4th National Report of DPR Korea to the Convention on Biological Diversity

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EXCUTIVE SUMMARY

In accordance with Article 26 of CBD and decision VIII/ 14 of the 8th COP, the State Accademy of Sciences, authorized by the National Coordinating Committee for Environment(NCCE), the Democratic People's Republic of Korea(DPRK), organized the Working Group for preparation of the 4th National Report of DPRK and led the Working Group including Ministry of Land & Environment Protection, Ministry of Forestry, Ministry of Fisheries, Ministry of Agriculture, Ministry of Public Health.

The preparation process of the 4th National Report included two rounds of national workshops,

three rounds of themetic consultations and five rounds of expert meetings at national and local levels.

The representatives from the State Academy of Sciences and its , Ministry of Land and Environment Protection, Ministry of Agriculture, Ministry of Forestry, Ministry of Public Health, Ministry of Fisheries, Bureau for Preservation of Cultural Relics, Hydro-meteorological Service, Academy of Agricultural Sciences and Academy of Forestry were involved in the workshops and consultations for preparation of the 4th national report.

Data necessary for preparation of the report was collected and synthesized focusing on the activities for implementing NBSAP and progress in the period of 2006 – 1st half of 2009 and the report was prepared following the guideline for preparation of the 4th report.

The 4th National Report is consisted of Excutive summary, four Chapters, Conclusion and Anexes.

Chapter I provides status, trends and threats of biodiversity, in addition, introduced summary of status and trends of ecosystems, habitats, species and significant biodiversity components, using exsisting indicators.

- **Plants**

The number of plant species recorded in DPRK by the end of 2006 is 10,012, including 207 families, 1,086 genera, 3,623 species of the vascular plants, 181 families, 1017 genera, 3,384 species with 844 varieties of spermatophyte and 781 species of bryophytes and 583 species of lichens, and , in addition, 2,310 species of fungi and 2,715 species of algae.

Lower plants take the place of primary producer among the components of ecosystem and are important for the conservation of terrestrial and marine ecosystem biodiversity. In DPRK, it is anticipated that more species of lower plants will be found through intensified survey and research.

- **Animal**

Animals recorded in DPRK are 1,435 species of 472 genera of 151 families at present.

- Mammals

  There are 107 species of 69 genera of 28 families of mammals, including 79 species of 48 genera of 20 families of terrestrial ones that are composed of 11 species of *Insectivora*, 24 of C*hiropter*, 2 of *Lagomorph*, 18 of *Rodentia*, 15 of *Carnivora* and 7 of *Artiodactyla*.

  The representative mammals are tiger(*Panthera tigris*), leopard(*Panthera pardus*), grey wolf(*Cuon alpinus*), wolf(*Canis lupus*), brown bear(*Ursus arctos*), bear(*Selenarctos thibetanus*), sable(*Martes zibellina*), common otter(*Lutra lutra*), deer(*Gervus nippon*), musk deer(*Moschus moschiferus*), water-deer(*Hydropotes inermis*), roe deer(*Capreolus capreolus*), goral(*Nemorhaedus goral*) and so on .

- Birds

  420 species of 190 genera of 61 families of birds have been recorded in DPRK, including 64 species of residential, 94 species of summer visitors, 106 species of winter visitor, 83 species of passing-migrants and 73 species of stray birds, of which the migratory birds cover high

proportion. Representative groups of migratory birds includes ducks-geese, cranes, snipes, egrets, spoonbills, stocks and swallows, of which number of species of three groups, including ducks-geese, cranes and snipes with many threatened species, reaches 106 species.

- Amphibians and Reptiles

  Reptilians involve 26 species of 17 genera of 11 families, which are represented by *Eumeces coreensis*, *Ancistrodon halys*, *Trionyx sinensis*, etc.

  Amphibians include 17 species of 8 genera of 6 families, which are represented by *Bufo bufo, Rana temporaria ornativentris, R. chosenica, R.coreana* and so on.

- Fish

  865 species of fish including marine fishes have been known so far, including 111 species of freshwater fish, 59 species of brackish fish and 15 species of anadromous fish. Freshwater fish includes many endemic species.

- Invertebrate

  8,360 species of invertebrate including about 7,600 species of insects have been recorded so far and its number is anticipated to be increased 3~4 times as much as the current one.

- **Microorganisms**

In DPRK, 1,005 species of 140 genera of microorganisms that were separated from various ecological environments are preserved.

Taxonomical classification: Bacteria (227 species of 50 genera);

Actinomyces (316 species of 6 genera);

Yeasts (203 species of 35 genera);

The investigation on the microorganisms in the area of Mt. Paektu recorded 306 species of 43 genera, among which molds (113 species of 15 genera) predominated and then were followed by yeast (81 species of 18 genera), *Actinomyces* (71 species of 2 genera) and bacteria (41 species of 8 genera). By the further intensified taxonomical research on microorganisms, the number of species will be increased and their regional characteristics will be revealed more clearly.

- **Invasive Alien Species**

DPRK has taken several rounds of surveys for invasive alien species, and some 60 alien species of plants have been recorded so far. Representative species are *Amorpha fruticosa*, *Dactylis glomerata* and *Meliotus alba* etc. The damages from invasive alien species, *Ambrosia qrtenemisifora*, destructuring biodiversity and negatively impacting on human lives, become serious. Besides, alien species include about 30 species of weeds, negatively influencing to agro-ecosystem.

Alien animals species and and their impacts can be found in insects and fishes related with agriculture and forest in DPRK, especially with damages from invasive vermin to agricultural production, agricultural eco-environment and related indigenous species. Representative invasive alien species to forest and agriculture are *Cecidomyia brachyntera*, *Matsucoccus pini*, *Dendrolimus sibiricus, Hyphantria cunea, Drycocosmus kuviphilus, Lissorhoptrus oryzopholis* etc.

At present, 70 species of insects and 60 species of plants are main quarantine species in DPRK,

including “Mad Cow Disease” and “Pig Pest” contagious diseases at A class, while the national framework for quarantine of diseases has sticktly established.

In DPR Korea where the forest land occupies about 73% of the whole territory, forest ecosystem holds an important place in the conservation of biodiversity.

Forests of DPRK are referred to the northern temperate forest zone, which are categorized into 3 types; coniferous forest, broadleaved forest and coniferous-broadleaved mixed forest.

Coniforous forest is representated by *Abies nephrolepis-Picea jezoensis* forest, *Larix olgensis* forest, *Pinus densiflora* forest and *Pinaceae* forest; *Poplus koreana, Betula platyphylla, B. eramani, Acer palmatum, Phellodendron amurense and Pinus koraiensis* in broad leaved forest; *Pinus densiflora-Quercus serrata* forest, *Larix olgensis - Betulaer amii - Poplus davidiana* forest, *Pinus koraiensis - Betula platyphylla - Poplus davidiana forest, Abies nephrolepis - Pinus Koraiensis - Tilia amurensis* forest and *Pinus densiflora - Betula platyphylla* forest, *Pinus densiflora–Alnus sibirica forests and Pinus densiflora–Robinia pseudoacasia* forests as artificial plantations in mixed forest.

Toatal water area approachs to about 6 percent of the territory in DPRK. Rivers which flow into the Korean West Sea are long with well-developed tributaries and have wider water area for their length, while rivers into the Korean East Sea are short with steep declivity. The main large rivers include: about 100 species of fish in Amnok river, 90 species of fish in Chongchon river, 70 species in Taedong river, 70 species of fish in Tuman river, including 30 endemic species of fish in inland water.

Marine fishes include 250 species in Korean West Sea and 600 species in Korean East Sea, and also 546 species of algae. The wetlands in Korean West Sea are placed on the East Asia-Australia flyway, one of the 8 global flyways of migratory birds, where about 180 species of migratory birds have been recorded, including 26 rare species like Grus japonensis, Platalea minor, Egretta eulophotes.

Agricultural ecosystem in DPRK covers about 16.6% of the land area, of which paddy field with 4.6%, cultivated field with 10% and grassland and the others with 2%.

The investigations and studies of wildlife species in the agricultural ecosystem have been led to agricultural vermin and weed: agricultural vermin is classified with 19 orders, 57 families and 160 species, weed with some 450 species(of them about 110 species in paddy field, some 340 species in cultivated field.

Chapter II provides status of policies, plans, strategies and laws and regulations related with CBD, and activities and progresses for implementation of NBSAP. For the further conservation and sustainable use of biodiversity in accordance with the requirement of the sustainable development in the new millennium, the Government of DPRK, based on the analysis of the past decade, has updated the NBSAP with the support from UNEP during December of 2005 – September of 2007.

The updated NBSAP has reviewed and analyzed the national activities done for the implementation of the CBD in the last decade and indicates the further activities for the conservation and sustainable use of biodiversity in the coming 10 - 15 years at least considering the

decisions adopted in the 4th -8th meetings of the Conference of the Parties (COP). It also described how the NBSAP contributed to the implementation of provisions of the Convention and the experiences and lessons learned in the implementation of NBSAP. It includes all the actions implemented by the government at all levels and the stakeholders in the field of forest, agriculture, fishery and traditional Korean medicine in close relation with NBSAP.

Chapter III described the government's efforts to integrate biodiversity conservation and sustainable use into relevant sectoral and cross-sectoral strategies, plans and national policies as required by Article 6(b) of the Convention. In this chapter includes the activities and best practices of integration of biodiversity conservation into sectors such as forest, agriculture, fishery, public health and education.

Chapter IV presented the progress towards the 2010 target and further priorities.

CHAPTER 1. BIODIVERSITY STATUS, TRENDS, THREATS IN DPRK

1.1 Introduction

Biodiversity is encompassing variety of all the ecosystems, species, genic resources on the earth and variability in living organisms. Biodiversity benefits human societies in a myriad of ways by providing wide range of ecological, economic, social, cultural, educational, scientific and aesthetic services. Climate changes and extensive anthropogenic interventions in the natural ecosystems in recent times have caused the loss of biodiversity.

The Convention on Biological Diversity, adopting during the Earth Summit in Rio de Janeiro in 1992, has set three main objectives reaffirming sovereign rights of nations over their biological resources, the Convention

(ⅰ) conservation of biological diversity;

(ⅱ) sustainable use of its components;

(ⅲ) fair and equitable sharing of benefits arising out of the use of genetic resources.

DPRK signed the Convention on Biological Diversity on 11th June, 1992 and became a contracting party to CBD on 26th October, 1994 and prepared NBSAP in December 1998 as a measure for its implementation in cooporation with GEF/UNDP.

All the parties, acceded to CBD in April 2002, are committed to achieve the significant reduction of the current rate of biodiversity loss at the global, regional and national level as a contribution to poverty alleviation and to the benefit of all life on earth. This target is represented in WSC(World Summit Conference) and in the Millenium Development Goals(7b) adopted at the United Nations General Assembly (UNGA).

This chapter includes analysis and assessment of status, trends and threats of biodiversity in DPRK.

Although DPRK is small in its territory, it is one of significant countries in biodiversity conservation for its geological condition.

DPRK is located on the north-east of Asian continent with 122,762.338 ㎢ of territorial area, and has the Korean East Sea on the east and the Korean West Sea on the west, bordering on China and Russia between Amnok river and Tuman river on the north.

DPRK has sharp 4 seasons with a typical temperate climate, and the average annual temperature is around 8-12℃ with the average annual precipitation of 1,000 ~ 1,200mm. The about 80 percent of territory is covered by the mountainous area with rather dense rivers and streams.

The territory of DPRK is divided into 15 sharp demarcated large watersheds, while the rivers are charaterized by large amounts of outflows for their small sizes.

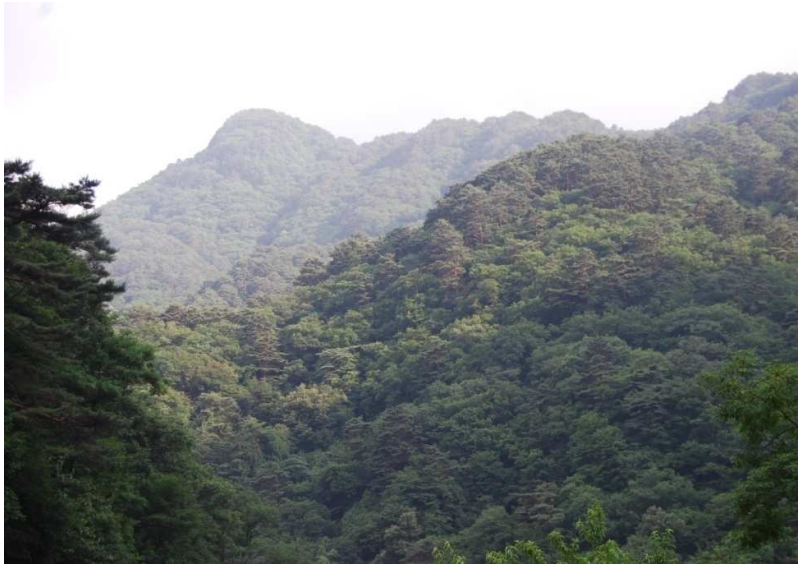
DPRK, as a penninsula with long running from north to south, has a variety of natural landscapes including mountainous areas, fields, rivers and coasts etc, and has abundant of biodiversity for its territory. DPRK is charaterized by indigenous endemic species with abundant species diversity.

1.2 Biodiversity Status

1.2.1 Forest Biodiversity

Forests play a vital role in social, cultural, economic development and in maintaining its ecological balance, and they are the basic resource for sustenance and conservation of biodiversity. Other land use practices, such as agriculture and animal husbandry, are benefitted by forests.

With cognition of a vital role of forest in the ecological balance and social-ecological development, DPRK laid down the policy of afforestation and gardening of the whole country for active conservation of forest and extention of forest area, and drives forward a 10-Years Plan for 1,500,000ha of forestation toward 2010 target. Also, NBSAP sugested the forestation as the top priority and set forward the task to establish the conservation network across the whole country and to protect the significant areas in biodiversity conservation and the environment of their adjacent areas.



Forest ecosystem is the mst important one in abundance of biological species and the correlation with other ecosystems as well as its areas.

Forest ecosystem in DPRK with the forest land reaching about 73% of the territory holds an important place in the conservation of biodiversity. The forest of DPRK refers to the Asian hemisphere of the northern hemisphere in the world flora, and covers from the ploral plant zone to the subtropical plant zone in plant zone. It includes 253 families, 1299 genera and about 3860 species (4118 species including freak plants) of higher plants, almost 200 species of pteridophyta, almost 600 species of moss. In addition, some 2850 species of the lower plants, including about 600 species of mushrooms, nearly 520 species of paracitic fungi and 508 species of lichenes, are living in it. The occupancy rate of trees among the forest plants is about 29% (some 1,100species) with some 130 species of evergreen trees of them.

Animal species of key groups in the forest of DPRK is showen in Table 1-1.

Table 1-1. Animal Species of Key Groups

Groups	Order	Family	Genus	Species	N.B.
Mammals	6	20	47	79	(excepting whales, seals)
Birds	23	71	178	382	
Reptiles	2	8	13	21	(excepting sea turtles, leather turtles)
Amphibia	2	6	8	14	

Forests in DPR Korea are referred to the northern temperate forest zone, which are categorized into 3 types; coniferous forest, broadleaved forest and mixed forest.

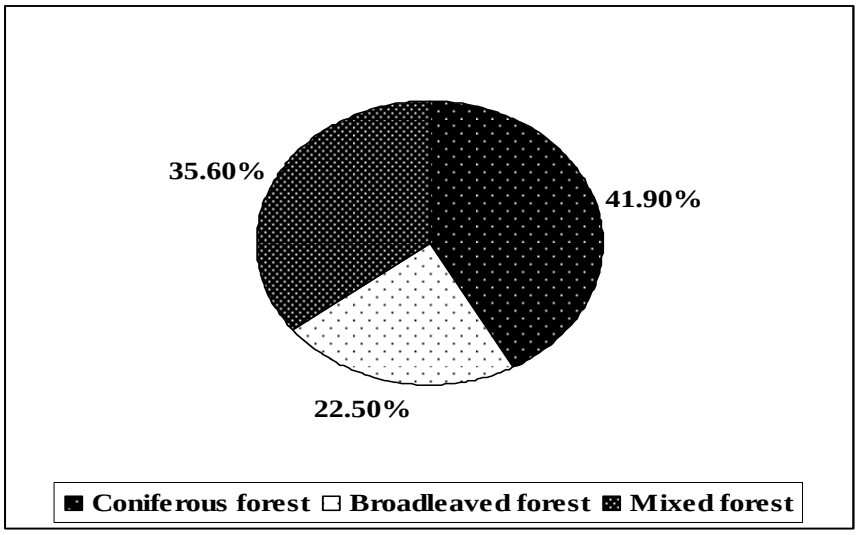


Figure 1-1. Proportion of forest types in DPRK

Table 1-2. Forest animals in forest types

Forest type	Main forest	Animal species
Coniferous forest	*Abies nephrolepis-Picea jezoensis* forest, larch forest, pine-nut forest, pine forest	*Ursus arctos, Cervus nippon, C. elaphus, Martes zibellina, Lyrurus tetrix, Dryocopus martius etc*
Broadleaved forest	Subarctic broadleaved forests, temperate deciduous broadleaved forests	*Sus scrofa, Hydropothes inerrrmis, Vulpes vupes, Nyctereutes procyonoides, Lepus mandschuricus etc.*
Mixed forest	Subarctic evergreen coniferous/ deciduous broadleaved forest, subarctic deciduous coniferous/broadleaved mixed forest, temperate evergreen/deciduous coniferous and	*Capreolus capreolus, Hydropotes inermes, Felis linx and Pteromys volans, residential birds,summer visitors etc.*

broadleaved mixed forest

Coniferous forest accounts for 41.9% of the whole forest area, the representatives of which are forests of *Abies nephrolepis-Picea jezoensis,* larch (*Larix olgensis*), *Pinus densiflora* and pine (*Pinaceae*). The pine forests take account for 45.1% of coniferous forests.

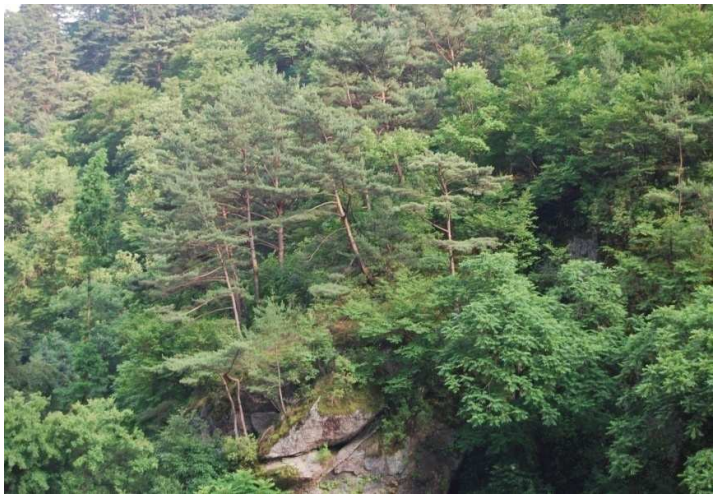
Abies nephrolepis-Picea jezoensis forest is a typical subarctic coniferous forest, including the main tree species of *Abies nephrolepis,* fir (*A. holophylla*), spruce (*Picea jezoensis*) and *P.koraiensis. Abies nephrolepis-Picea jezoensis* forests are mainly distributed in Paektu Plateau and Kaema Plateau in the northern part of DPR Korea, covering 14.5% of coniferous forests.

Larch (*Larix olgensis*) is also a typical subarctic coniferous one, distributed mainly in alpine regions (altitude of 1,000~1,900m) in Ryanggang Province and South and North Hamgyong Provinces, the representatives of which are *Larix olgensis var, Koreana* and *Larix olgensis.*

DPR Korea is the home of *Pinus koreaiensis,* which is distributed across the whole country except some northern high mountain areas. Its distribution stretches to areas of altitude of 1,200 m in Ryanggang and Jagang Provinces, especially with intensively distribution around Mt. Oga.

Pine forests including *Pinus densiflora* as the main species are distributed on all the parts of our country except the northern alpine region, mainly below 1,000m, forming mixed forest with oak trees and Korean larch trees in the northern part, but forming simple forest below 600m sea level. .

The mean temperature of subarctic coniferous forests distributed by *Abies nephrolepis-Picea jezoensis* forests and *Larix olgensis* forests is -5℃, and rare species such as *Ursus arctos, Cervus nippon, C. elaphus, Martes zibellina, Lyrurus tetrix, Dryocopus martius,* etc are habitating around these forests.



