



5th National Report on Biodiversity of DPR Korea



Contents

Executive Summary	5
Part 1. An update on biodiversity status, trends, and threats and implications for human well-being	7
1.1 Impotance of Biodiversity Conservation in DPRK	7
1.2 Status and Trends of Biodiversity	8
1.2.1 Status of Biodiversity	8
1.2.2 Trends of Biodiversity	11
1.3 Main Threats to Biodiversity	12
1.3.1 Overuse of natural resources	12
1.3.2 Habitat loss	13
1.3.3 Invasive alien species and environmental deterioration	13
1.3.4 Climate change	14
1.4 Impacts of the changes in biodiversity for ecosystem services and the socio-economic and cultural implications of these impacts	15
1.5 Future Changes for Biodiversity and their impacts	16
Part II: The national biodiversity strategy and action plan, its implementation, and the mainstreaming of biodiversity	17
2.1 National Biodiversity Strategy and Action plan	17
2.2 Main Actions to Implement the Convention on Biological Diversity	18
2.2.1 National Legislations, Policies and Administrative institutions for Biodiversity Conservation and Its Sustainable Use	18
2.2.2 Strengthening In –situ and Ex-situ conservation	19

2.2.3 Intensifying biodiversity survey and monitoring	23
2.2.4 Strengthening the conservation and sustainable use of components of biodiversity.....	24
2.2.5 Prevention and control of invasive alien species.....	27
2.2.6 Strictly controlling pollution and ecological damage.....	28
2.2.7 Strengthening the management of genetic resources	30
2.2.8 Improving scientific research and training.....	31
2.2.9 Enhancing public participation and education	34
2.2.10 International cooperation.....	35
2.3 Sectoral and cross-sectoral integration of biodiversity consideration.....	36
2.3.1 Forest sector.....	37
2.3.2 Agriculture sector	40
2.3.3 Fishery	42
2.3.4 City administration sector	43
2.3.5 Education sector.....	43
2.3.6 Other sectors	45
2.3.7 Overall assessment of progress in implementing NBSAP.....	45
Part III. Progress towards 2020 Aichi Biodiversity Targets and contributions to the 2015 Targets of the Millennium Development Goals.	47
3.1 Progress in the Implementation of 2020 Biodiversity Strategic Plan and Aichi Biodiversity Targets.....	47
3.2 Progress toward achievement of 2015 Millennium Development Goals.....	59
3.3 The experiences learned in the implementation of convention in DPRK.....	59
3.3.1 The experiences	60
3.3.2 The further activities at national and global level	61

Appendix I. Information Concerning Reporting Party and Preparation of National Report..... 63

 A. Reporting party63

 B. Information on the preparation of the report.....64

Appendix II. Further sources of information 66

Appendix III. Progress towards the Global Strategy for Plant Conservation 69

Executive Summary

Since the preparation of the 4th report, the Working Group for preparing the 5th National Report of DPR Korea was organized in accordance with the Article 26 of the CBD and the X/10 of COP with the involvement of several relevant agencies including the Ministry of Land & Environment Protection (MLEP), Ministry of Forestry (MOFr), Ministry of Fisheries (MOFs), Ministry of Agriculture (MOA) and Ministry of Public Health (MOPH), and the preparation has been conducted under the supervision of the State Academy of Sciences (SAOS), authorized by the National Coordinating Committee for Environment (NCCE), DPR Korea.

2 rounds of national workshops, 4 rounds of thematic consultations and 8 rounds of sectoral expert meetings at national and local levels were conducted to coordinate and make agreements between several relevant agencies in relation to the preparation of the 5th national report.

Above-mentioned workshops and meetings were participated by officials and experts from SAOS, MLEP, MOA, MOFr, Ministry of Education (MOE), MOPH, MOFs, and Bureau for National Legacies Conservation and Hydro-meteorological Service.

Lots of data were collected and summarized according to the guideline for the preparation of the 5th report, focusing on the progress in implementing the National Biodiversity Strategy and Action Plan (NBSAP) during the period of 2010 –2013.

More than 20 years have elapsed since the adoption of the Convention on Biological Diversity (CBD) on June 5, 1992 at the Earth Summit on Environment and Development (the Rio “Earth Summit”), and during the period global strategic plans for the conservation of biodiversity and the sustainable use of its components were developed several times.

The degradation of ecosystem and the loss of biodiversity are, however, being continued owing to the population growth, unsustainable use of resources, activities for economic development, intensifying climate change, land desertification and so on, all of which are still threatening human existence and safety.

The COP10(2010), therefore, presented the Strategic Plan for Biodiversity 2011-2020 and

Aichi Biodiversity Targets on the basis of the past experiences and lessons.

