MINISTRY OF NATURAL RESOURCES AND ENVIRONMENT

VIETNAM'S FIFTH NATIONAL REPORT TO THE UNITED NATIONS CONVENTION ON BIOLOGICAL DIVERSITY

Reporting period: 2009–2013

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TABLE OF CONTENTS

List of tables

LIST OF FIGURES

ABBREVIATION

ABS	Access and benefit sharing
BCA	Biodiversity Conservation Agency
BCI	Biodiversity Corridors Initiative
CBD	Convention on Biological Diversity
CDM	Clean Development Mechanism
CITES	Convention on International Trade in Endangered Species
DOF.	Directorate of Fisheries
EIA	Environmental Impact Assessment
FIPI	Forest Inventory and Planning Institute
FPD	Forest Protection Department
GEF	Global Environment Fund
IEBR	The Institute of Ecology and Biological Resources
IMER	Institute of Marine Environment and Resources
IUCN	International Union for Conservation of Nature
MARD	Ministry of Agriculture and Rural Development
MCD	Centre for Marine life Conservation and Community Development
MERC	Mangrove Ecosystem Research Center
MONRE	Ministry of Natural Resources and Environment
MPA	Marine Protected Area
MPI	Ministry of Planning and Investment
MSTE	Ministry of Science, Technology and Environment
NBAP	National Biodiversity Action Plan
NBSAP -2013	National Biodiversity Strategy to 2020, vision to 2030
NP	National Park

ODA	Official Development Assistance
PA	Protected Area
SUF	Special Use Forest
TPA	Terrestrial Protected Areas
VNFOREST	Vietnam Administration of Forestry
UNDP	United Nations Development Program
VAF	Vietnam Administration of Forestry
VEA	Vietnam Environment Administration
VEPA	Vietnam Environment Protection Agency
VND	Vietnamese Dong (currency 21,300 VND = 1 US)
WAP	Wetlands Alliance
WWF	World Wide Fund for Nature

PREFACE

Vietnam, due to its high and global significant biodiversity values is recognized as one of the nations where the conservation of biodiversity should be prioritized. Vietnam became a signatory to the United Nations Convention on Biological Diversity (CBD) in 1994. Since then the Government of Vietnam has taken a solid interest and made substantial investment of both human and financial resources to implement its commitments and obligations under the Convention.

Vietnam's first National Biodiversity Action Plan (NBAP) was approved by the Prime Minister in 1995. This was followed by the National Biodiversity Strategy

to 2010 - vision to 2020 to implement the Convention on Biodiversity and the Cartagena Protocol on Biosafety, which was approved by the Prime Minister on the 31st of May 2007 and its targets were considered consistent with the nation's socio-economic development situation at that time. On the 31st of July 2013, the Prime Minister approved Decision no.1250/QĐ-TTg on The National Biodiversity Strategy to 2010, vision to 2030 (NBSAP), which identifies a number of priority programs and projects aimed at preserving the biodiversity of Vietnam.

To implement the national obligations as a state signatory to the Convention on Biological Diversity (CBD), the Ministry of Natural Resources and Environment (MONRE) - the national focal point for Vietnam, in cooperation with relevant agencies, has developed the 5th National Report (NR) to report on the progress of implementation of the CBD in Vietnam.

The 5th NR responds to the guidance provided by the CDB Secretariat and is organized into three chapters as outlined below:

- Chapter One: Biodiversity in Vietnam, status, trends and threats
- Chapter Two: National Strategy and Action Plan on Biodiversity (NBSAP), integrating biodiversity into sectoral and inter-sectoral development plans and programs
- Chapter Three: Progress towards the CBD targets up to 2015 and Aichi targets.

EXECUTIVE SUMMARY

Biodiversity plays a very important role in the socio-economic and environmental development of Vietnam. It also plays a vital role in the provision of biodiversity services (provisioning services, regulatory services, cultural services and support services). Through these services, biodiversity makes a significant contribution to the national economy, providing a basis for ensuring food security; maintaining genetic resources of animals and plants; and providing materials for construction, fuel and pharmaceutical resources.

The recent change in Vietnam's biodiversity is reflected in a variety of ways and aspects: although the area of Vietnam's forest cover has increased, much of this increase has been due to the planting of production forest; overall the habitat for wildlife is decreasing as a result of land conversion; overall the status of rare and endangered species is declining sharply; and both inland water and marine ecosystems are being degraded due to inappropriate exploitative activities.

Biodiversity in Vietnam is currently is facing many threats. Pressure from the increasing human population combined with an increasing level of consumption is resulting in overexploitation of biodiversity resources. Rapid socioeconomic development has also changed the natural landscape. Land conversion and infrastructure construction has significantly reduced the area of natural habitats, increased ecosystem fragmentation, and degraded the habitats of many species of wild plants and animals. Natural resources, especially biological resources, are undergoing overexploitation and timber, non-timber and aquatic products are particularly vulnerable. In addition, alien species, environment pollution and climate change are all directly impacting on the biodiversity of Vietnam. In addition, the level of effort to manage the biodiversity resources of Vietnam is still insufficient. The system of state management agencies responsible for biodiversity remains fragmented and weak - laws and regulations to protect biodiversity are still unsystematic and lacking in policy conformity; community involvement is yet to be adequately mobilized; planning for national, regional and provincial biodiversity conservation has not been implemented in a systematic manner; and investment in biodiversity conservation and development remains highly limited.

Immediately after acceding to Convention on Biological Diversity, Vietnam developed its first *National Biodiversity Action Plan* (NBAP) approved by the Prime Minister on the 22nd of December 1995. Since its approval, the NBAP 1995 is considered as legally binding document, and acts as a guide to support actions for biodiversity conservation in Vietnam. *The National Biodiversity Strategy to 2010, vision to 2020* (NBS- 2007) was approved by the Prime Minister on the 31st of May 2007 and its objectives were considered to be consistent with the nation's socioeconomic development situation during that period. In July 2013, the *National Biodiversity Strategy to 2020, vision to 2030* (NBS) was officially approved by the Prime Minister, becoming the new orientation for the

conservation and management of biodiversity, aiming to support the green economy, and coping with climate change.

The Government of Vietnam has integrated elements of both environmental protection and biodiversity conservation into national plans, programs and policies, such as the Poverty Alleviation Strategy, National Sustainable Development Strategy, and the Territories Development Plan and so on. Recently, economic sectors such as agriculture, forestry, fisheries, and tourism have begun to integrate biodiversity conservation as one of their strategic development goals. It is recognized that the integration of biodiversity conservation into policies, strategies, plans and programs of both Ministries and agencies will be vital for long-term biodiversity conservation.

Despite some progress towards both the national targets and the strategic targets of the Convention on Biological Diversity, there remain some challenges in achieving these targets, particularly in the management of biodiversity. These include: lack of effective intersectoral coordination mechanisms to respond to overlap in functions among relevant ministries and agencies; laws and regulations to protect biodiversity are still unsystematic and lacking in uniformity; community involvement in biodiversity conservation has not been sufficiently mobilized, which leads to weak law enforcement; deforestation and illegal wildlife trade pose serious threats to biodiversity; overall investments in biodiversity are insufficient, resulting in a lack of financial, human and technological resources. In order to achieve both national targets and the CBD targets, the following priority activities are recommended:

- Enhance state management of biodiversity, including: clarifying the functions and mandates of both Ministry of Agriculture and Rural Development (MARD) and MONRE in biodiversity conservation management; promote the closer and integrated working relationships between key and relevant agencies and stakeholders in conservation; and enforce the law and legislation on biodiversity conservation;
- Increase investments of resources for biodiversity conservation. These investments should be targeted at: developing a biodiversity inventory; developing a comprehensive monitoring system for change in biodiversity; developing and operating a biodiversity database system and identification of mechanisms to share, exchange, and manage information; strengthening capacity for staff; promoting supervision of law enforcement; and finally increasing investment for biodiversity conservation from the state budget;
- Ensuring maintenance of a national system of Protected Areas (terrestrial/ forest, wetland, and marine) and ensuring critical ecosystems are safeguarded and protected. Conservation priority is to be granted to Protected Areas in critical ecoregions.
- Promote biodiversity conservation and management at three levels namely ecosystem, species and genetic diversity.

- Control and take steps to stop illegal trade and overexploitation of biodiversity resources, especially rare, threatened and endangered species;
- Preserve and develop genetic resources by completing an inventory and compiling information on biodiversity resources, and related indigenous knowledge nationwide;
- Develop risk management and risk control of alien species, with a particular focus on genetically modified organisms (GMO), their use, and any potential impacts on the environment, biodiversity and human health;
- Study and evaluate the role of biodiversity in response to climate change and propose appropriate solutions;
- Promote integration of biodiversity conservation into development strategies, plans, and programs at central, ministerial and provincial levels;
- Increase financial resources allocated for biodiversity conservation and ensure effective management of the public budget for conservation; and
- Maintain and promote support from international community in conservation.

CHAPTER I: BIODIVERSITY IN VIETNAM, STATUS, TRENDS AND THREATS

1.1 The role of biodiversity in Vietnam

Biodiversity is essential to both nature and human society in Vietnam. Ecosystems provide habitats for a great variety and number of wildlife. In addition, ecosystems provide a range of services. The 4 main ecosystem services recognized in Vietnam are outlined below:

- ***Provisioning Services:*** Ecosystems provide direct benefits to humans through providing a range of "provisions" to support society. These include contributions to the national economy – through provisioning agricultural, forestry and fishery products (Figure 1). Particularly,food security is ensured through agriculture and maintaining breeding livestock; forests provide construction materials and sources of raw and pharmaceutical materials; and the rivers and seas provide fishery products. For example, about 80% of fishery products are harvested from coastal seas and meet nearly 40% of the protein demand of Vietnam's people. Fisheries provide the main source of income for about 8 million people and contribute a portion of the income for about 12 million people [6].

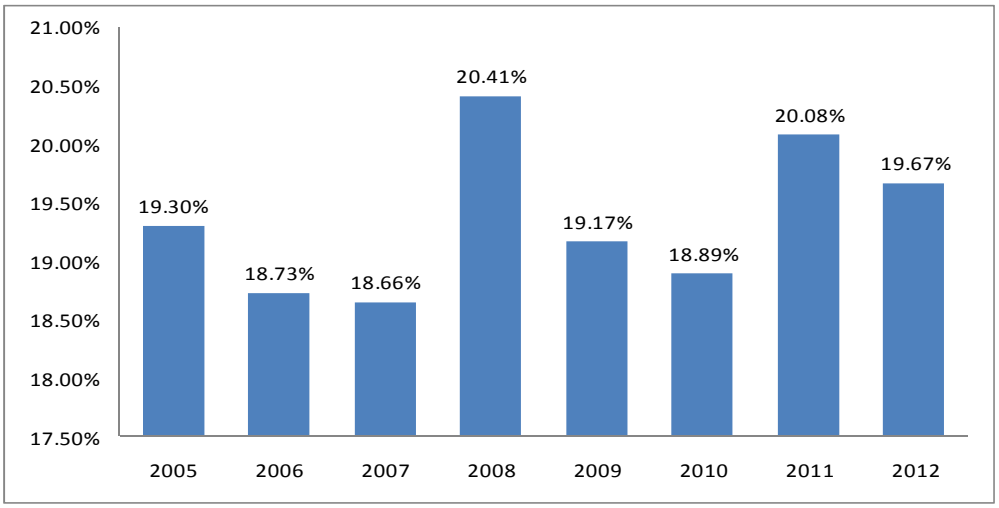
The estimated total biomass of the pelagic fishery resources in Vietnam's waters (2011-2012) was 3.075 million tonnes. It is suggested that levels of sustainable harvest from capture fisheries is around 1.7-1.9 million tonnes per year. However, capture fisheries harvest in 2013 was estimated to be 2.7 million tons [25].

Table 1: The value of agricultural production in constant prices in 2010 (unit: billion VND[1])

Year	Total	Planting	Breeding	Service sector
2006	451,550.8	342,367.4	101,792.1	7,391.3
2007	467,723.6	353,680.2	106,454.8	7,588.6
2008	500,411.5	378,012.7	114,543.8	7,855.0
2009	515,819.6	381,090.2	126,614.4	8,115.0
2010	540,162.8	396,733.6	135,137.2	8,292.0
2011	571,885.8	421,925.4	141,204.2	8,756.2
2012	587,792.7	433,870.1	144,862.5	9,060.1

[1] Note in term of currency – the currency referred to in this report is Vietnam Dong (VND) (US$ 1 = 21,000 VND 2014)

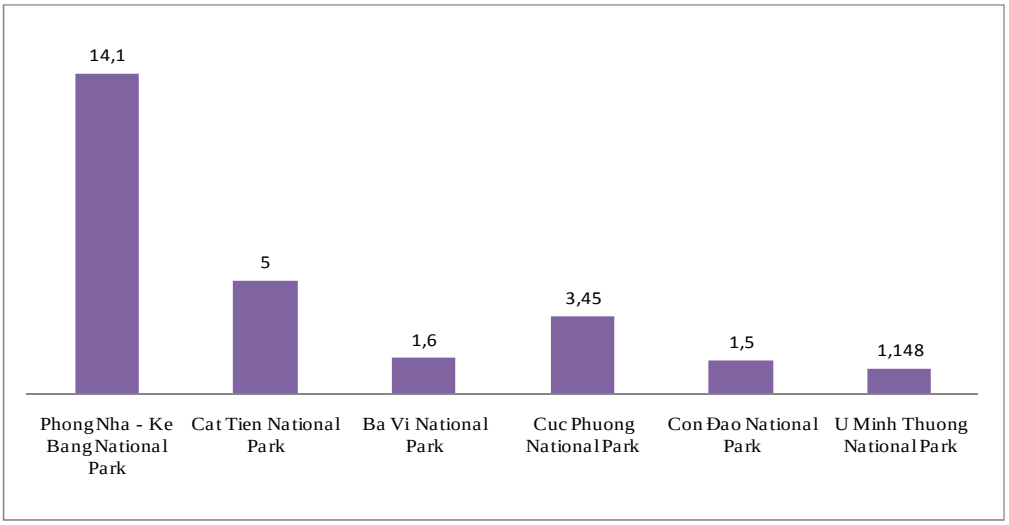
Figure 1- Percentage contribution of agriculture, forestry and fisheries in gross domestic product over the years



Source: General Statistics Office (2013), Statistic on agriculture, fishery and forestry

- *Cultural services:* Ecosystems not only provide direct material benefits, but also provide cultural and recreational opportunities for communities, which can motivate people to conserve biodiversity. The ecosystems with charismatic and visible biodiversity provide opportunities to develop the recreational industry of Vietnam, particularly ecotourism that can generate income and increase awareness on the importance of biodiversity and its conservation. About 70% of Vietnam's rapid tourism growth is occurring in the coastal areas and these areas contain natural ecosystems with high biodiversity. Fourteen of the 30 National Parks and Natural Reserves indicated they welcomed 728,000 visitors in 2011, with a total revenue of over 30 million VND.

Figure 2- Income from tourism in National Parks, 2011 (unit: million Vietnam Dong (VND)



Source: National Report on Biodiversity 2011, Ministry of Natural Resources and Environment (MONRE)

- ***Regulatory Services:*** Regulatory services include: climate regulation through carbon storage, rainfall control, air and water purification, waste decomposition and contribute to the mitigation of the adverse impacts of natural disasters such as landslides or floods. Carbon stored as plant biomass is the largest carbon stock and is easily impacted by deforestation and degradation.

Vietnam's forests are highly valued in terms of carbon storage and sequestration, especially the natural forests. This value is directly proportional to the forest timber volume and biomass. Research indicates the value of carbon storage of natural forests is 35- 85 million VND/ha/year and the value of carbon sequestration is approximately 0.4 to 1.3 million VND/ha/year in forests in the North. In the Central forests, the carbon storage value reaches 37 to 91 million VND/ ha/year, and the value of carbon sequestration gets 0.5 to 1.5 million VND/ha/year. This number of the Southern forests are 46 to 91 million VND/ha/year and 0.6-1.5 million VND/ha/year respectively [19]

Table 2- Total carbon stock estimated in mangroves in Kien Giang

Places	Area of mangrove (ha)	Carbon stock (ton/ha)
Hon Dat	793	64,800
Rach Gia	193	15,800
Chau Thanh	60	4,900
An Bien	518	42,300
An Minh	973	79,500
Total	2,537	207,300

Source: Project to preserve and develop Kien Giang Biosphere Reserve in 2010[2]

- ***Support Services:*** Besides the economic value of biodiversity to humans, biodiversity is also essential in supporting ecosystem functions. Biodiversity affects a range of services such as the formation of soil and the growth of plants. Vietnam is located in the tropical monsoon belt and typically suffers from between 5 to 8 hurricanes and tropical depressions accompanied by heavy rain each year. Research by the Mangrove Ecosystem Research Center (MERC) has demonstrated that the dense root system of mangroves is very effective in the stabilization and protection of estuaries and coastal areas. Mangroves assist in the protection of river shorelines, and assist in enhancing sediment deposition which can protect land.

Some typical mangroves, such as *Mam bien* (*Avicenna marina), Mam trang (Avicenna alba), Ban trang (Sonneratia alba),* that grow on alluvial soil are capable of holding silt

[2] GIZ (2011) Biomass and Carbon Study, researchers in Kien Giang province about conservation projects and develop the Kien Giang Biosphere Reserve.

and expanding the land towards the sea, as can be seen in Vietnam in Southwestern Ca Mau Cape, along the Tranh River, Can Gio, Ho Chi Minh City, or in the mudflats of the Red River estuary.

Studies show that the mangrove belts along the coast of Vietnam can assist through reducing by between 20 to 50% the damage caused by storms, rising sea levels and tsunamis. It is noted in Vietnam, the system of mangroves planted along the edges of dikes also act as a green shield through reducing 20-70% of the power of waves, thus protecting dikes and saving millions VND in the cost of maintenance and repairs [6].

1.2 Biodiversity Trends in Vietnam

1.2.1 Ecosystem Trends

a) Terrestrial ecosystem

Terrestrial ecosystems mainly consist of forests, agricultural and urban areas. Forests are characterized by rich diversity of both flora and fauna in Vietnam's tropical monsoon climate with a high temperature and rainfall. Three-quarters of the land area of Vietnam is hilly and mountainous and thus tropical evergreen forest is the dominant terrestrial ecosystem. The Government is currently aiming to increase Vietnam's forest coverage to 42%-43% by 2015, and to 44%-45% by 2020, to meet sustainable development goals in Vietnam[3]. In agricultural and urban areas, ecosystems are less diverse and house less natural ecosystems.

Table 3- Changes in forest area and forest coverage in Vietnam (1990 - 2010)

Year	**Forest Area (1, 000 ha)**			**Coverage (%)**
	Natural forest	Planted forest	Total	
1990	8,430	745	9,175	27.8
1995	8,252	1,050	9,302	28.2
2000	9,444.2	1,491	10,915	33.2
2002	9,865	1,919,6	11,785	35,8
2003	10,005	2,090	12,095	36.1
2004	10,088.3	2,218.6	12,306.9	36.7
2006	10,177.7	2,486.2	12,663.9	38.2
2009	10,339.3	2,919.5	13,258.8	39.1
2010	10,304.8	3,083.3	13,388,1	39.5
2012	10,423.8	3,438.2	13,862	40.7

[3] Decision no. 57/QĐ-TTg dated 9 January, 2012, approved the *Forest Protection and Development Plan, 2011- 2020*, by the Prime Minister, Government of Vietnam.

Source: Statistics from Forest Inventory and Planning Institute (FIPI) and Annual report on forest status by Forest Protection Department (FPD)

The summary report of the project *Five million hectares of forest Program* and the *Government Plan on forest protection and development 2001 -2010* (Report no.1328/BC-CP in 9August 2011) reported that in 2005 the total national volume of standing timber was 811.6 million m^3. By 2010, the total volume was 935.3 million m^3, of which natural forests accounted for 92.8%. Plantation forest volume was 74.8 million m^3 (7.9% of the total timber volume). When compared to 2006, the total country's timber volume had increased by 123.7 million m^3 (15.2%) by 2010. However, overall in Vietnam, the biodiversity values and "quality" of some rich forests, moderate forests and mangroves has continued to decline [1].

Statistics from FPD and FIPI indicate the overall forest coverage in 2010 reached 39.5% (Table 4).

Table 4- Current status of forest area and forest coverage in 2010

Eco-region	Total	Forest Area		Forest Coverage (%)
		Natural forest Area	Planted forest Area	
Nationwide	13,030,939	10,304,816	3,083,259	39.5
Northwest	1,581,564	1,429,237	152,328	41.9
Northeast	3,432,911	2,312,118	1,120,793	44.1
Red River Delta	95,442	46,767	48,675	7.0
North Central Coast	2,807,204	2,127,332	679,872	54.0
South Central Coast	1,919,735	1,428,235	491,500	41.7
Central Highlands	2,874,384	2,653,890	220,495	52.6
Southeast	407,949	246,109	161,840	14.7
Mekong Delta	268,885	61,129	207,756	4.3

Source: FPD, 2011; Report on the forest status in 2010.

Although the forest coverage is observed to be expanding, this is mainly due to an increase in planted forests, which has a lower value in terms of biodiversity, and in addition the area of natural forests with higher-level biodiversity values has also declined.

b) Inland water ecosystem

River ecosystem increasingly fragmented due to the construction of dams and reservoirs

Vietnam is the home of a variety of inland river and water ecosystems. However, these river ecosystems are being increasingly fragmented by the development of hydropower and related infrastructure.

The construction of a series of dams and reservoirs on the river mainstreams for hydropower has cleave a number of rivers into a series of layers. In addition to the loss of forests in the valleys and on the riverbanks, these hydropower constructions act as migration barriers to between rivers and the sea of many commercially valuable fish species. In addition, the operation of hydropower reservoirs has had negative impacts on downstream habitats, in particular estuaries and coastal ecosystems.

Increasing eutrophication

Due to Vietnam's rapid industrialization and urbanization, the amount of waste and sewage with high levels of nitrogen and phosphorus is increasing. In some cases, this is resulting in eutrophication of rivers and lakes and leading to the degradation of aquatic ecosystems with resulting impacts on biodiversity. In addition, aquaculture, in particular the high intensity catfish farming in the Mekong Delta, contributes to the eutrophication of areas where aquaculture is practiced.

Decline in population of endangered, rare and precious species

Aquatic species, particularly endangered, rare and precious species, are being threatened by the pressure of exploitation, infrastructure construction on rivers, e.g. hydroelectric dams, irrigation, and river ports, and illegal mineral exploitation. Each of these activities is leading to the degradation of river ecosystems, and disturbing the spawning grounds and habitats of many aquatic species.

c) Marine and coastal ecosystems

Marine and coastal waters and their abundant resources are an important source of Vietnam's food supply, and also provide livelihoods for approximately 20 million people in 125 coastal districts.

The increasing consumption of fisheries-related products is placing increasing pressure on the enhancing exploitation of natural stocks and further developing aquaculture.

A consequence of the current and planned harvesting and production pressure on marine and coastal ecosystems, the coastal ecosystem's biological resources and its ecosystem service functions are currently considered to be over-exploited. The continuous decline in quality of natural habitats including the inter-tidal areas, coral reefs, sea grass, as well as decline in coverage of coral reefs and sea grass is pointing towards "coastal desertification" in the future.

Coral reef habitats: According to research between 2008 and 2010 by Institute of Marine Environment and Resources (IMER), the remaining total area of coral reef Vietnam is estimated to be 14,130 ha. Currently, most of the surveyed coral reefs are considered to be in poor condition. The surveys carried out from 2004 to 2007 in seven reef locations in Vietnam identified that only 2.9% of the coral reefs were assessed to be in very good condition, 11.6% in good condition, 44.9% of the poor and very poor condition. The condition of coastal coral reefs are rapidly declining as demonstrated by the significant decrease in live-coral coverage (Table 5).