The broadleaved forests cover 35.6% of the whole forest area of the country with category into subarctic and temperate deciduous broadleaved forests.

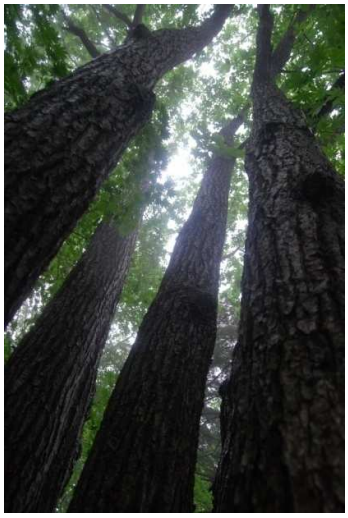
The former consists of *Poplus koreana, Betula platyphylla, B. eramani, Acer palmatum, Phellodendron amurense* and *Pinus koraiensis,* with *Pinus koraiensis, Aies holophylla, etc*.

The latter mainly consists of oak trees, including *Tilia amurensis, Juglans mandshurica, Acer palmatum* and *A. mandshuricum,* with *Carpinus laxiflora* and *Styrax japonica* in the southern regions.

The oak forest is a typical forest community of temperate deciduous broadleaved forests in DPR Korea and the main species are *Querqus mongolica, Q. dentat* and *Q. acutissima* with the annual

average temperature of 6-10℃ and the precipitation around 700-1,400mm in the distribution areas of these communities. The oak forests with Mongolian oak trees as the main species account for 52.4% of broadleaved forest area and they are distributed on the areas even up to 1,400m above sea level, except some alpine regions.

About 90% of wild mammals live in the broadleaved forest, which is represented by *Sus scrofa, Hydropothes inerrrmis, Vulpes vupes, Nyctereutes procyonoides* and *Lepus mandschuricus,* as well as many birds including *Dryocopus javensis richardsi,* the endemic species of DPRK.



The mixed forests in DPRK are classified according to climatic zone into: subarctic evergreen coniferous/ deciduous broadleaved forest, subarctic deciduous coniferous/broadleaved mixed forest, temperate evergreen/deciduous coniferous and broadleaved mixed forests. Their areas account for 22.5% of the whole forest area.

Forest types are *Pinus densiflora-Quercus serrata* forest, *Larix olgensis - Betulaer amii - Poplus davidiana* forest, *Pinus koraiensis - Betula platyphylla - Poplus davidiana* forest, *Abies nephrolepis - Pinus Koraiensis - Tilia amurensis* forest and *Pinus densiflora - Betula platyphylla* forest, and in addition with *Pinus densiflora–Alnus sibirica* forests and *Pinus densiflora–Robinia pseudoacasia* forests as artificial plantations. 56.4 percent of wild animal species covers on the mixed forests, which are represented by *Capreolus capreolus, Hydropotes inermes, Felis linx and Pteromys volans,* as well as residential birds and summer visitors including wood peckers .

DPRK has no typical grassland ecosystem in large areas; the grasslands can be found inside the forest and agricultural ecosystem. All the grasslands are oriented from and surrounded by forests, and are transformed into the forests through natural processes without management by human.

Therefore, grasslands in DPR Korea can be considered as forest-type grassland ecosystem and their species are *Miscanthus sinensis, Lespedesa crythopotria, Themeda japonica, Artemisia montana* and *Senecio nemorensis.*

Mountain ecosystems mainly cover on the alpine regions over 2,000m sea level, which is

occupied by 0.47% of the territory in area.

Alpine plant communities in DPR Korea are distributed in spots on the top of high peaks over 2,000m. Such mountains with developed alpine plant communities are Mt. Paektu (2750m), Mt. Pukpotae (2288m), Mt. Nampotae (2433), Mt. Sobaek (2171), Mt. Kanpaek (2162m), Mt. Kwanmo (2540m), Mt. Duryu (2309m), Mt. Chail (2505m), Mt.Buksobaek (2521m), Mt. Ryonhwa (2355m) and Mt.Rangrim (2186).

There are 250 species of alpine plants originated form Arctic in the alpine plant zone, which is representated by *Pinus pumila, Thuja koriensis, Rhododendron confertissimum, Rhododendron faurei* and *Oxytropis anentii*, etc in formation of communities. Alpine plants includes 30 endemic species and 50 herbal species, *Rheum coreana*, the endemic species, is valuable herbal plant.

In alpine ecosystem, antelope as well as pica, the living fossil of glacial era are distributed in the alpine ecosystem, and some birds as well, including *Apus pcificus, Hirundoapus eaudacuta* and *Monticola gularis*.

Below the alpine plant communities, sub-alpine ones are distributed in spots on the peaks of 1300-2000m high including North and South Phyongan Provinces, Jagang Province and Kangwon Province.

Mountain ecosystem includes peculiar landscapes and serves as valuable tourism resources. But mountain ecosystem is easy to be damaged, and biodiversity conservation in the ecosystem is very important. The global warming caused rapid changes in composition of biological species of the alpine ecosystems across DPRK as well as the world, and it needs to strengthen the studies of mountain ecosystem.

1.2.2 Inland water ecosystem

Inland water ecosystems consist of rivers, lakes and reservoirs.

DPRK is surrounded by the sea on three sides with high density of the rivers. The water area is some 720,000ha, including hundreds of thousands of hectares of broad tidelands in Korean West Sea, some tidelands in Korean East Sea and estuaries. DPRK has rather high density of rivers with density of 0.4~0.6km/km^2 and the inland water ecosystem takes an important place with some 1,700

natural lakes and reservoirs.

Total water area accounts for about 6% of the territory and the rivers has large amount of flow with high flow coefficient and rate of flow, and, in general, the upper stream has narrow and steep flow.

The long rivers to Korean West Sea has well-developed branches of flow with wider watershed for its length, but the rivers to Korean East Sea has steep and short flow.

Inland water ecosystem is served as an important habitat to the wildlife species.

Main plant species in the rivers are *Poplus maxinawczii, Poncircus koreana, Poplus davidiana* and *Salix koreensis* etc.

There are great amounts of species of fishes in the water area, including some 100 species in Amnok River, 90 species in Chongchon River, 70 species in Taedong River and 70 species in Tuman River.

In the rivers of DPRK, there are 30 endemic fish species including urrmchy (*Gonoprokopterus mylodon*) and sswery (*Coreoleuciscus splendidus*).

DPRK dose not accede to Ramsar Convention yet but emerges its efforts to accede to it.

Plant communities around the rivers have functions of watershed protection, land protection and anti-pollution. And the management of the rivers ecosystem needs to combine studies of plant communities with forestation in watershed and watershed management to ensure stability of ecosystem, and, in special, requires the restoration of forest ecosystem and rivers ecosystem in the degraded lands and to urgently promote the works for biodiversity conservation.

The rivers ecosystem is significant in the production of fresh water fishes and it is important to improve and strengthen the management of rivers ecosystem impacted by human activities including pollution.

1.2.3 Coastal and Marine Biodiversity

The coastal length reaches to 3,070km, and DPRK has about 340 islands and islets.

The Korean West Sea and Korean East Sea are influenced by Pacific Ocean through some straits. The Amnok, Chongchon and Taedong Rivers from DPRK and Yellow River and Yangtze River from China are flowing into the Korean West Sea, carrying enormous amount of deposits.

The offshore of Korean West Sea across-the-board forms tideland and has many islands, and the

key the arable land for crop cultivation. The Korean West Sea has high tide (a maximum of 11.02m high). Average depth of the Korean West Sea is 39m and the deepest one is only 118m.

Whereas, the Korean East Sea has deep depth and low tide, and most coastal areas form rock zones, except big estuaries. The Korean East Sea has average depth of 1,668m with the maximum of 3,699m and the length (from north to south) is longer than the width. There are about 600 species of fishes known in the Korean East Sea. Being wide, deep and less affected by inland fresh water, the Korean East Sea is clear and its salinity is high. The Korean East Sea has very favourable conditions for shallow-sea culture. The coast is estimated to have 546 species of seaweeds. Northern and southern species of seaweeds intermingle at the coast of the Korean East Sea.

Marine and coastal area consist of various marine ecosystem in DPRK, including coastal wetlands, estuaries, bays, lagoons, islands, islets and seaweeds-beds etc.

The coastal in the Korean East Sea includes 140 families and 295 genera and 450 species, and 108 families, 181 genera and 250 species in the Korean West Sea.

The Korean West Sea includes 78 percent of fish living in the warm currents such as anchovy, and also lobsters and shellfishes in the coastal area.

The Korean East Sea includes cold water fishes with fish living in the warm currents, and, in special, various seaweeds, including 320 species of marine algae and red algae. Most of wetlands are located in the coastal areas, but small area of alpine wetlands on peat hag in high mountain zones. Tidelands on the coastal areas of the Korean West Sea have a great abundant of biological diversity.

Along the coastline of the Korean West Sea from Island Pidan and Tasa at the estuary of Amnok River, the tideland plant communities are distributed in a shape of belt, 50~200m wide, and its width reaches 300~500m at the mouth of the bay, and at the estuary of Kumya river in the Korean East Sea. In reference to the formation history of the Korean West Sea, the history of tideland vegetation is not so long. Therefore, there is little variation in the composition and distribution of plant species. Its major plant species are *Salicornia europae, Suaeda japonica, S. glauca, Phragmites communis*, etc.

The tideland vegetation has very high biological productivity, e.g. 60t/ha at reed community. The tideland has various invertebrate species with high density, and, in particular, the coast of the Korean West Sea provides the major habitats for shells including *Metrix lamacki*.

By now, some 180 species of migratory birds, including 26 rare species, were taken censuses around the tidelands of the Korean West Sea coastal areas.

The wetlands along the east and west coasts are important transit and wintering places for migratory birds in the northeast Asia, including *Grus japonensis*, *Platalea minor* and *Egretta eulophotes*. The main areas are: Tongrim ri, Mundok County, South Phyongan Province at the estuary of River Chongchon; Haejung ri, Kumya County, South Hamgyong Province at the estuary of River Kumya; Taedong Bay between Ryongyon, Taetan and Ongjin Counties, South Hwanghae Province; September 18th Reservoir at Chongdan County, South Hwanghae Province; Lake area of Rajin-Sonbong City, North Hamgyong Province.

Above mentioned coastal wetlands are placed on the East Asia - Australia flyway, one of the 8 global flyways of migratory birds. Since this is so, coastal wetlands of DPR Korea, especially the estuaries of the Amnok, Chongchon, Taedong and Kumya Rivers have great regional and international significance.

1.2.4 Agricultural biodiversity

Agricultural ecosystem in DPRK covers about 16.6% of the land area, of which paddy field with 4.6%, cultivated field with 10% and grassland and the others with 2%.

As DPRK has restricted cultivated land area and the crops have been cultured in the same cultivated land for long period, nutritive elements for growth of the crops have been consumed with low soil fertility. As 80% of the whole territory of the country is mountainous, it is difficult to prevent the water and soil loss and provide the agricultural security without taking the measures for the protection of forest resource and land.

The government has laid down the policy to create the environmentally sound villages and encouraged to improve farmlands and the around-forests and achieved progresses, and to improve the soil biodiversity and soil fertility to increase the food security.

The investigations and studies of wildlife species in the agricultural ecosystem have been led to agricultural vermin and weed: agricultural vermin is classified with 19 orders, 57 families and 160 species, weed with some 450 species(of them about 110 species in paddy field, some 340 species in cultivated field), including the rest of animal species with birds. And the natural enemies are used to pest control based on these studies.

DPRK has taken the measures to establish the framework of crops genetic resources conservation for agricultural resources, specially agricultural genetic resources, are fundamental in promoting the green revolution in agriculture and to support the sustainable development of agriculture, while 57,000 gene resources were collected by some 180 crops and about 50,000 gene resources were estimated, some 10,000 gene resources are keeping at gene bank. But genetic resources might be lost at the gene bank with its poor facilities.

There are technical and financial difficulties for genetic resource conservation of domestic animals.

DPRK has taken the measures and encourages maintaining local traditional species and

knowledge and improving the traditional local production. In particular, the wild bean (*Glycine soja)*, originated from Korea has high value as genetic resource and special attention has given to its maintenance and dissemination.

1.2.5 Genetic diversity

Genetic diversity is the whole of genetic information of living organisms, including genetic varieties between different species and within species.

Genetic diversity means variation of gene in the living organism. Genetic diversity represents a long evolution process and is the basis of economic development. Bio-engineering and modern medical science needs to effectively use genetic diversity.

- ***Wildlife***

DPR Korea has relatively rich wild plants and animals for its size.

Herbal plants include more than 900 species, including *Panax ginseng, Schizandra chinensis, Rheum coreanum*, *Taxus cuspidate,* and medicinal animals include *Gervus nippon, Moschus moschiferus, Hydropotes inermis, Rana temporaria ornativentris* etc. In addition, it has many species of crop-relatives like *Glycine soja.*

- ***Cultivated plants***

Genetic diversity of cultivated plants is the valuable component of biodiversity and has great practical significance.

Historic relics of 6,000 years ago identified that our country has been cultivating the crops like *Oryza sativa,* soybeans (*Glycine max*), millet (*Panicum miliaceum*) and *Sorghum vulgare.* And *Cannabis sativa,* garlic, chestnut, peach have been cultivated from ancient times as well. A lot of cultivars have been bred up from them.

At present, in DPRK there are 2,368 cultivars of 114 species of crops including cereals (1,416 cultivars of 22 species), vegetables (801 cultivars of 70 species) and industrial crops (151 cultivars of 22 species). Besides, it has 433 cultivars of 25 species of fruits, 102 cultivars of 37 species of cultivated medicinal plants and 55 cultivars of 7 species of silkworm's fodder plants, in total 2,958 cultivars of 138 species of cultivated plants.

In particular, the cultivation of medicinal plants is actively promoted.

- ***Domestic animals***

At present, 7 species and 57 breeds of domestic animals are protected including 8 breeds of cow, 8 breeds of sheep, 15 breeds of goat, 11 breeds of pig and 13 breeds of rabbits, and poultry with 7 species and 31 breeds, including 8 breeds of domestic fowls, 7 varieties of ducks and 6 varieties of geese, and the rest of 3 species and 246 varieties of silkworms and 3 varieties of breeds.

The varieties of medicinal animals are also promoted and in particular there are 45 stock-farms for deer and 1 for musk across the country.

- ***Aquatic organisms***

DPRK is surrounded by seas on two sides and characterized by dense drainage network and lots of lakes and reservoirs and rich in aquatic organism species. According to the recent survey, there are aquatic plants of over 111 species of 53 genera of 35 families in the inland and coastal waters.

There are 111 species of freshwater fish and 59 of coastal brackish-water fish.

The cultivation of the marine algae such as *Laminaria japonica*, *Undaria pinnatifida*, and laver has long history and the aquiculture of marine animals with high economic value like *Haliotis gigantea* and lobsters has been promoted recently.

Considering the physio-geographical conditions of DPRK, the genetic diversity of aquatic ecosystem has a great significance in eco-environmental conservation and the development of fishery for economic development and improvement of people's livelihood.

1.3 Trends of biodiversity

1.3.1 In-situ conservation

CBD states that *in-situ* conservation means the conservation of ecosystem and natural habitats and maintenance and restoration of various species groups in their natural environment and, in case of domestic and cultivated species, in the surroundings where they have developed their distinctive properties. In recent years, for *in-situ* conservation, DPRK has taken measures including enlargement of natural protected areas.

After its ratification of the CBD, the government of DPRK took a measure to expand the nature reserves to 696,927ha, accounting for 5.68% of whole territory in 1995. And in 2006, the coverage of nature reserves was increased to 879,275ha, occupying 7.2% of the territory.

The newly expanded nature reserves are categorized as shown in Table.1-3.

Table 1-3. Protected areas of DPR Korea

No.	Classification	Name	Number	Area (ha)
I	Strict nature reserve	Mt. Oga & Kwanmo Peak Nature Reserves and others;	4	63,912
		Core areas of Biosphere Reserves of Mts. Paektu and Kuwol	2	24,247
II	Nature park	Mt. Kumgang Nature Park, Mt. Myohyang Nature Park, Mt. Chilbo Nature Park, etc.	21	167,900
III	Natural monuments area		127	191,157
IV	Habitat/species reserve	▪ Plant reserve	25	25,698.2
		▪ Animal reserve	25	58,973.4
		▪ Migratory bird(wetland/	24	26,917.5

No.	Classification	Name	Number	Area (ha)
		breeding area) reserve ▪ Sea-bird reserve	7	214.5
V	Landscape reserve		60	223,667
VI	Resources reserve	▪ Marine resources reserve ▪ Plant resources reserve ▪ Buffer zones of the Mt. Paektu Biosphere Reserve	26 4 1	50,690 6,659 36,000
		Total		879,275.2

The government made a plan to establish the framework of designated natural protected areas toward 2010 and enhance their functions and to expand it to 8% of the territory.

Successful accomplishment of this target will guarantee the implementation of the requirements of the decision adopted at COP 7 (*Decision VII/30, Annex II*) which stipulates that at least 10% of each of the world's ecological regions should be effectively conserved.

At present, the nature reserves of DPRK provide framework to meet one of the targets of Global Strategy for Plant Conservation endorsed at COP 6 which states that protection of 50% of the most important areas for plant diversity should be assured.

1.3.2 Ex-situ Conservation

"*Ex-situ* conservation" means the conservation of components of biodiversity outside their natural habitats.

Through the field conservation of traditional crops and *ex-situ* conservation of wildlife, conservation biological data are accumulated and therefore the conservation of genetic resources and the return of extinct species to nature (EW) are promoted.

- ***Measures for threatened species***

To ensure the stability of the populations of the endangered species in their habitats is a prerequisite for the conservation of wildlife. However, the continuous changes of natural environment and in particular the destruction and fragmentation of natural habitats, due to over exploitation and overuse of resources, make the *in-situ* conservation and restoration of populations more difficult.

It needs *ex-situ* conservation of species and returning of propogated individuals to nature, including *in-situ* conservation. In this case, priority should be given to the assessment on the changes of the local biota by reintroduction of propagated individuals, and, while reintroducing, to how to restorate and arrange the environmental status for inhabitation of the species.

The "Law on the Conservation of Wild Animals" stipulates the measures for *ex-situ* conservation of threatened animal species.

In DPRK, some studies for *ex-situ* conservation of wildlife have taken, including national project for *ex-situ* of the crops and herbal resources.

Taking account for the importance of *ex-situ* conservation in biodiversity, it is neccesary to develop national plan in relation with *ex-situ* conservation and to take comprehensive measures to promote the activities including enhancing the roles of zoos and botanical gardens and strengthening the contacts between the gene conservation facilities

- ***Conservation in botanical garden and arboretum***

Botanical gardens and zoos have favorable conditions for the effective conservation of populations, where necessary experts and enough facilities and the possibility of individual breeding and cultivation are available.

In Pyongyang, there is the Central Botanical Garden in the area of 270 ha established in 1959, and each province has its botanical garden as well. Moreover, areas significant for biodiversity conservation (e.g. Mt. Oga, Yangdok and Ongjin Counties, etc.) have their own botanical gardens. Our country has 14 botanical gardens and 3 arboreta at provincial level, and 21 flower gardens at municipal and county levels.

The conservation of representative local species is the main aim of provincial botanical gardens.

In the Central Botanical Garden, more than 6,500 species of plants are being cultivated (2,500 species of them inhabit in our country). It serves in particular, as a breeding ground for "*Dendrobium Kimilsung flower*", bred in the Bogor Botanical Garden, Indonesia, and "*Begonia tuberhybrida Uoss cv. Kimjongilhwa*" bred by a Japanese horticulturist. It, also, has a herbarium with conserving capacity of 200,000 botanical specimens and the 'Plant Science Hall' for public education is under preparation.

Near around the Central Botanical Garden, there is an arboretum in the area of 280ha and over 500 species of arbores.

Recently promoted reconstruction and expansion of nurseries at county level are offering favorable conditions for the conservation of local arbores specific.

The development of artificial cultivation engineering for economical valuable threatened plant species is being intensively pushed forward at central and provincial botanical gardens.

- ***Ex-situ conservation in the zoos and aquaria***

The Central Zoo is located at the foot of Mt. Taesong in Pyongyang, adjacent to the Central Botanical Garden, with an area of 100 ha and more than 650 animal species. It has an aquarium and a research institute specialized in animal breeding and keeping. Each province has its own zoo at its seat.

Furthermore, there are breeding farms specialized in raising deer (*Gervus nippon*), musk deer(*Moschus moschiferus*) , bear(*Selenarctos thibetanus*) and pheasant.