The Strategic plan and Aichi Targets highlighted, first of all, the importance of public awareness on the value of biodiversity and the way of its conservation and sustainable use, thus enabling them to contribute to the sustainable economic development.

In this context, the Government of DPR Korea has promoted the updating and implementation of its own NBSAP to contribute to achieving specific targets in global strategy. In order to achieve the goals for biodiversity conservation and sustainable use, the Government set forth the followings as important tasks and concentrated all efforts on;

- accelerating the national afforestation and gardening,
- restoring degraded forests within 10 years, increasing natural reserve areas gradually,
- establishing the national reserve network system, and
- thus improving and strengthening the reserve management and conservation of ecosystem, species and genetic diversity.

The 5th national report consists of Executive Summary, 3 Parts and Appendixes.

Part I provides the significance of biodiversity conservation, major recent changes in and threats to biodiversity, their impacts on ecosystem services and socio-economic and cultural consequences, and possible future changes and their impacts.

Part II describes the implementation of NBSAP, and its contribution towards the implementation of Strategic Plan for Biodiversity 2011-2020.

It highlights priorities for biodiversity conservation and sustainable use in DPR Korea, updates of the NBSAP and biodiversity targets, how the NBSAP includes global targets and contribute to promoting the Strategic Plan for Biodiversity 2011-2020, and how effectively the biodiversity has been mainstreamed into relevant sectoral/cross-sectoral strategies and plans and their implementation.

It also describes the progress in implementing the CBD and NBSAP since the preparation of the 4th national report.

Part III provides the progress towards the 2020 Aichi Biodiversity Targets and contributions to

the relevant 2015 Targets of the Millennium Development Goals.

As well, it describes the progress in implementing the Strategic Plan for Biodiversity 2011-2020 and Aichi Biodiversity Targets, the actions to implement the 2015 Targets for the Millennium Development Goals and experiences and lessons learned during the course and further priorities.

Part 1. An update on biodiversity status, trends, and threats and implications for human well-being

1.1 Importance of Biodiversity Conservation in DPRK

Biodiversity refers to the variability among living organisms of all forms of life and is intimately connected with human existence.

Biodiversity provides conditions for human survival and material foundations for sustainable social and economic development and becomes important source of literature, arts and scientific and technological innovations.

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

As a peninsula long stretched from north to south, the DPRK boasts a variety of natural landscapes including mountains, fields, rivers and coasts with abundant biodiversity for the territory size.

The number of plant species recorded in DPR Korea is 10,012, among which the number of higher plant species is 4,426, approx. 1.6% of the global number. And 1,494 species of vertebrates, 8,652 species of invertebrates and 866 species of fishes have been recorded so far.

Such a rich biodiversity becomes a priceless asset for developing national economy including agriculture, livestock breeding, fruit farming, forestry, aquiculture, bee-farming, and cultivation of herbs, as well as provides human health, cultural and emotional life.

Biodiversity provides enormous socio-economic benefits in agriculture such as the breeding of

new varieties, the increase in agricultural production, the improvement of soil fertility, fertilization of crops, the production of various foodstuffs, the solution of rural energy and so on. And also in forestry it provides various benefits and ecosystem services including the production of timber, herbs and fruits, the conservation of habitats for wild animals and its utilization, prevention of soil erosion and flood, and storage and purification of water. Likewise it brings great economic benefits to fishery, floriculture and tourism. It also becomes a basis of “bio-industry” such as biotechnological and pharmaceutical industry.

Lots of artists, writers and actors have described, via their arts and literatures, the rich biodiversity of the country, which make Korean people have an ardent love for their motherland.

Recently, lots of people take growing interests in environment protection and nature conservation with a deep understanding of which the biodiversity is a basis of natural resources and a fundamental key for the sustainable development of related field such as ecotourism and recreation.

And they have been developing tourism in Mt. Paektu, Mt. Myohyang, Mt. Kumgang, Mt. Chilbo and Mt. Kuwol, well known as worldwide scenic spots and the other rest areas all over the country with special landscapes so that they are increasing the value of cultural services from ecosystem and raising standards of cultural and emotional lives, and get the economic benefits.

Recent changes in eco-environment in DPR Korea highlights the importance of biodiversity conservation.

Biodiversity attracts increasing attention of the international community due to its significance in the national/regional socio-economic development, and becomes a hot topic after climate change.

1.2 Status and Trends of Biodiversity

1.2.1 Status of Biodiversity

DPRK, located on the north-east of Asian continent, is characterized by vertically and horizontally complicated topography with many mountains and rivers and long coastline. Among the whole territory of DPR Korea, the mountainous area covers the largest of about 74.7%, while the agricultural area occupies 15.2% and the water area does about 6.2%.