Research results from the Nha Trang Institute of Oceanography indicate that between 1994 and 2007 live coral coverage decreased by between 2.8% to 29.7% (average of 10.6%) in surveyed sites, especially in Con Dao, coastal areas of Ninh Hai - Ninh Thuan and Nha Trang Bay. The coral reef of Coto, Quang Ninh Province, was reported as having a healthy coral reef with the coverage up to 100%, however, Hai Phong IMER monitoring in 2007 recorded a reduction in live coral by 90%. The cause of coral loss was identified as being due to use of the toxic chemical, cyanide, by fishermen between 2002 and 2006 [6].

Table 5- Decrease in average coverage of coral in the monitored sites along some Vietnam's coastal areas

No	Sites	No. of monitored points	Decline of live coral coverage (%)	Decline of hard coral coverage (%)	Decline of soft coral coverage	Time period
1	Cu Lao Cham	5	-16.8	-10.4	-6.4	1994-2008
2	Van Phong	5	-2.8	-2.7	-0.1	2003-2006
3	Nha Trang	8	-16.2	-13.1	-3.1	1994-2007
4	Ninh Hai	6	-6.3	-6.5	-0.2	2002-2007
5	Ca Na	5	-6.3	-4.9	-1.4	1995-2006
6	Con Dao	8		-16.8	-12.9	1994-2004
7	Phu Quoc	6		-8.9	-0.1	1994-2007

Source: Oceanography Institute, Nha Trang, 2008, Nguyen Huy Yet et. al. (2010)

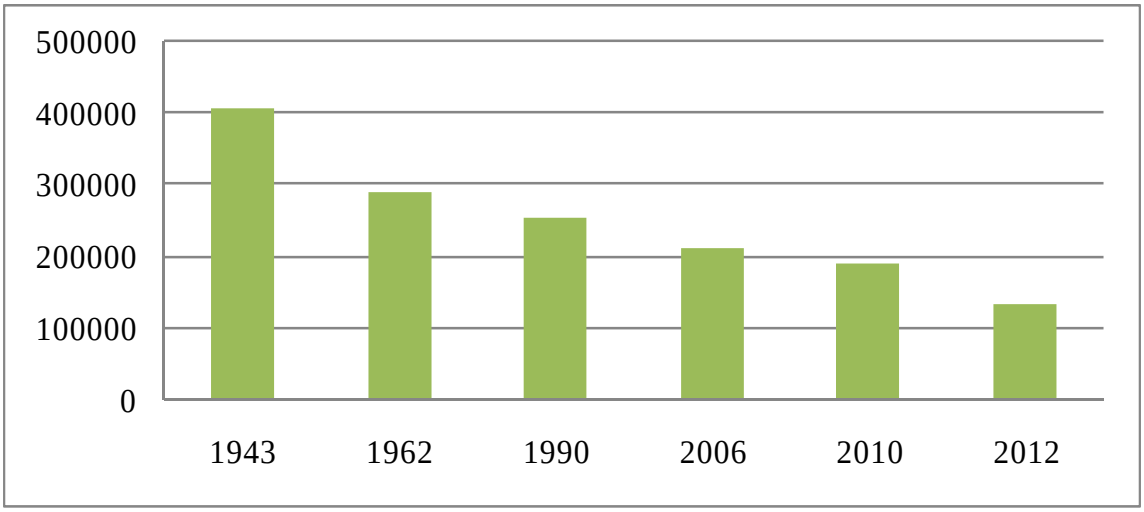
Seagrass habitats: The area of seagrass habitat is reported to be declining due to natural disasters, reclamation for aquaculture ponds and coastal construction. Statistics indicate the coverage of seagrass across Vietnam has decreased between 40-70% [6]. For example, the area of seagrass at Cua Dai beach (Quang Nam) fell by nearly 70% (2009); in the

south of Da Chong (Dong Nai) seagrass cover decreased from 45-60% to below 19% (2009) and in Ham Ninh (Quang Binh) decreased from 30% (2004) to 15% (2009). Thus, overall the average coverage of seagrass across all these sites is estimated to be only half of the area when compared to 5 years ago [6].

The decline in the quality of marine ecosystems has resulted in damage and loss of marine habitats and a subsequent loss of marine biodiversity. Ecosystem and habitat damage have resulted in the decrease and reduction of a number of species, and now some species are reported as being locally extinct.

Mangrove habitats: According to 2012 statistics, 56% of the total area of mangroves in Vietnam is considered as "planted mangroves" with a very low diversity of species. Areas of natural mangrove forests have almost completely disappeared. Mangrove degradation is clearly shown through the rapid decline in both the area and quality of forests. In 1943, the country had more than 408,500 ha of mangroves. In 1990, the area of mangroves was about 255,000 ha, declining to 209,741[4] ha in 2006, and 140,000 ha in 2010. By the end of 2012 only 131,520 ha of forests remained[5]. Figure 3 presents the change in area of mangroves in Vietnam 1943-2012.

Figure 3– Change in Vietnam's mangroves from 1943- 2012



1.2.2 Species trend

The area of natural habitats available for wildlife has continued to decline due to change in land-use:

In terrestrial areas the natural forests ecosystems house a great number of wildlife species, and these forests make a vital contribution to Vietnam's high biodiversity. If the current

[4] MONRE, Vietnam Environment Protection Agency (2006). Overview report on Vietnam's mangroves.

[5] Statistics are collected from annual reports on forest status and change of FPD.

rate of deforestation continues to meet the current needs and practices through changing land-use patterns, the area of suitable habitat for wildlife will continue to shrink.

Incidents of wild elephants destroying houses, crops and the serious reports of killing local residents in South-eastern Vietnam and the Central Highlands is viewed as a response to the growing conflicts due to the loss of elephant habitat. Most other large wildlife species, such as tigers, are today only found in and around National Parks and Nature Reserves. It is estimated that Vietnam currently may have only 30 tigers left in the wild.

The decline of endangered, rare and precious species:

The Vietnam Red List (2007) identified 882 species (418 animals and 464 plants) as threatened and endangered. This represented an increase of 161 species considered as threatened from the first assessment (1992-1996 – the first edition of the Vietnam Red List). Also between the first and second assessment were ten species that moved from being classified as "Endangered – EN" to "Extinct in the wild-EW" [18].

The status of aquatic species, particularly those species with an economic value, is rapidly declining. The numbers of individuals of rare and precious freshwater fish, in particular those with a high economic value, and migratory species have also decreased.

Table 6- Vietnam Red List (2007): Classification of threatened status and number of species

Taxon	EX	EW	CR	EN	VU	LR	DD
Flora	1		37	178	210	4	
Magnoliophyta							
- Dicots			29	96	147		
- Monocots	1		4	69	34	3	
Pinophyta			4	4	18	1	
Pteridophyta				1	1		
Lycophyta					1		
Rhodophyta				5	2		
Phaeophyta					4		
Mycophyta				3	3		
Fauna	4	5	48	113	189	17	30
Mammalia	4	1	12	30	30	5	8
Bird			11	17	25	11	9
Reptile-Amphibian		1	11	22	19		
Fish		3	4	28	51		3
Invertebrate			10	16	64	1	10

Note: EX: Extinct; EW: Extinct in the wild; CR: Critically endangered; EN: Endangered; VU: Vulnerable; LR: Low risk; DD: Data Deficient

Technical reports on the threatened status of many endangered, rare and precious animal species indicate a wide range of species are of concern and at risk of extinction due to overexploitation and habitat loss – this is especially a concern for endemic species. For example recently the total population of the Snub-nosed Monkey (*Rhinopithecus avunculus*) was estimated to be around 190 individuals [18] in isolated locations. In the early 20th century, this species distributed in mountainous forest areas in four provinces including Ha Giang, Tuyen Quang, Bac Kan and Thai Nguyen. Another example is Delacour's Langur (*Trachypithecus delacouri*) which today is only found in Cuc Phuong National Park and Van Long Protected Area (Ninh Binh) with an estimated 100 individuals remaining.

Vietnam's population of the Javan rhino (*Rhinoceros sondaicus annamiticus*) was one of the two remaining Javan rhino's populations on earth. A research program supported by WWF in 2010 surveyed for rhinos in Cat Tien National Park. Only one dead rhino was identified in Cat Tien National Park, which might have been the last rhino in Vietnam with the extinction dated in 2010 [6].

1.2.3 Trend in genetic resources

Vietnam was ranked as the 16th richest in natural resources[6] with the wide variety of ecosystems, species and abundance of endemic genetic resources.

However, Vietnam's biodiversity has been seriously threatened by overexploitation, natural disasters, outdated agricultural practices, population growth and urbanization. Climate change and sea level rise will further endanger genetic resources. Some endemic species/sub-species, e.g. Ba Xuyen pig and the Ho chicken, remain at very small population numbers. The loss of genetic resources is increasingly challenging if there is a lack of appropriate methods of genetic conservation.

1.3 Threats to biodiversity in Vietnam

1.3.1 Land conversion without proper scientific base; introduction of invasive alien species

a) Conversion of land inappropriate scientific base

The conversion of naturally forested land and wetlands for agriculture, industrial plantations and aquaculture, coupled with urbanization and infrastructure development has led to the loss or fragmentation of ecosystems and natural habitats, and contributed to the degradation and loss of biodiversity. The conversion of poor forest to rubber

[6] Reports presented at the conference "Performance evaluation of science and technology in gene bank (the period from 2001 to 2013 and orientations to 2020)" dated 11.03.2013 of Ministry of Science and Technology. (MIST)

plantation has significantly reduced the area of dipterocarp forests (semi-deciduous forests in the Central Highlands) and other natural forests throughout the country. In 2008, the Government agreed to convert 150,000 hectares of degraded forest to rubber plantations in Central Highland. To date, Dak Lak Province has converted a total of about 69,557 ha of forest to rubber plantation, of which 53,122 hectares was dipterocarp forest; Gia Lai Province converted 51,000 ha, and Binh Phuoc Province converted about 42,000 ha. According to statistics, since 2008 about 100,000 hectares of dipterocarp forest in the Central Highlands has been converted, representing the disappearance of a once typical ecosystem [6].

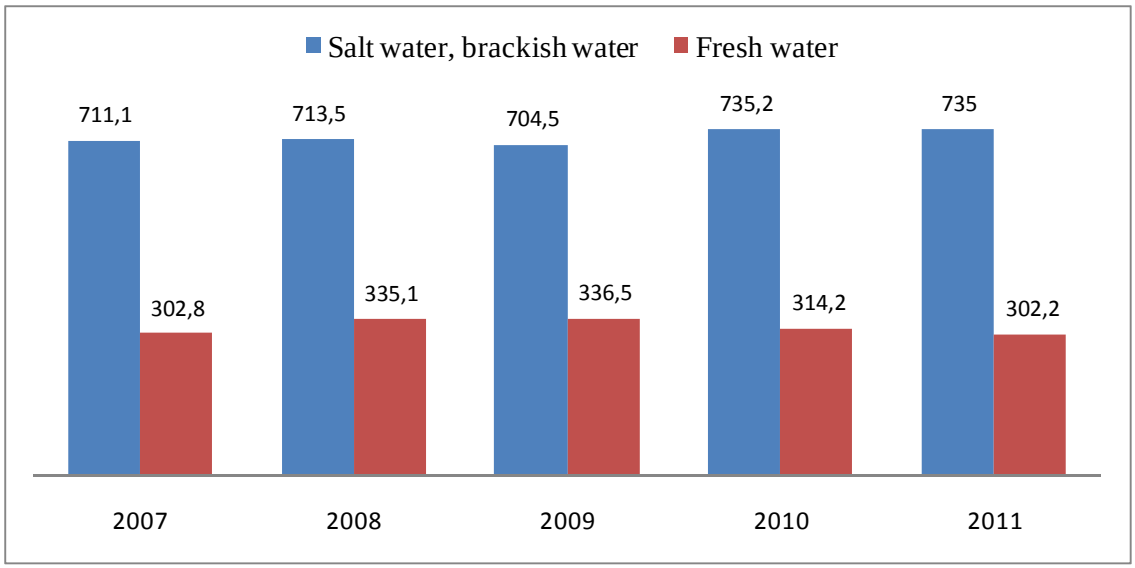
There are also increasing pressures to increase the productivity of the limited area of Vietnam's agricultural land (estimated to be about 0.11 ha per person), which is likely to continue to reduce in size due to urbanization and industrialization. On average, approximately 0.43% of agricultural land is lost annually (according to Ministry of Natural Resources and Environment, 2010). Consequently, farmers use more chemicals, e.g. fertilizers and pesticides, to ensure productivity. This results in the pollution of water, soils, and ecosystems and subsequent degradation of biodiversity. Currently, the conversion of agricultural land into golf courses and related service areas is creating substantial controversy. There are 18 operating golf courses, and over 140 projects licensed or under consideration for operation. The available golf courses are now using over 2,400 ha of land – much of which was once agricultural land[6].

The coastal sandy ecosystem, a typical ecosystem of Vietnam's Central coastal provinces, has been remarkably changed. Its ecosystem service functions including preventing sand movement, fighting coastal erosion and maintaining fresh water quality are now severely diminished. Older statistics recorded the area coastal sandy ecosystem between Ha Tinh and Ninh Thuan as 85,100 ha. However, since 1999 activities including shrimp farming, sand mining, and tourism infrastructure construction have destroyed thousands of hectares of the coastal sandy ecosystem in the Central Provinces. This has resulted in more rapid sand encroachment inland which has covered farm land and had a negative effect on agricultural production [6].

Surveys indicate the main cause of mangrove forest loss is due to conversion of mangroves into shrimp ponds. The vast natural tidal estuaries of the Northern and Southern deltas have also dwindled in size due to conversion of land into clam ponds. Recently, a significant water surface area in Ha Long Bay and Bai Tu Long Bay was used to develop cage aquaculture. These aquaculture practices are one of the causes of water degradation, loss of coral reef and sea grass ecosystems.

High density aquaculture farming of *tra* and *basa* fish in the Mekong Delta is also causing pollution. Uneaten fish food and fish excretion is leading to organic pollution and very high levels of nutrients that are impacting on nearby ecosystems and aquatic communities.

Figure 4- Area of water surface (million ha) used for aquaculture over the country from 2000- 2010



Source: General Statistics Office (GSO) (2012), Statistics on area of surface water for aquaculture.

Infrastructure development

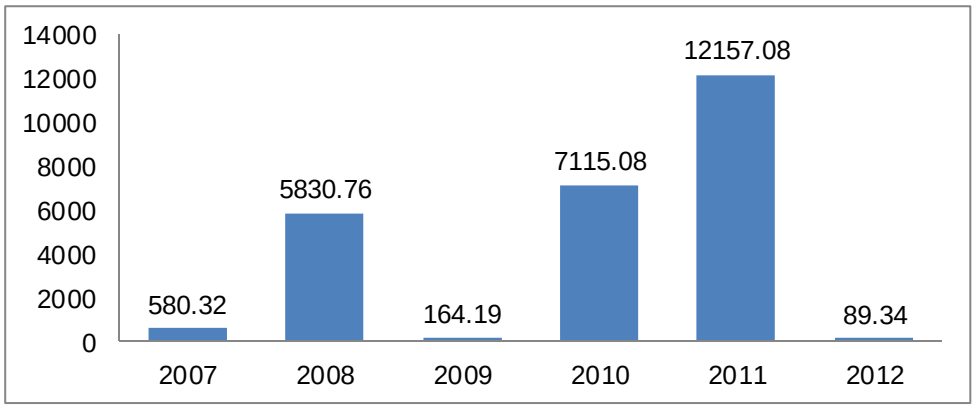
Construction of dams, reservoirs, roads and other infrastructure has directly caused the degradation and fragmentation of ecosystems, creating barriers to the migration of species and loss of natural habitats, resulting in harmful and long-term impacts on the survival of wildlife populations.

In relation to hydropower projects, by 2010 over 1,020 hydropower projects (total capacity of 24,246 MW) were planned throughout the country, of these planned projects 138 projects are planned to be built on the mainstream of the main rivers by the Ministry of Industry and Trade [6]. Hydropower development is essential for the socio-economic development of Vietnam. However, from an ecology and biodiversity conservation perspective, research suggests the construction and operation of dams and reservoirs has very large downstream impacts which includes: (i) Changes in habitat type along and within the river-streams system including river sand, riverbeds, riparian vegetation, etc. This will change the community structure and populations of aquatic species; (ii) Changes in lifecycles and growth stages of aquatic life such as reproduction, feeding, in response to habitat change; (iii) Physical barriers created for many aquatic species, particularly distant migratory species (sea-land), or species moving along river, and (iv) changes in flow may create favorable conditions for the introduction and spread of alien species into riverine systems.

The construction of reservoirs results in the cutting of natural forests, and also prevents fish migration by impounding natural river stream flow. Some hydroelectric dams that have operated outside permitted procedures (violations) have caused damage to people and property and downstream ecosystems through periodic water releases. The

development of infrastructure that contributes to an increase in population and/or migration into an areas is also the cause of biodiversity degradation.

Figure 5 – Forest land (ha) converted into infrastructure development 2007- 2012



Source: Statistics on forest change over year by FPD, 2013.

b) Introduction of new varieties and invasive alien species

The introduction of new plant varieties, particularly in agriculture, especially hybrid varieties with high productivity, has led to a decrease in both the planted area and genetic diversity of native crop varieties. This introduction has depleted native and traditional genetic resources, and has resulted in the loss of several traditional agricultural plant gene varieties.

According to the statistics, the number of exotic plants introduced into Vietnam through various pathways is relatively high. There are at least 94 species recorded as exotic. These exotic species belong to 31 different families, and include 12 species of invasive plants.

MARD (2009) published a list of 48 invasive alien aquatic species introduced into Vietnam through various pathways. Among them 10 species are considered as having no adverse impacts on aquatic biodiversity and aquaculture and are categorized as “white”; 24 species are considered as having uncertain adverse impacts and grouped as “grey”; while 14 species considered to adversely affecting aquatic biodiversity and aquaculture are categorized as “black” and need to be monitored closely in farming facilities and agricultural areas [15].

In 2013, MONRE and MARD issued an Inter- ministerial Circular providing criteria for determination of invasive exotic species and publishing a list of invasive exotic species which included 25 identified invasive alien species (4 species of microorganisms, 5 invertebrate species, 6 fish species, 1 mammal species and 7 plants); 15 potentially invasive species which had already appeared in Vietnam (1 invertebrate species, 5 fish species, 1 species of amphibian - reptile, 1 bird species, 7 plant species); 41 invasive

species have not yet appeared in Vietnam (22 species of invertebrates, 2 fish, 3 species of amphibians - reptiles, 3 species of birds - 11 species of plants)[7].

Table 7- List of known invasive exotic species

No.	English name	Scientific name
A. Invertebrate		
1	Coconut leaf beetle	*Brontispa longissima*
2	Apple snail	*Pomacea canaliculata*
3	Strike-topped apple snail	*Pomacea bridgesii*
4	The giant African snail	*Achatina fulica*
5	Red claw crayfish	*Cherax quadricarinatus*
B. Fish		
1	Mosquito-fish	*Gambusia affinis*
2	Red piranha	*Pygocentrus nattereri*
3	Sucker mouthed catfish	*Hypostomus punctatus*
4	Sail fin catfish	*Pterygoplichthys pardalis*
5	Smallmouth bass	*Micropterus dolomieu*
6	Largemouth bass	*Micropterus salmoides*
C. Amphibians - Reptiles		
1	Cuban crocodile	*Crocodylus rhombifer*
2	Pond slider	*Trachemys scripta*
D. Birds - Animal		
1	Coypu/ River rat	*Myocastor coypus*

Source: MONRE (2013) Inter ministerial Circulation No. 27/TTLT-BTNMT-BNNPTNT dated 26 Sept. 2013

1.3.2. Population growth pressure, overexploitation of biological resources and increasing consumption of natural resources

a) Population growth pressure:

During the period 1979 to 2013, the population of Vietnam increased from 52.7 million to 90 million[8] people. According to forecasts, the population of Vietnam could rise to nearly 122 million people by 2050. Currently, Vietnam has a very high population density with about 240 people per km^2. The Central Highlands and the South-east are the locations with

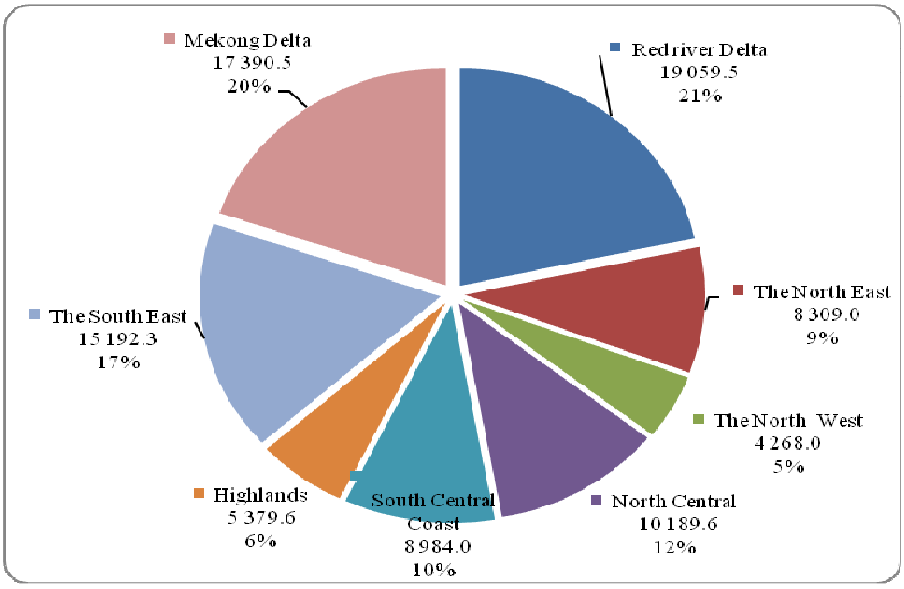
[7] Inter- ministerial Circulation No. 27/TTLT-BTNMT-BNNPTNT dated 26 September 2013 on providing criteria for determination of invasive exotic species and promulgating the list of invasive exotic species

[8] Report on national population after 10- year implementation population program by The General Office for Population and Family Planning (GOPFP)

the largest area of forests and are also the locations experiencing the greatest number of inward migrants from other regions of the country. MONRE reported that from 2005 to 2008 the total number of migrants arriving in the Central Highlands was an estimated 9,551 households representing 40,782 individuals. This represents an average of 2,413 households with 10,195 individuals per year. Free migration to the Central Highlands fell sharply in 2006 when compared to 2005, but however increased again in 2007, 2008 and still continues [6].

For most inward migrants, especially for people from ethnic tribes in the North, their new livelihoods are initially based on the exploitation of natural resources, e.g. logging and hunting. Population growth results in increasing pressure on natural resources. In particular, an increasing demand for land for farming and livestock may lead to uncontrolled deforestation. As a result, natural resources will become more severely depleted, wildlife populations will continue to shrink, biological populations will decline and genetic resources will become much poorer.

Figure 6 - Distribution of population by region nationwide (unit: thousand people)



Source: Statistics from General Statistics Office (GSO)

b) Increasing consumption of natural resources

Vietnam is currently in a transition period in terms of its economy, society and population. Over the past decade of economic reform, Vietnam's GDP has increased annually by 7%, the second highest rate of growth in Asia. This rapid economic growth has affected Vietnam's biodiversity in various ways, and has resulted in an increasing demand for biodiversity consumption at an ever-increasing rate.