The Central Zoo and Wonsan Zoo, the largest one at provincial level, are actively promoting the development of threatened species' artificial propagation engineering, and the establishment of species conservation system.

At the Central Zoo, progresses have been made in the propagation of some endangered species including Red crowned crane (*Grus japonensis)* and tiger (*Panthera tigris*).

In recent years, main fishery stations are really enthusiastic in building the artificial breeding farms of marine animals to improve the conditions of coastal fishing places and to stock them.

Activities for incubation and stocking of the main fish species with economic valuable have already been promoted.

- ***Ex-situ conservation via gene conservation facilities***

The number of species preserved in national agricultural gene bank totals 55,940 (41,700 kinds of grain crops, 10,900 of vegetables, 3,240 of industrial crops) in 2007 and the bank is undertaking the character analysis and registration of genetic resource.

It is important for the conservation of plant genetic resources to enhance the conservation capacity of existing crop gene banks and to establish an economical plant gene bank in the area of Mt. Taesong where plant and forestry research institutions are concentrated. It is also necessary to promote the research work on *in vitro* conservation, pollen/spore and DNA conservation and to provide the necessary conservation facilities.

Besides, for the conservation of microorganism strains and mushroom genetic resources, technical transfer for prolonging their storage life is indispensable.

1.3.3 Restoration and conservation of ecosystem

National Forest Resources Investigation during in 1999 to 2000 reported the destruction of many forests in the last decade, in special forests near the residential areas due to the food and energy shortages.

Under such circumstances, the government has promoted the improvement of the management of the rivers watershed in the 10-Year Plan for afforestation(2000-2010) and agroforestry in some reclamated cultivated fields near the residential areas and greatly formation of firewood forests. In addition, the national priority has been given to nature conservation of the natural protected areas and restoration of the degraded forest ecosystem in adjacent areas.

DPRK planted 890,000,000 trees in 1998 and 833,000,000 trees in 1999, performed river improvement in 6,600 km in 1998 and 3,000 km in 1999, and since then 80,000-90,000 ha are planting until now.

1.3.4 Conservation of rare and threatened species

The book " Red Data Book (animal)"was published in 2002, and "Red Data Book (plant)" in 2004. The book was catagoried with 183 rare and threatened species (36 species of mammal, 100 species of birds, 10 species of reptiles, 4 species of amphibia, 33 species of fishes), taking account for the criteria of IUCN, and discribed the status, distribution and natural life mode and issues in there conservation.

The investigation and studies of Balck faced spoonbill, the Asian endemic species, only bred in

DPRK with 1600 individuals in the world, made significant results for the conservation of rare and threatened species, and the field monitoring system on the population changes has been established.

The book "Red Data Book (plant)" was catagoried with 55 endemic species and 98 general species of vascular plants and discribed their status, distribution and natural life mode, and issues for their conservation.

Also, the natural protected areas and plant protected areas have been arranged by measures for biodiversity conservation, and the endemic plants (*Pentactina rupicola*, *Kumgangsania asiatica*, *Styrax japonica, Abeliophyllum distichum Nak*., *Abeliophyllum distichum Nak*., *Sasa coreana* etc.) the threatened plantsincluding *Kwanmobong Rheum coreanum* and precious natural monuments are preserved under the concrete measures for conservation of rare plants and economic plants.

1.3.5 Alien species

The Article 8 of the CBD stipulates that the alien species threaten to ecosystems, habitats and species should not be introduced and be eradicated or controlled.

To control the threats from invasive alien species is also incorporated into the 2010 Biodiversity Target.

As invasive alien species has high spreading ability, adaptability to environment and viability, they have high risk to cause genetic pollution, predation of and habitat concurrence with other species and ecosystem disturbance. In DPRK, the invasive alien species are threatening its specific ecosystems and species and also causing great damage to agriculture, stockbreeding and forestry.

DPRK had taken the overal investigation about the residential alien species before the publication of the book " Inventory and Impact Assessment of Alien species in DPRK" in 2009. The book introduced 226 species of spomatophyta in the northern part of DPRK with their homes, characters, distribution and influances, and issues for the management.

Pigweed (*Ambrosia artemisifolia*), the representative of invasive alien species, is notorious for its pollen that causes allergic diseases and for its threats to indigenous plant communities.

As for animal, *Lecidomja brachyntera* and *Matsucoccus pini* are major invasive alien species harmful to forest, and *Lissorhoptrus oryzopholis* to paddy rice.

The assessment on the impact of alien species to biodiversity of the whole country including protected areas is at the beginning stage. In particular in the field of fishery, assessment of the impact from the aquatic animals and plants introduced for higher productivity has been sparsely conducted.

1.4 Analysis of causes of Threats to Biodiversity and Biodiversity Loss

Causes of biodivesity loss are very complex, and mostly by human activities across the world. At present, biodiversity on the earth is faced with a series of threats, such as the destruction, fragmentation and degradation of ecosystem and depression of function of the global ecosystem thereby.

The main threats to biodiversity are population increase, habitat destruction, invasive alien species, environmental pollution and over-exploitation of resources.

The same holds truth in the case of DPRK, even though the impact of every factor varies considerably. In this context, the 3 main factors of threats to biodiversity in DPRK are over-use of natural resources, soil erosion and loss of water and habitat. Of course, the invasive alien species and environmental pollution also impact to a certain extent.

1.4.1 Over use of natural resources

The over- use of natural resources is closely related to population increase. Population density in DPRK is 180 per km^2, which is higher than that in China (131 per km^2).

The population increase causes the over- use of forest resources.

The area of the forest land in DPRK was decreased with about 6.8% in 2005 compared with in 1990, but the area of treeless land was increased into double in 2005 for in 1990.

The root cause is the increase in firewood use referred to the worsening of rural energy supply rather than cultivated area expansion, damage by fire and insect pest.

The current amount of firewood use per family in rural areas comes to 6-8m^3 a year and totals more than 7~8 million m^3/year all over the country.

The loss of medicinal plant resources is caused by the change in forest ecosystem and over-exploitation as well.

1.4.2 Loss of soil and water

The increase of treeless areas caused by the excessive use of forest resources deteriorates the ecological service of forest. In particular, the denudated sloping land increase the loss of soil and water, and exerts subsequently great influence to water ecosystem.

Almost 60 % of the annual precipitation of the country falls in summer (July-August), and some areas have rainfall due to topographical geography.

Therefore, without preservation of forest resources, it is difficult to halt the loss of soil and water and is almost impossible to prevent natural disasters.

Reclamation on the slope land for farmland also causes the loss of soil and water.

It is important for DPRK to improve the watershed management and to promote conservation agriculture, including agro-forestry management. Especially, it is urgent to prevent degradation of land for sustainable economic development as well as biodiversity conservation.

1.4.3 Loss of habitats

The existence of wild plants and animals greatly depends on the habitat conditions.

The 2010 Biodiversity Target stresses on mitigation of the destruction of ecosystems and habitats and reducing the rate of loss of genetic, species and community diversities that are the components of biodiversity.

The fundamentals of the habitat conservation of wildlife in DPRK are to:

- Stop the degradation of forest ecosystems and conserve forest biodiversity since 80% of the territory is mountainous;
- Conserve coastal biodiversity, as the country is peninsular, in particular diversity of coastal wetland ecosystems, where the transit areas of northeast Asian migratory birds are located;
- Conserve agro-biodiversity on the farmlands that account for about 17% of the country's territory.

The destruction of forest ecosystems causes the fragmentation of wildlife habitats and consequently the rapid disappearance of large animals like *Ursus aritos* and *U. tibetanus.* The deterioration of river ecosystem, consequent upon forest destruction, exerts negative influences on the existence of threatened mammals such as otter (*Lutura lutura).*

The coastal wetland is an ecosystem with very high biological productivity which has important environmental protection function such as flood control and water purification, etc.

Large body of *Grus japonensis, G. monacha* and *G. vipio* that are globally threatened species which requires the conservation of wide areas of wetland, hence, the impact of wetland loss on the existence of cranes is really great.

In addition, about 20% of the global populations of *Anas cygnoides* and 10% of *A. formosa* inhabit at the estuary of the Chongchon River of the Korean West coastal area on the East Asia-Australia flyway.

The main threatening causes to protected birds are:

- Reclamation of tideland into farmland;
- Over- exploitation of aquatic plants like reed and *Typha orientalis*;
- Habitat destruction and disturbance by the unsustainable use of feed animal resources for bird, like *Nereis japonica.*

1.4.4 Other factors

Pollution, invasive alien species and climate change are also the threatening factors to biodiversity in DPRK.

Since DPRK can be divided into 38 watersheds, along which most of cities and industrial districts are arranged, satisfactory purification should be applied to industrial and household wastewater, otherwise there might be risk of pollution of water resources. Densely populated residential districts are subject to the eutrophication of water resources.

Alien species, especially invasive ones, greatly impact to the local biodiversity.

As for animal, *Dryocosmus kuriphilus* and *Matsucoccus pini* migrated from north and *Lecidomyia brachyntera* and *Lissorhoptrus oryzopholis* from south have inflicted great damage to forestry and agriculture. *Ambrosia artemisfolia* can be cited for plant. Introduction of alien species should be seriously considered.

For the biodiversity conservation in DPRK, the attention should be paid to acid rain and sandy dust from neighboring countries.

The impact on biodiversity by climate change becomes serious.

Average precipitation during the past decade has decreased to 89% and 93% of average one of the past 80 years (1921-2000) and 30-years one (1971-2000), respectively.

On the other hand, changeable weather caused the flood damages in 1995 and 1996. Especially, since the country has a high precipitation during summer, about 60-70% of annual one, and the areas of heavy rainfall topographically coincide with upper/middle areas of large rivers, inappropriate watershed management might result in catastrophic disasters.

Temperature is raising and evaporation is getting greater. Average temperature of the past decade has increased by 9% and 4.3% respectively compared with the average one of the past 80 years (1921-2000) and 30 years (1971-2000). Quantitative assessment should be performed on the impact of biodiversity by climatic changes.

CHAPTER 2. CURRENT STATUS OF THE IMPLEMENTATION ON NATIONAL BIODIVERSITY STRATEGY AND ACTION PLAN

Article 6(a) of the CBD calls upon Parties to develop national strategies, plans or programes for the conservation and sustainable use of biological diversity. As well, a series of decisions at COP 8 in 2006 requests parties to submit information on particular strategic approaches through the national reporting.

This chapter highlights the current status of national policies, plans, strategies and legislations relevant to the CBD. It also provides overviews of the efforts to plan for biodiversity conservation and of the implementation projects that have been undertaken to protect biodiversity.

2.1 National Biodiversity Strategy and Action Plan

In pursuance of the CBD, DPRK had developed a National Biodiversity Strategy and Action Plan in 1998 with the support from UNEP/GEF.

The preparation of NBSAP involved experts from State Academy of Sciences, Ministry of Land and Environment Protection, Ministry of Agriculture, Ministry of Forestry, Ministry of City Management, Ministry of Fishery, Ministry of Public Health, Ministry of Education, Ministry of Finance and Korean Nature Conservation Union.

The National Strategy and Action Plan includes the strategic issues and actions for carrying out the priorities in biodiversity conservation, its sustainable use and benefit sharing in order to protect the ecosystem and fully implement its obligation of the party to the CBD.

After the development of the NBSAP, DPRK has still face the challenges such as the decrease in forest resources, deterioration of ecosystem and environment, unsustainable use of biological resources due to the difficult economic conditions.

Under this circumstance, for the promotion of the perfect implementation of the CBD, DPRK has continuously taken several national measures and activities including the expansion of protected areas, improvement of watershed management and the development of agricultural production, through which the national framework for bio-safety has been established.

For the further conservation and sustainable use of biodiversity in accordance with the requirement of the sustainable development in the new millennium, the Government of DPRK, based on the analysis of the past decade, has updated the NBSAP with the support from UNEP.

The NBSAP which has been developed in consultation with various stakeholders, attempts to

identify threats and constraints in biodiversity conservation. Taking cognisance of the existing legislations, implementation mechanisms, strategies, plans and programs, action points have been designed so as to integrate biodiversity concerns into various other sectors. The attempt has been to make the NBSAP consistent with the ecological, social, cultural and economic mosaic of the country and provide a focus and impetus to the current efforts towards biodiversity conservation.

In pursuance of the Article 6 of the CBD, the NBSAP was formulated concentrating upon the following subjects in 1998:.

- Establishment of the protected area system including the key areas, significant in the biodiversity conservation and improvement of its management.
- Restoration of ecosystem damaged by natural disasters, and integration of biodiversity conservation plans into land use programme
- Bio-resource creation and establishment of the system for its sustainable use;
- Reinforcement of the laws and regulations on biodiversity conservation
- Intensified scientific research on biodiversity conservation
- Training of the experts and technicians in the field of biodiversity

The updated NBSAP has reviewed and analyzed the national activities done for the implementation of the CBD in the last decade and indicates the further activities for the conservation and sustainable use of biodiversity in the coming 10 - 15 years at least, considering the decisions from the 4^{th} -8^{th} meetings of the Conference of the Parties.

The long-term objectives of the national biodiversity conservation strategy are:

- Enhance the conservation function of protected areas including nature reserves, and establish the protected area networks for a complete national protected area system;
- Promote the civilized and rich life of the present and coming generations with the benefits from biodiversity by establishing a system of sustainable use of biodiversity components.

DPRK has put forward the strategic target which promotes the economic development in a sustainable manner harmonized with the resources, environment and industry by means of giving precedence to conservation, improving overall eco-environment, concentrating on priority activities and using resources in a reasonable and sustainable way and identified the following priority actions:

- Establishment of national protected area system and capacity-building for its management
- Planning and designing of the national protected area network
- Biodiversity conservation in Mt. Kumgang and Mt. Chilbo Natural Parks and their management
- Preparation of Wetland Action Plan and restoration of degraded wetland ecosystem
- Updating the “Red Data Book” and capacity-building for the conservation of threatened species
- Conservation of Black-faced spoonbill and cranes

- Community- based conservation and management of wildlife
- Capacity building for ex-situ conservation of genetic resources
- Capacity building for National Biosafety Management Centre (NBMC)
- Restoration of degraded forests and improvement of watershed management
- Demonstration for the forest biodiversity conservation and its sustainable management
- Popularizing the agro-forestry management
- Establishment and dissemination of environmentally friend farming system
- Combination of organic farming and agricultural biodiversity conservation
- Increment of coastal aquatic resource and its sustainable use, and establishment of the monitoring system for coastal biodiversity
- Conservation and sustainable use of widely used traditional Koryo medicine resources
- Establishment of eco-observation stations and observation network for the improvement of terrestrial ecosystem management
- Establishment of national biodiversity information system
- Preparation of biodiversity conservation plan at the provincial level
- Strengthening the education, training and public awareness for biodiversity conservation

The updated NBSAP is a milestone for DPRK in implementing the requirements of the CBD, and contribute to the biodiversity conservation in DPRK and the world as well through the implementation of Action Plan. .

2.2 Relations of the NBSAP with other international conventions

After the UNCED in 1992, DPRK acceded to the Convention on Biological Diversity (CBD) and UN Framework Convention on Climate Change (UNFCCC) in 1994, and joined the UN Convention to Combat Desertification (UNCCD) in 28th March 2004 and undertook the national activities for the Agenda 21 Action Plan and sustainable development and global environmental management.

The National Capacity Needs Self-Assessment (NCSA) project had been implemented in DPRK from July 2004 to November 2005 with support from UNEP. The Project aimed to assist in enhancing national institutional framework through strengthening of linkages and coordination mechanisms leading to more efficiency in response to meeting the global environmental challenges.

The NCSA assessment report provided the cross-cutting capacity constrains of 3 conventions and the following capacity building priorities:

- Simultaneous implementation of plantation and management of forest resources and introduction of renewable energy in rural areas
- Monitoring network for observing biodiversity components and land status
- Regular renewal of national development system for preparation of an inventory of anthropogenic emissions by sources and removals by sins of all greenhouse gases.

- Development of technologies for organic farming, eco-farming and their application.
- Identification of criteria, indicator and method for EIA.
- International cooperation and exchange for the implementation of Rio Convention in training, technical transfer, information exchange and planning

The national strategy for capacity development under NCSA is summarized in the form of six goals:

- Establish effective institutional framework for implementing the Rio Conventions
- Develop information system for environmental management
- Develop operational methodologies and tools for implementing the Rio Conventions
- Expand technology transfer and development for environment management,
- Strengthen environmental education and the human resources development
- Increase public awareness of environmental issues.

As one of the parties of CBD, UNFCCC, CCD, DPRK aims to evaluate the activities for capacity building, identify priorities and needs for political, social-economic and ecological capacity building and raise the national, regional, and global benefits and therefore is actively engaged in implementing its outcomes.

2.3 National Legislations, Policies and Plans relevant to CBD

The Article 57 of the "Socialist Constitution of DPRK" stresses the importance of the state role in environmental protection.

The "Law on Environmental Protection" is the main law for the environmental protection in DPRK (issued on April 9, 1986, revised and supplemented on March 4, 1999 and July 4, 2000).

Important laws relevant to the conservation of environment and biodiversity are as follows:

"Law on Land" (1997)

"Law on Public Health" (1980)

"Law on Customs" (1983)

"Law on Forest" (1992)

"Law on City Management" (1992)

"Law on Construction" (1993)

"Law on Underground Resources" (1993)

"Law on the Protection of Cultural Relics" (1994)

"Law on the Protection of Scenic Spots and Natural Monuments" (1995)

"Law on Fishery" (1995)

"Law on Hygienic Quarantine" (1996)

"Law on the Boundary Inspection of Animals and Plants" (1996)

"Law on Trade" (1997)

"Law on Quality Supervision" (1997)
"Law on Veterinary Quarantine" (1997)
"Law on the Prevention of Marine Pollution" (1997)
"Law on Water Resource" (1997)
"Law on Fish Farming" (1998)
"Law on the Protection of Useful Animals" (1998)
"Law on Agriculture" (1998)
"Law on Public Hygiene" (1998)
"Control Law on Land and Environment Protection" (1998)
"Law on Science and Technology (1998)
"Law on Lock Gate" (2001)
"Law on Rivers" (2002)
"Law on Land Planning" (2002)
"Law on Mt. Kumgang Tourist Area" (2002)
"Law on Fruit Farming" (2002)
"Law on City Planning" (2003)
"Law on Provenance" (2003)
"Law on Medicinal Plants" (2004)
"Law on Bio-safety" (2004)
"Law on the Prevention of the Pollution of River Taedong (2005)
"Law on Environmental Impact Assessment" (2005)
"Law on Organic Industry" (2005)

In recent years, various sectoral and thematic laws, regulations and detailed rules for the conservation of environment and biodiversity have been legislated and in particular, recognizing the important position and role of protected areas in the biodiversity conservation, the "Law on Nature Reserve" is now preparing in DPRK. But further reinforcement of legal system is expected for the conservation of eco-environment and biodiversity.

Although there are laws and regulations closely related to biodiversity conservation, DPRK has no laws on the conservation of wild plant and threatened species and the comprehensive biodiversity conservation and therefore, still some challenges remained.

In this context, it is necessary to supplement the relevant laws and regulations and take the measures to strictly keep them for the biodiversity conservation and its sustainable use.

2.4 The National Biodiversity Action Plan – Progress in Implementation

2.4.1 Strengthening In –situ and Ex-situ conservation

In- situ conservation is key goal of the NBSAP.

The National Biodiversity Strategy and Action Plan has the target to expand the protected area by 8% of the whole territory by 2010 and reached to 879,275ha, occupying 7.2% of the territory in

2006.

DPRK has taken certain steps to establish a system of protected areas and ensure their management recognizing the great importance of protected areas which support the main ecological processes, represent rare and endemic species and preserve and protect historical and cultural property.

In line with the proclamation of laws and regulations on the habitat conservation, national measures including regular explanations of law and regulation are being undertaken to raise the public awareness and to establish the atmosphere of law observance.

National laws related to the habitat conservation are as follows:

"Law on Environment Protection" (1986),

"Law on Forest" (1992),

"Law on Protection of Scenic Spots and Living Monuments" (1995)

"Law on Land" (1997),

"Law on Conservation of Useful Animals" (1998),

"Law on Medicinal Plants" (2004),

"Law on Land Planning" (2005),

"Law on Environmental Impact Assessment" (2005)

Researches on the species, ecosystem diversity in the key areas of biodiversity was adapted as one of the focal task of the 5-Year Development Plan on Science and Technology (2003-2007) and successfully conducted resulting the quantitative assessment of the current status of the main reserves including Mt. Paektu Biosphere Reserve, Mt. Kuwol BR and Mt. Myohyang BR and provided the scientific bases for the reserves management.

