Tel./Fax (66) 2 265 6684
E-mail: bdcommittee@gmail.com
<http://chm-thai.onep.go.th>