Table 8 - Forecast of demand for some major timber product

Type of products	Unit	2005	2010	2015	2020
Timbers	1,000 m^3	2,570	3,589	5,009	6,991
Fibreboard (MDF)	1,000 m^3	46.6	65	90.7	126.5
Particle board	1,000 m^3	94.4	136.2	196.7	284.2
Veneered plywood	1,000 m^3	12.9	18.4	26.1	37.2
Pit props	1,000 m^3	90	120	160	200
Paper and paperboard	1,000 m^3	1,232	2,177	3,478	5,361

Source: Consultant Group for Forestry Development Strategy 2000-2020, MARD, 2005

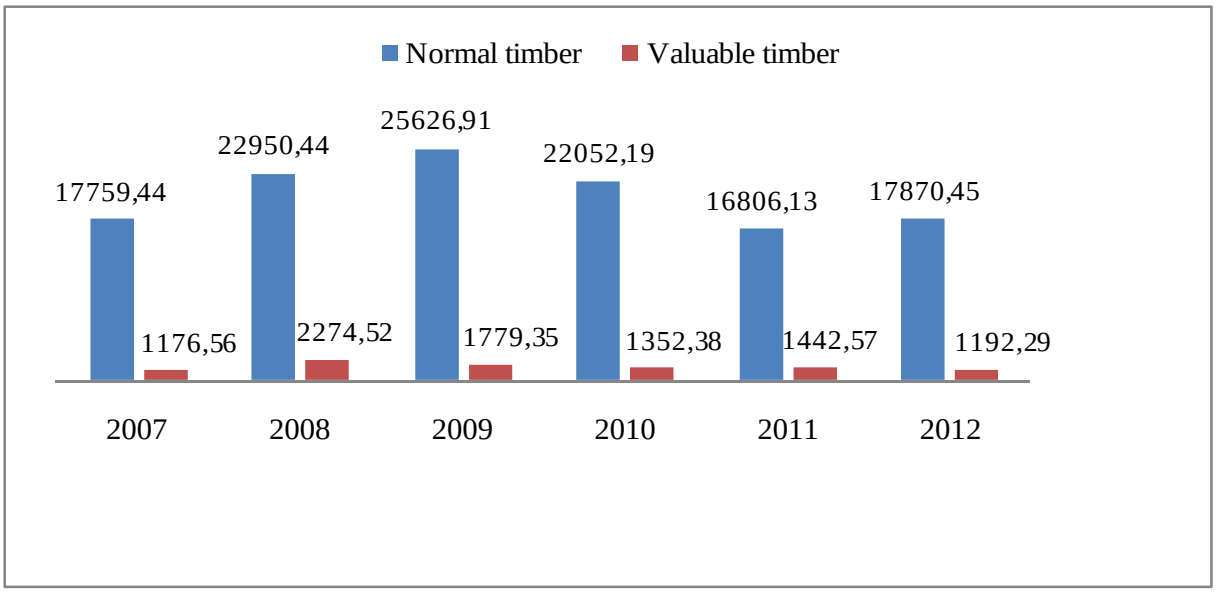
Over exploitation

Illegal logging of forests

According to Vietnam Administration of Forestry, MARD (2009), between 2000 and 2009 timber output went through a substantial increase when compared to previous periods. On average the national annual production of timber in this period was estimated to be about 3,247 million m^3. In 2010, the national annual production was estimated about 4,950 million m^3 [6].

To limit the decline in the area and quality of natural forests, the government has issued a series of regulations to control commercial logging. However, it is currently reported that there are increasingly severe cases of illegal logging that cannot be controlled. These illegal logging activities are occurring in all types of forests, with a particular challenge in the *Special Use Forests* of the Protected Areas system. The construction of new roads as part of the national development process have also provided easier access for trucks to transport timber, and has provided easier access for wildlife hunting and exploitation of non-timber forest products. This has resulted in additional pressure on the wild fauna and flora, which are already severely affected by habitat degradation and fragmentation.

Figure 7 - The volume of timber confiscated by year (m^3)



Source: Statistics from reports on confiscated timber over year by FPD, 2013.

c) Overfishing using unsustainable tools and techniques

Approximately 20% of Vietnam's population directly depends on fishery resources as part of their livelihoods. Fishing related activities contribute greatly to both domestic consumption and national export figures.

However, an increase in the consumption of fishery products, coupled with management inefficiencies has led to overfishing in many part of Vietnam resulting in a decline in fishery resources and severe degradation of inshore coral reefs. The populations of many high value marine species have severely declined, e.g. lobster (*Panulirus spp*.), abalone (*Haliotis spp*.), and scallops (*Chlamys spp*.). In addition, destructive fishing methods, such as fishing with poison and creating electric shocks to stun and kill fish, are widely used for fishing in both coastal and inland areas. Fishing practices using poison are reported to be severely threatening over 80% of the coral reefs of Vietnam [6]. In 2010 in the Ca Mau area, patrols discovered many 40-100 HP fishing vessels equipped with an electric shock generator. The use of electric fishing tools is resulting in the depletion of fisheries resources.

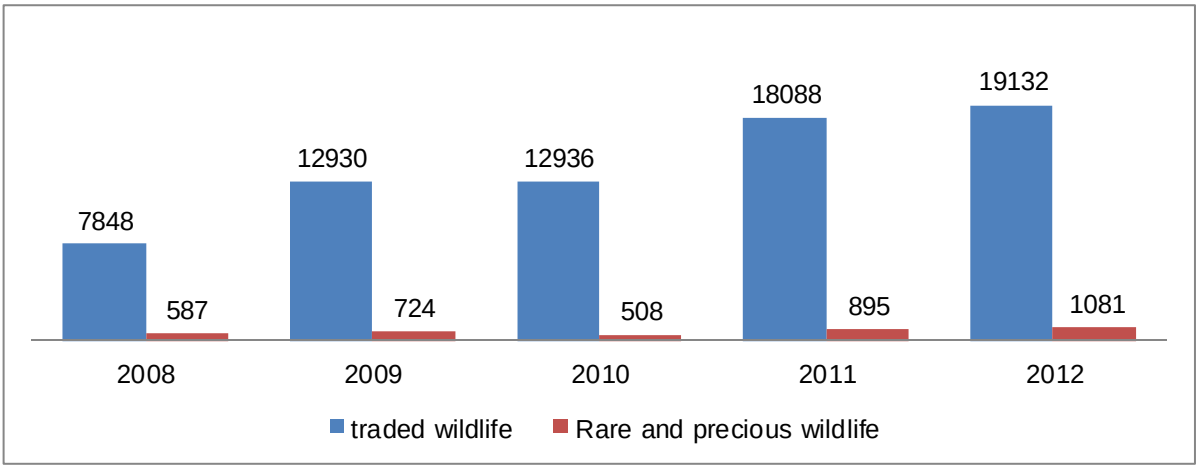
In summary increased demand for household consumption coupled with poor fishery management has led to overexploitation in many locations, which has resulted in a reduction in the volume of total catch, and the degradation and destruction of natural ecosystems including coastal coral reefs.

Illegal wildlife hunting and trade

Although Vietnam adopted the *National Action Plan on Illegal Wildlife Trade until 2010*, this Plan did not achieve all results and targets due, in part, to the lucrative market associated with wildlife trafficking. This, together with the weak capacity of the government's law-enforcement bodies, is making the control and prevention of wildlife trafficking very challenging.

The commonly trafficked wildlife includes bears, monkeys, civets, turtles, lizards, pangolins, pythons and snakes that are purchased to make traditional medicine. Many bird species are also trapped for sale as pets.

Figure 8 - The number of wildlife trafficked by year (unit: individual)



Source: Annual reports of FPD, VAF

One of the most lucrative species for the wildlife trade in Vietnam is the tiger trade. According to the statistics compiled by Education for Nature Vietnam (ENV), between 2005 to 2010 authorities in 29 cases of trafficking confiscated tiger bodies or parts from smugglers and illegal trafficking.

1.3.3. Environmental pollution and climate change

a) Environmental pollution

The components of the natural environment in Vietnam are being degraded by a range of factors. This degradation is being compounded by the discharge of untreated waste into rivers, thus posing serious threats to biodiversity. Environmental pollution is having a serious impact on a variety of species, leading to the deaths and reduction in number of selected populations, and in addition, water pollution is leading to the destruction of natural habitats and the terrestrial and marine organisms they contain.

In July 2011, MONRE released the *National Report on Environment - 2010*. Some of the concerns highlighted in the report included increasing environmental pollution, e.g. organic pollutants in river systems as a result of agriculture and other human activities;

pollution in urban and industrial parks, craft villages; and pollution from activities in coastal areas. Surface water in cities and river basins was reported to be severely contaminated by organic pollutants. The pollution levels exceeded national standards by a number of factors, especially in the Nhue River, Day River and the Dong Nai River [7].

Surface water pollution and dust pollution in Hanoi and Ho Chi Minh City are very serious issues. Specificially, environmental pollution in industrial parks close to urban areas is alarming. Only 50% of 249 licensed industrial parks have centralized wastewater treatment systems [7].

Pollution from agricultural activities is becoming increasingly environmentally damaging with the sector consuming over 19,600 tons of fertilizers annually. The amount of fertilizer used has increased by 517% in the last 25 years, and it is estimated around 2/3 of the fertilizer is not absorbed by plants [7] and enters groundwater, rivers and coastal waters.

At a Conference on development of the *Environment Protection Master Scheme for the downstream of the Dong Nai River* in 2008, the experts agreed that water resources of the downstream portions of the Saigon River and Dong Nai River were heavily polluted and not to be used for people's daily lives. According to 2008surveys by Ho Chi Minh Environment Protection Department in collaboration with Saigon Water Supply Company the levels of ammonia (NH_3), suspended solids, oil and microorganism levels were very high, and were higher in canals, drains and at discharge points. In some certain areas, NH_3 concentration in water was over 30 times the permitted limit, e.g. Thi Tinh River. The level of lead (Pb) in water exceeded the safety standards by multiple times. Suspended solids were in excess of safety standards by 3 to 9 times. The pollution is caused by over 9,000 factories scattered within the Dong Nai River basin with daily discharge of 48,000 m^3 of untreated wastewater directly into the basin. In addtion, within the basin there are 56 industrial parks, however only 21 of them are equiped with the wastewater treatment systems. The other parks all discharge the waste direcly into the river, causing water quality impairment of the river [6].

b) Climate change:

Vietnam is one of the countries in the world predicted to be the most impacted by climate change. Under current climate change scenarios, Vietnam is predicted to house fragmented ecosystems that will undergo a high rate of loss of biological diversity resources compounding its vulnerability to climate change.

According to the Institute of Hydrometeorology and Environment of MONRE, at the end of this century, the average temperature in Vietnam will have increased by about 2.3^0 C. The total wet season rainfall and the total annual rainfall will increase, however total dry season rainfall will decrease. Projections for a rise in sea levels are between 75cm to 1 m compared with the average level of the 1980-1999 period. As a result of this increased level it is estimated approximately about 20-38% of the area of the Mekong Delta and

about 11% of Red River Delta would be inundated, and 78 important natural habitats (27%), 46 PAs (33%), 9 areas of national and international importance for biodiversity conservation (23%) and other 23 high value of biodiversity areas (21%) would be seriously affected [6].

The rising temperature will change the distribution and population structure of many species, habitats and ecosystems. Scientists have already demonstrated the migration of some species due to a warming of the earth. Research in Hoang Lien National Park (2003-2007) identified an upward vertical shift of some typical plants of different vegetation belts. This phenomenon called "thermal belt uplifting" is thought to be a response to warmer temperatures. Among the species that migrated were the *Van San Hoang Lien*- an endemic pine, previously identified in the range of 2,200m – 2,400m height but now only can be found at the range of 2,400m- 2700m [6]. The Xi-Pan pine, Sapa pine and some other species also have demonstrated a tendency towards vertical migration. Rising temperatures have also increased the likelihood of forest fires, especially those forests on peatland. It is recognized that fires cause a loss of biological resources, increasing greenhouse gas emissions and enhance the effects of climate change. Climate change combined with the degradation and depletion of forests of key watersheds, and changing use of water resources may lead to more frequent floods, flash floods and landslides, causing heavy damage to both people and the environment.

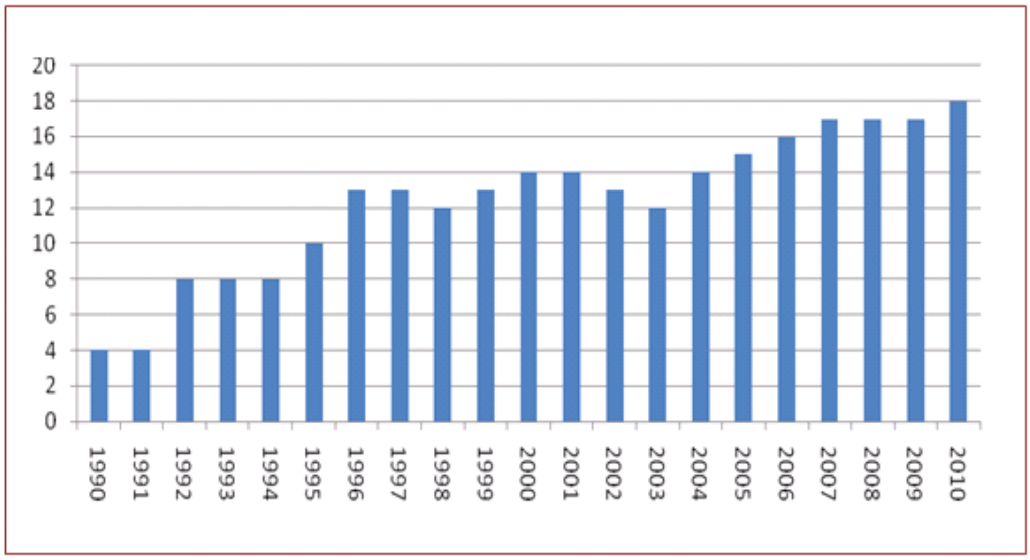
Some climate change scenarios predict an increase in the frequency and intensity of cyclones in Vietnam. These predictions suggest the track of the cyclones at some time of the year will be more southward, while the cyclone season may extended to the later months of the year. The amount of rainfall has decreased in the dry season and increased in rainy season; and more frequent heavy rains are causing more serious and frequent flooding in Central and Southern regions. The floods that occurred in 2007, 2009, and 2010 caused severe damage to people and property and also greatly changed ecosystems, particularly the agricultural ecosystems.

Droughts now occur almost every year in most areas of the country. The annual average temperature is estimated to have increased by about 0.10°C per decade; and in summer has increased between 0.1 to 0.3°C per decade. Rising temperatures and changes in precipitation have great impacts on agriculture and water resources. In relation to sea level, if sea levels rise 1 meter by end of the century, Vietnam is projected to lose over 12% of its total land area. The consequences of climate change will directly impact on biodiversity.

Flash floods over the last 10 years in Vietnam are recognized to have become more serious. On average, between 1990 and 2010 approximately 12 flash floods were recorded per year. The year 2006 marked a record year with 18 flash floods recorded, and the years of minimum number of floods were in the range of 3 to 4 floods per year. The increasing trend of flash floods in recent decades in Vietnam is described in Figure 9.

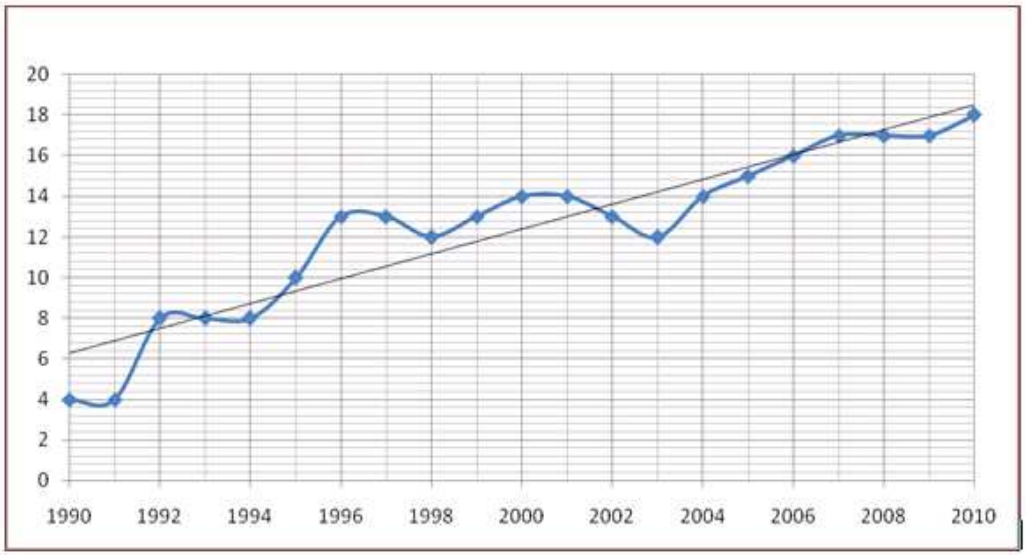
Drought and water shortages that last for a few months are more common and have been more frequent in recent dry seasons, i.e. 2004, 2005, and 2010. According to a study from The Vietnam Institute of Meteorology, Hydrology and Environment, these dry periods tend to increase the scale of forest fires. Some estimates suggest that over 254,000 ha of crops are affected yearly by drought, including 25,000 ha of rice field and 178,000 ha of coffee plants.

Figure 9 - Number of flash floods from 1990 to 2010



Source: The Vietnam Institute of Meteorology, Hydrology and Environment (IMHEN)

Figure 10- Trend of flash flood in period of 1990- 2010.



Source: The Vietnam Institute of Meteorology, Hydrology and Environment (IMHEN)

1.3.4. Limited resources for biodiversity conservation

The quantity and quality of human resources for biodiversity conservation remains limited. Punishments for violations are not strong enough, which is partly the reason for the increase in the number of violations in the field of wildlife trade and trafficking.

Despite a slight increase in the State budget for biodiversity conservation, the effectiveness of investment is low due to approaches to use of the budget. Most of the funding from non-governmental organizations depends upon the short-term funding and projects. Therefore, it is difficult to implement long-term commitments in biodiversity conservation.

Although there have been some useful baseline surveys of ecological resources and biodiversity, these surveys currently remain unsystematic. There is no comprehensive monitoring system for tracking changes in biodiversity. In addition, there is no national biodiversity database. Formal mechanisms for information sharing are limited.

Although a number of protected areas have been established and many have operated for a long period of time, most of them are small, isolated and separated, which makes it difficult for unified conservation and linked management.

Many important natural ecosystems have not been given proper attention. Wetland ecosystems are partially conserved through inland water protected areas, however these sites are failing to meet the urgent demands for wetland conservation.

There are shortcomings in biodiversity policies and challenges due to an overlap in responsibilities and regulations between key agencies, compounded by a weak and fragmented approach to law enforcement.

1.4. The impacts of biodiversity change on economy and society.

1.4.1 Impacts on economy

The economy of Vietnam relies considerably upon natural resources, and biodiversity plays an important economic role. Despite having no specific and significant recognition, biodiversity makes a real and important contribution of value to the national economy, especially in the fields of agriculture, forestry, fisheries and human health.

- In 2010, agriculture contributed to over 20% of total gross domestic product (GDP) and accounted for 28% of national export turnover.
- Approximately 20 million people in Vietnam derive their income and/or earnings from marine and aquatic resources through exploiting over 300 marine species and over 50 species of valuable freshwater fish.
- About 25 million people live in or around forests, and 20%-50% of their income is reportedly derived from non-timber forest products, e.g. hundreds of species of medicinal plants, and plants for oil and dyes.

- Biodiversity, terrestrial landscapes, coastal and island landscapes and natural features with high biodiversity values contribute to the foundation of the rapidly growing tourism industry. Particularly, eco-tourism is heavily promoted as a discovery and educational services in and around protected areas. It is also has the potential for the participation of local communities in tourism services which will generate local economic benefits.

Thus, the degradation of biodiversity has impacts and consequences, and will directly result in impacts on the national economy.

A typical example of the loss of biodiversity is the decline in the quality of saltwater fish harvest in recent years. Research indicated that current exploitation of marine resources is dominated by a catch focused on "trash fish", i.e. fish with low economic value. In Vietnam's key saltwater fisheries the total productivity, average catch and total volume is decreasing, and the size of individual fish that are caught much smaller than before. The total stock of marine fish resources in Vietnam in 2012 was estimated to be about 4.25 million tons (MT). This comprised small pelagic fishes stock with an estimated stock of about 2.65 MT (accounting for 62.4% of total reserves); demersal fishes estimated at 487 thousand tons (11.5%); crustacean estimated at 79 thousand tons (representing 1.9%); coral reef fishes estimated at 2.6 thousand tons (accounting for 0.1%); and large pelagic fishes with an estimated 1,031 thousand tons (accounting for 24.3%). There is a considerable change in small pelagic fishes stock across the region in Vietnam. Small pelagic fishes stock have tended to increase in the Gulf of Tonkin and in the Central and South-east region but have declined up to 50% in the South-west region when compared to the period 2000 - 2005.

Deforestation, resulting in declining biodiversity, is a major cause of global climate change. Sea level rise will impact upon the wetlands of coastal Vietnam. The most seriously impacted sites are projected to be the Mekong and Red River Deltas, and in particular the mangrove areas of Ca Mau, Ho Chi Minh City, Vung Tau and Nam Dinh. Both the flat deltas and plains and the coastal areas of the Vietnam with rich mangroves and wetland systems are increasingly sensitive and vulnerable.

As sea levels rises, it is projected that about half of the 68 wetlands of national importance will be badly affected. Saltwater will intrude further inland, killing various freshwater species, and contaminating freshwater resources that currently support livelihoods and farming systems in coastal areas. It is projected that sea level rise induced by climate change will inundate a large area of the Mekong Delta, the Red River and the Central coastal areas. This will subsequently threaten food security. Projections also show serious risk to the production of 7.6 million tonnes of rice / year in the Mekong Delta, equivalent to more than 40 % of total rice production of the area. Additionally, sea level rise is projected to cause salination of an additional 2.4 million hectares of inland agricultural land. Already, saline water, with a salinity level of around 4%, has encroached 30 – 40 km

inland in some locations in the Mekong Delta and Red River Deltas, which is equivalent to an area of approximately 1.3 million hectares.

1.4.2. Impacts on environment and society

Ecosystems are closely linked to the process of climate regulation and environmental maintenance. Terrestrial vegetation and coastal waters helps to regulate climate through carbon storage, air and water purification, waste decomposition, and may mitigate some of the negative impact of natural disasters, e.g. landslides and floods. Mangroves along the coast serve as “green shields " reducing 20 to 70% of the waves’ power and contribute to the protection of constructed sea dikes, thus saving millions of dollars in repairs and supporting the formation of new land in the estuaries of the Red River and the Mekong River. The degradation of ecosystems, habitats and biodiversity will increase the risk of erosion, environment pollution, directly threaten the economy and human health.

Vietnamese culture has a strong and ancient connections to biodiversity. Many customs have been shaped by linkages to nature and the natural environment. Many species of plants and animals are associated with Vietnam’s history and culture and have become objects of worship for the community.

Biodiversity is a source of spiritual inspiration through the beauty of nature. It helps relax people and also contributes to human understanding of nature. Biodiversity degradation not only causes economic damage, but also can be interlinked with a series of social problems such as: cultural change, unemployment, high population growth, problems in education and medical care. However, while it is important to recognize these linkages, it is difficult to quantify the damage caused by these problems. However it is clear these issues pose challenges to human society.

CHAPTER II: NATIONAL STRATEGY AND ACTION PLAN ON BIODIVERSITY- INTERGRATING BIODIVERSITY INTO SECTORAL AND INTER- SECTORAL DEVELOPMENT PLANS, PROGRAMS

2.1. National Biodiversity Strategy and Action Plans (NBSAP) for Vietnam from 2007 until today

The first NBSAP was developed and approved in 1995. To align to updated CBD guidance, the Prime Minister approved the *National Biodiversity Action Plan to 2010 and Orientation towards 2020* (NBAP 2007) via Decision 79/2007/QĐ-TTg dated on 31 May 2007, to support implementation of the CBD in Vietnam.