The guideline for the establishment of reserve and its zonation has been developed to design and manage the protected areas for the conservation of eco-environment and sustainable use and the activities to review the zontion of Mt. Paektu BR and its identification are now on going based on the guideline.

The Mt. Myohyang Natural Park was designated as 3rd International Biosphere Reserve in DPRK in May 2009 and nominated at the World Biosphere Reserve Network.

The practical measures to improve the conservation of coastal ecosystem have taken through the successful implementation of the UNEP/GEP project "Coastal Biodiversity Management in the Korean West Sea" in 2005-2007 which aimed to improve the biodiversity conservation at the lower reach of Chongchon River and coastal area of Korean West Sea where the Mundok Migratory Bird Reserve, the main habitat and transit area of migratory birds located.

The project "Crane Restoration at Anbyon and Construction of Community –based Protected Area" is now successfully implementing with the assistance from Birdlife International and International Crane Foundation since April 2008 to create the demonstration of the local biodiversity conservation and community- based reserve management integrating the agriculture and sustainable development in local area through the habitat restoration of Red crowned crane, the

threatened species of the world.

Actions needed to be carried out for in- situ conservation:

- Develop the low on designation and management of the protected areas and build the capacity for reserve management
- Encourage the local government and people to actively participate in the reserve management and establish the protected area network
- Encourage environmentally sound development in buffer zones around protected areas
- Strengthen the scientific research on protected areas and provide the long-term biodiversity observation facilities and their proper operations.

The NBSAP highlights the need and importance of Ex-situ conservation and the "Law on Protection of Wild Animal" defines the protection measures for ex-situ conservation of animal species under the threat of extinction.

In DPRK, progresses have been achieved in ex-situ conservation of wildlife, in line with the nationwide measures for the conservation of traditional crop and medicinal plant resources.

The Central Botanical Garden which plays important role in ex-situ conservation has performed the research and experimental works on the breeding of Korean endemic species including *Keumkangsania asiatica, Pentactina rupicola Nak., Forsythia ovata Nak, Abeliophyllum Nak., Stewartia Koreana Nak*. etc.

And the researches to return the endangered species including *Rheum coreanum* to nature are under implementation at the Central Botanical Garden, Institute of Botany, State Academy of Sciences and its experimental stations.

At the Central Zoo, progresses have been made in captive breeding of endangered species including Korean tiger (*Panthera tigris*), Bear (*Selenarctos thibetanus),* Water deer (*Hydropotes inermis),* Red-crowned crane (*Grus japonensis*) and White –naped crane (*Grus vipio*).

Wonsan Zoo, the largest one at provincial level plays the important role in the protection of bird species of Korean East Sea.

Not only the Central Zoo but also the Central Botanical Garden and others in provincial level are actively promoting the artificial breeding of animal and plant species and their returning to nature.

In addition to this, the fishery stations are really enthusiastic in building artificial breeding farms of marine animals to improve the conditions of coastal fishing places and to stock them.

Actions needed to be carried out for ex- situ conservation:

- Strengthen the ex-situ conservation facilities and management capacity
- Promote the technical exchange and cooperation with foreign countries
- Pay more attention to improve the method, technology and facilities for ex-situ conservation
- Promote co-operation in providing financial and other support for ex-situ conservation

2.4.2 Intensifying biodiversity survey and monitoring

The identification and monitoring of the components of biodiversity constitute the basis of the Millennium Ecosystem Assessment and establishing the regular and irregular monitoring system on the current status of biodiversity and its change becomes urgent issue in biodiversity conservation and its sustainable use.

The NBSAP of DPRK highlights the need for developing wildlife inventories and monitoring them and the establishment of nationwide reserve network. Issues on constant observation, controlling and analyzing the ecosystem components and providing a database on nature have been legalized in the "Law on Environmental Protection", "Law on Protection of Useful Animal", "Law on Environment Impact Assessment" and "Law on Medicinal Plant"

DPRK has striven to establish the monitoring system for the investigation on major ecosystems and key species.

The government has a plan to conduct the nationwide forest investigation every 10 years and implemented the investigation on forest across the country in 2000.

Since July 2008, the national investigation on wild animal resources is now proceeding.

The comprehensive investigation on the threatened species including White-bellied black woodpecker (*Dryocopus richardsi*), Black faced spoonbill (*Platalea minor*), Red crowned crane (*Grus japonensis*) and otter (*Lutra lutra*) were conducted in 2006 – 2009.

The field survey on the main nature reserves had undertaken throgh the implementation of the UNESCO funded project "Development and publication of data book "Natural Reserves in DPRK", and the improvement of their management capacity" and as a result, the book "Main Protected Areas in DPRK" and " List of Animal and Plant in the Main Nature Reserves were published and disseminated in 2005-2006.

In 2006, in collaboration with the relevant institutes under the State Academy of Sciences, the "Vegetation Cover Map of DPRK" was developed and, after that, in 2007, "Biosphere Reserve Atlas of DPRK" was published with the support from UNESCO and disseminated to the concerning agencies and reserves which helped the management of the reserves in scientific and rational way.

What is important for identification and monitoring on biodiversity in DPRK is to make the regular investigation system on main ecosystems, key species and significant genetic resources, to collect the information and build database and to manage it adequately.

The regular or irregular monitoring on the biodiversity components are done by the concerning institutions under the State Academy of Sciences, Ministry of Land & Environmental Protection (MoLEP), Ministry of Forestry and Ministry of Fishery.

In order to manage and share the information concerned with biodiversity, investigated and collected from the relevant agencies, the Biodiversity Clearing House (BCHM) was established at the Centre for Biodiversity under the State Academy of Sciences in the period of project implementation funded by UNEP/GEF.

It is important for DPRK to establish the monitoring and information systems to prevent

over-exploitation of forest, over-cutting of trees, insect pest control, over-use and pollution of marine resources.

For the further implementation of identification and monitoring of biodiversity, it is necessary to reinforce the relevant biodiversity monitoring network including forest and eco-agriculture monitoring network and establish the national system to provide the interrelationship of each section and to establish the systems for sharing biodiversity information by enhancing the training and exchange, and to provide technical and financial guarantee for the full operation of the established system.

2.4.3 Strengthening the conservation and sustainable use of components of biodiversity

Sustainable use of biodiversity components is vital to sustainable development of economy and eco-environmental protection.

Sustainable utilization of the biological components has been put as the main objective in the Agenda 21 Action Plan, National Biodiversity Strategy & Action Plan and other relevant laws and programmes which have created the legal basis and regulated the relations on sustainable use of natural resources.

In recent years, the government of DPRK, taking into consideration of the decisions of the World Summit on Sustainable Development, took a series of national measures for the conservation of biological diversity and the sustainable use of its components.

It is most urgent to promote the actions to conserve forest biodiversity and raise the function of eco- service of forest, since the forests are damaged by recent economic difficulties of the country,

Therefore, the government of DPRK has put forward the policy for afforestation and gardening the whole country to increase forested area and improve the structure and ecological function of the forest. Nationwide campaign for implementing this policy has been strenuously promoted.

The Central Nursery managed by the Ministry of Land and Environment Protection (MoLEP) has increased 100ha more in its area and 400,000 seedlings more in seedling production capacity compared with 2006. The creation of firewood forests (total area of 800,000 ha) for solving the issue of firewood shortage, which is the main cause of forest deterioration and soil degradation, is being promoted by MoLEP.

The restoration of destroyed ecosystem in DPRK is one of great issue in biodiversity conservation and its sustainable use, as the forests near the residential areas and reserves are damaged due to the continuous natural disasters, food and energy shortages. Therefore, the government gives priority and is actively engaged in the restoration of the degraded forest ecosystem of the valuable areas in implementing 10 Year plan for afforestation which includes the improvement of watershed management and promotes the agro-forestry at slope land areas.

Since 2003, the Ministry of Land &Environment Protection has implemented the slope land management project supported by SDC which aims to contribute to the ecologically sustainable, economically viable and socially accepted management of sloping land and as a result, the

experiences and best practices achieved in the agro-forestry management are widely disseminated.

The 1st and 2nd National Workshops on Agro-forestry Management held in July 2008 and October 2009 provided very good opportunities to exchange the information and sharing the ideas for the development and introduction of agro-forestry technologies.

The book "Technology of Agro-forestry" which contains the main theories and principles of agro-forestry and slope land management was published and disseminated to raise the public awareness.

In 1998, the Ministry of Agriculture (MOA) prepared the strategy and action plan for the conservation of agricultural eco-environment and sustainable agricultural development, and tries its efforts to carry out it.

The agricultural ecosystem in DPRK is the one directly related with the agricultural production critical in the country and greatly impacted by human activities, which is important in terms of sustainable development of agricultural production and conservation of biodiversity.

The Ministry of Agriculture is striving to promote the establishment of an intensive and safe agricultural production system to conserve the regional biodiversity by improving crop cultivation structure and introducing organic farming method in conformity with the specific characters of the farmland.

In order to enhance the soil fertility and ensure the food security by introducing the organic farming and other free chemical farming method in line with the current trends of agricultural development, the activities to introduce the cycling production system combined with agriculture and livestock and organic farming by mud snail are promoting across the country. In addition to this, the technology for agro-forestry is widely applied to prevent the soil erosion and use the land effectively.

It also exert its effort for the promotion of good varieties and bean farming, preservation of agricultural gene resources, production of bio-fertilizers, enforcement of plant quarantine, especially the control over the genetically modified crops.

The conservation and sustainable use of inland water, coastal and marine ecosystems are very important in DPRK which is surrounded by sea on two sides with dense drainage network.

In this context, the Ministry of Fishery (MOF) and the Bureau of Pisciculture are actively engaged in expanding inland water fish farming and development of coastal cultivation, inter alia of seaweed.

In compliance with the legal requirements of the "Law on Fishery" (1995) and the "Law on Fish Farming" (1998), state control for the conservation of aquatic resources has further strengthened.

Considerable successes have been achieved by converting the fishery which only catches fish into cultivating in consideration of the current economic conditions.

It has set out every April and July as the "Marine Resource Protection Month" and performs the activities to protect and increase marine resources and fish farming in a nationwide campaign.

In DPRK with limited area for cultivation, the main direction of fish farming development is to make best use of natural feeds and to expand the multidimensional fish breeding.

2.4.4 Preventing and controlling invasive alien species

The 2010 Biodiversity Target also highlights the controlling the treats from invasive alien species.

In DPRK, the invasive alien species are threatening its specific ecosystems and species and also causing damage to agriculture, stockbreeding and forestry.

DPRK has established its legal and institutional framework to prevent the introduction of invasive alien species by enacting the "Law on Quarantine of Animal and Plant at Borders" (1997), "Law on Veterinary Quarantine" (1997), "Law on Hygienic Quarantine" (1996) and "Law on Bio-safety"(2004).

The country controls and restricts introduction of invasive alien species and makes efforts to check the damage from the species that have already been introduced. Especially extermination of the species that have a negative impact on the ecological environment is undertaken on a nationwide and all-people campaign.

At present, the invasive alien species is checked by the Central Plant Prevention Center and Central Veterinary Prevention Center under the Ministry of Agriculture (MOA) and the customs at boundaries of the country.

The National Committee for Emergency Quarantine has the functions of arranging collaboration between sectors at every stage of checking, early warning, control and eradication of invasive alien species and of rapidly corresponding to emergency.

According to the data surveyed so far, about 60 wild alien species of plant have been rooted in DPRK. Pigweed (*Ambrosia artemisifolia*), the representative of invasive alien species, is notorious for its pollen that causes allergic diseases and for its threats to indigenous plant communities.

Lecidomja brachyntera and *Matsucoccus pini* are major invasive alien species harmful to forest, and *Lissorhoptrus oryzopholis* to paddy rice.

The comprehensive assessment of the impact of alien species to biodiversity of the whole country is at the beginning stage. Particularly, in the field of fishery, impact from the aquatic animals and plants introduced for higher productivity has not been fully assessed.

Recognizing the risk and threats of the invasive alien species for the conservation of biodiversity and eco-environment, the National Committee for MAB, published and disseminated the book " Inventory and Impact Assessment of Alien Plants in DPRK" to raise the public awareness on the alien species in 2008.

The State Emergency Anti-Epidemic Committee and the anti-epidemic offices at all levels take the measures to control the avi-flue, one of the world concerning issues and promote the research and development of medicines to prevent and treat avi-flue.

Followings are suggested to be priorities for the conservation of ecosystem, habitat and species:

- Prepare overall inventory of alien species in the country to evaluate their eco-environmental and economic threats;
- Enhance the monitoring capacity on invasive alien species;

- Reinforce the relevant legislations;
- Establish a national database on alien species;
- Raise public awareness on the impact of alien species;
- Strengthening the training of experts.

2.4.5 Strictly controlling pollution and ecological damage

The Government of DPRK has taken necessary measures for all regional plans and construction programmes including the Master plan for Land Development attaching high priority to the important role of environmental impacts which ensure the prevention of potential adverse impacts such as the destruction of biological diversity, air or soil pollution.

DPRK has been constantly taking measures to decrease or eliminate the factors that are likely to have adverse impact on land and environment through the legislation of following laws:

"Control Law on Land and Environment Protection" (1998)

"Law on Construction" (1993)

"Law on the Prevention of Marine Pollution" (1997)

"Law on Land Planning" (2002)

"Law on City Planning" (2003)

"Law on Preventing Pollution of Taedong River" (2005)

Relying on these legal bases, DPRK formulated the "Law on Environmental Impact Assessment" in 2006 to assess the environmental impact of the several national economy plans including construction in advance.

Attaching high priority to eliminate the adverse impact on people's living circumstance by all kinds of construction development in EIA, the Government prepares EIA report and implements it by taking thorough measures in advance not to damage the ecological function of natural environment in nature reserves and areas significant of water resource conservation including reservoirs in rivers and lakes.

In accordance with " Polluter payment basis ", the polluters like factories/ plants and enterprises polluting the rivers and streams are attended with legal controls on a firm basis, while by means of mass media like radio, newspapers and newsletters. The efforts are keenly directed to raise more public awareness for protection of the water resources.

In DPRK, it is very important to keep the state standards which have already been formulated for the prevention of environmental pollution. The assessment of the adverse impact to ecological health and security and ecosystem services should be conducted to promote the environmentally sound development of the local areas.

In this context, the public education and awareness on EIA should be implemented as a prerequisite for the voluntary observance of state laws and regulations.

2.4.6 Strengthening the management of genetic resources

The Government of DPRK indicated the direction and ways for investigating and collecting the

genetic resources in the country and making effective use of them in the development of the national economy and makes it as a national policy and vigorously promotes its implementation.

It also actively engaged in the activities to collect, preserve and study on the apicultural genetic resources to develop the breeding of new varieties with high resistance and productivity putting forward the seed revolutionary policy to increase the crop yield.

The 2nd 5-Year Development Plan for Science and Technology included and successfully implemented the research projects for protecting and increasing the genetic resources of farming crops, plants of economic value, animals, forest and other genetic resources of the country and making effective use of them in the economic development.

The activities for plantation and greening the whole country have been undertaken through a nationwide movement and the great attention is paid to the preservation of forest genetic resource including quick growing trees.

Genetic resources of various living organisms from FAO and other international organizations and research institutions, foreign botanical gardens and zoos are preserved and used in the country.

The biological genetic resource research centers including the Crop Gene Resource Center, Institute of Crop Variety under the Academy of Agriculture are now working with the protection, proliferation, development and utilization of the biological genetic resources and collect and preserve the genetic resources from the other countries.

The investigation and recording of the plants gifted by the other countries have been conducted since 1970s and resulted in publishing the book about the gifted plants in 2008.

2.4.7 Improving scientific research and training

The Government of DPRK attaches great importance to develop the scientific research necessary to achieve biodiversity conservation.

The 2nd 5 - Year Development Plan for Science & Technology in 2003-2007 and 3rd 5 - Year Development Plan for Science & Technology in 2008-2012 incorporate the building of powerful nation with an economic structure based on sustainable natural resource utilization.

The key biodiversity research areas in DPRK are the conservation of biology, restoration of degraded forest ecosystem and development of biosafety technology.

The research projects are successfully implemented on the population of animal and plants, their ecological characters, ecosystem assessment and impact assessment on biodiversity.

The main research projects are;

- Ecological study for the improvement of agricultural environment in paddy field area of Korean West Sea
- Assessment on the animal and plant species and ecosystem in the key areas of biodiversity
- On the species diversity of plant of Mt. Keumgang
- On the Species diversity of bird and its migration in the area of West Sea Barrage
- On the α and β diversity of plant community in the upper stream of Amnok River of Mt. Paektu area

The researches on the main protected areas of the country have been conducted to improve the function and management of reserves which contribute to the establishment of national reserve network. The representative studies are:

- On the ecological assessment of the main protected areas and improvement of their management
- Is it possible to extend the core area in the coastal ecosystem of Mt. Kuwol Biosphere Reserve?
- On the design of migratory bird reserve

The data on the higher plant species of the country were investigated and collected through building the database of species diversity of Korean higher plants.

During these period, many books including “Mt. Kwol Biosphere Reserve”, “Biological Species and Their Distribution in Mt. Paektu”, “Ecological Engineering”, “Fauna of Korea” , “Endemic Plants of Korea”, “Water birds of the Coastal Area of Korean West Sea”.

At present, the research projects including “On the assessment, conservation and sustainable use of biodiversity of wetlands”, “On the conservation of ecosystem of main nature reserves” have been adapted as the state focal tasks for 3rd 5-Year Development Plan for Science &Technology and successfully undertaking to evaluate, restore the damaged ecosystems, vulnerability, change and impact by climate change and its mitigation method.

Training and re-training on the national professionals in the up-to date methods for conserving biological diversity is also important.

National workshop on biodiversity conservation, strengthening protected area management, environmental impact assessment, and environmental law enforcement are regularly organized every year by the Korean Nature Conservation Union involving representatives from all levels of both central and local organizations. In the national workshops, the successes and experiences, achieved in the activities of biodiversity conservation, eco-environment conservation, nature reserve management and the research papers on the prevention of forest fire, effective insect pest control, reuse of industrial wastes and its purification, reasonable use and management of water resources, prevention of soil erosion and increasing of the soil fertility were presented.

The pamphlet “Guide Book for Rangers” was published and disseminated for the officials and rangers in the field of nature reserves to raise their capacity.

2.4.8 Enhancing public participation and environmental awareness

Public education and awareness on biodiversity-related issues are actively conducted in the DPRK through TV, radio and other mass media, festivals, celebrations and other various occasions.

In particular, programmes related with biodiversity and environmental protection by TV channels play an important role in giving correct knowledge on biodiversity to broad masses of the people: “*Afforestation and Seedling Production*” and “*Let Us Prevent the Damage from Pine Caterpillar*” and other scientific films on biodiversity and its sustainable use are produced in recent years and broadcasted. In addition, “*Let Us Plant Many Hybrid Trees”, “White bellied woodpecker”*

and other scientific films which were already broadcasted have been rebroadcasted on several times: number of their broadcast reaches hundreds of times during 2006 - 2009.

" *Multi-functions of Forest*", "*Planting Method in Autumn*", "*Eco-environment and Human Life*", " *Global Warming*" and other programmes of common knowledge on biodiversity conservation and global warming were newly produced and programmes on the protection, cultivation and use of biological resources, like stock breeding, fish farming, mushroom and medicinal herbs, on land, climate, forestation, for example, "*Bio-fertilizer*", "*Valuable Marine Resource- Ahnfelt's seaweed*", "*Production of Bio-gas and Its Use in Rural Family*" and "*Mushroom Profitable in Cultivation*" have been broadcasted or rebroadcasted on TV; about 2310 times in the report period.

Education on biodiversity is activated through such newspapers as *Rodong Sinmun*, *Rodong Chongnyon, Pyongyang Sinmun* and *Minju Jonson* and the journals. The examples are; the *Rodong Sinmun* carried materials related with biodiversity hundreds of times every year, like the editorial, *The Environmental Protection is the Urgent Common Task of Humanity* (June 5,2007), *Impact on Eco-environment by Climate Change and Its Preventing Measures* (April 19, 2008), *Let Us Plant Even One More Tree for the Future of Powerful Motherland* (March 2009), *in Pyongyang Sinmun*, articles on positive examples, *Let Us Plant More Trees* (March 2, 2006) and *Let's Bring About a New Turn in Land Management with Patriotic Mind* (April 9, 2003), *Produce Many Quick Growing Seedlings* (March 26, 2009), the article for public awareness, *Reserves in Our country* (March 18,2009), articles on common knowledge, *International Day of Environment* (June 5, 2008).