Most recently, the Prime Minister approved the *National Biodiversity Strategy to 2020, vision to 2030* (NBAP) via Decision 1250/QDD-TTg, dated 31 July 2013, to enhance biodiversity conservation across Vietnam and to conform to the sustainable development targets.

In addition to the NBAPs, the Vietnamese Government has approved a number of strategies and action plans relating to conservation and development of biodiversity resources. These are outlined in the table below.

Table 9 - National Strategies, Plans, Projects and Action Programs for Biodiversity Conservation approved by the Vietnamese Government

Year	Strategies/ Programs	Related goals on biodiversity conservation
2007	The National Action Plan on Biodiversity to 2010, orientation to 2020 to implement the Convention on Biological Diversity and Cartagena Protocol on Biosafety	- Conserve and develop terrestrial biodiversity - Conserve and develop wetlands and marine biodiversity - Conserve and develop agricultural biodiversity - Sustainably use biological resources - Enhance state management capacity in biodiversity and biosafety.
2008	Program on protecting valuable aquatic creatures endangered and threatened with extinction - till 2015, vision till 2020	- Preventing endangered species becoming extinct - Recovering populations and developing precious, endemic and high- value aquatic species; - Conserving biological diversity and sustainably develop fishery and aquaculture with communities' engagement.
2008	Planning the system of Interior Water Preserved Areas (IWPA) till 2020	- Designing and establishing a system of 45 IWPAs - Having detailed planning completed for IWPAs at the national level.
2010	Planning the national system of marine protected areas (MPAs)	- Establishing a system of 16 MPAs accounting for 169,617 hectares of coastal and marine waters - Complete the detailed planning of 5 MPAs - Establish 5 operational MPAs, namely: Nha Trang Bay,

		Cu Lao Cham, Nui Chua, Phu Quoc and Con Co.
2010	Vietnam's fisheries development Strategy to 2020	- Industrializing and modernizing the fisheries sector and sustainably developing the sector; gradually increasing the awareness of fishermen on protecting the ecological-environment and ensuring security in sea and islands. - The fisheries economy to make up 30-35% of GDP, within the agriculture-forestry- fisheries sector. - Creating 5 million jobs for fishermen with an average per-capita income tripling from the current level. Provide training for over 40% of fishermen.
2011	The National strategy on climate change	- Protecting and developing forests sustainably, increasing the absorption of greenhouse gases and conserving biodiversity
2012	Program on protection and development of aquatic resources through 2020.	- Establishing and putting into operation 10 MPAs and 19 IWPAs by 2015 - Having the nationally planned protected areas from the MPAs system and IWPAs system finalized and operational by 2020 - By 2015, complete the planning of fishing-prohibited zone, promulgate the list of banned activities.
2012	The national strategy on environment protection to 2020, vision to 2030	- Mitigating the deterioration and exhaustion of natural resources - Preventing and limiting the degradation of biodiversity.
2012	Program on prevention and management of invasive alien species to 2020	- Ensuring that invasive alien species are periodically investigated and assessed; categorized and controlled in accordance with law - Prevent and control the spread of invasive alien species, mitigating the harmful effects of invasive species which are a serious threat in Vietnam - Effectively managing the importation, cultivation and development of biological species that may become invasive in order to prevent negative impact on environment and biodiversity in Vietnam - Ensure 80% of communities in the provinces and cities directly under the central government have increased awareness on identifying, preventing and controlling invasive alien species.
20	National	- Improving the quality and the increase the area of

13	Biodiversity Strategy to 2020, Vision to 2030	protected ecosystems, ensuring that the area of terrestrial PAs account for 9% of the total territorial area; MPAs account for 0.24% of the sea area, forest coverage reaches 45%, primary forest remains at 0.57 million hectares coupled with effective protection plans; mangrove forests, sea grass beds, and coral reefs are maintained at the current levels; 15% of degraded critical ecosystems are restored; the number of internationally recognized PAs are increased to 10 Ramsar wetlands, 10 biosphere reserves and 10 ASEAN heritage parks (AHP); - Enhancing the populations of rare, threatened and endangered species; and establishing priorities for protection ensuring that no new case of species extinction are reported, significantly improve the status of endangered, rare and threatened species; - Compiling an inventory, store and conserve native, endangered, rare and precious genetic resources (including animals, plants and microorganisms) to ensure that they are not impaired or eroded
2014	Decision No.45/QD-TTg dated January 08, 2014 of the Prime Minister approving the Biodiversity Conservation Planning to 2020, vision by 2030	- Ensuring that important natural ecosystems, endangered, rare and precious species and genetic resources are conserved and sustainably developed; maintaining and developing ecosystem service adapt to climate change to promote the national sustainable development

Source: Synthesis Report on developing the National Biodiversity Strategy to 2020, vision to 2030, MONRE, 2013

2.2. The National Biodiversity Action Plan - 2007

Implementation of the 1995 National Biodiversity Action Plan (NBAP 1995) made substantial progress in the conservation and development of biodiversity in Vietnam. However, in response to CBD guidance and the lessons learnt from implementing NBAP 1995, the Government approved the updated NBAP in 2007.

In comparison with NBAP 1995, the later NBAP 2007 included more detail and clear steps to approach the Plan's targets more broadly; and each main target includes specific quantitative measure for implementation. In addition, the NBAP 2007 established a longer-term vision for conservation up to 2020, including: proposed improvements to the system of institutions, mechanisms and policies, and legal documents on management of

biodiversity conservation and bio-safety; proposal for the approach to complete the protected areas system; restoration of 50% of degraded, critical and vulnerable ecosystems; to conserve, develop and sustainably use biodiversity in genes, species and ecosystems; effectively manage bio-safety and fully implement international commitments on biodiversity.

Table 10 – The links between targets of the National Biodiversity Action Plan (NBAP) approved in the year 2007 and Convention on Biological Diversity (CBD)

NBSAP Targets		CBD Global Targets	
General Target (GT) 1: Conservation and development of terrestrial biodiversity			
Specific Target (ST) 1.1	Develop the system of special-use forests (to reach a forest coverage of 42-43%)	Sub-Target (ST) 1.1 ST 1.2	• At least 10% of each of the world's ecological regions effectively conserved • Areas of particular importance to biodiversity protected
ST 1.2	Restore 50% of the area of degraded watershed forests	ST 1.1 ST 1.2	• At least 10% of each of the world's ecological regions effectively conserved • Areas of particular importance to biodiversity protected
ST 1.3	Effectively protect precious, rare and endangered animals and plants	ST 2.2	• Status of threatened species improved
ST 1.4	Have three natural reserves accredited as Natural World Heritage or as Biosphere Reserves	-	-
GT 2: Biodiversity conservation and development in wetlands and marine areas			
ST 2.1	Increase the total area of wetlands and marine reserves of national and international importance to over 1.2 million hectares	ST 1.1 ST 1.2	• At least 10% of each of the world's ecological regions effectively conserved • Areas of particular importance to biodiversity protected
ST 2.2	Restore 200,000 hectares of mangrove forests;	ST 1.1	• At least 10% of each of the world's ecological regions effectively conserved

		ST 1.2	• Areas of particular importance to biodiversity protected
ST 2.3	Designate five (05) wetlands to be in the list of wetlands of international importance (Ramsar sites).	-	-
GT 3: Agricultural biodiversity conservation and development			
ST 3.1	Complete a national conservation system to efficiently conserve rare and precious, indigenous livestock breeds, plant varieties and agricultural microorganisms of high socio-economic value	ST 3.1	• Genetic diversity of crops, livestock, and of harvested species of trees, fish and wildlife and other valuable species conserved, and associated indigenous and local knowledge maintained.
GT 4: Sustainable use of biological natural resources:			
ST 4.1	Develop models of sustainable use of biological natural resources; to monitor, prevent and eliminate the exploitation, trading and consumption of precious, rare and endangered animals and plants;	ST 4.1	• Biodiversity-based products derived from sources that are sustainably managed, and production areas managed consistent with the conservation of biodiversity.
ST 4.2	Monitor, evaluate and prevent invasive alien species introductions;	ST 6.2	• Management plans in place for major alien species that threaten ecosystems, habitats or species.
ST 4.3	Verify 100% of the breeds, species and genetic sources of imported organisms.	ST 6.1	• Pathways for major potential alien invasive species controlled.
GT 5: Strengthen state management capacity in biodiversity and bio-safety			
ST 5.1	Consolidate personnel and enhance State management capacity in biodiversity and bio-safety	-	-
ST 5.2	Develop and complete a		

	system of mechanisms, policies and legal documents on biodiversity and bio-safety management;	-	-
ST 5.3	Develop infrastructure and strengthen staff training	-	-
ST 5.4	Conduct awareness and education campaign to increase public awareness	-	-
ST 5.5	Ensure that 100% of genetically modified organisms, products and commodities produced from genetically modified organisms undergo risk assessment in Vietnam and are labeled, checked and monitored in accordance with the law.	-	-

In general, the Vietnam NBAP targets were consistent with the strategic goals of the CBD. However, certain specific targets in NBAP 2007 were not fully compatible with the CBD's targets and vice versa. For example, the sub-target 11 of CBD urges developed countries to assist the supporting and developing approaches in relation to financial and technical issues; therefore it is not presented in Vietnam's NBAP. Meanwhile, targets of management capacity building and improvement of legal documents for developing countries to improve the legal framework systems and natural resource management are certainly set.

2.3. The National Biodiversity Strategy to 2020, vision to 2030 (approved in 2013)

On 31 of July 2013, the Prime Minister signed Decision no.1250/QD-TTg approving the *National Biodiversity Strategy to 2020, vision to 2030 (NBSAP 2013)*. The overall objectives of the strategy are: conservation of important natural ecosystems; endangered, rare and precious species, and genetic resources are preserved and sustainably used, contributing to the development of the green economy, and actively responding to climate change.

In comparison to NBAP 2007, the NBSAP 2013 has been developed to better suit the current situation, with specific focus on the following areas: Focus on system expansion and improvements in management quality of terrestrial protected areas (TPAs) and marine

protected areas (MPAs); Cooperate with neighboring countries in biodiversity conservation; Prioritize conservation of ecosystems which are of national and international importance; Conserve native, rare and precious species; Sustainably use and implement reasonable mechanisms for sharing the benefits from biodiversity ecosystem services; Control the negative impacts on biodiversity (including land use conversion, unsustainable farming practices, pollution, illegal hunting, trafficking and consumption of wildlife, invasive species control); Plan for and preserve biological diversity in the context of climate change [9].

Table 11 - The linkages between National Biodiversity Strategy 2013 and Aichi Targets

The National Biodiversity Strategy 2013		***Aichi Targets***
Target Group (TG) 1: *Conservation of natural ecosystems*	**Consolidate and complete the system of Pas**	
	• Identify critical ecosystems and prepare plans for expanding the system of PAs; Establish biodiversity corridors connecting natural habitats of endangered, rare and precious species prioritized for protection; establish 3 prioritized areas for tiger conservation in the trans-boundary protected area among Vietnam, Laos and Cambodia	C-11
	• Conduct a comprehensive review of biodiversity related provisions in the current legal documents, and make proposals for amendments, revisions, and adjustments to ensure the consistency; conduct research on institutional structures to propose a model for a unified management authority for PAs;	A-2
	• Strengthen the management system for PAs, ensuring all operate with an established management board; review and improve the functions, tasks and organization; enhance the capacity of management boards by rational measures; implement policies to create incentives for staffs at PAs; upgrade necessary infrastructure to support managerial activities; provide field equipment for PAs, including biodiversity monitoring and reporting systems;	
	• Develop and improve regulations on the decentralization, ranking and classification of PAs and the procedure for establishing new PAs; prepare and implement management and financial plans, monitoring and regulations for the management of PAs, with the target to have these in place for all PAs by 2015; the goals towards 2020 are set that the area of TPAs accounts for 9% of the total terrestrial area; MPAs account for 0.24% of the sea area, forest coverage reaches 45%;	A-3
	• Conduct investigation and assess the values and ecosystem services of PAs	D-14
	• Develop long- term plans for investment in the buffer zones of PAs and implement a sustainable economic development model for households in these zones.	B-7

	• Conservation of ecosystems of national and international significance	
	• Investigate, review and map ecological regions, identify areas of high biodiversity value, degraded areas and sensitive areas.	C-11
	• Conduct research and collect statistics and data to assess the status; develop a bank of data, maps of natural wetlands, sea grass beds, coral reefs and other typical natural ecosystems.	
	• Strengthen the strict protection of primary forests, maintain area at 0.57 million ha; take measures to prevent deforestation and illegal logging in natural forests, SUFs and protected forests; ensuring the coverage of critical watershed forests to be maintained at 60% of the basin areas.	B-5
	• Implement forest regeneration and a forestation programs, enrich forests with native plants and promote the active prevention of forest fire; enhance the capacity of fire response for stakeholders at all levels	
	• Continue to actively implement the targets and tasks in the mangrove forest restoration program	
	• Continue to implement the national plan for conservation and sustainable use of wetlands with priority given to critical river basins.	B-10
	• Determine the size, scope and implementation of measures to protect and restore the ecosystems of coral reefs and sea grass on a national scale; restore at least 15% of degraded critical ecosystems	
	• By 2020, the numbers of internationally recognized PAs are: 10 Ramsar sites, 10 Biosphere Reserve, 10 ASEAN heritage parks.	C-11
TG 2: *Conservation of wild and rare and precious species, crop*	• Prevention of a decline in threatened wildlife species, particularly endangered, rare and precious species identified as priorities for conservation	
	• Continue to effectively implement the targets and tasks of the program to protect rare and precious aquatic species at risk of extinction to 2015, vision to 2020	C-12
	• Investigate, monitor, periodically update and publish the list of endangered, rare and precious species prioritized for protection	

varieties and livestock	• Implement conservation programs for endangered, rare and precious wild species prioritized for protection, with special priority given to endangered large mammals: elephants, tigers, saola and primates; Ensure there is no increase in number of endangered, rare and precious species and extinct species	
	• Investigate and assess the status of endangered, rare and precious fauna and flora, periodically update and republish the Vietnam Red List in accordance with IUCN standard. Improve the status of biome of endangered, rare and precious species prioritized for protection of Vietnam	
	Conservation of rare and precious species of traditional agricultural crops, livestock and their wild relatives	
	• Take measures to conserve traditional agricultural crops, livestock and their wild relatives; increase the variety of crop samples that are stored and preserved in gene bank	C-13
	• Review, assess, and improve the effectiveness of the program for on-farm conservation of rare and precious crop varieties and livestock breeds; apply and develop positive incentives for farmers to encourage their engagement in conservation	
	• Continue to implement the national in-situ and ex-situ gene bank conservation program, for in-situ and ex-situ conservation of rare and precious crop varieties, livestock and microorganisms	
	• Development, consolidation and enhancement of the operating efficiency of ex-situ conservation facilities	
	• Assess the current state of ex-situ conservation facilities (zoos, botanic gardens, wildlife captive breeding centers, medicinal plant gardens, gene banks, animal rescue centers etc.); take reasonable measures to improve the effectiveness of ex-situ conservation	C-12
	• Accelerate the establishment of the Vietnam Nature Museum	
	• Establish a network of rescue centers across the country to ensure the needs of rescued wildlife species by region and category	C-13
	• Upgrade the Centre of Plant Genetic Resources to a National Plant Gene Bank in accordance	

	with ASEAN standards	
TG 3: *Sustainable use, fair and equitable access, and sharing of benefits arising from ecosystems and biodiversity*	**Sustainable use of ecosystems**	
	• Conduct research, develop guidelines and pilot the economic valuation of biodiversity and ecosystem services	E-19
	• Improve the policies and institution to implement payments for the environmental services of forest at a national scale; pilot a policy for payment for environmental services that is applicable to marine ecosystems and wetlands	D-14
	• Replicate models for the management of protected areas involving community participation, and implement mechanisms to share benefits in an equitable way amongst stakeholders	
	• Develop and enforce the regulations on ecological tourism in Vietnam; promote and manage ecotourism in order to provide an important source of earnings for local communities	
	• Develop and implement policies to support production of agricultural, forestry and fisheries that meet international standards for conservation and sustainable use of biological resources; assess the process to grant certificates for environment- friendly (eco-labeling) products from the agriculture sector, fishery and forestry sector; support businesses in agriculture, forestry and fishery sectors to register for international certificates for sustainable and environmentally friendly products.	B-7
	Sustainable use of species and genetic resources	
	• Investigate, record and take measures to protect and develop valuable non- timber forest products (NTFP), especially medicinal and ornamental plants; effectively control the unconstrained exploitation and cross- border trafficking of wild species.	
	• Promulgate policies and guidelines on breeding, farming and trading of common wild species; reducing pressures caused by natural resources exploitation; issue official documents guiding on breeding, farming and trading common wild animals and plants; publish the list of common species which are allowed for farming and trading. Developing and guiding a registration process and supervision of the farming of wild species.	
	• Establish a management mechanism of accessing and benefits sharing from the genetic	

	resources and traditional knowledge on genetic resources	
	• Conduct research and develop regulations guiding a mechanism for access to and benefit sharing of genetic resources; pilot models for access and benefit sharing, focusing on the interests of communities	D-16
	• Collect, document, and develop a geographical directory and take measures to conserve traditional knowledge associated with genetic resources	
	• Develop and implement the action plan for capacity building to implement the Nagoya Protocol on access and benefits sharing of genetic resources	E-18
TG 4: *Control activities that generate negative impact on biodiversity*	**Control activities considered unsustainable or causing environmental pollution such as conversion of land and water surface area use and agricultural practices**	
	• Control the conversion of natural forestland and water surface of conservation value, to minimize negative impacts on biodiversity.	B-5
	• Limit overexploitation and change unsustainable fishing, harvesting, and breeding practices of agricultural, forestry, and fisheries; implement measures to gradually eliminate destructive fishing methods and exploitation.	B-6
	• Effectively apply solutions to curb increasing pollution which poses negative impact on biodiversity; limit the impact of environmental pollution on ecosystem, species and genetic resources, particularly in river basins, inland wetlands and coastal region; support the community in overseeing and reporting about water pollution in order to strengthen law enforcement.	B-8
	Control illegal hunting, trade and consumption of wild fauna and flora	
	• Encourage the large participation of communities and mass media in the detection and prevention of illegal acts of exploitation, tracking and consumption of wildlife.	A-1
	• Improve and implement inter- sectoral coordination mechanisms between the environmental police, market management, customs, rangers, and fisheries authorities in the detection and enforcement of illegal exploitation, trafficking, and consumption of wildlife in accordance with the law.	

	• Advocate and conduct awareness programs to prevent the use and consumption of wildlife products nationwide; take steps to eliminate trafficking of wild animals.	A-4
	• Strengthen cooperation with regional and international law enforcement networks (ASEAN WEN, Interpol) in the trafficking and illegal transportation of wildlife.	
	Control and prevent intrusion of invasive alien species; strengthen bio-safety management of genetically modified organisms (GMO)	
	• Investigate the status of invasive alien species as well as potentially invasive alien species on a national scale, with particular emphasis on protected areas, agricultural areas, and forest ecosystems.	B-9
	• Implement the program to prevent and control invasive alien species to 2020.	
	• Enhance cooperation, exchange and learning from experience on the bio-safety management of GMOs, to improve technical and professional expertise of bio-safety management agencies and units at all levels.	E-19
	• - Increase investment in infrastructure and resources for implementation of measures to monitor and control the risks of GMOS to the environment and biodiversity; develop and promulgate legal documents on liability and compensation in the bio-safety management activities of GMOs	
TG 5: *Biodiversity conservation in the context of climate change*	**Identify climate change impacts on biodiversity and promote biodiversity conservation as a means to actively respond to climate change**	
	• Conduct research to assess and predict impacts of climate change on biodiversity of Vietnam	D-15
	• Conduct research on the role of biodiversity in mitigation of and adaptation to climate change in vulnerable areas such as river basins, coastal areas, especially Red River Delta and Mekong River Delta; take measures to increase resilience ability of biodiversity in these regions.	
	Develop biodiversity corridors to increase connectivity between forest ecosystems and critical biodiversity areas to adapt to climate change.	
	• Develop policies for the management of biodiversity corridors, defining management	D-14

	objectives, the use of land in biodiversity corridors, and their connection to the development of land use planning at local level	
	• Establish biodiversity corridors connecting protected areas, and prioritized implementation of pilot projects in the northern mountainous areas, central and western highland regions; apply financial support mechanism in the corridors of forest ecosystems.	
	Implement forest regeneration programs applying appropriate methods and approaches to biodiversity, carbon storage and climate change adaptation and mitigation.	
	• Integrate biodiversity conservation targets into the implementation of the national action plan on "Reducing greenhouse gas emissions through efforts to limit deforestation and forest degradation, sustainable management of forest resources, and conserving and enhance forest carbon stocks" period 2011- 2020 (REDD+)	
	• Map areas of high biodiversity value in the REDD + program; promote the use of native species for forest enrichment and restoration in the framework of REDD+; share information about implementation of national action plan on REDD+, contributing to achieve the goals of biodiversity conservation and adaptation to climate change.	
	• Reduce risks to biodiversity by implementing the REDD+, which strictly complies with social and environmental security mechanisms.	A-3

2.4. Integrating biodiversity into sectoral and inter-sectoral development plans and programs.

2.4.1. Integrating biodiversity conservation into inter-sectoral plans, programs and policies and regional development.

The various elements of environmental protection, natural resource management, and biodiversity conservation have been integrated into national plans, programs and policies.

Some example include:

- Strategies for hunger eradication and poverty reduction:

- In order to achieve the Millennium Development Goals, the Vietnamese Government released the *Strategy for Comprehensive Growth and Poverty Reduction to the year 2010*, which aimed to protecting the environment in general and biodiversity in particular; increasing forest coverage from 33% to 43%; placing emphasis on solving environmental degradation and conserving natural resources[9].
- A report by FAO released on 12 of June 2012 highlighted that Vietnam was among the top countries meeting the international objective on decreasing poverty. Already, 38 countries have completed the achieved the poverty reduction objectives, which is includes halving the proportion of impoverished people by 2015. Vietnam achieved the goal that the number of hungry people decreased by 50% in periods of 1990-1992 and 2010-2012.

- Planning to respond to climate change

- On 6th April 2007, the Prime Minister released the Decision 47/2007/QĐ-TTg to approve a plan to implement the Kyoto Protocol of the United Nations Framework Convention on Climate Change (UNFCCC) in the period 2007-2010. Objectives of the plan included to manage, exploit and use natural resources appropriately and effectively; to protect the environment, resources and climate; and to reduce greenhouse gas emission.

- Regional development plans

- Vietnam has 8 recognized geographical regions. In each region, there are areas with high biodiversity that has been selected for establishing PAs. The formation of green corridors and biodiversity corridors to link PAs together is considered as an effective mechanism to reduce ecological fragmentation of wildlife habitats and to create biological pathways between the PAs. Thus, it is necessary to develop

[9] Socialist Republic of Vietnam (2002), a comprehensive strategy for growth and poverty reduction by 2010

comprehensive biodiversity plans together with regional and provincial biodiversity action plans.

- Vietnam Sustainable Development Strategy for 2011 – 2020

- On April 12 2012, the Prime Minister signed Decision No. 432/QD-TTg approving the *Vietnam Sustainable Development Strategy for 2011-2020*. It mandates that sustainable development is critical to the process of national development. Sustainable development is the common work of the Party, authorities at all levels, ministries, agencies, localities, enterprises, social organizations, communities and individuals.
- In general, biodiversity and environment protection supports sustainable development viewpoints, objectives, contents and prioritized programs of inter-sectoral and regional development policies in Vietnam.

2.4.2. Biodiversity conservation in the implementation framework of biodiversity related conventions

- The World Heritage Convention, 1972 (Paris Convention)

- Vietnam ratified to the World Heritage Convention in 1987, despite the challenges the country was facing. Up to 2012, Vietnam has 7 Natural World Heritage sites listed on the World Heritage List of the total 962 Listed Cultural and Natural Heritage sites of the member states.

- The Convention on international importance wetlands (Ramsar Convention)

- Vietnam has acceded the Ramsar Convention since 1989. MONRE has been the appointed national focal point for the implementation of Ramsar Convention in Vietnam. In 2007, the Vietnam Environment Protection Agency (VEPA) proposed the National Masterplan for wetland conservation. From 2007 to-date, a range of legislation and policy related to wetland conservation have been developed including: Criteria for wetland evaluation and selection; guidelines for typical wetlands planning; wetland classification system. To-date, Vietnam has listed 5 wetlands sites as Ramsar sites on the list of “Wetland sites of international importance”.

- Convention on International Trade in Endangered Species (CITES)

- After signing CITES, the implementation of the convention has been integrated into action plan of relevant ministries and agencies through cooperation between MARD and MONRE. The National Action Plan to combat illegal wildlife trafficking to 2010 (approved 2004) emphasized wildlife trade management required an appropriate approach to be applied nation-wide, which includes

capacity building for state management agencies, and education and awareness raising for communities - especially those in mountainous areas.

- In order to implement CITES, Vietnam's government agencies have promoted international cooperation, and signed many bilateral and multilateral agreements with partners from neighboring countries.

- The Convention on Biological Diversity- CBD

- Fully recognizing the importance of conservation and sustainable use of biodiversity, the government signed the CBD on the 28 May 1993. As a result, Vietnam was one of the first countries to officially join the Convention on 16th November 1994. The national focal point, which officially implements the Convention, is MONRE. The first and most significant achievement of Vietnam to CBD implementation is developing Vietnam National Action Plan in 2005, 2007 and 2013 respectively.

- Cartagena protocol on biosafety

- In order to implement the Cartagena Protocol and to ensure the objective to strengthen the government's management capacity for biodiversity and bio-safety in the NBAP (2007), the government released Decision 102/2007/QĐ-TTg to approve the project titled "*Enhancing management capacity for bio-safety of GMOs and GMO-products until 2010, to implement the Cartagena Protocol on Bio-safety*".

- United Nations Convention to Combat Desertification (UNCCD)

- On 2nd September 2006, Prime Minister released Decision 204/2006/QĐ-TTg to implement the National Action Plan to Combat Desertification in 2006-2010 and Orientation until 2020.

- United Nations Framework Convention on Climate change, 2007-2010 (UNFCCC)

- The Prime Minister released Decision 47/2007/QĐ-TTg to approve the plan to implement the Kyoto Protocol in the United Nations Framework Convention on Climate Change, 2007-2010.

In addition, Vietnam is considering participation in other international agreements on biodiversity conservation including:

- Convention on Migratory Species (CMS)
- The Nagoya Protocol on Access to Genetic Resources and Benefit-sharing

- The Nagoya – Kuala Lumpur Supplementary Protocol on Liability and Redress to the Cartagena Protocol on Bio-safety.

2.4.3. Integrating biodiversity conservation into relevant sectors

Recently, economic sectors including agriculture, forestry, fishery and tourism are considering biodiversity conservation as part of their development strategies. The integration of biodiversity conservation into related sectors is reflected in decisions of the government and ministries to approve plans and programs incorporating biodiversity, especially in agriculture, forestry and fishery sectors. Many objectives and tasks outlined in these plans and programs are very specific and provide additional detail on the general approaches outlined in the NBSAP.

The Natural Resources and Environment sector

On 31 of July 2013, the Deputy Prime Minister signed Decision no.1250/QD-TTg approving *the National Biodiversity Strategy to 2020, vision to 2030 (NBSAP)*. MONRE was assigned as the implementing body. The objectives of the strategy are ensure important natural ecosystems, endangered, rare, and precious species, and genetic resources are preserved and sustainably used, contributing to the development of the green economy, and actively responding to climate change.

In 2012, the Prime Minister approved *The National Target Program to Respond to Climate Change for 2012-2015*, and assigned MONRE as the implementing body. The overall objectives are to raise awareness of community about climate change and to take steps in establishing developing policy directions and tasks, action plans to adapt and mitigate the impacts of climate change[10].

In 2006, Prime Minister approved the "National Strategy for Water Resources until 2020"[11] and "Master Plan on Baseline Survey and Management of Marine Resources and Environment until 2010, vision to 2020"[12]. One task in this strategy is to protect the integrity of aquatic, wetlands, marine and estuarine ecosystems. In addition, another task is to sustainably protect and develop water resources through strengthening forest protection and appropriate management. Priority is given to watershed forests to maintain and develop water sources of rivers and the coast.

In 2012, the Prime Minister issued the Decision No.1216/QD-TTg approving the National Environment Protection Strategy upto 2020, vision by 2030. Particularly, the

[10] Decision 1183/QĐ-TTg dated 30th August, 2012 The National Target Program to Respond to Climate Change for 2012-2015"

[11] Decision 81/2006/QĐ-TTg dated 14th April, 2006 approved "National Strategy for Water Resources until 2020"

[12] Decision 47/2006/QĐ-TTg dated 1st March, 2006 approved "Master Plan on Baseline Survey and Management of Marine Resources and Environment until 2010, vision to 2020".

Prime Minister also issued the Decision No.166/QD-TTg of Jan.21, 2014 on approving the plan to implement the Strategy. In which, biodiversity conservation is integrated into their goals and activities.

Agriculture and Forestry sectors

The Agriculture and Forestry sectors have integrated conservation and sustainable use into national laws, policies, and programs and the national strategy. The *"5 million Hectares Reforestation"* Program had a budget of about US$2.5 billion over 12 years. It aimed to increase forest coverage in Vietnam to 43% by 2010, and in addition conserve biodiversity, eradicate hunger, eliminate poverty and develop the national economy.

In 2009, the Ministry of Agriculture and Rural Development issued "*Regulations on Risk Assessment Testing of Genetically Modified Crops to Biodiversity and Environment*" to regulate requirements and the process of risk assessment for genetically modified plants and identification of risks to the environment and biodiversity[13].

The Prime Minister approved the *Vietnam Strategy for Forestry Development from 2006-2020* in 2006. This Strategy includes a comprehensive forestry development strategy covering all dimensions from management, protection, development, sustainable resources use, reforestation, forest product exploitation and processing, environmental services and ecotourism. Forestry development must contribute to economic growth, hunger eradication, poverty reduction and environment protection. Sustainable forest management, utilization, and development are regarded as the foundation of forestry development in Vietnam. Forestry development should promote the policy to involve communities in forestry, and attract additional investments for forest protection and development[14].

Based on the above points, the Strategy's goals towards 2020 is to establish, manage, protect, develop and sustainably use 16.2 million hectares of land for forestry; to increase Vietnam's forest coverage to 42-43% in 2010 and to 47% in 2020; ensure active participation of different economic partners and social organizations in forestry development in order to maximize contributions to socio-economic development, environment protection, biodiversity conservation, provision of environmental services, hunger eradication, poverty elimination, livelihood improvement for mountainous communities, and ensuring national security.

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[13] Circular 69/2009/TT-BNNPTNT dated 27th October, 2009 about "Regulations on Risk Assessment Testing of Genetically Modified Crops to Biodiversity and Environment"

[14] The Vietnam Strategy for Forestry Development from 2006-2020 approved by Prime Minister of Government at Decision 18/2007/QĐ-TTg dated 5th February, 2007.

The Fishery Sector

The Fisheries sector has promulgated a range of regulations and developed several large-scale projects and programs to promote sustainable resource management and the development of aquaculture resources.

In 2008, Vietnam's Prime Minister approved the project of *Protection of Endangered, Rare and Precious and Aquatic Species to 2015 and Vision Towards 2020*. This project aims to prevent an increase in number of endangered species, and to support the gradual recovery of endemic, rare and precious species in Vietnam. This will be achieved through promoting community participation to contribute to biodiversity conservation and sustainable fisheries. This decision created a legal framework and provided guidance for an important funding program to protect genetic resources of rare, precious and valuable aquatic species in Vietnam[15].

Also in 2008, the Prime Minister approved the *Management Regulations for Vietnam's Marine Protected Areas of International and National Importance.* This decree regulates activities in MPAs and identifies funding sources for MPAs. In addition, the planning document that outlines proposals for MPAs and Interior Water Protected Areas (IWPAs) developed in 2006 is pending approval from the Government[16].

Tourism sector

In 2007, the Ministry of Culture, Sports and Tourism approved the *National Tourism Action Plan 2007-2012* after Vietnam joined WTO. This plan supports various approaches to biodiversity conservation and environmental protection though sustainable tourism development; cooperation with MONRE to develop projects for environmental protection; capacity building for monitoring and responding to environmental problems at national tourism sites; inspection, monitoring and enforcement of natural resource exploitation and environmental protection for sustainable tourism development; formulation of sustainable tourism development strategy in response to Vietnam Agenda 21; formulation of environment protection program for the tourism sector; and development of a program for education, information and communication activities, and development and application of environmental standards for tourism[17].

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[15] Decision 485/QĐ-TTg approved Plan on Preserving Endangered, rare and presious Aquatic Species until 2015, vision to 2020"

[16] Decree No. 57/2008/ND-CP dated May 2nd, 2008 promulgating the regulation on management of the MPA of national and international importance

[17] Decision No. 564 / QD-BVHTTDL dated September 21, 2007 on "Action Plan of Tourism"

The Industry and Trade sector

The industry and trade sector has developed documents approved by the Government to address the requirements for biodiversity and environmental protection in mining, chemical production and construction material production projects through and Environmental Impact Assessment (EIA) process. It proposes implementation of programs to respond to climate change and includes a proposal titled *"Development of Environmental Industry Vietnam in 2015, with a Vision to 2025"*.

The Finance sector

The Finance sector has the role of approving budget allocation for the environment in general, and biodiversity in particular. The Ministry of Finance has released official guidance documents for the formulation of budget proposals, expenditure management, and budget use to ensure the performance of policies, strategies and plans. The Inter-ministerial Circular No.01/2008/TTLT-BTNMT-BTC dated on 29th April 2008 provides guidance to develop budget proposals for environment protection efforts from the state budget allocated for the environmental sector.

Furthermore, the Circular No.01/2008/TT-BTC dated on 3rd January 2008 provides guidance on budgeting, managing and using State financial resources in the implementation of National Biodiversity Action Plan to 2010, Vision to 2020 under the Convention on Biological Diversity and Cartagena Protocol on Bio-safety. In addition, Amendment Circular No. 152/2011/TT-BTC 11/11/2011 provides guidance on the implementation of Decree No. 67/2011/ND-CP dated 8th August 2011 detailing and guiding the implementation of a number of articles of the Law on Environmental Protection.

The Training and Education Sector

The Training and Education Sector has developed and submitted to the Prime Minister for approval projects that seek to integrate environmental protection into the national education system.

All of the legal documents mentioned above reflect the commitment of Vietnamese Government to strengthen biodiversity conservation and sustainable utilization by integrating biodiversity conservation into all sectoral development.

2.4.4. Ecosystem-based approach to integrating biodiversity into sectoral and inter-sectoral strategies, plans and programs.

An ecosystem-based approach to biodiversity management provides an integrated approach to manage ecosystem components including land, water, and biological

resources, as well as the relationship between them in order to promote conservation, sustainable use and equitable benefit-sharing of these resources and their ecological services.

The term "*Ecosystem-based approach*" may has been introduced into the forestry and fishery sectors, in some certain localities and into PAs such as U Minh Ha National Park, Can Gio Biosphere Reserve, Tam Giang and Cau Hai Lagoons. Activities in the Can Gio Biosphere Reserve and the cajuput forests of the Mekong Delta wetlands can be seen as demonstrations of the ecosystem-based approach in achieving integrated conservation, equitable benefit-sharing and sustainable use of natural resources and the production of specific products and services. These approaches are integrated into the land and forest allocations for local people for plantation and production management.

Vietnam has identified landscape conservation approaches as newer and more appropriate method for PA management. Thus, recently PAs have been planned and managed based on landscape or biological eco-regional approaches which reflect the ecosystem-based approach proposed by the CBD. This approach extends to conservation activities beyond the strictly managed core zones of PAs into the buffer zones. This type of conservation also requires the establishment of green and/or biodiversity corridors linking various PAs. The NBSAP identifies the application of the ecosystem-based approach to protect biodiversity and establish biodiversity corridors linking PAs.

The ecosystem-based approach has been demonstrated in a number of different areas: Facilitating green corridors linking PAs in Thua Thien-Hue, Quang Nam, and Gia Lai Provinces, and promoting integrated coastal zone management in Nam Dinh, Thua Thien-Hue and Ba Ria-Vung Tau provinces; Eco-regional based approach in the initiative for biodiversity conservation for Central Annamitte Conservation; Landscape-based watershed management for Ca River (Nghe An), A Vuong River (Quang Nam), and Dong Nai River; Ecosystem-based management of Bau Sau wetlands, Cat Tien National Park; Ecosystem-based biodiversity conservation and sustainable use in the Lower Mekong River Basin; Application of the ecosystem-based approach for biodiversity conservation in Yok Don National Park (Dak Lak) and Ba Be National Park (Bac Kan) (VIE/95/G31&031 Project).

According to specialists' evaluation, obstacles that emerge in the application of ecosystem-based approach for biodiversity conservation in Vietnam include:

- Stakeholder participation in planning and management is not highly effective;
- Terminologies and definitions are inconsistently applied in the "ecosystem-based approach";

- Decentralization and sectoral cooperation is usually weak due to inadequate capacity;
- Inadequate awareness and understanding of ecosystem functions, and the lack of professional agencies to guide the ecosystem-based approach;
- The lack of guidance in using ecosystem-based approach as a tool to integrate biodiversity management into broader development activities; and
- Challenges in solving conflicts between conservation priorities, development needs and requirements and identifying suitable solutions.

International experience and the experience in Vietnam reveal that the most common obstacle in biodiversity management and conservation is the lack of consensus in the establishment of a focal point with full authority for long-term and consistent implementation.

2.4.5. Some achievements of biodiversity integration into sectoral and intersectoral policies

The recent integration of biodiversity conservation in sectoral and intersectoral development policies has generated a number of achievements, especially within the economic sectors considering biodiversity conservation as a strategy for future development.

Vietnam's Five Million-hectare Reforestation Program (Program no. 661) implemented from 1998 to 2010 increased the forest coverage to 38.2% in 2006 representing an increase of 11% above the 1990 coverage. Forests have been allocated to the following categories: 2 million hectares allocated as special-use forest, 5 million hectares allocated as protection forest and 8 million hectares allocated as production forest. Through this process more employment has been created, contributing to hunger elimination and poverty reduction in mountainous areas.

The government has contributed to biodiversity management through promoting planting and reforestation with native forest species and captive wildlife breeding to support sustainable development. By the end of 2006, about 50 species of wildlife and tens of wild plant species were produced in 316 farms and 1,658 households mostly for commercial purposes. However, as a CITES's state member, captured wildlife breeding in Vietnam is strictly guided, regulated and managed.

The *Off-shore Fishing Program* aims to reduce overexploitation of, and to protect, inshore coastal resources which have been exhausted for many years. The various initiatives related to aquaculture farming of rare, precious and valuable marine and aquatic species have achieved encouraging results. The total aquaculture production has

increased dramatically and many valuable marine species have been studied to identify opportunities for facilitated reproduction to support both farming and ranching.

Biodiversity Monitoring: In 2007, the Vietnam Environment Protection Agency (VEPA) drafted the Overall Plan for Nation-wide Biodiversity Monitoring to 2020; Indicator Development of Biodiversity Monitoring of Forest, Wetland and Marine Ecosystems; and Technical Guidance and Economic and Technical Framework for Biodiversity Monitoring. Several on-site monitoring systems were established in Nature Reserves and National Parks, such as: Soil and Water Resources Monitoring in the Northwest Limestone Region by Geographic Institute (1998-2003); Monitoring Distribution and Changes of Vietnam's Coastal Wetlands by Hai Phong Institute of Oceanology (1996-1999); Forest Fire Monitoring and Bear micro-chipped Monitoring by the Forest Protection Department; Rhinos Monitoring in Cat Tien National Park; Primate Monitoring in Phong Nha – Ke Bang, Na Hang, Cuc Phuong, Cat Ba National Parks; Sea Turtle Monitoring in Con Dao National Park; Asian Elephant Monitoring by WWF; and the Monitoring and Evaluation System for Forest Regeneration in Central Annamittes.

Biodiversity Education, Training and Awareness: The education and training network for biodiversity conservation managers and technical staff in Vietnam has been developed, and includes universities, colleges, institutes and professional centers. About 20 universities offer undergraduate degrees in biodiversity-related majors such as biology, environment management, forestry, agriculture and fisheries. Many of them have graduate programs such as the Ha Noi University of Natural Sciences, Ha Noi University of Pedagogy, Ha Noi University of Agriculture I, University of Forestry, Nha Trang University of Aquaculture, and HCMC University of Ago-Forestry.

About 200 undergraduates in biology, 200 undergraduates in biotechnology, and 400 pedagogical undergraduates in biology, together with 5,000-8,000 agricultural, forestry and aquaculture engineers complete their education every year in Vietnam. An estimated 50 Masters students and 10 PhD students are annually trained in zoology, botany, ecology, biodiversity and natural resource management; and there are also students studying overseas with support from bilateral scholarship programs or cooperation projects.

The subject of biodiversity is also included in the current curricula of primary and secondary school education programs. The subjects of biology, botany, tree planting and care techniques, soil and water and environment are being integrated into natural and social science subjects (grade 2, 3, 5), sciences-techniques (grade 4 and 5) and ethics (grade 4). Also, the concepts of biology and animal life, ecosystem components, agricultural techniques, people and the environment are included in biology and geography subjects (grade 6, 7 and 9) and technology (grade 9).

Several universities provide training programs and subjects in wetland management and sustainable use, such as the joint-training Program in wetland management by University of Can Tho, National University in Ho Chi Minh City and Mahidol University. Many conferences and short courses on wetlands have also been organized for environmental management officers at central and local levels.

The development of *Environmental Impact Assessments (EIA)* for infrastructure development projects has been enforced, in which biodiversity related issues were taken into consideration in compliance with the EIA regulations. However, follow-up activities (monitoring and inspection) have not been fully complied with which has resulted in various environmental problems, especially in water pollution from wastewater discharge.

Development of Community-based Conservation Management: Different forms of community-based forest management have been common in mountainous areas. The most common traditional forest management approaches include holy forests, rainforests, watershed forests, village forests or kinship forests.

A demonstration of community-based sustainable use of mangrove forests was developed and monitored at Dong Rui (Quang Ninh); ecological shrimp farming demonstrated in Tien Hai (Thai Binh); wetland conservation and sustainable use demonstrated in Van Long (Ninh Binh).

There have been various demonstrations models of mixed farming. These include rice field farming mixed with fish-raising in Gia Thanh, Gia Tan, Lien Son communes of Gia Vien district (Ninh Binh); models of co-raising shrimp and tilapia fish in Con Chim, Thi Nai Lagoon (Binh Dinh), which has maximized profits from wetland use by aquaculture production. Community-based ecotourism has been established in the buffer zone of Xuan Thuy National Park (Nam Dinh) and U Minh Thuong (Kien Giang). Community-based livelihood development and sustainable use of natural resources demonstrations were undertaken in wetland areas of K9 village of Phu Duc commune and Phu Lam village of Phu Thanh B of Tam Nong district (Dong Thap).

The demonstration of community-based sustainable livelihood and natural resources conservation piloted in Lang Sen Wetland Protected Area has helped improve local livelihoods in the buffer zone, raise awareness about wetlands, and improved co-management mechanisms. In addition, several other models to promote sustainable exploitation and utilization of wetland resources including coral reef breeding and conservation in Area 1 of Ghenh Rang Commune in Quy Nhon City, and grassland conservation and exploitation in Phu My commune of Kien Luong district (Kien Giang).

CHAPTER III: PROGRESS TOWARDS THE TARGETS UP TO 2015 AND AICHI TARGETS

A – Progress towards the targets up to 2015

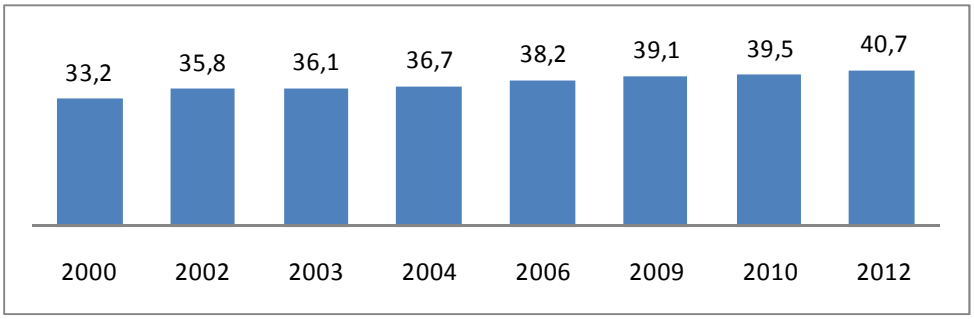
1. Conservation of natural ecosystems

1.1. Natural forests

The MARD target is to increase national forest coverage to 42-43% by 2015 and 44-45% by 2020. According to a 2013 report by the VAFS of MARD, at the end of 2012 Vietnam had 13,862,043 ha of forest, of which 10,423,844 ha (75.2%) was natural forest and 3,438,200 ha (24.8%) was land that had been re-forested; and Vietnam's total forest cover was approximately 40.7% [18].

In addition to the increased coverage of terrestrial forests, mangrove forests are also being restored and there is new planting occurring. MARD reported that in 2012 the total mangrove area of Vietnam was 131,520 hectares, however, planted mangrove forests dominates (est. 56%) the total mangrove cover.

Figure 11 - Progress in coverage of forest over year



Source: Report on forest area, VAF, 2013

1.2. National ssystem of PAs is established

Terrestrial Protected Areas (TPAs)

According to an evaluation of the system of Special Use Forests (SUF) by the Ministry of Agriculture and Rural Development (2010) and project planning review of the national SUF system (Forest Inventory and Planning Institute, 2007), there are currently 164 designated SUFs with an area of 2,198,744 ha (encompassing 7% of Vietnam's total area), including 30 national parks, 58 nature reserves, 11 wildlife reserves, 45 protected landscape areas and 20 experimental forests for scientific research. The

[18] The area and coverage of forest and perennial plants up to 31st of December, 2012 under Decision No. 1739 / QD-BNN-TCLN dated 31st of July 2013 of the Ministry of Agriculture and Rural Development.

function of SUFs is to act as a reserve of biodiversity and genetic resources, and in the long- term to contribute to national socio-economic development [15].

Table 12 - Number and Area of PAs

Types of SUVs	Number	Area (ha)
Natural Park	30	1,077,236
Nature Reserve	58	1,060,959
Species PAs	11	38,777
Landscape PAs	45	78,129
Forests for empirical research	20	10,653
Total	***164***	***2,198,744***

Source: Report of Projects on reviewing planning of SUFs (Forest Inventory and Planning Institute, 2007), MARD 2010

After PA and SUF revision, the area of SUF decreased by 0.3 million ha in comparison with its total of 2.5 million ha (accounting for 7.6 % of the whole territory). The reasons for this change included:

- During the SUF review, agricultural land, residential land, surface water - including both freshwater and seawater, were not taken into account but according to State regulations these land uses were within the remit of the PAs management;
- Some SUFs were excluded from the national SUF system because they no longer meet the criteria for conservation. Some of these areas were converted to use as protection forests and other areas under the management of the Ministry of Culture, Sports and Tourism.