For the public awareness raising through books and, journals, the books and pamphlets such as "Common *Sense on Plant for Everybody*", "*Animal in Medical Use*", "*Secret of Animal World*", "*Pant and Health*", "*Interesting Story about Animal*" and "*Interesting Common Sense on Plant and Animal*" were published and disseminated.

On the occasion of "Environment Day", "Earth Day" and "Day of Biodiversity", and "Tree Planting Month", "Bird-Loving Month", "Animal Protection Month", the programmes were shown through newspapers and TV and educational and propaganda activities were conducted.

The universities and educational institutions have increased the lectures on biodiversity and environmental protection and give the lectures on the world trends, status and direction of research and development.

And the newly published textbooks and references including "Use of Economic Plant Resources"(2007), "Breeding of Economic Plant"(2007), "Mushroom Dictionary"(2008), "Bio-geography"(2009), "Biological Taxonomy"(2009) and "Common Sense on Plant and Animal for Kindergarten Teachers"(2009) greatly contributed to the improvement in education and knowledge of the students.

2.4.9 Promoting international cooperation

DPRK has ratified the international environmental conventions including the Convention on Biological Diversity, the Cartagena Protocol on Biosafety, United Nations Framework of

Convention on Climate Change and Convention on Combating Desertification and tried all means to fulfill obligations as specified by these conventions.

GEF-funded projects, "Coastal Biodiversity Management at the Korean West Sea" (2003-2006) have been undertaken in DPRK for the implementation of CBD through which the considerable progresses were made in the management of protected areas and the conservation of wetland ecosystem biodiversity.

In 2006-2008, FAO supported the project for plantation and conservation of agricultural production at plain areas in DPRK promoting the demonstration of watershed management, protection of riversides and agro-forestry management. On the other hand, several projects for conservation agriculture have been supported by WFP and other projects for seed improvement, food supply, pest control, grazing and small-scale animal husbandry by international organizations including UNDP.

EU Aids projects have been implemented; the representative one is "Food Security in Slope Land and Improvement of Peoples Livelihood" in 2007-2009.

The project "Slope Land Management in Suan County" developed in 2003 and implemented in 3 stages with the support from SDC can be cited as an example of bilateral cooperation in the field of biodiversity conservation and its sustainable use. The project aims at the demonstration of agro-forestry management.

Agriculture-related cooperative projects have also been promoted energetically. The representatives are "Introduction of Organic Farming and Green Manure Crops" by the American Friends Service Committee (AFSC); "Grassland Creation, Goat Rearing and Milk Processing" by the Campus for Christs (LAMPAS); "Operation of the Environmental Information Centre" by the Environmental Education Media Plan (EEMP).

In 2006, the strategic framework for the cooperation between DPRK and United Nations (2006-2009) was developed, in which the biodiversity-related environment management was considered to comprise the development of environment-concerned laws, strategies and programs, capacity-building, sustainable use of environmental resources, prevention of environmental pollution and ecosystem management.

Taking the strategic framework into consideration, the arrangement of domestic conditions, active information exchange and more regular and harmonious contacts with international and regional organizations are vital for the promotion of international cooperation with respect to the conservation and sustainable use of biodiversity. Through the international cooperation, access to and transfer of advanced technologies, technical and scientific cooperation, expert training and inter-governmental exchange should be promoted in accordance with the requirements of the Articles 16 and 18 of the CBD.

2.5 Achievements in Biodiversity Conservation

With the support from central and local governments, various stakeholders as well as

international organizations, remarkable achievements have been made in biodiversity conservation in DPRK. A biodiversity conservation and management system with Korean characteristics has been basically established and progresses have been made in the activities for restoration of deteriorated ecosystem.

What is the most successful achievement is that the targets for the conservation and sustainable development have been cleared and the institutional, administrative, legal, scientific and technical capacities have strengthened through the implementation of NBSAP and its updating.

As DPRK has 80% of mountainous area of the whole territory, the public awareness have been raised on the impact of deterioration of forest ecosystem which causes water and soil loss and flood and the activities for greening the whole country and the material and technical foundation for forest plantation including nursery making have been promoted and strengthened.

Modern aquaculture and fishing farms have been built at east and west sea areas and the framework for the conservation and sustainable use of marine resources have been reinforced.

The organic farming and conservation agriculture have promoted and disseminated to the farms and the public awareness on eco-environment have enhanced.

The legal, administrative and technical framework for biosafty has established.

Mt. Myohyang has been nominated in the World biosphere reserve Network and the management of the reserves including Mt. Oga, Mt. Kumgang and Mt. Chilbo have further improved.

Considerable progress have been made in the conservation and increment of useful animal and pant as well as the conservation of threatened species.

The innovative capacity of universities, colleges and research institutions has been substantially increased.

The public capacity and enthusiasm for participation in biodiversity conservation are greatly increased.

2.6 Experiences and Lessons learned

2.6.1 Experiences

- Biodiversity conservation must be done in nationwide led by the government.

  The government at all levels in DPRK have been playing a leading role in enhancing biodiversity conservation by integrating biodiversity conservation into economic and social development plans, establishing and improving related management systems, continuously increasing investment in biodiversity conservation, strengthening capacity building and establishing a number of nature reserves as rescue measures. The biodiversity conservation and its sustainable use should be further developed at government level.

- Biodiversity conservation must be based on cross-sectoral coordination.

  DPRK has established the National Coordinating Committee for Environment (NCCE) involving Ministry of Land &Environment Protection, State Academy of Sciences, State

Planning Commission, Ministry of Forest, Ministry of Fishery, Ministry of Public Health, Ministry of Agriculture, Ministry of Education, Ministry of Finance and some other relevant agencies. The NCCE is playing primary role in coordinating, consulting and making decisions relating activities of the stakeholders for the implementation of CBD and related agreements.

- Biodiversity conservation relies on strict law enforcement.

Biodiversity –related legislations were widely promoted and publicized to the public and the measures were taken to strengthen the observance in the whole country. And the excellent institutions in law observance have honored and their examples have been generalized.

- Biodiversity conservation must draw support from scientific and technological progress and requires more public involvement.

Cooperation between governments at all levels, related departments, universities and colleges and research institutions was intensified to promote the conservation and sustainable use of biodiversity and remarkable progress was made in this aspect.

Through various forms of promotion, education and participatory activities, local governments and related departments publicized scientific knowledge and demonstrated achievements of biodiversity conservation to make people aware of the importance and urgency of biodiversity conservation and enhance the extent of and capacity for public participation.

2.6.2 Lessons learned

- More effort shall be put into the promotion of biodiversity conservation.

Since CBD entered into force, the term “biodiversity’’ is heard more often among the public. However, neither government officials nor the public have fully understood the strategic significance of biodiversity conservation. From now on, more efforts shall be put into the promotion of biodiversity conservation and biodiversity indicators shall be included into the system of reviewing government performance and achievement of various targets. The most important one is to make the government decision makers and public as well to understand the value of biodiversity and the way to conserve and sustainable use of biodiversity. For this, the demonstration of regional ecosystems and reserves with socio-economic and eco-environmental benefits by improving the reserve management and sustainable use of biodiversity should be created and generalized their best practices.

- Legislation and plans shall be implemented more efficiently.

First, the law enforcement committees at central and local levels shall be strengthened and the solemnity and authority of laws and regulations shall be improved; second, the operability and accessibility of plans shall be increased and related plans and programs shall be introduced into national economic and social development plans; third oversight by the public, media and civil organizations shall be further increased. In particular, the main causes of biodiversity loss should be assessed and the legal sanctions the factories and

institutions against biodiversity conservation including over-exploitation and environmental pollution. It is also necessary to take various socio-economic incentive measures.

- More attention shall be paid to the ecosystem approach.

  Although remarkable progress was made in the establishment and management of nature reserves in DPRK, disproportional attention was directed to the conservation of endangered species, which are not the targets of conservation, integration of ecosystems and habitats didn't receive enough attention. As the government of DPRK gives the priority to the restoration of deteriorated forest ecosystem and wetland ecosystem, the ecosystem approach shall be applied for the conservation and sustainable development of land, water and biological resources and more attention shall be given to the overall protection of ecosystems.

- Establishment of the national biodiversity monitoring system shall be accelerated.

  DPRK attaches great attention to biodiversity conservation but the biodiversity monitoring work lags far behind conservation needs.

  The establishment of national biodiversity monitoring system shall be accelerated and long-term biodiversity monitoring shall be carried out.

CHAPTER 3. SECTORAL AND CROSS-SECTORAL INTEGRATION OR MAINSTREAMING OF BIODIVERSITY CONSIDERATION

In this chapter, the efforts in DPRK to integrate measures for the conservation and sustainable use of biodiversity into national policies and strategic plans by relevant sectoral and cross-sectoral plans which are related with biodiversity were described.

3.1 The Strategic Direction of Eco - environmental Conservation of DPRK

The general direction of nature and environment conservation of DPRK is to:

1) Promote the conservation of forest and eco-environment by implementing the activities for afforestation and water management and the development and rational use of water resources paying attention to the management of river and streams. .
2) Protect and manage soil resources and promote the use and development of land in perspective way.
3) Attach importance to biodiversity conservation and promote the conservation of biological resources and coastal management.
4) Prevent the environmental pollution and improve the eco-environment. Those are to keep off air pollution, plant trees in town, improve the livelihood in rural areas and management of natural monuments.

These policies requires the enthusiastic participation of stakeholders and their cooperation in the activities and planning for biodiversity conservation and its sustainable use and mitigation of climate change

3.2 Relations between NBSAP and the sectoral plans of national economy

|In pursuance of the Article 6.b for the conservation and sustainable use, the NBSAP of DPRK is closely related with the sectoral and cross-sectoral plans of forestry, fishery, traditional Koryo medicine manufacturing and agriculture which take main part in the use of bio-resources and is also integrated into the scientific research development plan, energy development plan and Master Plan for Land Development.

In the past decade, the implementation of the NBSAP has been promoted in close relation with the Master Plan for Land Development (MPLD). The general mobilization for land construction in both spring and autumn of every year from 1998, as an all people campaign, has played a

significant role in land management and biodiversity conservation.

In the fields of forestry, fishery and Koryo medicine manufacturing, programs were prepared and are now undertaken to establish the systems and processes for the conservation and sustainable use of ecological environment, mainly focused on the creation of resources. Particularly, in fishery, there was a definite conversion from catching fishery into cultivating one with great emphasis on the conservation of coastal ecosystem.

In the scientific researches on biodiversity conservation, considerable successes have been achieved during the period of 2nd 5-Year Development Plan for Science & Technology (2003-2007), on the basis of which the 3rd 5-Year plan (2008-2012) is now under preparation putting a great effort on the research and technological development for the conservation and sustainable use of biodiversity.

At present, the action plan is under preparation in the field of education to improve the quality of education on biodiversity and environment.

3.3 Integrating biodiversity issues into relevant sectoral plans of national economy.

3.3.1 Forest sector

The forest ecosystem in DPRK takes very important position for land management and resource development, because over 80% of its territory is mountainous. Especially, considering the forest destruction due to recent economic difficulties of the country, it is urgent to intensify the actions in order to halt the deterioration of eco-environment, protect forestry biodiversity and raise the ecological service of forest. In this context, the government of DPRK has presented the policy for afforestation and greening the whole country and to improve the structure and ecological function of the forest. Nationwide campaign for implementing this policy has been strenuously promoted. The Ministry of Land and Environment Protection (MoLEP) arranged the restoration of destroyed nurseries and the establishment of a new central nursery with an area of 100 ha in 2000, and also organized the construction of mother nurseries of 20-25 ha at municipal and county levels, which resulted in the increase of sapling production capacity in 2002 four times as much as that in 1994. From 2002, annual reforestation of over 900,000,000 trees has been organized as a nationwide campaign. In addition, the production capacity of central nursery was increased as much as 400,000 of nursery tree in the period of 2006 - 2009.

The creation of firewood forests (total area of 800,000 ha) to solve the fire wood, which is the main cause of forest destruction and soil degradation, is gaining more and more impetus.

On the other hand, the government of DPRK has quadrupled the number of forest rangers in order to strengthen legal controls on the illegal tree-cutting and to improve the forest management.

In the field of forestry for lumber production, active reforestation has been promoted at deforested areas in compliance with the principle of cyclic felling, and the transformation of forests and afforestation for erosion control have been energetically driven at the areas of low productivity

and extraordinary soil erosion.

In particular, it is recommended to correct the tendency to concentrate felling at the areas with favorable cutting conditions, and actively apply the useful methods for lumber transportation.

In DPRK, on the principle of proper planting on the proper soil, they progress the afforestation works to guarantee the intensified use of forest land for the purpose of various and adequate use of land, and to assurance the maximum productivity of the forests, by the rational regulation of planting thickness of fast growing and high commercial valued trees. The afforested mixed forests, could prevent soil acidification and damage by harmful insects, increase soil fertility, productivity of the forests and enrich the forest's biodiversity.

Either in the mountains and plains, many forests of economic value such as metasequoia and walnut forests were afforested, so that those were contributed to national economy growth and improvement of people's life. By giving priority to survey and research work on the economic plants and on basis of those results, planting trees of economic value was encouraged on nationwide scale.

In the afforestation sector, the production system of nursery trees and seed selection were established, besides many scientific problems including earlier ripening of the pine nut tree, acclimation of bamboo, standardization of afforestation technologies including distribution of the kind of trees based on afforestation group and planting thickness were solved.

For the tree planting in forest, the method for rational thinning, forest innovation issues have been studied.

The pest controlling methods by bio- agricultural chemicals were developed and widely introduced in the forest protection sector.

In the forest utilization sectors, technological and scientific problems arising from the cultivation of edible and medicinal mushroom and various mushroom cultivation methods have developed.

There have been some efforts to introduce the advanced technical and scientific achievements by aerospace photographs, satellite images and computer technologies to the afforestation and forest management activities and increase the production of seedling by establishing the seed selection and breeding system and introducing the advanced technology. The forest management institutions have actively engaged in the activities for scientific conservation and plantation which result in the perfect production process systems from the seedling breeding to conservation and management. The modernizations, reconstructions and expansions of production systems were accomplished in nurseries of Huichon, Tongchon and Songgan experimental station, therefore, the solid foundation for mass production of hybrid young trees was provided.

3.3.2 Agriculture sector

The area of farmland per capita in DPRK is 0.08ha and that for grain like rice and maize is nearly 0.06ha.

In this context, protection and sustainable use of farmland emerges as one of the most pressing

issues for the increase of agricultural production. Being particularly abundant with sloping lands and surrounded by sea on two sides, it is very important for ensuring stable agricultural production to prevent soil erosion and create protective forests for flat field area.

In recent years, the activities which are vital for the sustainable development of agriculture and biodiversity conservation are greatly progressed. Measures for preventing soil erosion by decreasing gradients of lands for building terraced fields are now taken. Besides, the activities for plantation have been promoted with the aim of conservation of forest' biodiversity through the afforestations for erosion controls and the protection of foot of mountains with steep gradient and planting mixed forest with tall and short trees. In DPRK, great successes have achieved in the improvement of cold and humid lands, high acidity lands, and tidelands. All fields of North Phyongan, Kangwon, and South Hwanghae provinces were developed into standard ones not only to do farming easier, but also to prevent soil erosion and loss. The efforts have been made to prevent the soil erosion by making terraced field. Recently in DPRK, the activities for conservation and sustainable use of farmland, increase of soil fertility by introducing organic farming, developing cycling production system combined with agriculture and livestock, to increase efficiency of resource use, and to prevent the pollution. Furthermore, in DPRK with the cooperation of FAO, the experiences and best practices were achieved through implementation of the projects for applying the conservation agriculture. Recent years, many farms have attached the priority to the conservation of biodiversity and organic farming by producing and applying bio-chemicals and effective micro-organic compounds to the field. For this, the biological methods to control weeds by mud snail and microorganic herbicides, seed sterilization by bio-chemical, pest control by natural enemy have been widely introduced. Microorganic compounds including phosphorus bacteria compounds, effective microorganic compound are also developed and applied to increase the crop yield and soil improvement.

In some cooperative farms, agro- chemicals extracted from plant, tree and potato are widely used in seed sterilization. Effective microorganic compounds and bio-fertilizers are already applied across the country.

Many cooperative farms are widely using fermented organic fertilizer (fermented compost and hay) in vegetable cultivation and organic fertilizer in potato growing.

The examples showed that in DPRK, practical measures were actively taken for sustainable use and conservation of agricultural ecosystem, preventing soil acidification, and pollution of agriculture ecosystem by chemicals trough active application of organic farming.

And the agro- forestry management which guaranteed the sustainable use of agriculture and forest ecosystem was widely applied. The research project to apply the agro-forestry management in Pisan Farm, Anbyon County by Center for Biodiversity, State Academy of Sciences can be the good example.

The attention has been paid to the conservation of gene resources including crops and endemic livestock in agriculture.

All of these practical examples are the evidence to the effort for sustainable development and

conservation of agricultural ecosystem in DPRK.

However, the activities to improve the land with low fertility into high one which provides sustainability of agricultural production and rich in biodiversity have to be continued together with improvement of slope land management, protect the natural habitat of natural enemies and pest control which promote the conservation of agricultural biodiversity and sustainable agricultural production and improvement of eco-environment.

3.3.3 Public health

Koryo medicine, the traditional medicine of Korea is a part of the medical science and closely related not only to the people's heath and but also biodiversity in DPRK. The resource of Korean medical plant is rich with its endemic plants, phylogenic varieties and chemical components. Therefore, medical plants serve as a concrete foundation for the treatment and prevention of all diseases and development of Koryo medicine from the time of ancient civilization. The Korean ancestors created traditional medicine on their own since the earliest time of history and the traditional Koryo medicine has become an excellent national cultural inheritance with the longest history and plenty of its content. From earlier time, the Korean ancestors applied acupuncture in medical treatment, and used various kinds of medical plants like wormwood, garlic, and ginseng for people's healthcare. '*Hyangyakjipsongbang*' (encyclopedia of herb medicine, published in the 14th century) contains 649 species of traditional medicaments, and '*Tonguibogam*' (handbook of traditional Korean medicine, 1599-1610) provides 1,400 types of prescriptions.

Decrease in forest resources in recent years has brought the changes in mountain ecosystem, which consequently made a great impact on the production of natural medicinal herbs. These conditions make it difficult to meet growing demands for Koryo medicines. The measures are taken to control the over-exploitation and conservation of medical plants resources. All the illegal exploitation of medical plants are strongly controlled and medical plant farms and production bases for plants and animals in medical use have been built in every parts of the country and the activities for investigation and protection of medical plant have been strengthened.

In DPR Korea, the pharmaceutical industry of Koryo medicine is a traditional one which comprises profound knowledge, abstruse expertise and mysterious recipes accumulated for a long time.

The cultivation and use of medicinal plants in DPR Korea is subject to the "Law on Medicinal Plant" (December 29, 2004) and its enforcement regulations. Under the control of the Management Bureau for Koryo Medicine Production (MBKMP), the Survey Team for Koryo Medicine Resources (PTKMR) undertakes the periodic nationwide investigations on Koryo medicine resources, inter alia of medicinal plants. By relying on these investigation data which are classified by region and species, Designing Office for Koryo Medicine Resources (DOKMR) prepares plans relevant to Koryo medicine resources. The Korea Koryo Medicine Technology Center Technology is in charge of the development for and dissemination of Koryo medicines. By 2008, the total cultivation area of medical plants in DPRK is about 10 000ha and the numbers of cultivated

medicinal plants are almost 80 species. Every city and county has the target to cultivate the medical plants in the area of 300ha and very active in its implementation. The cultivation of medical plant in mountain area has positive influence to the forest ecosystem and traditional Koryo medicine production reducing the pressure to forest ecosystem and providing the sustainable management of forest resources.

3.3.4 Fishery

The conservation and sustainable use of aquatic resources is very important for the development of national economy and improvement of people's living as well as the increasing of fishery production.

In DPRK with dense drainage network and surrounded by sea on two sides, the conservation and sustainable use of inland water, coastal and marine ecosystems is very important.

The changes in marine condition, decrease in aquatic resources due to over- use in coastal areas and particularly the reduction of pelagic fishery by recent economic difficulties have hampered the growth of fisheries output. The forest degradation greatly changed the environment of inland water ecosystems and the water pollution by organic wastes makes the aquatic ecosystem worse.