By 2013, Vietnam had established 8 Biosphere Reserves (Cat Ba Island Biosphere Reserves, Biosphere Reserves of the Red River Delta, Western Nge An, Cat Tien National Park, Biosphere Reserves of Ca Mau, Coastal islands Biosphere Reserves in Kien Giang, Biosphere Reserve of Can Gio Mangrove Forest, and Cu Lao Cham Biosphere Reserve); 2 Natural UNESCO World Heritage Sites (Phong Nha- Ke Bang National Park and Bai Tu Long National Park of Ha Long Bay); 5 Ramsar sites (Xuan Thuy National Park, Nam Dinh; Bau Sau site of Cat Tien National Park, Dong Nai; Ba Be Lack, Bac Can; Tram Chim National Park, Dong Thap; Ca Mau National Park, Ca Mau) and 4 ASEAN Heritage Sites (Hoang Lien National Park, Ba Be National Park, Chu Mom Ray, Kon Ka Kinh Mau – Cà Mau).

The national system of Inland Water Protected Areas (IWPAs)

Decision No 1479/QD-TTG of October 13 2008 approved the national system of 45 IWPAs to be established by 2020. This includes, but is not limited to, important river sections, natural lakes, man-made reservoirs, lagoons, estuaries, and seasonally

inundated grasslands[19]. Between the years 2009-2011 the Ministry of Agriculture and Rural Development developed a detailed plan for five national inland water PAs including: Da-Lo- Thao River, Lak Lake, Ca Mau coastal area, Red River estuary and Hau River [53].

National system of Wetland Protected Areas

Vietnam is reported to have over 10 million hectares of land classified as wetlands. In 2001 MONRE proposed to protect 68 wetland areas with high biodiversity, and of these sites the Prime Minister approved 17 sites to be included in the SUF national system. Some sites have piloted and demonstrated piloted approaches to management of these wetlands in line with guidance from the Ramsar Convention (e.g. Ramsar sites as Xuan Thuy in Nam Dinh, and Bau Sau in Dong Nai).

Table 13 - Wetland sites of national and international importance by geographical distribution

No.	Region	Number of wetland site	Area (ha)
1	Northwest	1	20,800
2	Northeast	4	54,110
3	Red River Delta	16	45,519
4	North Central	6	114,519
5	South Central Coast	15	50,870
6	Highlands	11	20,217
7	Southeast	4	70,600
8	Mekong Delta	10	75,478

Source: Vietnam Environment Administration (2009)

The national system of Marine Protected Areas (MPAs)

On 26 May 2010 the Government issued Decision No.742/QDTTG 2010 approving the plan for a national system marine protected areas to be established by 2020 including 16 MPAs with an area of 169,617 ha of coastal and marine territory. The goal by 2015 is firstly to have at least 0.24% of Vietnam's waters contained within MPAs, and secondly to have at least 30% of the area of each MPA be strictly conserved[20]. There are five MPAs currently operating, namely: Nha Trang Bay, Cu Lao Cham, Nui Chua, Phu Quoc and

[19] Decision 1479/QĐ-TTg dated October 13th , 2008 Approving the planning on the system of inland water conservation areas up to 2020.

[20] Decision 742/QĐ-TTg dated 26th May, 2010 approving the planning of inland water protected area system by 2020

Table 14– Vietnam's national system of MPAs

No	MPA	Local	Region	Area (ha)	Marine area (ha)
1	Trần Island	Quang Ninh	Northeast	4,200	3,900
2	Co To	Quang Ninh	Northeast	78,500	4,000
3	Bach Long Vi	Hai Phong	Red river delta	20,700	10,900
4	Cat Ba	Hai Phong	Red river delta	20,700	10,900
5	Hon Me	Thanh Hoa	North Central	6,700	6,200
6	Con Co	Quang Tri	North Central	24,900	2,140
7	Hai Van-Son Tra	Hue- Da Nang	North Central / South Central	17,039	7,626
8	Cu Lao Cham	Quang Nam	South Central	8,265	6,716
9	Ly Son	Quang Ngai	South Central	7,925	7,113
10	Nam Yet	Khanh Hoa	South Central	35	20,000
11	Nha Trang Bay	Khanh Hoa	South Central	15	12,000
12	Nui Chua	Ninh Thuận	South Central	29,865	73,52
13	Phu Quy	Binh Thuan	South Central	18,980	16,680
14	Hon Cau	Binh Thuan	South Central	12,500	12,390
15	Con Dao	Ba Ria-Vung Tau	Southeast	29,400	23,000
16	Phu Quoc	Kien Giang	Mekong Delta	33,657	18,700

Source: According to 742/QĐ-TTg Decision No. 26/5/2010 by the Prime Minister

1.3. Biodiversity Corridors

Biodiversity corridors, if well planned, can play an important role in biodiversity conservation at the landscape level and realize a long-term vision for landscape level planning. Corridors connect protected areas together allowing animals and plants to migrate and move, provide opportunities for adaptation to climate change and other habitat modifications. A biodiversity corridor can enhance the role of linking ecosystems through the protection and strengthening the food chain and ecological processes.

In Vietnam, there are not yet formally established biodiversity corridors. However, since 2004 there has been international support for a number of projects and programs piloting approaches to establish biodiversity corridor in Vietnam. These include:

- "Green Corridor" Project

The "Green Corridor" Project (2004-2008) focused on building models to protect and maintain the value of important forest landscapes. The project planned green corridors to connect Phong Dien Nature Reserve with Bach Ma National Park in Hue Province. This area is vital for the biological integrity of the wider landscape of Truong Son eco-region. The corridor is large with an area of up to 134,000 ha, and is located on the territory of 11 communes in the 3 districts of A Luoi, Huong Thuy and the South-east.

- Lam Dong biodiversity corridor

The small- scale project titled "*Pilot program to develop biodiversity corridor in Lam Dong, Vietnam*" 2005-2006 was supported by the World Bank (WB). The selected corridor is a part of expanding forest landscape from Chung Yang Sin National Park (Dak Lak) to Ta Dung SUF (Dak Nong) of Bidoup-Nui Ba National Park, under the management of Da Nhim Protection Forest Management Board.

- Corridor linking Kon Ka Kinh National Park to Kon Chu Rang nature reserve

From April 2006-2010 the Global Environment Facility (GEF) funded the project *"Develop Corridors and Sustainably Manage Kon Ka Kinh National Park and Kon Chu Rang Nature Reserve"*. The goal of the project was to build plans, foundations and management to maintain biodiversity and connect Kon Ka Kinh National Park with Kon Chu Rang Nature Reserve with the long term aim to preserve and sustainably conserve the unique biodiversity characteristics of Central Truong Son.

- Biodiversity Conservation Initiative (BCI) in the Mekong sub-region

*Critical Environmental Programs - Biodiversity Conservation Initiative (*CEP-BCI) pilot was implemented in Quang Tri and Quang Nam from 2006 to 2011. This was expanded to Cao Bang, Quang Tri and Quang Nam, which were located in Central Truong Son from 2010-2012. The area faces a high level of fragmentation of habitat due to road construction including the East - West economic corridor, and the Ho Chi Minh Highway from North to South.

The Quang Tri - Quang Nam BCI proposed developing six biodiversity corridors with a total area of 130,000 hectares, including a system within the Vu Gia River's upstream area, Thu Bon River, Quang Nam and Phong Dien Nature Reserve, a part of A Luoi, upstream of Ta Trach River, Thua Thien-Hue, North Huong Hoa Nature Reserve, Dak Rong Nature Reserve and Northern Huong Hoa. The corridor system is currently being

further developed by the project named *the Greater Mekong Sub-region Biodiversity Conservation Corridors Projects (Vietnam component) - Phase 2 (2011-2019).*

Pilot activities in Cao Bang - Guangxi were initiated in 2010 in the trans-boundary biodiversity corridors to improve ecological connectivity in the border area. The project aims to enhance biodiversity connections between the newly established Bangliang Guangxi Nature Reserve, China, to Cao Bang, Vietnam, to protect *Cao-vit*, the Black-crested Gibbon and the Eastern Black-crested Gibbon (*Nomascus nasutus*) which are globally threatened.

- The Greater Mekong Sub-region Biodiversity Conservation Corridors Projects (Vietnam component) - Phase 2 (2011-2019).

Biodiversity corridors will be established between three provinces, namely Quang Nam, Quang Tri and Thua – Hue, with a total area of 227,860 ha, of which 193,516 hectares is forest, connecting the Phong Dien Nature Reserve, Ho Chi Minh road (A Luoi District), upstream of Ta Trach river (Nam Dong district) in Hue province and Dak Rong and Bac Huong Hoa Nature Reserves in Quang Tri.

2. Conservation of endangered, rare and precious species and genetic resources

2.1. Promote the conservation of species diversity

Conservation of endangered, rare and precious species and their habitats is mainly being conducted within the national system of Protected Areas (in-situ conservation).

In addition to in-situ conservation, ex-situ conservation is being more fully developed. Examples of ex- situ conservation in Vietnam include: a system of wildlife rescue centers (11 centers); zoos/ botanic gardens (Thu Le Zoo, Bach Thao Botanic Garden, Thai Cam Vien Botanic Gardens); a system of botanic gardens in protected areas (15 gardens over 8,000 ha); system of medicinal plants gardens (50 gardens over 300 ha) and some facilities for breeding economic valuable animals.

Table 15 – Centres of Ex-situ plants conservation over the country

Types	Unit	No	Area (ha)	Current status
Botanic garden	Garden	7	479	Distributed across Northeast, Red river delta, Southeast Mostly, small areas and small number of species, <300
Empirical, scientific research zone	Zone	20	10,652	Distributed over 7 eco-regions (except Central South). Conserved species limited, activities mainly serves for production

Botanic garden in PAs	Garden	41		Mostly located in the border of PAs, conserve mainly native plants, few plants near PAs
National park	Garden	30	2,793	Most of the botanic gardens are under PAs, expanding areas without specific planned list.
Nature reserve	Garden	11	572	Remain in planning. Botanic gardens are planned to locate in PAs
Plants garden	Region	8		Provide more than 400 mil plants/year
Forest for seed			5,288 ha/ 54 major species	Provide 400-500 ton of seeds per year. The seeds can be afforested as 350,000-400,000 ha of forest /year.
Seeding garden	Garden	783	-	Provide 292 mil plants/year
Incubator	Incubator	192	-	Provide 115 mil plants/year
-Garden for tissue production	Department	43	-	Provide 17 mil plants/year.
Medicinal plants	Facility	10	-	Distributed across 7 eco-regions (except South Central, number of species is low and in small area)
Plants varieties storage center	System	1		Organized as system, store crop varieties, including: bank of seed genetic resources, on-farm bank, and in-vitro gene bank of 24 organizations. Centre holds 20.890 genetic resources of 341 plants. Units hold 7.080 genetic resources of 275 plants

Source: BCA, Reviewing Report on Protected Areas (2013)

Achievements in species diversity conservation in Vietnam:

- *In management:* Vietnam has established criteria for identifying endangered, rare and precious species and published a list of *Aquatic Species prohibited from exploitation*. Baseline surveys and monitoring programs have been completed at a number of PAs. For example, the monitoring program of primates in Phong Nha - Ke Bang National Park, Quang Binh; the monitoring project of White-headed Languor in Cat Ba National Park, Hai Phong; the monitoring project of Snub-nosed Languor in Na Hang Nature

Reserve, Cham Chu - Tuyen Quang; Khau Ca - Ha Giang; the monitoring program of *Platalea minor* at Xuan Thuy National Park; and investigation on resources and recovery for the giant clam (*Tridacnidae sp.*) at 8 islands within marine protected areas in the Central, Eastern and South-western seas of Vietnam.

- *Strengthen breeding of endangered, and rare species with a high economic value*: Due to the protection and development of the forest sector, some plant species at risk of extinction in the wild have thrived through forestation program, for example the Lat flower (*Chukrasia tabularis)* and agarwood (*Aquilaria crassna*).

- The fisheries sector has developed and implemented two conservation programs "*The protection and development of aquatic resources by 2010"* and "*Protection of rare aquatic species at risk extinction in 2015, with a vision to 2020*" respectively.

The Fisheries sector also has implemented the program "*Preserving genetic resources and breeds*" through conducting research into cage culture of fish and shellfish which are indigenous, rare, precious, of a high economic value, and are also under the threat of extinction. To date approximately 50 sources housing 60 varieties of marine and aquatic species have been bred and preserved. Recent success includes research into the reproduction of Anh Vu fish (*Semilabeo obscurus),* Ho fish (*Catlocarpio siamensis),* Spotted Lăng (*Hemibagrus guttatus*), Moi co hoa (*Clupanodon thrissa*) and the White seahorses (*Hippocampus kellogi*) which is listed on the IUCN Red List and Vietnam Red List (2007) [17].

It is noted that while fishery wild catch is continuing to decline, total fishery production is increasing each year due to a massive increase in aquaculture production, which accounts for more than 50% of the total aquaculture production since 2007. This increased aquaculture helps meet the demand for seafood in both domestic and foreign markets and also reduce pressure for the exploitation of wild fisheries. The increase in aquaculture can be seen as a significant result from the research on artificial breeding and the process of rearing aquatic species of high economic value.

Government policies provide incentives for captive breeding of selected species (including endangered, rare and precious species) with a priority on species that are not yet extinct in Vietnam. There have been a number of successes in the captive breeding of rare wild animals in their local area. One example is *Crocodylus Siamensis* – a species in high risk of extinction, which is being restored through a reintroduction program in Cat Tien National Park. According to preliminary assessments, the reintroduced crocodile population in Cat Tien National Park is progressing well.

Currently, only 5 *Crocodylus Siamensis* farms are permitted to breed crocodiles by the CITES Secretariat. Each year, over 50,000 crocodiles are bred at these farms. In addition, *Python molurus* and *Python recticulatus* are popular captive breeding species in the Southern provinces and their products are exported. Vietnam is the only country

in the world to export the python products from captive breeding. *Naja naja* is bred successfully in many localities, e.g. Vinh Tuong - Vinh Phuc. Long-tailed macaques are bred successfully in breeding farms with numbers in the tens of thousands. Many other animals such as *Sus scrofa*, *Cervus nippon*, tortoise, turtle and amphibian species are also bred in large numbers [17].

The successful captive breeding has supported socio-economic development for many local communities, has contributed to genetic resources conservation, and reduced the pressure on exploitation of wildlife stocks in nature.

2.2. Promote the conservation of genetic resources

In Vietnam, conservation of genetic resources begun in the early 1960s and was applied in agriculture, forestry, industry, health, fisheries and related areas. However, the national conservation program of genetic resources of plants, animals and microorganisms only started in 1987 and has been implemented over various periods including 1987-1990, 1991-1995, 1996-2000, 2001-2005, and from 2006 to 2010. In 2010, the Ministry of Science and Technology issued Circular 18 on gene banks in Vietnam. Currently, the gene bank program focuses on three main tasks namely, conservation of genetic resources, exploitation and development of genetic resources, and genetic evaluation of genetic resources.

At the genetic level, genetic resources include plant genetic resources, animal genetic resources and microorganisms genetic resources. Plant genetic resources is the largest portion of the collection in relation to species and thier varieties, comprising up to 90% of the total amount of genetic resources[21].

Currently there is a network of focal agencies and 68 separate departments/units under 6 ministries involved in implementing the mission and objectives of the program on *Plant, Animal and Microorganisms Genetic Resources Preservation*.

Some achievements in the conservation of genetic diversity include:

- A national network of plant genetic resource preservation has been established and led by the Vietnam Plant Resources Centre (VPRC) with 21 official members nationwide
- The National Institute of Animal Sciences (NIAS) has 28 agencies working in animal genetic resources conservation.

[21] Trinh, Luu Ngoc and Hung, Nguyen Tien and Trinh, Hoang Gia and Cuong, Pham Hung and Sen, Pham Thi (2006), Establish information sharing mechanism on implementing the global plan of national genetic resources concerning agricultural plant genetic resources conservation and sustainable use in Vietnam

Table 16 - Institutes participating in agricultural genetic resources

No	*Institute/ Academy*	*Conservation mandate*	*Start*
1	Vietnam Academy of Agricultural Sciences (Plant Resources Centre)	Preserve plant genetic resources served for food supply and agriculture.	1989
2	Vietnam Academy of Agricultural Sciences (Department of Microbiology)	Preserve microbiology genetic resources for agriculture (soil, manure).	1992
3	Rubber Research Institute of Vietnam	Preserve rubber genetic resources	1989
4	Vietnam Academy of Forest Sciences	Preserve forest plant genetic resources	1990
5	Agricultural Genetic Institute	Conserve resistant plant genetic resources	1996
6	National Institute of Animal Sciences	Conserve animal genetic resources	1989
7	Research Institute for Aquaculture No 1 (Bac Ninh)	Preserve and store genetic resources and breeding of freshwater aquatic species	1988
8	Research Institute for Aquaculture No 2 (Ho Chi Minh city)	Preserve and store genetic resources and breeding of freshwater and brackish aquatic species	1988
9	Research Institute for Aquaculture No 3 (Nha Trang)	Preserve and store genetic resources and breeding of salty and brackish aquatic species	1988
10	Research Institute for Marine Fisheries	Preserving germplasm of saltwater fisheries	2012
11	Bee Research and Development Centre.	Conserve bee genetic resources	1989
12	National Centre of Vet Medicine Control	Conservation genetic resources of veterinary microorganisms	1990
13	Plant Protection Research Institute	Preserve genetic resources.	2000

Source: Le Minh Sat (2011), Management and conservation of genetic resources of animals, plants and microorganisms

The National Institute of Animal Sciences in Thuy Phuong, Hanoi, Vietnam has carried out a program on Livestock Genetic Resources Conservation since 1989 and a number of international cooperation projects on genetic resources conservation. In this program, the genetic material of approximately 70 livestock and poultry that were considered as threatened was preserved. This included conservation of genetic material including sperm (U ax head beef, beef Hmong), embryos, cells and DNA - the Mong Cai breed (20 samples), Ỉ Pigs (12 samples), Nghe An pigs (8 samples), Ho Chicken (25 samples), Mia Chicken (35 samples), Ri Chicken (20 samples), Dong Tao Chickens - a precious and endemic chicken in Vietnam (15 samples), Ac chicken (*Gallus gallus domesticus brisson*) (20 samples) , Zebu *(Bos taurus indicus)* (20 samples), Coc cow (15 samples) and Deers *(Cervus nippon)* (18 samples). In addition, 7,275 biological samples of buffalos, cows, goats, pigs, and chickens were collected in Ha Giang province. Deers *(Cervus nippon)* numbering approximately 8,000 were tagged and are being tracked in Nghe An and Ha Tinh. At present, MARD focuses on conservation of genetic resources as an important part of programs and projects in order to promote production [17].

Institute of Biotechnology have been successful in preserving frozen cells and embryos of some animals such as cows, gaur (Bos gaurus) and rabbit with no time restrictions.

At the Plant Genetic Resources of Vietnam- PGR (under MARD), over 30% of genetic resources are conducted initial assessments of the biological criteria and agronomy; approximately 5-10% of the genetic resources are taken detailed evaluation and genetic evaluation. A total of 17,000 germplasm were assessed from 30 to 60 traits, over 7000 varieties have been identified the resistance to one or a variety of diseases. The evolutionary relationships and genetic diversity among germplasm sources in the same species of rice, potato, melon, lemon, mango ... been studied using molecular signals [17].

The PRG anually provides about 2,000 genetic materials and seed samples as well as providing information for farming and manufacturing , researches and training.

MONRE has been implementing a range of activities to strengthen the capacity of ministries, sectors and localities on biosafety through workshops and trainings. The promulgation of Decree 69/2010/ND-TTg Decree on biosafety for genetically modified organisms, genetic specimens and products of genetically modified organisms has created a firm legal foundation for the activities relating to genetically modified organisms are made safe for human health, the environment and biodiversity.
MARD has developed and issued Circular No. 69/2009/TT-BNNPTNT dated 27 October 2009 guiding Risk Assessment of Genetically Modified Crops to Biodiversity and Environment and Circular on the list of crops genetically modified assay allows assessment of the risks to biodiversity and the environment. At present, genetically modified maizes have been conducted risk assessments.

3. Promote sustainable use and the benefits of sharing mechanism of ecosystems service

Building models of community-based sustainable development

Ecosystems and their biomes provide food, medicines, material, environmental and other social services. In Vietnam, biological resources provide sustainable livelihoods, and ensure food security, especially for the poor in remote regions.

The models for sustainable use of biological resources based on community-based approaches have brought positive results. It has not only protected environment and biodiversity effectively, but it also has created jobs and increased income for residents in nature reserves. Agricultural development, for example increased rice production and aquaculture has greatly reduced pressure on exploiting natural resources. The project: *Pilot co-management and wise use of fishery resources in Xuan Thuy National Park* is a typical example. The Xuan Thuy Management Board is cooperating with domestic and international organizations namely Wetlands Alliance (WAP), Centre for Marine life Conservation and Community Development (MCD) to implement pilot initiatives in co-management and wise use of fishery resources. The principle is set to "*only allow exploitation of aquatic species with good resilience ability. Absolutely prohibit deforestation, destructive exploitation and depletion of natural resources which change the natural landscape and pollute the environment"*. With the implementation of co-management, the local community has received stable income from the exploitation of fisheries resources such as mollusks, crustaceans and fish.

The release of the list of precious species prohibited from export, together with the efforts of authorities in preventing wildlife exploitation and illegal trading has helped reduced the consumption of biological resources and reduced impacts on wildlife.

Every year, the fishery sector returns breeding shrimp and fish back to the sea or reservoirs to promote the wild stock development. To sustainably manage the fishery, some coastal and marine areas were seasonally closed to fishing permission.

Ecotourism has been strengthened in PAs and now is contributing to economic and social development at the local level through creating jobs for community members. According to reports from 13 of 26 National Parks, in 2010 they welcomed 629,961 tourists (537,571 in 2009) with a revenue of 23.9 million VND (22.2 million VND in 2009). The National Parks with revenue over 1 million VND included Phong Nha - Ke Bang National Park (11.6 million); Cat Tien National Park (4 million); Cuc Phuong National Park (3 million); Ba Vi National Park (1.3 mil); Ba Be National Park (1 million); and Cat Ba National Park (1million) [15].

Preserving indigenous knowledge, innovations and practices

The Institute of Ecology and Biological Resources (IEBR), the National Institute of Medicinal Materials, Ha Noi University of Pharmacy, and the Institute of Social Sciences have conducted research on anthropological botany over many years. They have investigated, assessed, conserved and assisted in further development of indigenous knowledge of mountainous ethnic communities related to natural resource protection and utilization. As a result, hundreds of medicinal plants and traditional family-based remedies have been collected from Dao, Nung, Tay, and Hmong ethnic minority populations in mountainous areas in Vietnam. Some traditional practices such as protecting the holy forests and holy watersheds (home to many species of flora and fauna) are maintained and developed by local authorities. Several traditional festivals like *Cau ngu* (praying for fish) in coastal communities are still organized every year.

Ensure equitable sharing of benefits arising from genetic resources

Ensuring community's rights and participation in the process of developing and reviewing policies, strategies, plans, programs and investment projects related to PAs are some of the approaches adopted in implementation of the NBAP 2007, and this approach is gaining acceptance. On the other hand, the policies of the Government reflected in sectoral development strategies and projects, have recognized the importance of equal sharing of benefits from biodiversity resources and ecological services. One project has enabled local people in Cuc Phuong National Park to plant orchids to generate income. In other PAs, local people are trained to deliver ecotourism services. In the no. 327 and no. 661 reforestation programs, local people have been allocated land, forests, and water to manage and utilize for production.

4. Control activities which generate negative impacts on biodiversity

Over the past few years a number of studies and proposals have been completed on invasive alien species. Several publications addressing invasive alien species and their threats have been developed and disseminated. The agriculture and fishery sectors have approved examination procedures of imported alien species to review for potential "invasiveness" prior to large-scale production in Vietnam.