In this context, the Ministry of Fishery and the Department of Pisciculture concentrate on expanding inland water fish farming and on the development of coastal cultivation, inter alia of seaweed.

The Ministry of Fishery has adhered to the conversion of fishery from only catching fishery into cultivating one and achieved considerable successes therefrom.

Main fishery stations of the Korean West Sea and Korean East Sea are equipped with breeding facilities for the aquatic plants and animals of economic value, and much engaged in the creation, maintenance and management of coastal fishery.

The Institute of Aquaculture is engaged in the artificial collection of eggs of shellfishes like short neck clams and raising the littleneck clams and introduce their results into practices are on progressing and widely introducing. In Raksan, North Hamgyong Province, hundreds ha of sea cultivation bed has been built to breed scallops, sea cucumbers and fishes. Especially in Hongwon County, hundreds of thousands of trepang larvas are produced and released into the sea.

On the other hand, the fishing industry is developing in the direction of protecting and increasing the coastal non-migratory fishes by improving the fishing structure.

In the inland water areas, extensive construction and enlargement of fish farms, and scientification and modernization of their management are being energetically promoted, so as to meet the demands of the people for freshwater fishes.

In accordance with the national measures, the activities to develop the fish farming are activated in all people movement. In DPR Korea with limited area for cultivation, the main direction of fish farming development is to make best use of natural feeds and to expand the multidimensional fish breeding.

In compliance with the legal requirements of the "Law on Fishery" and the "Law on Fish

Farming", state control for the conservation of aquatic resources has further strengthened.

The Ministry of Land and Environment Protection is in charge of the management of 11 freshwater aquatic resource reserves and 15 coastal ones.

In DPRK, spawning ponds can be found in every water areas and every year hundreds of million of fry are incubating and stocking to the rivers and lakes. The government provides the financial support to the fish farms who stock the rivers with fishes and control them to implement the stocking plan.

In addition to this, the habitats for marine animals such as tries, trepangs, and ear shells are now providing in DPRK.

Every year, during general mobilization period for land management, people are encouraged to put stones and shells into the shallow seas to provide the habitat to seashells and the best example is Ongjin Bay. Accordingly in the coastal areas, fishing and purse nets are encouraged and the trawl fishery is prohibited.

In DPRK, April and July are designated as "Marine Resource Protection Month" and in this period, the government policy related with the conservation of marine resources are publicized to make the people aware of the value of marine resources and encourage them to participate in the conservation and propagation. And the knowledge on protected fish, its spawning season, prohibited fishing period, prohibited size of fish and the principles of marine resource protection are explained to the fishermen, local people and school students. And this period provides good opportunity for the conservation of marine resources through the activities to prepare spawning condition, control fishing and polluted sewage flow into natural water area.

3.3.5 Efforts to raise public awareness of nature and ecological environment

The universal 11-year compulsory education system of DPR Korea has introduced from kindergarten (1-year preschool education), primary school (4-years) and secondary school (6-years).

The education on environment protection begins at the stage of kindergarten and continues through the stage of primary education (Nature Observation during the 1^{st} and 2^{nd} grades and Nature subject during the 3^{rd} and 4^{th} grades).

At secondary school, Biology and Geography subjects are providing the students with knowledge on the protection of animal and plant and environment. By 1992, the Ministry of Education incorporated subjects of strengthening biodiversity environment education into teaching programs and took adequate measures to implement these programs. Biodiversity and environment related education are aimed to educate basic knowledge of biodiversity conservation to develop environment education for young people, on the other hand not only biodiversity related universities with the main subjects of biology, geography, fishery, forestry, public health and architecture but also other ones to begin the environment education. Accordingly important meanings were granted to the educational parts of biodiversity and environment and some measures were taken. The Department of Biology and Department of Geography of the **Kim Il Sung** University were renamed as Department of Life Science and Department of Global Environment,

respectively, at the early 2000's.

Agricultural universities and Fishery colleges at the provincial level, especially Hyesan Agro-Forestry College in Ryanggang Province and Pihyon Land Management College in North Phyongan Province, are attaching great importance to the education on the conservation and sustainable use of biodiversity. The public awareness activities on biodiversity and environment were enhanced. In every province (including municipality), there are school children's palaces that play the role as a center of extracurricular education for primary and secondary school students. Special attention is being paid to nature conservation in natural science education.

"Homeland loving Teams" in every primary and secondary school, whose mission is to maintain the cultural and sanitary conditions of their villages, streets and towns, are conducting various activities for biodiversity conservation, especially during 'Birds Loving Month" in April and 'Tree Planting Month' in March and November.

In 1996, propaganda activity programs of nature and environment protection was prepared by Korean Nature Conservation Union.

Public education and awareness on biodiversity-related issues are actively conducted in the DPRK through TV, radio and other mass media, festivals, celebrations and other various occasions.

In DPRK, by means of mass media such as TV, broadcasting, newspapers, and journals, thebasic knowledge about biodiversity and its importance for its conservation are widely addressed.

On the occasion of "Environment Day", "Earth Day" and "Day of Biodiversity", and "Tree Planting Month", "Bird-Loving Month", "Animal Protection Month", "Medical Plant cultivation Month", "Month for Preventing Forest Fire", the intensive propagation campaigns are conducted for biodiversity conservation.

Together with this, communication related to biodiversity conservation and nature protection is actively undertaken at natural parks, scenic spots, parks, zoos and botanical gardens and arboretums in close relation with extracurricular education at schools.

3.3.6 Other sectors

The reduction of green house gas (GHG) emission is critical to prevent negative impact on biodiversity by global warming.

The government has established the Designated National Authirity for CDM to mitigate the negative impact of climate change, to participate the global environment issues and to coordinate the activities for GHG emission reduction comprehensively. Therefore, it attaches priority to energy saving and promotes this activity.

The government has exerted its efforts to raise the public awareness on energy saving and encouraged their enthusiastic participation by taking the energy saving measures such as the use of no- load breaker, no stoppage condenser, ampere-hour meter and compact fluorescent lamp.

It also promotes the development and use of wind, geothermal and biomass while paying attention to the construction of the large -sized hydropower plants and medium and small sized hydropower plants. In order to reduce the air pollution and GHG emission, the government has

established the system for granting the allowance for pollutant emission and the system for compensation of environment while taking the technical and engineering measures and enforcing the activities for supervision and control.

Since 2009, the government has planned to introduce the environment management systems to the factories in pilot level to establish the environmentally sound production system and since 2010, these systems have been popularized. In cities, the monitoring and controlling on the factories and enterprises with great amount of pollutant emission have been strengthened and such factories are encouraged to introduce the clean production process. In addition to this, the development and introduction of environmentally friend coal burning technologies including coal briquette for heating and cooking at the city residential areas have been promoted while implementing the activities to provide the electricity for heating at the city areas.

The government attaches great attention to the development of alternative fuels and alternative energies, favorable for human health and eco-environment to meet the growing demands for energy and protect the environmental pollution.

CHAPTER 4. PROGRESS TOWARD 2010 AND IMPLEMENTATION OF THE STRATEGIC PLAN OF THE CONVENTION

The 2010 BIP was established to track progress at the global level in achieving the CBD 2010 Biodiversity Target. This target was adopted at the sixth Conference of the Parties of the CBD in April 2002 in decision Ⅵ/26 and its full definition is, "*to achieve by 2010 a signifivant reduction of the current rate of biodiversity loss at the global, regional and national level as a contribution to poverty alleviation and to the benefit of all life on Earth"*. Two years later at the seventh CBD COP in Kuala Lumpur, in decision Ⅶ/30, the COP adopted a framework of global indicatiors to "*facilitate the assessment of progress towards achieving the 2010 Biodiversity Target and communication of this assessment, to promote coherence among the programmes of work of the Convention and to provide a flexible framework within which national and regional targets may be set, and indicators identified"*. This framwork was more completed in decision VIII/15 including 7 Goals, 22 targets to assess the progress towards 2010 Target and communication and other key contents.

DPRK has developed national indicators to assess progress toward 2010 target under the global indicators.(Table 4-1)

Table 4-1. Indicators of DPRK toward CBD 2010 Target

Indicators	Meaning
Status and trends of the components of biodiversity	
1. Status of threatened species	Refers to hierarchy of threatened species of animals and plants by classifications and threatened degrees.
2. Area and proportion of land cover	Refers to proportion of coverage of forest land and agricultural land.
3. Genetic diversity of cultivated plants and domestic animals	Refers to status of genetic diversity of valuable cultivated plants and domestic animals.
4. Number and coverage of nature reserves	Refers to status of *in-situ* conservation of biodiversity.
Ecosystem integrity, ecosystem goods and services	
5. Water quality of freshwater ecosystems	Refers to comparative assessment of main water quality indicators.
Threats to biodiversity	

Indicators	Meaning
6. Emission of major pollutants	Refers to comparative assessment of annual emission and deposition of pollutants.
7. Impact of climate change on biodiversity	Refers to comparative assessment about average changes of climate and length of seasons per decade years of last fifty years.
8. Degree of damage caused by invasive alien species	Refers to assessment of invasive alien species threatened to biodiversity and main alien species.
Sustainable use	
9. Sustainable use of herbal resources	Refers to status of herbal resources and its use in DPRK.
10. Sustainable use of fishery resources	Refers to status of fishery resources in DPRK.
Status of access to genetic resources and benefit sharing	
11. Status of access to genetic resources and traditional knowledge and benefit sharing	Refers to status of access to genetic resources and traditional knowledge and benefit sharing.
Public awareness	
12. Public awareness	Refers to progress to promote the basic knowledge for biodiversity and public awareness for biodiversity conservation.

4.1 Analysis of the Evaluation Indicators toward the 2010 targets

4.1.1 Reduce the rate of biodiversity loss

Indicator 1: Status of threatened species

The CBD 2010 biodiversity target adopted in the decision(VI/26) of Conference of Parties emphasized the importance of identifying status of selected ecosystems and habitats, the changes in status of threatened species in abundance and arrangement of selected species. The threatened plant species (seed plant) in DPRK account for about 4.54% of the total number of species

Threatened plants classified, according to the criteria of IUCN, into extinct (EX), critically endangered (CR), endangered (EN), vulnerable (VU) and near threatened (NT) species is shown in Table 4-2.

Among these 153 threatened species, many endemics are involved, including *Picea tonaiensis (gymnosperm), Celtis cordifolia, Rosa jaluana, Nymphaea minima, Prunus choreiana, Pedicularis ishidayana, Saussurea myokoensis, Euphorbia hakutosanensis* and *Pentactina rupicola.*

Table 4-2. Threatened Species of Plants in DPR Korea

Taxon	CR	EN	VU	NT	Total
Gymnosperm	1	2	3	3	9
Angiosperm	15	29	48	52	144
Total	16	31	51	55	153

Main threatening causes to plant species are:

- Environmental changes in habitat (e.g. 12 species of *Orchidaceae including Neottia nidus-avis var. mandshurica, Cypripedum guttatum, Listera yatabei, Goodyera repens, Galeorhis cyclochila* and *Perularia usuriensis*, etc. are representative);
- Over-exploitation (*Panax ginseng, Astragalus setsureianus, Asarum heterotropoides var. seoulense, Thymus quinquecostatus, Dioscorea nipponica, Scopolia parvipolia* and *Gastrodia elata*);
- Deterioration of the general eco-environment due to decrease in forest land.

The threatened animal species in DPRK cover approximately 21% of vertebrate species (Table 4-3).

Table 4-3. Threatened animals of DPRK

Taxon	Species	Number of threatened species	Rate of threatened species (%)
Mammalia	107	28	26.2
Aves	420	76	18.1
Reptilia	26	13	50.0
Amphibia	17	9	75.0
Piscea	185	33	17.8
Total	755	159	21.0

The threatened animal species are classified into 4 categories, i.e. EX, CR, EN and VU (Table 4-4).

Table 4-4. Threatened animals classified according to the criteria of IUCN

Taxon	EX	CR	EN	VU	Total
Mammalia		3	9	16	28
Aves	2	2	26	48	78
Reptilia			4	9	13
Amphibia			3	6	9
Piscea		3	4	26	33
Total	2	8	46	105	161

Indicator 2: Area and proportion of land cover

The forest coverage in DPRK accounts for about 73% of the territory with 8,927,300 ha, while accounting for 7,643,200 ha with forest tree land and 876,800 ha with treeless land and the rest is non-forest. During the last decade, the area of treeless land increased 496,800 ha more. The over-exploitation of forest for food and firewood in rural areas together with the forest damage by fire and insect pests increased the treeless land in DPRK.

In DPRK, the forest land area per capita is 0.4 ha and the average accumulation of forest tree land is 57.3 ㎥ which takes 1/2 of world average level.

Agricultural land coverage accounts for 16.6% of the territory with 2,042,100 ha, while accounting for 574,000 ha with paddy field, 1,005,000 ha with cultivated field, 144,000 ha with orchard and 85,000 ha with mulberry field. Almost 60,000 ha of agricultural land have decreased for last decade by different constructions.

At present, slopes of more than 5° accounts for 61% of the territory, but 200,000 ha with sloping cultivated field of more than 16°. Agricultural land is 0.09 ha per capita, but 0.06 ha per capita in grain cultivated field.

Table 4-5. Proportion of land cover with angle of inclination

Angle of inclination (°)	< 5	5~15	15~25	25 <
Proportion of land cover (%)	21.52	21.19	24.13	33.16

Indicator 3: Genetic diversity

The priority is given to effective use of genetic diversity in bio-engineering and modern medical field in DPRK, especially conservation and security of genetic resources, but with some problems in finance and from lagging equipments.

The valuable genetic diversity in DPRK is shown in Table 4-6.

Table 4-6. Composition of species and varieties of valuable cultivated plants and domestic animals.

Cultivated plants						Domestic animals			
Crops			Cultivated plants			Domestic animals		Poultry	
Kinds	Species	Variety	Kinds	Species	Variety	Kinds	Variety	Kinds	Variety
Grain	22	1416	Fruit			Cow	8		
Vegetable	70	801	Cultivated	25	433	Sheep	8	Hen	8
Industrial	22	151	herbs	37	102	Goat	15	Duck	7
crops			Silkworm's	7	55	Pig	11	Goose	6
			fodder			Rabbit	13		

114 species 2368 varieties	138 species 2958 varieties	7 species 57 varieties	7 species 31 varieties

In addition, genetic resources include domestic animal species (3 species and 246 varieties of silkworms, 3 varieties of honeybees), 111 species of hydrophytes, 111 species of freshwater fishes and 59 species of coastal brackish-water fishes.

Indicator 4: Number and area of natural protected areas

See 1.3.1.

4.1.2 Ecosystem integrity, ecosystem goods and service

Indicator 5: Water quality in freshwater ecosystem

DPRK has settled National Standard for Water Environmental Conservation (NSWEC) under International Standard for Water Environmental Conservation (ISWEC) with water quality standards less than international standards in the rivers, reservoirs, lakes and marshes. These standards include chosen assessment degrees and standards on indices due to degrees.

Water quality assessment has been undertaken in some rivers according to the national standard.

4.1.3 Reduction of threats to biodiversity

Indicator 6: Emission of the pollutants

DPRK has settled National Soil Environmental Standards (NSES) under International Soil Environmental Standards (ISES). DPRK has been strengthening the supervising function for prevention of soil pollution and reduction of impacts on biodiversity.

Table 4-7. Contents of heavy metals in soil by propriety of Municipal solid waste.

Index	Unit	NSES
Cd	mg/kg	3
Hg	mg/kg	2
Pb	mg/kg	100
As	mg/kg	20
Cr	mg/kg	100
Zn	mg/kg	280
Cu	mg/kg	170

Indicator 7: Impact of climate changes to biodiversity

Rising in temperature by global warming in DPRK is considerable like in the other countries.

The rising rate in temperature per ten-years was average 0.204℃ for last fifty years. The Chart 4-1 shows changes of the average temperature per ten-years for last fifty years.

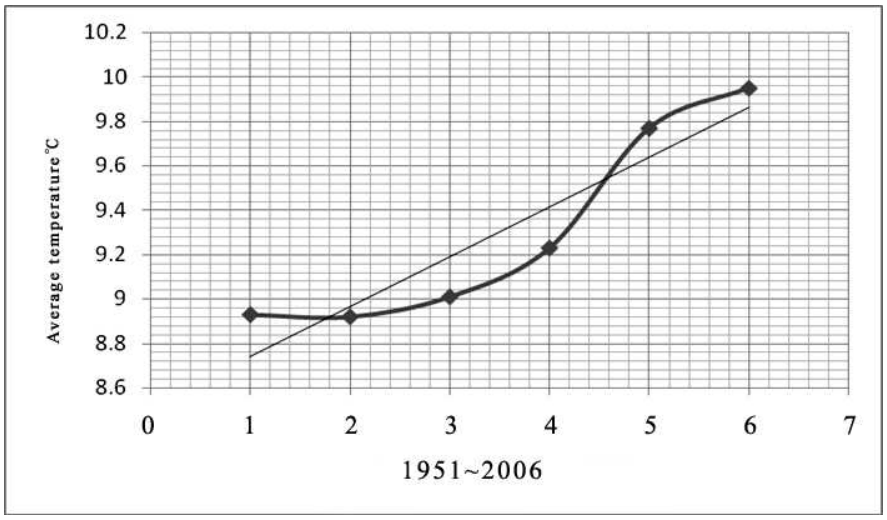


Chart 4-1. Changes of the average temperature per 10 years for last 50 years

The chart shows changes of average amount of precipitation per ten-years for a hundred of year. As you can see at the chart, the amount of precipitation has been getting decreased for last hundred of year. The average amount of precipitation in 2000s with 888.3mm has decreased about 21% for the heavy rainy seasons during the last 100 years and almost 3.2% for 1910s.

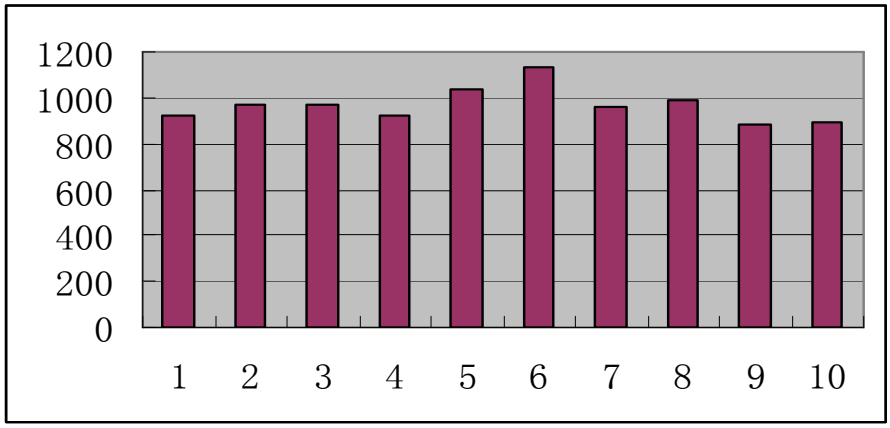


Chart 4-2. Changes of average amount of precipitation for 90 years (1910-2000)

Summer got longer with nearly ten days in seasonal length for last 90 years, while winter getting shorter with some 19 days. This indicates the global warming in DPRK very serious, and negatively impact on biological species diversity.

Indicator 8: Degree of damage caused by invasive alien species

DPRK has comprehensively assessed alien species of plant but very little assessment on aquatic animals and plants introduced to increase the fish production. According to the data surveyed so far, more than 60 invasive alien species of plant have been rooted in our country. Pigweed (*Ambrosia artemisifolia*), the representative of invasive alien species, is notorious for its pollen that causes

allergic diseases and for its threats to indigenous plant communities. As for animal, *Lecidomja brachyntera* and *Matsucoccus pini* are major invasive alien species harmful to forest, and *Lissorhoptrus oryzopholis* to paddy rice (See 2.4.4).

4.1.4 Promotion of sustainable use

Indicator 9: Sustainable use of herbal resources

DPRK designated every April to May and September to October as "Medicinal Plant Cultivation Month" for creation and picking of herbs.

It has preceded the comprehensive re-survey on the medicinal plant under the Cabinet decision No.24th decision of the Cabinet during 1965-1968 before the national assessment on medical plant resources in 1970 and 1984. DPRK has about 900 species of medical plants, among which 170 species are used for traditional medicine to improve the people's health. It has about 43,000 ha of cultivated medical plant and almost 93,000 ha in protected area of medical plants. In addition, there are about 40 stock-farms for animals in medical use.

Indicator 10: Sustainable use of fishery resources

Recently, DPRK faced with rapid decreasing of fishery resources due to some reasons including natural calamity in neighboring countries. It exerts great efforts on freshwater fish breeding and shallow-sea culture. Possible area for fish farming accounts for about 8.8% of the inland water area. It has about 190 species of fresh water fishes, among which 20 species are good for fish farming.

4.1.5 Status of access to genetic resources and benefit sharing

Indication 11: Status of access to genetic resources and traditional knowledge and benefit sharing

In DPRK, the access to genetic resources and the fair and equitable sharing of benefits arising out of the use of genetic resources should be considered as much important as the further development of bio-technology. In this regard, it is necessary to establish a legal framework for the access to and the sharing of benefit from genetic resources. It is also important to organize an ad hoc group and further develop it into a specialized institution. Through these systems and processes, more effective utilization of genetic resources should be promoted, and the international cooperation and exchange in this field should be intensified.

4.1.6 Promotion of public awareness

Indicator 12: Public awareness

The education on environment protection begins at the stage of kindergarten and continues through the stage of primary education (Nature Observation during the 1st and 2nd grades and Nature subject during the 3rd and 4th grades). At secondary school, biology and geography subjects are providing the students with the knowledge of animal and plant conservation and environment protection. 14 teacher-training colleges and 19 universities of education are conducting the training

for primary and secondary school teachers. At the stage of higher education, subjects related to environmental protection have been taught since 1993 in line with the practical condition of every collage. The Department of Biology and Department of Geography of the Kim Il Sung University were renamed into Department of Life Science and Department of Global Environment, respectively, at the early 2000's. Agricultural universities and Fisheries colleges at the provincial level, especially Hyesan Agro-Forestry College in Ryanggang Province and Pihyon Land Administration College in North Phyongan Province, are attaching great importance to the education on the conservation and sustainable use of biodiversity. In every province (including municipality), there are school children's palaces which serve as a center of extracurricular education for primary and secondary school students. In the education of natural science, special attention is being paid to nature conservation. "Homeland loving Teams" in every primary and secondary school, whose mission is to maintain the cultural and sanitary conditions of their villages, streets and towns, are conducting various activities for biodiversity conservation, especially during 'Birds Loving Month" in April and 'Tree Planting Month' in March and November. Public education and awareness on biodiversity-related issues are actively conducted in the DPRK through TV, radio and other mass media, festivals, celebrations and other various occasions. Number of broadcasting on TV accounts of all 2310 times, and hundreds of times on newspapers, journals and publications. (See 2.4.8)

4.2 Progress Towards the 2010 Target

DPRK has made substantial progress towards the 2010 targets.

Biodiversity in DPRK is still facing severe threats. The years to come are vital to biodiversity conservation.

Table 4-8. Progress towards the 2020 Target

Goal	Progress
Goal 1. Promote the conservation of the biological diversity of ecosystem, habitats and biomes	★★★
Target1.1 At least 10%.of each of the world's ecological regions effectively conserved	★★★
Target 1.2 Areas of particular importance to biodiversity protected	★★★
Goal 2. Promote the conservation of species diversity	★★
Target 2.1 Restore, maintain, or reduce the decline of populations of species of selected taxonomic groups	★★
Target 2.2 Status of threatened species improved.	★★

Goal	Progress
Goal 3. Promote the conservation of genetic diversity	★★
Target 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.	★★
Goal 4. Promote sustainable use and consumption.	★
Target 4.1 Biodiversity–based products derived from sources that are sustainably managed and production areas managed consistent with the conservation of biodiversity	★
Target 4.2 Unsustainable consumption, of resources, or that impacts upon biodiversity, reduced	★
Target 4.3 No species of wild flora or fauna endangered by international trade	★★
Goal 5. Pressures from habitat loss, land use change and degradation, and unsustainable water use, reduced	★★
Target 5.1 Rate of loss and degradation of natural habitats decreased	★★
Goal 6. Control threats from invasive alien specie	★★
Target 6.1 Pathways for major potential alien invasive species controlled	★★
Target 6.2 Management plans in place for major alien species that threaten ecosystems, habitats or species	★★
Goal 7. Address challenges to biodiversity from climate change, and pollution.	★
Target 7.1 Maintain and enhance resilience of the components of biodiversity to adapt to climate change	★
Target 7.2 Reduce pollution and its impacts on biodiversity.	★★
Goal 8. Maintain capacity of ecosystems to deliver goods and services and support livelihoods	★
Target 8.1 Capacity of ecosystems to deliver goods and services maintained	★
Target 8.2 Biological resources that support sustainable livelihoods, local security and health care, especially of poor people maintained	★

Goal	Progress
Goal 9. Maintain socio-cultural diversity of indigenous and local communities	★★
Target 9.1 Protect traditional knowledge, innovations and practices	★★
Target 9.2 Protect the rights of indigenous and local communities over their traditional knowledge, innovations and practices, including their rights to benefit sharing	★★
Goal 10. Ensure the fair and equitable sharing of benefits arising out of the use of genetic resources	★★
Target 10.1 All transfers of genetic resources are in line with the Convention on Biological Diversity, the International treaty on Plant Genetic Resources for Food and Agriculture and other applicable agreements	★★
Target 10.2 Benefits arising from the commercial and other utilization of genetic resources shared with the countries providing such resources	★★
Goal 11. Parties have improved financial, human, scientific, technical and technological capacity to implement the Convention	★★
Target 11.1 New and additional financial resources are transferred to developing country Parties, to allow for the effective implementation of their commitments under the Convention, in accordance with Article 20	Not applicable
Target 11.2 Technology is transferred to developing country Parties, to allow for the effective implementation of their commitments under the Convention, in accordance with Article 20, paragraph 4	Not applicable

★ Little progress ★★ some progress ★★★ significant progress

4.3 Progress Towards Achieving goals and Objectives of the Strategic Plan

Strategic goals and objectives	Progress
Goal 1. The Convention is fulfilling its leadership role in international biodiversity issues.	★★★
1.1 The convention is setting the global biodiversity agenda.	★★★
1.2 The Convention is promoting cooperation between all relevant international instruments and processes to enhance policy coherence	★★★
1.3 Other international processes are actively supporting implementation of the Convention, in a manner consistent with their respective frameworks	★★★
1.4 The Cartagena Protocol on Biosafety is widely implemented	★★★

Strategic goals and objectives	Progress
1.5 Biodiversity concerns are being integrated into relevant sectoral or cross-sectoral plans, programmes and policies at the regional and global levels	★★
1.6 Parties are collaborating at the regional an sub regional levels to implement the Convention	★★
Goal 2. Parties have improved financial, human scientific, technical and technological capacity to implement the Convention	★★
2.1 All Parties have adequate capacity for implementation of priority actions in national biodiversity strategy and action plans.	★★
2.2 Developing country Parties, in particular the least developed and the small island developing States amongst them, and other parties with economies in transition, have sufficient resources available to implement the three objectives of the Convention.	★★
2.3 Developing country Parties, in particular the least developed and the small island developing States amongst them, and other Parties with economies in transition have increased resources and technology transfer available to implement the Cartagena Protocol on Biosafety.	★★
2.4 All Parties have adequate capacity to implement the Cartagena Protocol on Biosafety.	★★★
2.5 Technical and scientific cooperation is making a significant contribution to building capacity.	★★
Goal 3. National biodiversity strategies and action plans and the integration of biodiversity concerns into relevant sectors serve as an effective framework for the implementation of the objectives of the Convention	★★★
3.1 Every Party has effective national strategies, plans and programmes in place to provide a national framework for implementing the three objectives of the convention and to set clear national priorities	★★★
3.2 Every Party to the Cartagena Protocol on Biosafety has a regulatory framework in place and functioning to implement the Protocol.	★★★
3.3 Biodiversity concerns are being integrated into relevant national sectoral and cross-sectoral plans, programmesand policies	★★★
3.4 The priorities in national biodiversity strategies and action plans are being actively implemented, as a means to achieve national implementation of the Convention and as a significant contribution towards the global biodiversity agenda.	★★★
Goal 4. There is better understanding of the importance of biodiversity and of the Convention, and this has led to broader engagement across society in implementation.	★★★

Strategic goals and objectives	Progress
4.1 All Parties are implementing a communication, education, and public awareness strategy and promoting public participation in support of the Convention.	★★★
4.2 Every Party to Cartagena Protocol on Biosafety is promoting and facilitating public awareness, education and participation in support of the Protocol.	★★★
4.3 Indigenous and local communities are effectively involved in implementation and in the process of the Convention, at national, regional and international levels.	★★
4.4 Key sectors and stakeholders, including the private sector, are engaged in partnership to implement the Convention and are integrating biodiversity concerns into their relevant sectoral and cross-sectoral plans, programmes and policies.	★★

★ Little progress ★★ some progress ★★★ significant progress

4.4 Conclusion

The implementation of CBD in DPRK stimulated the development of national economy, improvement of land management and environmental protection and people's livelihood by protecting the ecosystem, species of animal and plant and sustainable utilization of biological resources.

The CBD implementation contribute not only to the achievement of the target towards the greening of whole country but also to the improvement of eco-environment of the country and promoting the sustainable economic development by sustainably using the biological resources

In pursuance of CBD, the National Biodiversity Strategy & Action Plan of DPRK has prepared and updated in line with the requirement of millennium sustainable development.

In this NBSAP, the long-term target and priority actions have highlighted.

Through the implementation of CBD, the biodiversity–related laws and regulations have formulated and enacted and the "Law on Nature Reserve" are now preparing from the importance of protected areas in biodiversity conservation.

The material and technical foundation have been strengthened for the ecological conservation and biodiversity conservation.

As DPRK has 80% of mountainous area of the whole territory, the public awareness on the impact of deterioration of forest ecosystem which causes water and soil loss and flood have been raised and the activities for greening the whole country and the material and technical foundation for forest plantation including nursery making have been promoted and strengthened.

The measures have been taken in nationwide for the conservation and sustainable use of marine resources and the fish culture in inland water has been advanced in high level.

The organic farming and conservation agriculture have promoted and disseminated to the farms and the public awareness on eco-environment have enhanced.

The legal, administrative and technical framework for biosafety has established.

The progresses have been achieved in the activities of establishing the national reserve network and the conservation and increment of useful animal and pant as well as the conservation of threatened species

The innovative capacity of universities, colleges and research institutions has been substantially increased and the public capacity and enthusiasm for participation in biodiversity conservation are greatly increased.

The experiences in the implementation of CBD showed that the biodiversity conservation must be done in national project led by the government and based on cross-sectoral coordination and relies on strict law enforcement.

And it also proved that enthusiastic participation of the public with the deep understanding about the value of biodiversity and demonstration of regional ecosystems and reserves with socio-economic and eco-environmental benefits should be promoted and their best practices generalized.

And the main causes of biodiversity loss should be assessed and the legal sanctions against biodiversity conservation including over-exploitation and environmental pollution should be strengthened and various socio-economic incentive measures should be taken.

As the government of DPRK gives the priority to the restoration of deteriorated forest ecosystem and wetland ecosystem, the ecosystem approach shall be applied for the overall protection of ecosystems.

The followings are the future priorities and capacity –building needs in DPRK;

1. Enforce the policies and legislation system for the conservation and sustainable use of biodiversity
   - Evaluate all existing laws and other policies
   - Develop favorable policies for the conservation and sustainable use of biodiversity
   - Strengthen the construction of legislation system and increase the law enforcement capacity of related authorities.
2. Carry out biodiversity survey, evaluation and monitoring
   - Carry out nationwide surveys and cataloguing on major ecosystem, species, genetic resources and related traditional knowledge
   - Set up related databases and information networks, establish national biodiversity monitoring and early-warning systems, and
   - Undertake national biodiversity assessments
3. Strengthen in –situ biodiversity conservation
   - Establish the national system of nature reserves

- Carry out pilot projects of establishing national nature reserves, and enhance the management of nature reserve
- Improve scientific research on nature reserves and provide the necessary facilities for biodiversity conservation and its operation

4. Strengthened ex-situ biodiversity conservation and storage
   - Strengthen the facilities for ex-situ conservation build management capacity
   - Carry out the activities for reintroducing artificially bred populations into nature
5. Demonstration of eco-environmental conservation combined with sustainable use of biological resource and generalize their best practices
   - Forest: demonstration of restoration of degraded forest and the sustainable use of forest
   - Fishery: increase the demonstration site for fishing and aquaculture
   - Medicinal plant: demonstration of conservation of medicinal plant and
   - Agriculture: demonstration of sustainable agriculture, rural development and conservation of agro-biodiversity
6. Enhancing the human, scientific and technical capacity for biodiversity conservation and sustainable development

APPENDIX I. INFORMATION CONCERNING REPORTING PARTY AND PREPARATION OF NATIONAL REPORT

A. Reporting party

Contracting Party	Democratic People's Republic of Korea
NATIONAL FOCAL POINT	
Full name of the institution	*National Coordinating Committee for Environment (NCCE), DPR Korea*
Name and title of contact officer	*KIM Chol Guk, CBD National Primary Focal Point*
Mailing address	*Jungsongdong, Central District, Pyongyang, DPR Korea, PO. Box 44*
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CONTACT OFFICER FOR NATIONAL REPORT (IF DIFFERENT FROM ABOVE)	
Full name of the institution	
Name and title of contact officer	
Mailing address	
Telephone	
Fax	
E-mail	
S U B M I S S I O N	
Signature of officer responsible for submitting national report	*National Coordinating Committee for Environment* *Secretary General* *RI Hung Sik* 
Date of submission	*December 12 , 2011*

B. Information on the preparation of the report

The State Academy of Sciences, authorized by the National Coordinating Committee for Environment(NCCE), DPRK, led the preparation for the 4th National Report of the DPRK to CBD.

NCCE was responsible for overall coordination and oversight of the preparation of the 4th National Report

The preparation of 4th National Report has started since 2007 after the 8th meeting of the Conference of Parties of CBD and the information was collected and desk-top studies and review were performed.

The UNEP/GEF have provided the financial support.

The preparation of the 4th National Report on the implementation of the Convention on Biological diversity consists of the following stages:

1 . 1st Meeting of Coordinating Group for the preparation of the 4th National Report

NCCE convened the first meeting of the Coordinating Group for the preparation of the Fourth National Report on September 5, 2011 and established the National Report Coordinating group. During the meeting, the involvement of different stakeholders, providing the information, and task assignments were discussed. The meeting approved Expert and Compilation Group from various institutions for the 4th National Report.

2. Activities of the Expert and Compilation Group for the 4th National Report

The Expert and Compilation Group held its first meeting on September 14, 2011 to discuss the general format of the report, collection and analysis of relevant information for each article.

The group also set the timetable for preparing the first draft report. The timetable clarified the assignment of different ministries and stakeholders.

Data necessary for the preparation of the report was collected from a range of information sources such as government policies on biodiversity conservation, the 2nd and 3rd National Reports on Biological Diversity of DPR Korea, international and national project reports, research work and other relevant publications. The expert group organized 5 rounds of meetings and 3 rounds of thematic consultations.

3. Drafting the 4th National Report

The 2nd Expert and Compilation Group meeting was held on October 5, 2011 to discuss the synthesis and compile the collected information. After the meeting the group collect and clarify the materials and data as required by the preparation outline. They sorted materials and data submitted by relevant departments and developed the chapters and appendices of the report.

The first draft of the Fourth National Report was completed and sent to NCCE, MoLEP and other relevant agencies and research institutes.

4. 2nd meeting of the Coordinating Group for review of the draft 4th Report

The meeting was held on November 25, 2011 to seek the suggestions from deferent departments. During the meeting, representatives from different departments put forward suggestions for revision of the draft report. The expert group revised based on these suggestions and completed the report.

5. Submission and Approval of final 4th National Report

The final 4th National Report was submitted to NCCE on December 5, 2011 in accordance with relevant procedures for its approval.

6. Translation of the 4th National Report and its submission to CBD Secretariat

The approved 4th National Report was translated into English before being submitted to CBD Secretariat.

Ministries and institutions involved in the preparation of the report:

- Ministry of Land &Environment Protection
- State Planning Commission

- Ministry of Agriculture
- Ministry of Fishery
- Ministry of Forestry
- Ministry of Public Health
- Ministry of Culture
- Ministry of Municipal Administration
- Hydro-meteorological Bureau
- Central Statistic Bureau
- Korean Nature Conservation Union
- Korean General Federation on Science &Technology

APPENDIX Ⅱ FURTHER SOURCES OF INFORMATION

1. Code of DPR Korea, Legislation Publishing House, 2004
2. National Biodiversity Strategy and Action Plan of DPR Korea, Foreign Languages Books Publishing House, 1998
3. The 1st National Report of Biodiversity of DPR Korea, Foreign Languages Books Publishing House, 1998
4. The 2nd National Report of Biodiversity of DPR Korea, Foreign Languages Books Publishing House, 2005
5. The 3rd National Report of Biodiversity of DPR Korea", Foreign Languages Books Publishing House, 2006
6. National Biodiversity Strategy and Action Plan of DPR Korea, (updated), Foreign Languages Books Publishing House, 2007
7. National Forum on Conservation and Use of Plant Genetic Resources, 2004
8. Report on National Bio-safety Framework of DPR Korea, State Academy of Sciences, 2004
9. State of Environment, DPR Korea, Foreign Languages Books Publishing House, 2003
10. National Capacity Self-Assessment and Action Plan of DPRK for Global Environmental Management, Foreign Languages Books Publishing House, 2006
11. National Capacity Self- Assessment for Biodiversity for Global Environmental Management, Foreign Languages Books Publishing House, 2006
12. National Capacity Self-Assessment for Cross-cutting of DPRK for Global Environmental Management, Foreign Languages Books Publishing House, 2006
13. National Capacity Self-Assessment for Desertification of DPRK for Global Environmental Management, Foreign Languages Books Publishing House, 2006
14. Diversity Assessment of Plant Species, Animal Species, Ecosystem in the Focal Areas of Biodiversity, Publishing House of Science and Encyclopedia, 2007
15. Coastal Management in the Korean West Sea (Report of investigation of Wildlife), Publishing House of Science and Encyclopedia, 2007
16. Pak U Il et al, "Red Data Book of DPR Korea" (Animal), MAB National Committee, 2002
17. Ra Ung Chil et al, "Red Data Book" (Plant), MAB National Committee of DPRK, 2005
18. Pak U Il, Yun Chol Nam et al, Natural Protected Areas of DPR Korea, MAB National Committee of DPR Korea, 2005
19. Yun Chol Nam, Rim Choo Yeon et al, List of Animal and Plant in the Main Natural Protected Areas of DPR Korea, MAB National Committee of DPR Korea, 2005
20. Pak Hyong Seon et al, Catalog and Assessment to Alien Species, DPRK, Foreign Language Books Publishing House, 2009
21. Pak U Il et al, Ecological Engineering, Science and Encyclopedia Publishing House, 2007

22. Kim Kwang Joo et al, Agro-Forestry Management, Industrial Publishing House, 2009
23. Kim Kang Ryong et al, Environmental Dictionary, Science and Encyclopedia Publishing House, 2007
24. Im Rok Jae et al, Encyclopedia of Forest (Vol. 1), Industrial Publishing House, 1994
25. Im Rok Jae et al, Encyclopedia of Forest (Vol. 7), Industrial Publishing House, 2000
26. Pak Byong Ho et al, Conservation Agriculture and Sustainable Use of Land, Industrial Publishing House, 2007
27. Ri Pong Rak, History of Korean Natural Environmental Conservation(Vol. 2), Agricultural Publishing House, 2000
28. Choe Jin Ok, Variation and Management of Fishery Resources, Industrial Publishing House, 2001
29. Ri Chan Kee et al, Use of Genetic Resources in Vegetable Breeding of Vegetables, Agricultural Publishing House, 2006
30. Ra Ung Chil et al, Mt. Kuwol Biosphere Reserve, Agricultural Publishing House, 2009
31. Won Hong Koo et al, Korean Fauna, Science and Technical Publishing House, 2008
32. Ra Ung Chil et al, Korean Endemic Plants, Industrial Publishing House, 2007
33. Ri Myong Hwa, Study on Plant Species Diversity of Mt. Kumgang, 2007
34. Sin Nam Hui, Study on the Ecological Assessment and Implementation of Conservation Management in the Main Natural Protected Areas of DPRK", 2009
35. Sin Myong Ho, Study on Database Building of Korean Higher Plant Species, 2007
36. Sin Nam Hui, Is It Possible to Extend Core Area in the Coastal Ecosystem of Mt. Kuwol Biosphere Reserve?, 2008
37. Breeding of Adult Flatfish in the Breeding place, Settlement of size of mussels for the period of producing-stop, Korean Fishery (No. 1), 2004
38. Effectiveness applied extracted depositions from potato to vegetables, Reasonable proportion of the applying-time of Nitrogen fertilizer in the wiesenboden paddy field applied by phosphate bacterium fertilizer, Agricultural Science and Technology (No.6, 7), 2006
39. Characters of ecological effective microorganisms fertilizer and its effectiveness in use, effect of compound bacterial fertilizer and effectiveness of organic fertilizer in potato cultivation, Agricultural Science and Technology (No.6, 7, 9, 12), 2007
40. Principles in the use of forest resources, Journal of Forestry (No. 4), 2007
41. Controlling of pine caterpillars by bio-pesticide, Journal of Forestry (No. 2), 2008
42. Microorganism compounds for forest, effective in seedling growing, Forestry (No. 2), 2008

APPENDIX III. PROGRESS TOWARDS THE GLOBAL STRATEGY FOR PLANT CONSERVATION AND THE PROGRAM OF WORK ON PROTECTED AREAS

A. Progress towards targets of the global strategy for plant conservation

Target 1: A widely accessible working list of known plant species, as a step towards a complete world flora.