Furthermore, the increasing trend in the illegal trading, including importation, of exotic species and their products has prompted the government to develop harsher penalties for smugglers.

The Decree No. 69/2010/ND-CP dated June 21st 2010 outlined *Stipulated Biosafety for Genetically Modified Organisms, Genetic Specimens and Products of Genetically Modified Organisms*. This Decree applies to organizations, households and individuals in Vietnam, and foreign organizations, agencies, individuals and overseas Vietnamese engaged in activities directly related to genetically modified organisms, genetic

specimens and products of genetically modified organisms on the territory of the Socialist Republic of Vietnam.

In 2013, the Ministry of Natural Resources and Environment and Ministry of Agriculture and Rural Development cooperated and issued the joint-circular 27/2013/TTLT-BTNMT-BNNPTNT setting criteria for identifying harmful alien species and promulgating the list of harmful alien species.

Most recently, the Minister of Natural Resources and Environment released Decision No. 2140/QĐ-BTNMT dated 6 November 2013 on *Administrative Procedures and Procedures for Granting a certificate of biosecurity for GMO Crops*.

In addition, Vietnam has already issued regulations to strengthen the management and protection of both marine and terrestrial protected including:

- Decree No. 117/2010/NĐ-CP by Prime Minister dated 24th December 2010 on *Organization and Management of the SUF System*. This Decree regulates the management of the SUFs; which includes their establishment, defines authority and responsibility in the management of SUF. In addition, it considers planning for SUFs including change PA category (switching type), adjustments and changes to the purpose of SUF, restoration of natural ecosystems in SUF, scientific research, and sustainable use of natural resources and services in SUF.
- Decision No. 07/2012/QĐ-TTg by the Prime Minister dated February 8th, 2012 on *Issuance of Policies to Strengthen Forest Protection*, outlines: i) Decentralization of state management responsibilities on forest and forestland to People's Committees at all levels; ii) Provides funding for Commune People's Committees to protect local forests; iii) Forest co-management policy; iv) Policy for local forest protection arrangements; v) Policy for building capacity and performance of forest rangers.
- Decision 218/QĐ-TTg by the Prime Minister dated 7th February 2014 on approving the *Strategy for Management of SUF, Marine Protected Areas and Inland Water Protected Areas in Vietnam until 2020 and Vision 2030*. According to Strategy to 2020, all of SUFs, MPAs and IWPAs will have to adopt new management methods including co-management and benefit-sharing. Endangered, rare and precious wild species of plants and animals in SUFs, MPAs and IWPAs are to be managed. Rare and precious species declining in numbers and in danger of extinction will be preserved and populations enhanced. International commitments on PAs and biodiversity will be implemented effectively via the programs and projects on building management capacity of SUF, MPAs and IWPAs, etc.

5. Consolidating the policy framework and strengthening law enforcement in the management and protection of biodiversity

5.1. To consolidate the policy framework

Since the early 1960s, to prevent biodiversity degradation, Vietnam's Government has developed and issued a range of policies, plans, legal documents and laws related to biodiversity conservation. These legislative and institutional reforms have been completed and supported by a number of laws on the conservation and sustainable use of biodiversity. These laws include the Law on Forest Protection and Development 1991 (as amended and supplemented in 2004); Law on Land 1993 (as amended and supplemented in 1998 and 2003); Law on Environmental Protection 1993 (as amended and supplemented in 2005); Law on Fisheries 2003; and Law on Biodiversity approved by the XII th National Assembly's fourth session on November 13th, 2008 (No. 20/2008/QH12) and put into effect from July 1st, 2009.

The promulgation of the Biodiversity Law marked a fundamental step in the process of developing legislation to support biodiversity conservation in Vietnam. For the first time there is one law covering most aspects of conservation, from biodiversity conservation planning to conservation of natural ecosystems, species and genetic resources. In addition, the Biodiversity Law also provides the legal basis for additional decrees and circulars guiding biodiversity conservation on matters such as the establishment of financial mechanisms and organizational arrangements.

Prior to the *Biodiversity Law, the Law on Forest Protection and Development* and the *Law on Fisheries* contained regulations on the management of specific element such as forest ecosystems, wild plants and animals, marine ecosystems, marine fauna and flora, inland waters, etc. However, currently the Law on Biodiversity addresses the responsibilities for biodiversity conservation in the fullest sense of the term, that is *biodiversity is refers to genes, species and natural ecosystems* (Term 5, Article 3) and referring to the genetic resources of animals and plants, species on land or underwater, forest ecosystems, and marine ecosystems and wetland.

Besides the laws mentioned above, Vietnam has also issued a number of legal documents related to biodiversity conservation. These include:

- Decree No. 32/2006/NĐ-CP dated 30th March 2006 on the *Management of Endangered, Precious and Rare Species of Wild Plants and Animals*;
- Decree No. 82/2006/NĐ-CP dated 10th August 2006 on *Managing Activities on Export, Import, Re-export, Introduction from the Sea, Transit, Breeding, Rearing and Artificial Propagation of Endangered, Precious and Rare Species of Wild Plants and Animals*;

- Joint Circular No. 19/2007/TTLT/BNNPTNT-BTP-BCA-VKSNDTC-TANDTC dated 8th March 2007 on *Guiding the Implementation of the Penal Code on Forest Management, and the Protection and Management of Forest Products*. This includes a list of Vietnam's protected rare or endangered species, rehabilitation and development; and a list of species banned from exploitation under the regulations of MARD, issued together with Decision 82/2008/QĐ-BNN dated 17th July 2008 on announcing the *List of Vietnam's Precious and Rare Aquatic Species at Risk of Extinction and in Need of Protection, Rehabilitation and Development;*
- Decree No. 117/2010/NĐ-CP by the Prime Minister dated 24th December 2010 on *Organization and Management of the SUF system*;
- Circular No. 47/2012/TT-BNNPTNT dated 25th September 2012 of the Ministry of Agriculture and Rural Development on *Management of the Exploitation and Breeding of Common Wildlife Species*;
- Decree No. 103/2013/NĐ-CP by the Prime Minister dated 12th September 2013 on *Administrative Sanctions for Illegal Fishing*;
- Decree No. 157/2013/NĐ-CP dated 11th November 2013 of the Government on *Penalties Imposed on Administrative Sanction in respect of Forest Control, Forest Development, Forest Protection and Forest Product Management*;
- Decree No. 160/2013/NĐ-CP dated 12th November 2013 of the Government on *Criteria for Identification and Management of Endangered, Rare and Precious Species Prioritized for Protection*;
- Decree No. 179/2013/NĐ-CP by the Prime Minister dated 14th November 2013 on *Penalties Imposed for Administrative Sanctions in respect of Environmental Protection.*

5.2. Strengthening law enforcement

One of the main threats to biodiversity is the illegal exploitation of natural resources, especially forestry and seafood products. Vietnam's law clearly stipulates a punishment framework for handling violations in Chapter 17 of the Penal Code 2009 (Article 188-191) [2].

Forest rangers are a specialized force to support functional forest management and protection. Currently, Vietnam has about 11,800 forest rangers nation-wide. The provincial FPDs have established teams of mobile rangers and FPDs located in the important trafficking hubs to control shipping of forest products, which includes wild plants and animals. Law enforcement for forest management and protection requires the empowering of forest rangers with the right to arrest and handle violations in the management, protection, trading and shipping of forest products. Of particular relevance

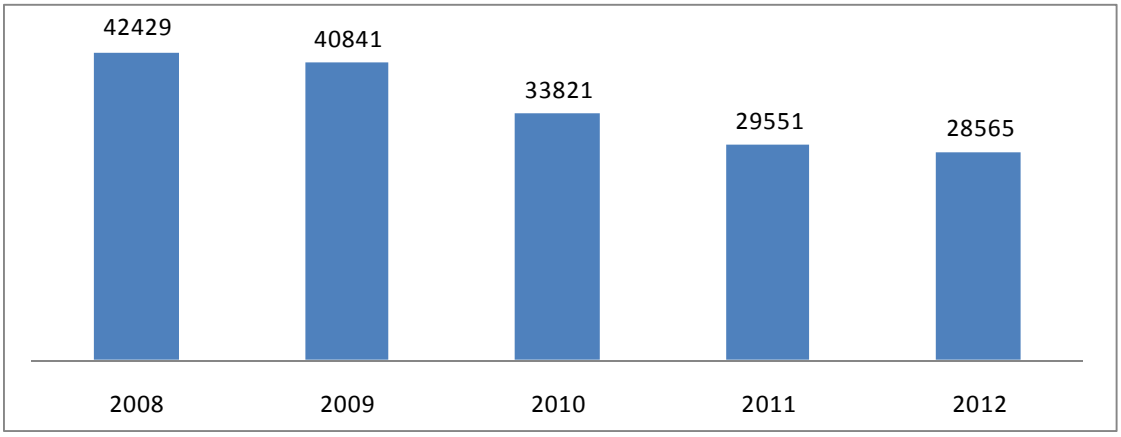
is that forest rangers are directly responsible for managing forests, combating deforestation and hunting of wild plants and animals. Vietnam's Marine Police were established in 1998 with the mission to patrol and enforce the laws of Vietnam and international treaties and deal with Vietnam's matters as a contracting member of United Nations Convention on the Law of the Sea (UNCLOS). The Marine Police patrol to protect the sovereignty, jurisdiction, protection of natural resources, prevention of environmental pollution; detect, prevent and combating acts of smuggling, piracy, armed robbery against ships, illegal transport and trafficking, transporting illegal narcotics and precursors. They are also responsible for cooperating with functional agencies to complete assignments. In relation to incidents at sea, the Vietnam Marine Police have the responsibility to inform the functional agencies and coordinate with foreign countries to manage the issue.

Currently, there is increasing demand for forest and seafood products. Therefore, the forest and seafood industries and their products can be considered as a commodity which is under the management of many law enforcement agencies, not only forest rangers and the Vietnam Marine Police, but also agencies including the economic police, customs, market management bodies, etc.

The legal basis underpinning the controlling and handling of violations related to trafficking, illegal consumption of forest resources and seafood products has been strengthened. It is supplemented in *Criminal Procedure Code* (2003) whereby rangers have the right and responsibility to prosecute, investigate criminal offenses and issue punishments for administrative violations in forest management, protection and forest product trade. The *Ordinance on Organization of Criminal Investigation 2009* (amended and supplemented) also increased the power of the Border Guard and Coast Guard.

In response to the increase in trafficking and consumption of timber and non-timber forest products, over the past year forest rangers have made concerted efforts to prevent, control, and deal with violations. The government has also instructed other related forces to coordinate to provide support forest rangers in the protection of wild plants and animals. The Ministry of Defense and Ministry of Public Security has issued written guidance asking forces to coordinate, investigate and assist in dealing with violations of the Forest Protection and Development Law.

Figure 12 - Number of deforestation violations between 2008- 2012



Source: FPD (2013), Report on violations and forest change by years

The police, the border guards and customs play important role in enforcing the implementation of Law on environmental protection and biodiversity. A number of timber smuggling, wildlife trafficking in the country and across borders have been detected and handled. A number of criminal organizations have been dismantled and thousands of tonnes of cargo of trafficking have been confiscated and disposed. In 2009, the anti-smuggling force of Vietnam Customs Service detected an ivory smuggling with the volume up to 5.6 tonnes in two containers at the Hai Phong port. This is not only the largest ivory smuggling in the history of Vietnam, but also one of the most large scale ivory smuggling which had been detected and destroyed in the world up to that point.

6. Ensuring resources for biodiversity conservation

6.1. Human Resource

a, At the national level

Between 2007- 2010, human resources were strengthened at the national and provincial levels. At the national level in 2008 and 2010 respectively, the Government assigned three agencies to implement State management functions for biodiversity conservation and biosafety. The agencies are: Vietnam Environment Administration[22] (VEA),

[22] Decision 132/2008/QĐ-TTg dated 30 September 2008 defining the functions, tasks, powers and organizational structure of the Vietnam Environment Administration (VEA) under the Ministry of Natural Resources and Environment (MONRE).

Vietnam Administration of Forestry [23](VNFOREST) and Directorate of Fishery [24](DOF).

The Biodiversity Conservation Agency (BCA) was established under the VEA to implement state management functions for the conservation and sustainable development of biodiversity resources. The BCA is a national focal agency to implement the CBD, Ramsar Convention on Wetlands, Cartagena Protocol on biosafety, Vietnam Biodiversity Law, NBSAP 2013, National Action Plan on wetlands conservation and sustainable development. At present, the BCA has only 27 government officials to secure the state management function for biodiversity conservation at national level.

The DOF and VNFOREST are both under MARD. VNFOREST is assigned to manage SUFs and at the same time act as the MARD focal points for the implementation of CITES and other laws related to endangered wildlife. The mandate of DOF is to generally manage fisheries resources, and the marine and the inland waters protected area systems. The role of forest rangers and fisheries control officers have been strengthened over the past year within the Nature Reserves of the PA system.

b. At the provincial level

Sixty three provinces all over the countries have established a Department of Natural Resources and Environment (DONRE) which also was initially formed units managing biodiversity conservation.Most of them work with biodiversity conservation as a part of job, a few specialize in conservation. At districts and communes, the officials will follow the activities related to biodiversity conservation as a part of environmental protection mission.

Prior to 2010, to fulfil the task of special use forests (SUF) management, there was only a unit with 5 to 6 officers working under the Forest Protection Department. In fact, this unit only manage six national parks over the country, most of remaining SUF were assigned under the management of Provincial People's Committee and the provincial authorities which lack biodiversity- related specilized staff.

According to a 2011 review report, the country has already established 88 SUF Ranger Units of 164 Forest Protection Units (including 30 national parks, 58 nature

[23] Decision 04/2010/QĐ-TTg dated 25 January 2010 stipulating functions, tasks, authorities and organizational structure of the Vietnam Administration of Forestry (VNFOREST) under the Ministry of Agriculture and Rural Development (MARD).

[24] Decision 05/2010/QĐ-TTg dated 25 January 2010 by Prime Minister stipulating regulations on functions, responsibilities, authorities and organizational structure of the Fisheries General Department (FGD) under MARD.

reserves, 45 protected landscape areas and 20 forests for scientific research and experimental). Of 164 Forest Protection Units, 6 Forest Protection Units directly under Forest Protection Department, VN FOREST, MARD; 36 Forest Protection Units directly under Forest Protection Branch and 46 so-called Forest Protection Units but acting as forest protection force of SUF Management Board, in fact.

The staff working directly in special use forests have not received the full- time training. Most of the leaders and staff of the SUF Management Board are forestry engineers, some prviously worked in the forestry plantation. Therefore, they do not have specialized knowledge about forests and biodiversity and lack the training on conservation skills.

According to Nguyen Huu Dung (2009), the qualifications of the staff working at the SUF management boards are 1% of the holds postgraduate, 27% have college Degree, 33% at intermediate level and 39% at secondary level.

Under regulations of Decree 117/2010/ND-CP on Organization and Management of the Special – use Forestry System by the Government, the payroll of a special-use forest ranger unit is included in the state employee payroll assigned by a competent state agency to the special-use forest management unit under current regulations, with no more than 1 ranger officer per 500 ha of special-use forest with national parks, nature reserves or species/habitat conservation zones of 15,000 ha or more in area.

6.2 Budget for biodiversity conservation

Since 2006 the state budget allocation for environmental protection (including biodiversity conservation) accounted for only 1% of total government budget. However, this represented only 0.4% of GDP. The national budget allocation arrives through two systems: central budget and provincial budget. In recent years, the budget allocation for biodiversity conservation programs and projects has gradually increased. For example, through support to the 5 Million Hectares Reforestation Program, activities by Vietnam Environment Protection Fund, and the Vietnam Mangrove Forest Conservation Fund.

ODA has been a remarkable financial resource for biodiversity conservation, accounting for approximately 20 to 30 % of the total resources for environment protection. Between 2006 and 2010, Vietnam received approximately US$64 million for biodiversity conservation from international donors. However, from the state budget allocation almost 90% of funds identified for biodiversity conservation were utilized for

infrastructure development and only 10% left for on-the-ground management and conservation.

6.3. Socialize finance for biodiversity conservation

A range of finance options have been identified for biodiversity conservation. These are outlined below:

- *Payment mechanisms for ecosystem services*: Payment mechanisms for ecosystem services were identified and drafted in 2008, with pilot programs implemented in Lam Dong and Son La. As part of the agreements, facilities that utilize catchment water, including hydropower plants and bottle water producers, are required to pay for environmental services. Of the income generated from the payment for environment services, approximately 80-90% of the funds are paid to the provider of the ecosystem services. These include forest owners, local communities, organizations, forest management boards, and a percentage of the funds is planned to be returned to the state budget. Since September 2010, the mechanism has been widely applied and enlarged to include carbon finance and related instruments.
- *Carbon Finance*: To-date, there are a very limited number of carbon reduction projects in the natural environment sector providing benefits to biodiversity. Of the 50 registered projects funded with support from the Clean Development Mechanism (CDM), most focus on energy efficiency. Only one relatively small CDM project works on forestry and land use (Cao Phong reforestation).
- *Reducing Emissions from Deforestation and Forest Degradation (REDD+*): Since 2008 Vietnam has cooperated with the World Bank, the UN-REDD and international non-governmental organizations, to build capacity to implement REDD +. This includes reducing emissions of greenhouse gases through reduced deforestation and forest degradation through payments to communities for local implementation of REDD +. Currently, SNV is implementing a pilot project to integrate REDD+ into areas with high biodiversity to promote biodiversity conservation in the implementation of REDD+ projects. REDD+ provides a very good opportunity to mobilize financial resources for biodiversity conservation.
- *Biodiversity off-sets:* Biodiversity off-sets are not yet officially implemented in Vietnam but international demonstrates experience shows them to be good mechanism for biodiversity conservation when development activities impact on biodiversity. The legal framework and relevant policies on biodiversity off-sets are based on Article 75 of the Biodiversity Law.
- - *Financial contributions from the private sector*: A number of businesses are willing to contribute funds to the conservation of biodiversity. In Kien Giang, a cement company has committed approximately $1 million for the conservation of

limestone karst landscapes and endangered species, including the Indochinese Silvered Langur (*Trachypithecus germaini)* and the Sarus Crane (*Grus antigone*). The employees of the company have also been trained in environmental protection.

- - *Ecosystem and biodiversity valuation*: Over recent years, there has been additional focus on applied research on methods of economic evaluation of natural ecosystems in Vietnam, which has focused on terrestrial forests, mangrove forests, coral reefs and seagrass beds. These findings indicate that ecosystems services make significant contributions to economic development, livelihoods and human life. The economic valuation of natural ecosystems and biodiversity can assist in guiding decision-makers and managers to identify conservation priorities as well as the facility to exchange knowledge and enhance decision-making on conservation goals and development objectives.

B – Overall assessment of the CBD and implementation of strategic plan in Vietnam

1. Overall assessment of recent achievements.

Biodiversity conservation and sustainable use, and access and equitable sharing of biodiversity and relate benefits are controversial issues that need special attention in the implementation of the current NBSAP. Increasing forest coverage, an improved terrestrial PA system, the planned IWPA system, and the proposed MPA system reflect Vietnam's commitment, efforts and successes in nature conservation in past years.

Community-based nature conservation has progressed. Many models of community participation in conservation and management of biodiversity have been implemented with positive results, demonstrating the effectiveness of state policies related to biodiversity conservation.

Biodiversity conservation is mainstreamed and integrated into a series of priority programs and inter-sectoral policies (such as: the *National Targeted Program for Poverty Reduction*, *National Targeted Program for Sustainable Development*, *Forestry Development Program*, etc) as well as the implementation of the international conventions. Over time, there has been progress in promulgation of legal documents by the Government and relevant ministries and agencies relating to biodiversity conservation. Vietnam's progress in agriculture, i.e. increasing rice output, enhancing livestock production, and aquaculture development, has helped to reduce the pressure on the exploitation of biodiversity.

Biodiversity conservation contributes to protect the environment and support sustainable development. The conservation achievements in Vietnam indirectly support

the implementation of the Millennium Development Goals such as reducing the rate of extreme poverty and hunger; ensuring environmental sustainability and enhancing global cooperation for development.

The achievements in biodiversity conservation have actively contributed to implementation of the Aichi Targets in general, and to implementation of the Vietnam's NBAP (2013) in Vietnam in particular.

2. Lessons learnt

The Vietnam Government approved the *National Action Plan on Biodiversity 199*5, *National Action Plan on Biodiversity 2007* and the *National Biodiversity Strategy to 2020- Vision to 2030*. The development of these plans demonstrates Vietnam's strong commitment to the implementation of the CBD and its targets and strategies. During implementation over the last almost 20 years, lessons learnt have included:

- Loose cooperation among ministries, and between central and local agencies for biodiversity conservation leads to the ineffective implementation of the key plans and strategies;
- Monitoring, inspection and evaluation in relation to biodiversity-related law enforcement is weak, which impairs the ability to implement legislation and subsequent impact of legislation;
- The integration of biodiversity and environment protection into socio-economic development programs has been begun. However these programs have not yet been fully implemented, thus limiting the outcome to-date for biodiversity conservation;
- The lack of specific relevant policies and operational mechanisms for equal sharing of benefits from biodiversity resources is hindering the promotion of large-scale community participation in conservation activities;
- There is still inadequate communication, education and public awareness campaigns on biodiversity. In addition, biodiversity-related law enforcement is limited thus placing additional pressure on biodiversity;
- Regular cooperation with the CBD Secretariat, GEF and other partners should be strengthened to promote sharing updated information and creating a mutual understanding among CBD state parties. Additional efforts should be supported through more information, technical and financial support to implement the CBD.

3. Priority Activities

The national objectives of the NBAPs 1995 and 2007 as well as the strategic goals of the CBD have been basically addressed over the past years. In order to achieve the

current national goals and the CBD goals, the following priority activities are recommended:

- Enhance state management functions in relation to biodiversity. This will include: clarify the functions and mandates between MARD and MONRE in biodiversity conservation and management; establish close working relationships between relevant agencies and stakeholders in conservation; enforce laws and legislation on biodiversity conservation;
- Increase investment in baseline resources for conservation. This will include: promoting biodiversity inventories; developing a comprehensive monitoring system to measure changes in biodiversity; developing and operating database systems and mechanisms to share, exchange, and manage information build capacity for technical staff; promote supervision of law enforcement; increase investment for biodiversity conservation from the state budget;
- Establish a national system of Protected Areas (forest, wetland, marine), safeguard critical ecosystems and maintain ecosystem services. Priority to be given to conservation of protected areas in critical ecoregions;
- Promote biodiversity conservation and development at all three levels: ecosystem, species and genetic diversity. Control and take steps to stop illegal trading and overexploitation of biodiversity resources, especially precious, rare and endangered species; preserve and develop genetic resources by inventorying and compiling list of biodiversity resources and indigenous knowledge nationwide;
- Develop risk management and risk control tools for alien species, genetically modified organisms (GMO) and their related production processes to minimize potential impacts on the environment, biodiversity and human health;
- Study, monitor and evaluate changes in biodiversity in response to climate change and propose appropriate actions;
- Promote integration of biodiversity conservation into national development strategies, plans, and programs at central, ministerial and provincial level; increase levels of financial resources allocated to conservation, and effectively manage the public budget allocation for conservation; Maintain and promote the support from international community for conservation in Vietnam.