In DPRK, the books "Flora of Korea", "Spore-bearing Plants of Korea" and the plant inventories of each application field including " Inventory of Medicinal Plants", "Encyclopedia of Korean Traditional Medicines" and "Dictionary of Plants of Economic Value" , "Series of Forest" (volum1-8) have been published and disseminated. The "List of Animal and Plant of the Main Nature Reserves" was published and the program "Mokran" for database of higher plant species in Korea were developed in 2007, and produced the updated one in 2009 including lower plants continuously revising and supplementing the data about the plants.

Recently, the books "Wild Flowers of Korea", "Endemic Plants of Korea" with valuable list of plants have been published. For the implementation of NBSAP and 3rd 5-Year Development Plan for Science & Technology (2008-2012), the Center for Biodiversity, State Academy of Sciences is now building database on the flora of Korea with species names in five languages (Korean, English, Russian, Chinese, and Japanese), scientific names, taxonomical degrees, pictures and species description which reaches in nearly completion. Research and investigation have performed to supplement and update "Korean Flora" and "Korean Spore-bearing Plants" every ten years.

The Institute of Botanical is preparing the inventory of agricultural fungi, but there are some constraints including the insufficient financial support for its completion.

Target 2. A preliminary assessment of the conservation status of all known plant species, at national, regional and international levels.

In 2005, "Red Data Book of DPR Korea" (Plant) was published. Researches are carrying out to evaluate the rareness and threatening of plants well-known at home and abroad.

Target 3. Development of models with protocols for plant conservation and sustainable use, based on research and practical experience.

This target is highlighted in the NBSAP, Master Plan of Forest Management (to 2020), the 10-Year Plan of Afforestation, and "Law on Medicinal Plant". The specific models with protocols and models relevant to plant conservation and sustainable use have not been prepared in DPRK. The Institute of Botany and institutes under the Branch Academy of Forest Science have exerted their efforts to develop the models for plant conservation and sustainable use through exchanging and sharing their experiences and ideas.

Target 4. At least 10 percent of each of the world's ecological regions effectively conserved.

Recent years, DPRK has taken various measures to expand protected areas. In particular, attention has been paid to the expansion of protected area, buffer zones and ecological corridor, and as a result, the protected areas have been increased in its number and coverage. After its ratification of the CBD, the government of DPRK took a measure to expand the nature reserves to 696,927ha, accounting for 5.68% of whole territory in 1995. And in 2006, the coverage of nature reserves was increased to 879,275ha, occupying 7.2% of the territory. (See 1.3.1) The NBSAP highlighted the target to expand the total area of nature reserves to 8% of territory and establish a national network by 2010. At present, the number of plant reserve is 25 and the total area is 25698.2 ha.

Target 5. Protection of 50 percent of the most important areas for plant diversity assured.

Nearly all of the key areas for plant diversity in DPRK were designated as reserves and managed. The NBSAP highlighted the expansion of protected areas to 8% of territory and establishment of national network by 2010. Among them, 489,377.8 hectares of forest areas are protected under the system of protected areas. Especially the special significance was attached to the plant conservation of Mt. Oga, Mt.Kumgang, Mt.Paektu, and Mt. Chilbo where the endemic and threatened species of plants are distributed.

Target 6. At least 30 percent of production lands managed consistent with the conservation of plant diversity.

DPRK have not yet reached at 30% of production lands managed consistent with the conservation of plant diversity However, in some local areas, the agro-forestry management technology which provides the sustainable use of tree, crop, medical plants and wild edible plants has introduced to contribute to the conservation of local biodiversity. The farms and areas, applied with agro-forestry management will be increased and the great progress will be achieved in conservation and sustainable use of plant diversity.

Target 7. 60 percent of the world's threatened species conserved in-situ.

The most of all endemic and threatened species are protected in the main nature reserves such as Mt. Kumgang, Mt. Myohyang, and Mt. Kuwol, and scattered threatened species are designated into natural monuments and protected. The Institute of Botany and Plant Society has performed the assessments on the threatened species of plants and taken measures for conservation and restoration of these plants. Particularly, investigation and conservation programmes of the endemic species of Korea and the regional threatened species of East Asia like *Goodyerea reens, Neottinanthe cucullata, Lilium duricum, Psudostellaria sylratica, Viola westeri, Lilium hausonii, Taxus cuspidata, Gastrodia el*ata, *Rhododendron micanthum, Brasenia schreberi* are strengthened.

Target 8. 60 percent of threatened plant species in accessible Ex-situ collections, preferably in the country of origin, and 10 percent of them included in recovery and restoration programmes.

The Central Botanical Garden has 6500 species of plants and performs the research and experimental works on the breeding of Korean endemic species including *Keumkangsania asiatica, Pentactina rupicola Nak., Forsythia ovata Nak, Abeliophyllum Nak., Stewartia Koreana Nak.* etc. And the researches to return the endangered species including *Rheum coreanum* to nature are under implementation at the Central Botanical Garden, Institute of Botany, State Academy of Sciences and its experimental stations.

In particular, the Yangdok Experimenal Station under the Institute of Botany has attached the importance to the protection and propagation of threatened species with the restoration plan for some species and expand their habitats. And the forest management stations under MoLEP, and industrial forest management station**s** under Ministry of Forest are promoting the activities for mass proliferation, acclimatization of decreased wild plants and reintroduced them into nature(See 1.3.2).

Target 9. Seventy percent of the genetic diversity of crops and other major socio-economically valuable plant species conserved, and associated indigenous and local knowledge maintained.

The varieties of indigenous crops are preserved in gene bank at the Institute of Crop Variety under the Academy of Agricultural Science. In order to preserve the agricultural crops and the species and genetic diversity of major plants with socio-economic value, the Institute of Crop Variety under the Academy of Agricultural Sciences, Branch Academy of Cell and Genetic Engineering and Branch Academy of Biology under the State Academy of Sciences, Central Botanical Garden, **Kim Il Sung** University and other research institutes and universities are trying to establish a gene bank and germ plasm bank and improve their capacity. Conservation of genetic diversity is controlled by the "Law on Biosafety" incorporated into the national action plan. Furthermore, the National Biosafety Committee has been organized and strictly controll the cultivation of LMO.

Target 10. Management plans in place for at least 100 major alien species that threaten plants, plant communities and associated habitats and ecosystems.

The activities against invasion of alien plant species are incorporated into the national plans and strategies. The inspection system on the plants and phytopathogen from foreign countries is established under the "Law on the Boundary Inspection of Animals and Plants" in DPRK. In 2009, a book "Inventory and Impact Assessment of Alien Species in DPRK" was published with the list of 226 species of alien plants and the measures have taken to strengthen the controlling of alien species.

Target 11. No species of wild flora endangered by international trade.

To prevent the loss of wild medicinal herbs, the Government of DPRK limits their exploitation and use and strictly controls their import and export. It expands the cultivation area to meet the growing demands for wild medicinal plants. Particularly, exports of threatened species of plants are strictly limited in nationwide scale.

Target 12. 30 percent of plant-based products derived from sources that are sustainably managed.

Efforts are being made to derive at least 30% of the traditional medicines from the resources that are sustainably managed and to obtain many foodstuffs from the agricultural products which are produced by the sustainable farming method, and organic farming.

The total cultivation area of medical plants in DPRK is about 10 000ha and the numbers of cultivated medicinal plants are almost 80 species. Every city and county has the target to cultivate the medical plants in the area of 300ha and very active in its implementation.

Target 13. The decline of plant resources and associated indigenous and local knowledge, innovations and practices that support sustainable livelihoods, local food security and health care, halted.

Comprehensive analysis on the resources of plant-based products has not been performed. However, the strict restrictions and distribution system are applied to the exploitation of forest resources, including timber, firewood, and medicinal herbs, and premium system is applied to the units advanced in the sustainable use and the principle is maintained to generalize their examples.

The NBSAP incorporated the plan related with the conservation and promotion of plant resources and associated indigenous knowledge and practical experiences. “Law on Agriculture” regulated that all institutions and enterprises, citizens must conserve good indigenous species and “Law on Organic Industry” encouraged production of organic farming. “Law on Invention” and “Law on Copyright” legally protect the traditional crops, medicinal herbs and other traditional plant genetic resources, their handling technology, traditional know-how and inventions related with them, and defends the peasants’ rights in benefit-sharing.

Target 14. The importance of plant diversity and the need for its conservation incorporated into communication, educational and public-awareness programmes.

Botanical gardens and arboreta play important role not only as protected bases, but also as learning site that provide regular opportunities for public outreach and contact with living plants. Every day, thousands of people visit the Central Botanical Garden and broaden their ideas on plant. It has made significant progress in organizing workshops and providing research plans and public education materials related to plant diversity and conservation. In 2007 – 2009, many books for public awareness including the books “Common Sense on Plant for the Kindergarten Teachers”, “Common Sense on Plant for Everybody”, “Botanical Garden of DPRK”, “Korean Endemic Plants” were published. Environment related education programmes are developed for universities and colleges. Every year many students graduate from the universities in this botanical and environment field.

Target 15. The number of trained people working with appropriate facilities in plant conservation increased, according to national needs, to achieve the targets of this Strategy.

In 1992, the *Ministry of Education* integrated the issue of strengthening the environment education into the education program and took practical measures. The education program followed general education steps has incorporated the educational contents on the importance and needs of biodiversity conservation. By 1994, the State Academy of Science integrated the biodiversity expert training programs into the curriculum of postgraduate course of biology sector to educate biodiversity exports. Consequently, through this course, a lot of biodiversity and ecology experts are trained every year and their number increased.

In addition to this, the lectures related to plant protection in universities and other specialized educational institutions have increased. Along with this, re-education for the officers has performed to raise their qualifications(See 3.3.5).

Target 16. Networks for plant conservation activities established or strengthened at national, regional and international levels.

DPRK is trying to build a biodiversity conservation network for the environmental management of the basin of the Tumen River. In collaboration with the Chinese Academy of Sciences and the Far East Branch of the Russian Academy of Sciences, the State Academy of Sciences is preparing the development of network for biodiversity conservation including plants and its sustainable use.

However, this project is out of implementation due to financial problems and other constrains.

B. Goals and Targets of the Program of Work on Protected Areas

Goal 1.1 To establish and strengthen national and regional systems of protected areas integrated into a global network as a contribution to globally agreed goals.

Target: By 2010, terrestrially and 2012 in the marine area, a global network of comprehensive, representative and effectively managed national and regional protected area system established as a contribution to (i) the goal of the Strategic Plan of the Convention and theWorld Summit onSustainable Development of achieving a significant reduction in the rate of biodiversity loss by 2010; (ii) the Millennium Development Goals – particularly goal 7 on ensuring environmental sustainability; and (iii) the Global Strategy for Plant Conservation

DPRK has established the target to increase the protected area to 8% of the territory by 2010 and reached to 7.2% of the territory (879,275 ha) in 2006. As Mt.Myohyang Natural Park was registered as the International Biosphere Reserve in 2009, DPRK had three international biosphere reserves (Mt.Paektu Biosphere Reserve, Mt.Kuwol Biosphere Reserve, Mt.Myohyang Biosphere Reserve) which are nominated in the World Biosphere Rreserve Network. The activites for establishing the national protected areas network are on proceeding, and the book "Atlas of Biosphere Reserves in DPRK", published in 2007, contributed to strengthening the exchanges between the memberships of East Asian Biosphere Reserves Network (EABRN). At present, the general survey is on proceeding to increase the protected areas of land, inland water and coastal zones.

Goal 1.2 To integrate protected areas into broader land-and seascapes and sectors so as to maintain ecological structure and function.

Target: By 2015, all protected areas and protected area systems are integrated into the wider land- and seascape, and relevant sectors, by applying the ecosystem approach and taking into account ecological connectivity 5/ and the concept, where appropriate, of ecological networks.

DPRK establishes the strategic target in the priciple of supporting sustainable economic development harmonizing with resources and environment and economic activities with conservation in advance in biodiversity conservation and its sustainable use and improving the general eco-environment and reasonable and sustainable use of natural resources. The priority is given to strengthening the national framework of protected areas conservation and capability of its management, and the measures have been taken to improve the management of coastal wetland ecosystems. It needs to attach the attention to restore the degraded forest ecosystem and wetland

ecosystem and to apply the ecosysem approach, the integrated management plan for local ecosytem to promote the conservation and sustainable use of land,water and biological resources.

Goal 1.3 To establish and strengthen regional networks, transboundary protected areas (TBPAs) and collaboration between neighboring protected areas across national boundaries.

Target: ***Establish and strengthen by 2010/2012 6/ transboundary protected areas, other forms of collaboration between neighboring protected areas across national boundaries and regional networks, to enhance the conservation and sustainable use of biological diversity, implementing the ecosystem approach, and improving international cooperation***

DPRK has take the measures to strengthen the joint studies for conservation and management for Mt.Paektu Biosphere Reserve with China and Tuman River area.

Goal 1.4 To substantially improve site-based protected area planning and management.

Target: ***All protected areas to have effective management in existence by 2012, using participatory and science-based site planning processes that incorporate clear biodiversity objectives, targets, management strategies and monitoring programmes, drawing upon existing methodologies and a long-term management plan with active stakeholder involvement***

The government is carrying out its activites in the principle of “Bottom-Up Participatly Method” to encourage the local people participate from the planning stage and management of the reserves.
The projects, “Coastal Biodiversity Management in the Korean West Sea” in 2005-2007 and “Restoration of Red crowned crane Habitat in Anbyon and Construction of Community–based Management” are the good examples which demonstrated the effectiveness of integration of reserve manaegement into national and local planning and the participatory method.

Goal 1.5 To prevent and mitigate the negative impacts of key threats to protected areas.

Target: ***By 2008, effective mechanisms for identifying and preventing, and/or mitigating the negative impacts of key threats to protected areas are in place.***

The measures are taken to identify the main threats to protected areas and to assess its impact and to prevent them, but still, in poor level.

Goal 2.1 To promote equity and benefit-sharing.

Target: ***Establish by 2008 mechanisms for the equitable sharing of both costs and benefits arising from the establishment and management of protected areas***

The government supports finance for disignation and management of the protected areas. The government has integrated the development plan of reserves into the national economic plan by implementing economic and technical policies and measures in consistent with the development of reserves. The development and management of reerves shall take into account local economic development and improving working and living conditions of local communities.

Goal 2.2 To enhance and secure involvement of indigenous and local communities and relevant stakeholders.

Target: ***Full and effective participation by 2008, of indigenous and local communities, in full respect of their rights and recognition of their responsibilities, consistent with national law and applicable international obligations, and the participation of relevant stakeholders, in the management of existing, and the establishment and management of new protected areas***

Under the supervision of Ministry of Land and Environmental Protection, the departments of forest management have the responibility to manage the reserves involving the rangers in the protected areas. The government also organizes the activities including training course for rangers every year and encourage the stakeholders, especially local communities to participate in such activites.

Goal 3.1 To provide an enabling policy, institutional and socio-economic environment for protected areas.

Target: ***By 2008 review and revise policies as appropriate, including use of social and economic valuation and incentives, to provide a supportive enabling environment for more effective establishment and management of protected areas and protected areas systems.***

DPRK has laid down the policies for thorough conservation of the natural protected areas and tried its best to carry out this policy.

Goal 3.2 To build capacity for the planning, establishment and management of protected areas.

Target: ***By 2010, comprehensive capacity-building programmes and initiatives are implemented to develop knowledge and skills at individual, community and institutional levels, and raise professional standards***

As MoLEP takes some measures for thorough conservation of the natural protected areas and strengthening of management level, management of the natural protected areas is improving. In addition, through implementation of projects and action plans for conservation and management of the protected areas in corporation with the international organizations, capacity building for the protected areas has been further strengthened. The "Guide Book for Rangers" was published and distributed in 2007 for capability building of rangers and improvement of reserves management.

Goal 3.3 To develop, apply and transfer appropriate technologies for protected areas.

Target: ***By 2010 the development, validation, and transfer of appropriate technologies and innovative approaches for the effective management of protected areas is substantially improved, taking into account decisions of the Conference of the Parties on technology transfer and cooperation.***

The State Academy of Science is responsible for the researches on the assessment and management of protected areas while Korean Nature Conservation Union has disseminate the innovative technology for management of natural protected areas through training courses etc. In addition, the innovative technical results have been developed and introduced through the implementation of projects for biodiversity conservation and sustainable use in wetland and for restoration of habitats in corporation with the international organizations.

Goal 3.4 To ensure financial sustainability of protected areas and national and regional systems of protected areas.

Target: ***By 2008, sufficient financial, technical and other resources to meet the costs to effectively implement and manage national and regional systems of protected areas are secured, including both from national and international sources, particularly to support the needs of developing countries and countries with economies in transition and small island developing States.***

Ministry of Land & Environment Protection, Ministry of Culture, Cultural Relics Preservation Bureau and Ministry of Municipal Administration are in charge of supporting finance for the management of reserves and scenic spots but not full supporting. There was no any support except the international support for Mt. Myohyang Biosphere Reserve and the migratory reserve at the Korean West Sea areas.

Goal 3.5 To strengthen communication, education and public awareness.

Target: ***By 2008 public awareness, understanding and appreciation of the importance and benefits of protected areas is significantly increased***

The non-governmental organizations related with biodiversity conservation are Korean Nature Conservation Uniond (KNCU) and Korean Federation of Science and Technology(KFST). KNCU is responsibe for public awareness, education and propoganda, involving Plant Protection Association, Animal Protection Association and Water Resources Protection Association and so on, while KFST is responsible for resources management, eco-environmental protection involving Biology Society, Animal Society, Plant Society, Agricuture Society, Forest Society and Plantation Society and others for reseach, propoganda, public awareness, education and exchanges of biodiversity.

Goal 4.1 To develop and adopt minimum standards and best practices for national and regional protected area systems.

Target: ***By 2008, standards, criteria, and best practices for planning, selecting, establishing, managing and governance of national and regional systems of protected areas are developed and adopted.***

DPRK has developed the criteria for the proted areas under the standards of IUCN and newly disignated the natural protected areas and established the framework for management of the protected areas. The guideline for criteria of disignation and zonation of the reserve has been prepared to manage the natural protected areas for eco-environmental conservation and sustainable use. And review and re-identification of zonation of Mt. Paektu Biosphere Reserve are now reviewed and re-identified.

Goal 4.2 To evaluate and improve the effectiveness of protected areas management

Target: ***By 2010, frameworks for monitoring, evaluating and reporting protected areas management effectiveness at sites, national and regional systems, and transboundary protected area levels adopted and implemented by Parties***

After the ecological assessment of the main six reserves including Mt. Paektu Biosphere Reserve, approaches and standards for ecological and management assessments of the reserves have been developed and the standard process and programs have provided good opportunity for effective management of the reserve.

Goal 4.3 To assess and monitor protected area status and trends

Target: ***By 2010, national and regional systems are established to enable effective monitoring of protected-area coverage, status and trends at national, regional and global scales, and to assist in evaluating progress in meeting global biodiversity targets***

See 4.1, Chapter 2.

Goal 4.4 To ensure that scientific knowledge contributes to the establishment and effectiveness of protected areas and protected area systems.

Target: ***Scientific knowledge relevant to protected areas is further developed as a contribution to their establishment, effectiveness, and management***

The investigation and research results on Mt. Paektu, Mt. Myohyang, Mt. Kuwol and wetland reserves have been databased and provided with the basic data for the establishment of natural reserves network and implementation of management of natural reserves. The project for building database on animal and plant of the main natural reserves is under implementation from 2009 to promote the scientific conservation and management of reserves and public awareness raising.