APPENDIX

Appendix 1. Reporting Party and preparation of National Report

A. Reporting Party

Contracting Party	
NATIONAL FOCAL POINT	
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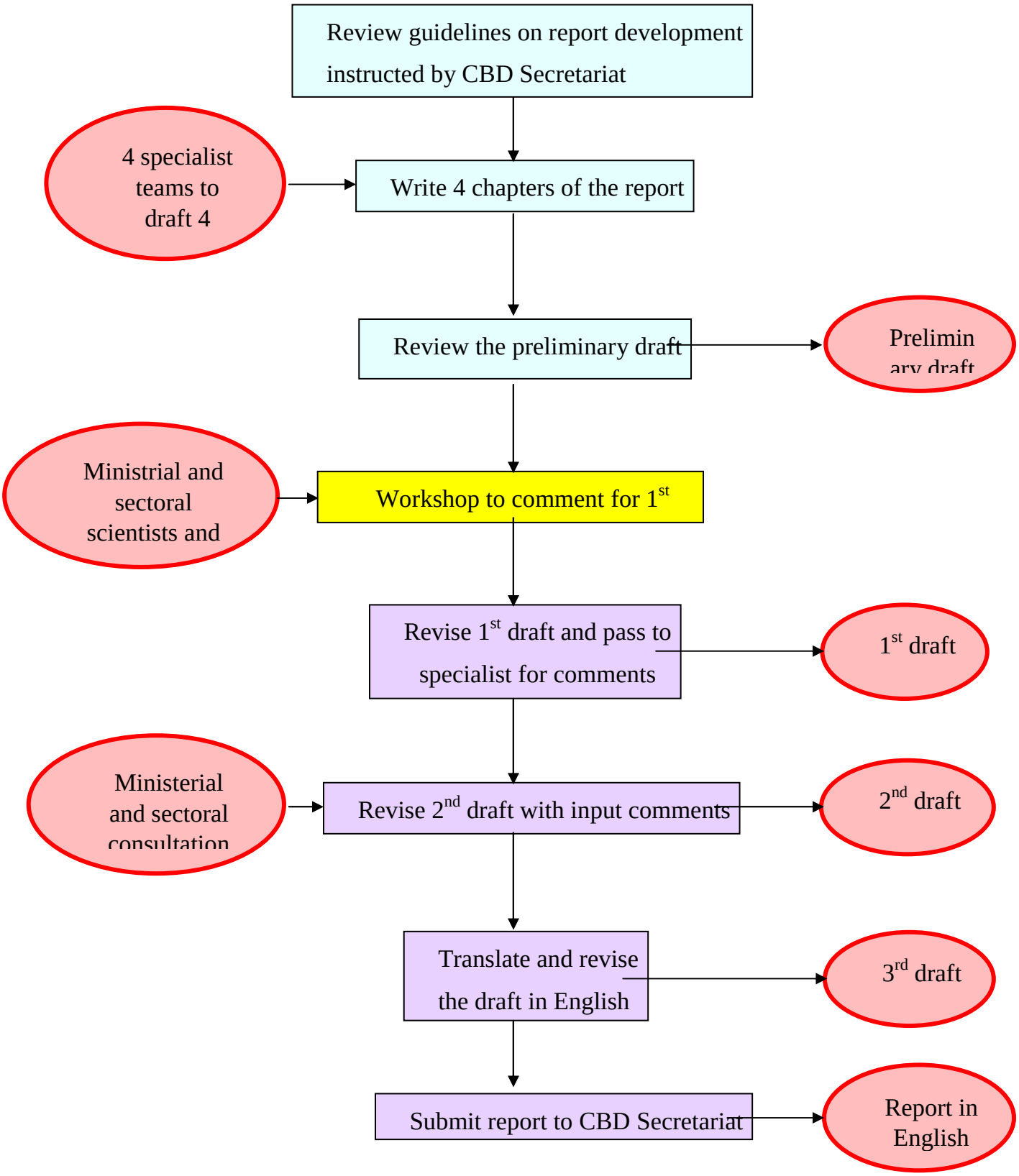
SUBMISSION	
Signature of officer responsible for submitting national report	
Date of submission	

Process of National Report development



List of key organisations contributing to the 5th National Report

No.	ORGANISATIONS
	MINISTRIES
1	Ministry of Natural Resources and Environment
2	Ministry of Agriculture and Rural Development
3	Ministry of Culture, Sport and Tourism
4	Ministry of Science and Technology
5	Ministry of Training and Education
6	Ministry of Health
	RESEARCH ORGANISATIONS
7	Institute of Ecology and Biological Resources
8	Forest Inventory and Planning Institute
9	Hanoi National University
10	Vietnam Association of Nature Conservation and Environment
	NATIONAL AND INTERNATIONAL ORGANISATIONS
11	World Wide Fund for Nature
12	IUCN
13	Birdlife International
14	FFI
15	PanNature

APENDIX II: Criteria to achieve Vietnam's NBSAP, 2013

No	Criteria	Implement -ing Agency	Roadmap			Evaluation Method
			2010	2015	2020	
I	**Strategic Target (ST) 1: Conserve ecosystems of national and international significance**					
	Total area of TPAs (including inland wet lands)	MARD	2.5 mil ha	2.75 mil ha	3.0 mil ha	By statistics
	Forest coverage	MARD	40%	42-43%	45%	By statistics
	Area of primary forest	MARD	0.57 mil ha	No decreas e	No decreas e	By statistics
	Area of mangrove	MARD	190.000 ha	No decreas e	No decreas e	By statistics
	Area of sea grass	MARD	12.380 ha	No decreas e compar ed with 2010	No decreas e compar ed with 2010	By statistics
	Area of inshore coral reef	MONRE	14.131 ha	No decreas e compar ed with 2010	No decreas e compar ed with 2010	By statistics
	Number of internationally recognized PAs	MONRE	2 Ramsar sites, 8 biospher e reserves and 4 ASEAN heritage parks (AHP)	07 Ramsar sites, 09 biosphe re reserves , 07 AHPs	10 Ramsar sites, 10 biosph ere reserve s , 10 AHP	By statistics

No	Criteria	Implement -ing Agency	Roadmap			Evaluation Method
			2010	2015	2020	
	PAs ecosystem service assessment	MORE	0	5	30	By statistics
II	**ST 2: To curb the degradation of endangered, rare and precious species**					
	Banks of gene and plant varieties meet international standard	MARD	-	-	Upgrade	By statistics
	Number of crop varieties stored in gene bank and on-farm storage	MARD	Over 20.000 samples	40.000 - 50.000 samples	80.000 - 120.000 samples	By statistics
	Number of endangered, rare and precious species	MONRE	47	No increase compared with 2010	No increase compared with 2010	survey
	Extinct species	MONRE	9	0	0	survey
	Improved biome of Vietnam endangered, rare and precious species	MONRE	-	-	10	By statistics
III	**ST 3: Sustainable use and equitable sharing benefits from ecosystems, species and genetic resources**					
	Degraded ecosystems restored	MARD	No database		At least 15% up compared with to 2010	By statistics
	Valuable wildlife are bred	MARD	…	15% up compared with	30% up compar	By statistics

No	Criteria	Implement -ing Agency	Roadmap			Evaluation Method
			2010	2015	2020	
				to 2010	ed with to 2010	
	Percentage of PAs having benefit sharing mechanism	MARD	10 PAs	10% up	50% up	
IV	**ST 4: Reduce direct pressure on biodiversity**					
	Area of forest loss and surface loss due to land use conversion.	MARD	No data	10% down to 2010	40% down to 2010	By statistics
	Violation cases of wildlife protection.	MARD	876 cases	10% down to 2010	40% down to 2010	By statistics
	Illegal forestry trade	MARD	17.899 cases	10% down to 2010	40% down to 2010	By statistics
	Deforestation	MARD	3.503 cases	20% down to 2010	50% down to 2010	By statistics
	Confiscated wildlife (rare and precious)	MARD	12.936 (508)	20% down to 2010	40% down to 2010	By statistics
	Identified invasive aliens	MONRE	33	No up to 2010	No up to 2010	By statistics
V	**TG5: Actively respond to climate change through biodiversity conservation**					
	Area and number of biodiversity conservation corridor	MONRE	Piloting	3	6	By statistics

Appendix III: Aichi Targets

Aichi Targets	
Strategic Goal A: Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society	
Target 1	By 2020, at the latest, people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably.
Target 2	By 2020, at the latest, 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.
Target 3	By 2020, at the latest, 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.
Target 4	By 2020, at the latest, 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 use of natural resources well within safe ecological limits.
Strategic Goal B: Reduce the direct pressures on biodiversity and promote sustainable use	
Target 5	By 2020, 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.
Target 6	By 2020 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.
Target 7	By 2020, areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity.
Target 8	By 2020, pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity.

Target 9	By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment.
Target 10	By 2015, 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.
Strategic Goal C: To improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity	
Target 11	By 2020, at least 17 per cent of terrestrial and inland water, 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.
Target 12	By 2020 the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained.
Target 13	By 2020, the genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable 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	
Target 14	By 2020, 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.
Target 15	By 2020, 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.
Target 16	By 2015, 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.
Strategic Goal E: Enhance implementation through participatory planning, knowledge management and capacity building	
Target 17	

	By 2015 each Party has developed, adopted as a policy instrument, and has commenced implementing an effective, participatory and updated national biodiversity strategy and action plan.
Target 18	By 2020, 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.
Target 19	By 2020, 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, transferred and applied.
Target 20	By 2020, at the latest, 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.

APPENDIX IV: List of Vietnam's terrestrial Protected Areas

LIST OF SUFs
(Updated to 2012)

No	Forest	Place	Area after review (ha)	Category		
				Forest land	Bare land	Sea surface
I. NATIONAL PARKS			1077236.13	932370.76	77855.37	67010.00
1	Ba Be	Bac Kan	9022.00	8555.80	466.20	
2	Ba Vi	Ha Tay	6486.40	5165.77	1320.63	
		Hoa Binh	4263.30	1072.40	3190.90	
3	Bach Ma	Thua Thien Hue	34380.00	29050.80	5329.20	
		Quang Nam	3107.00	3107.00	0.00	
4	Bai Tu Long	Quang Ninh	15600.00	5233.00	709.00	9658.00
5	Ben En	Thanh Hoa	12033.00	11401.50	631.50	
6	Bidoup-Ba Mountain	Lam Dong	55968.00	50713.00	5255.00	
7	Bu Gia Map	Binh Phuoc	25926.00	25695.00	231.00	
8	Cat Ba	Hai Phong	15331.60	8168.30	1763.30	5400.00
9	Cat Tien	Dong Nai	39627.00	34288.30	5338.70	
		Lam Dong	27530.00	24130.00	3400.00	
		Binh Phuoc	4300.00	3837.00	463.00	
10	Chu Mom Ray	Kon Tum	56434.20	54316.90	2117.30	
11	Chu Yang	Đak	59316.10	59316.10	0.00	

	Sin	Lak				
12	Con Đao	Ba Ria Vung Tau	19991.00	4854.00	1137.00	14000.00
13	Cuc Phuong	Ninh Binh	11350.00	11343.80	6.20	
		Thanh Hoa	4981.60	4857.81	123.79	
		Hoa Binh	6074.30	6074.30	0.00	
14	Hoang Liên	Lao Cai	21000.10	19413.60	1586.50	
		Lai Chau	7500.00	5906.00	1594.00	
15	Kon Ka Kinh	Gia Lai	39955.00	37102.00	2853.00	
16	Lo Go Sa Mat	Tay Ninh	18345.00	15484.00	2861.00	
17	Mui Ca Mau	Ca Mau	41089.00	8749.00	5740.00	26600.00
18	Nui Chua	Ninh Thuan	29865.00	17223.00	5290.00	7352.00
19	Phong Nha Ke Bang	Quang Binh	125362.00	125156.00	206.00	
20	Phu Quoc	Kien Giang	29135.90	27849.10	1286.80	
21	Phuoc Binh	Ninh Thuan	19814.00	15545.40	4268.60	
22	Pu Mat	Nghe An	93524.70	91952.90	1571.80	
23	Tam Đao	Vinh Phuc	14679.03	11321.88	3357.15	
		Thai Nguyen	8757.60	8757.60	0.00	
		Tuyen Quang	6078.40	5105.40	973.00	
24	Tram Chim	Thap	7313.00	2893.00	4420.00	
25	U Minh Hạ	Ca Mau	7926.00	7321.00	605.00	

26	U Minh Thuong	Kien Giang	8038.00	7111.70	926.30	
27	Vu Quang	Ha Tinh	52882.00	51571.00	1311.00	
28	Xuan Son	Phu Tho	15048.00	9398.00	5650.00	
29	Xuan Thuy	Nam Đinh	7100.00	1650.00	1450.00	4000.00
30	Yok Don	Dak Lak	109196.00	108885.50	310.50	
		Dak Nong	2905.90	2793.90	112.00	
II. NATURE RESERVES			1099736.11	938602.69	161133.42	
II a	Nature reserves		1060958.87	910334.90	150623.97	
1	Ba Na-Nui Chua	Đa Nang	30206.30	29136.30	1070.00	
2	An Toan	Binh Đinh	22545.00	16943.00	5602.00	
3	Ap Canh Dien	Bac Lieu	363.00	66.60	296.40	
4	Bac Huong Hoa	Quang Tri	25200.00	22138.00	3062.00	
5	Bac Me	Ha Giang	9042.50	8298.90	743.60	
6	Ban dao Son Tra	Da Nang	3871.00	3778.00	93.00	
7	Bat Dai Son	Ha Giang	4531.20	4263.10	268.10	
8	Ba Na - Nui Chua	Quang Nam	2753.00	2609.00	144.00	
9	Binh Chau Phuoc Buu	Ba Ria-Vung Tau	10905.00	7912.00	2993.00	
10	Cham Chu	Tuyen Quang	15902.10	15593.50	308.60	
11	Copia	Son	11995.90	6655.20	5340.70	

		La				
12	Dakrong	Quang Tri	37640.00	32289.00	5351.00	
13	VND Son - Ky Thuong	Quang Ninh	14851.00	12259.00	2592.00	
14	Du Gia	Ha Giang	11540.10	10737.50	802.60	
15	Ea So	Dak Lak	24017.00	21065.60	2951.40	
16	Hang Kia - Pa Co	Hoa Binh	5257.77	4882.75	375.02	
17	Hon Ba	Khanh Hoa	19164.48	16160.95	3003.53	
18	Hon Chong	Kien Giang	964.70	868.40	96.30	
19	Huu Lien	Lang Son	8293.00	8129.00	164.00	
20	Kon Cha Rang	Gia Lai	15446.00	15386.90	59.10	
21	Ke Go	Ha Tinh	21759.00	19780.00	1979.00	
22	Kim Hy	Bac Kan	14772.00	13913.70	858.30	
23	Krong Trai	Phu Yen	13392.00	12648.00	744.00	
24	Lang Sen	Long An	5030.00	3381.00	1649.00	
25	Muong Nhe	Đien Bien	44940.30	26881.90	18058.40	
26	Muong Te	Lai Chau	33775.00	22412.00	11363.00	
27	Na Hau	Yen Bai	16399.90	12705.20	3694.70	
28	Na Hang	Tuyen Quang	22401.50	21277.70	1123.80	
29	Nam Ca	Dak Lak	21912.30	21912.30	0.00	
30	Nam Nung	Dak Nong	10912.00	10618.80	293.20	
31	Ngoc Son	Hoa	15890.63	12928.00	2962.63	

	- Ngo Luong	Binh				
32	Ngoc Linh	Kon Tum	38109.40	34294.60	3814.80	
33	Ngoc Linh	Quang Nam	17576.00	13916.00	3660.00	
34	Nui Ong	Binh Thuan	24017.00	23131.00	886.00	
35	Nui Pia Oac	Cao Bang	10261.00	7732.00	2529.00	
36	Phong Đien	Thua Thien Hue	30262.80	30262.80	0.00	
37	Phong Quang	Ha Giang	7910.90	7271.40	639.50	
38	Phu Canh	Hoa Binh	5647.00	4077.90	1569.10	
39	Pu Hoat	Nghe An	35723.00	32508.80	3214.20	
40	Pu Hu	Thanh Hoa	23028.20	19983.20	3045.00	
41	Pu Huong	Nghe An	40127.70	31668.90	8458.80	
42	Pu Luong	Thanh Hoa	16902.30	16722.10	180.20	
43	Song Thanh	Quang Nam	79694.00	61752.00	17942.00	
44	Sop Cop	Son La	17369.00	13654.10	3714.90	
45	Ta Dung	Dak Nong	17915.20	13406.30	4508.90	
46	Ta Xua	Son La	13412.20	12257.20	1155.00	
47	Ta Kou	Binh Thuan	8468.00	6721.00	1747.00	
48	Tay Con Linh	Ha Giang	14489.30	14018.60	470.70	
49	Tay Yen Tu	Bac Giang	13022.70	12308.80	713.90	
50	Than Sa - P.Hoang	Thai Nguyen	18858.90	17833.60	1025.30	

51	Thạnh Phu	Ben Tre	2584.00	1914.00	670.00	
52	Thuong Tien	Hoa Binh	5872.99	5284.80	588.19	
53	Tien Hai	Thai Binh	3245.00	2259.00	986.00	
54	Van Ban	Lao Cai	25173.00	24574.00	599.00	
55	Van Long	Ninh Binh	1973.50	1860.50	113.00	
56	Vinh Cuu	Dong Nai	53850.30	48188.10	5662.20	
57	Xuan Nha	Son La	16316.80	14643.90	1672.90	
58	Xuan Lien	Thanh Hoa	23475.00	20459.00	3016.00	
II b	Species Pas		38777.24	28267.79	10509.45	
1	Che Tao	Yen Bai	20293.20	10779.80	9513.40	
2	Dak Uy	Kon Tum	659.50	491.00	168.50	
3	Ea Ral	Dak Lak	49.00	49.00	0.00	
4	Huong Nguyen	Thua Thien Hue	10310.50	10310.50	0.00	
5	Khau Ca	Ha Giang	2010.40	1875.00	135.40	
6	Lung Ngọc Hoang	Hau Giang	790.64	599.19	191.45	
7	Nam Xuan Lac	Bac Kan	1788.00	1788.00	0.00	
8	Trap Kso	Dak Lak	100.00	15.30	84.70	
9	Trung Khanh	Cao Bang	2261.00	2135.00	126.00	
10	San Chim dam Doi	Ca Mau	130.00	123.00	7.00	
11	Bac Lieu	Bac	385.00	102.00	283.00	

	bird garden	Lieu				
III. Landscape PAs (cultural-social- historical value)			78129.39	60554.52	17574.87	
1	ATK Đinh Hoa	Thai Nguyen	8728.00	6779.30	1948.70	
2	Ban Doc	Cao Bang	566.00	494.00	72.00	
3	Can cu Dong Rum	Tay Ninh	32.00	32.00	0.00	
4	Can cu Chau Thanh	Tay Ninh	147.00	138.00	9.00	
5	Chang Riec	Tay Ninh	9122.00	8088.00	1034.00	
6	Chua Thay	Ha Tay	37.13	37.13	0.00	
7	Con Son Kiep Bac	Hai Duong	1216.90	1216.90	0.00	
8	Cu Lao Cham	Quang Nam	1490.00	596.00	894.00	
9	Da Ban	Tuyen Quang	119.60	119.60	0.00	
10	Đen Hung	Phu Tho	538.00	307.30	230.70	
11	Deo Ca-Hon Nua	Phu Yen	5768.20	3369.50	2398.70	
12	Muong Phang	Dien Bien	935.88	283.98	651.90	
13	Dray Sap-Gia Long	Dak Nong	1515.20	1458.60	56.60	
14	Duong Ho Chi Minh	Quang Tri	5680.00	3377.00	2303.00	
15	Go Thap	Đong Thap	289.80	170.00	119.80	
16	Ho Lak	Dak Lak	9478.30	7765.20	1713.10	
17	Hoa Lu	Ninh Binh	2985.00	2985.00	0.00	

18	Huong Son	Ha Tay	2719.80	2471.00	248.80	
19	K9 - Ho Chi Minh Mausoleum	Ha Tay	200.00	200.00	0.00	
20	Kim Binh	Tuyen Quang	210.80	149.50	61.30	
21	Lam Son	Cao Bang	75.00	75.00	0.00	
22	Nam Hai Van	Da Nang	3397.30	2925.80	471.50	
23	Mount. Ba	Binh Đinh	2384.00	1940.00	444.00	
24	Mount. Ba Den	Tay Ninh	1545.00	788.00	757.00	
25	Mount.Ba Ra	Binh Phuoc	1056.00	764.00	292.00	
26	Mount. Chung	Nghe An	628.30	542.30	86.00	
27	Mount.Na	Phu Tho	670.00	670.00	0.00	
28	Mount. Lang Don	Cao Bang	1149.00	1032.00	117.00	
29	Mount. Sam	An Giang	171.00	79.32	91.68	
30	Mount. Than Dinh	Quang Binh	136.00	136.00	0.00	
31	Pac Bo	Cao Bang	1137.00	1070.00	67.00	
32	Quy Hoa-Ghenh Rang	Binh Dinh	2163.00	831.00	1332.00	
33	Ru Linh	Quang Tri	270.00	95.00	175.00	
34	Hon khoai Island	Ca Mau	621.00	581.00	40.00	
35	Tan Trao	Tuyen Quang	4187.30	3783.20	404.10	
36	Thang Hen	Cao Bang	372.00	356.00	16.00	

37	Thoai Son	An Giang	370.50	172.19	198.31	
38	Tra Su	An Giang	844.10	715.80	128.30	
39	Tran Hung Dao	Cao Bang	1143.00	770.00	373.00	
40	Tuc Dup	An Giang	200.00	0.00	200.00	
41	Vat Lai	Ha Tay	11.28	11.28	0.00	
42	Nguyen Hue orange garden	Binh Đinh	752.00	307.00	445.00	
43	Xeo Quyt	Dong Thap	50.00	23.62	26.38	
44	Yen Tu	Quang Ninh	2687.00	2518.00	169.00	
45	Yen Lap	Phu Tho	330.00	330.00	0.00	
IV. FORESTS FOR EMPIRICAL RESEARCH			10652.25	9924.88	727.37	
1	Northeast research center of seedings	Vinh Phuc	534.50	498.20	36.30	
2	Tan Tao	TP. Ho Chi Minh	29.92	26.35	3.57	
3	Cu Chi botanic garden	TP. Ho Chi Minh	39.49	38.63	0.86	
4	Center of Empirical research Cau Hai	Phu Tho	700.80	700.80	0.00	
5	Mangrove technology application	Ca Mau	281.00	245.00	36.00	

	center Minh Hai					
6	Empirical Center Ha Long	Quang Ninh	64.00	64.00	0.00	
7	Empirical Forest of Forestry University	Ha Tay	73.00	73.00	0.00	
8	Forestry Empirical center Cam Ly	Da Lat	348.00	300.00	48.00	
9	Forestry Empirical center Lang Hanh	Da Lat	105.00	105.00	0.00	
10	Dak Plao	Dak Nong	3280.00	3200.00	80.00	
11	Da Chong, Cam quy, Ba Vi	Ha Tay	215.10	215.10	0.00	
12	Tay Bac	Son La	152.00	142.00	10.00	
13	Forestry college	Pleiku	723.60	386.90	336.70	
14	Tropical forestry center, Pleiku-Gia Lai	Pleiku	1611.80	1546.70	65.10	
15	Center of Forestry technology application	Hoa Binh	150.00	150.00	0.00	
16	Center of North Central Forestry technology application	Quang Tri	879.20	879.20	0.00	
17	Center of Southeast	Dong Nai	326.42	302.90	23.52	

	Forestry technology application					
18	Binh Duong Center of Forestry technology application	Binh Dương	1.10	1.10	0.00	
19	Research center of forest specialty	Quang Ninh	227.52	200.00	27.52	
20	Center of Northeast Forestry technology application	Quang Ninh	909.80	850.00	59.80	
	Area after review		2265753.88	1941452.85	257291.03	67010.00
	Area excluding sea surface		2198743.88			

Source: Statistics of MARD

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