Thanks to long and complicated coastline, it has various coastal ecosystems as well as rich and

abundant diversity.

Number of plant and animal species

The number of plant species recorded in DPRK so far is 10,012, including 4,426 species of higher plants which accounts for about 1.6% of the number of plant species worldwide.

And the number of chordate species recorded so far is 1,494, among which vertebrate covers 1,436 species and one of invertebrate is 8,652 species, among which insect species covers 6,257.

In DPR Korea, there are 107 species of mammals (79 species of terrestrial ones and 20 species of marine ones), 420 species of birds, 866 species of fishes (190 species of fresh water fish, 676 species of sea fish, 17 species of amphibians, and 26 species of reptiles).

Status of the Threatened Plants and Animals

“Red Data Book” (Plant, 2004) classified the endangered/rare plant species among indigenous plants with the conservation category (from 1st to 4th), where 8 species belongs to the 1st category, 10 to the 2nd, 17 to the 3rd and 20 to the 4th.

The 1st category includes *Quercus neoglandulifera*, *Celtis edulis*, *C. cordifolia*, *Rosa kokusanensis*, *R. Jaluana*, *Lespedeza sarmentosa*, *Stewartia pseudo camellia* and *Lonicera coreana*.

The common endangered/rare plants covers 108 species in total, of which 8 species belongs to the 1st category including *Juniperus coreana*, and *Panax ginseng*, 21 to the 2nd, 34 to the 3rd, and 35 to the 4th.

Following Table 1-1 shows the rank of threatened plant species of DPRK throughout the whole East Asia area.

Table1-1: Threatened Plant Species in DPRK

Rank	Threatened species in DPR Korea	Threatened species of East Asia
Critically Endangered (CR)	<i>Quercus neoglandulifera</i> <i>Celtis cordifolia</i> <i>Stewartia pseudocamellia</i> <i>Megaleranthis saniculifolia</i> <i>Deutzia coreana</i>	<i>Neottinantho cucullata</i> <i>Goodyera repens</i> <i>Lilium dauricum</i>
Endangered (EN)	<i>Celtis edulis</i> <i>C. choseniana</i>	<i>Pseudostellaria sylvatica</i> <i>Viola websteri</i>

	<i>Drosera anglica</i> <i>Forsythia densiflora</i> <i>Albelia tyaihyoni</i>	
Vulnerable (VU)	<i>Nymphaea minima</i> <i>Lindera salicifolia</i> <i>Syringafauriei</i> <i>Albelia mosanensis</i>	<i>Taxus cuspidata</i> <i>Linium hasonii</i> <i>Gastrodia elata</i> <i>Rhododendron micranthum</i> <i>Brasenia schreberi</i>

The threatened species of mammals and birds are classified considering the status of the whole Asian area

The table 1-2 shows the threatened species of vertebrates in DPR Korea.

Table 1-2. Threatened species of vertebrates in DPR Korea

Classification Community	CR	EN	VU	Total
Mammals	1	5	8	14
Aves	2	6	13	21
Reptiles		2	3	5
Amphibians		1	2	3
Total	3	14	26	43

As Table 1-2 shows, the threatened species of mammals accounts for 17.7% of terrestrial ones, aves for 5.0%, reptiles for 19.2% and amphibians 17.6%.

The threatened birds in the coastal area of the Korean West Sea is 21 species (among which 1 CR, 6 EN, 14 VU species), while the one in the coastal area of the Korean East Sea is 16 species (1 CR, 5 EN, 10 VU species).

Status of genetic diversity

During the past 4 years in DPR Korea, lots of new super-varieties of economical significance have been bred and used for national economic development. A lot of new varieties have been developed in agriculture, fruit farming, livestock breeding, fish culture and horticulture.

In 2012, the Pyongyang Floriculture Institute has bred hundreds of new varieties of flowers and the Institute of Crop Variety under the Academy of Agricultural Science has built the database for collection, preservation, management and use of crop genetic resources by developing and

introducing the information system of crop genetic resources in 2009.

Though the assessment on the loss of genetic diversity is now underway, but the conservation of genetic diversity is faced with some difficulties from finance and equipments.

1.2.2 Trends of biodiversity

In DPR Korea, forest takes up most part of the territory, and thus, farming land is extremely limited. Among the territorial land, the forest and farming land accounted for about 74.7% and 15.2% respectively, and the area of them per capita in 2011 is 0.38 ha and 0.08 ha, respectively.

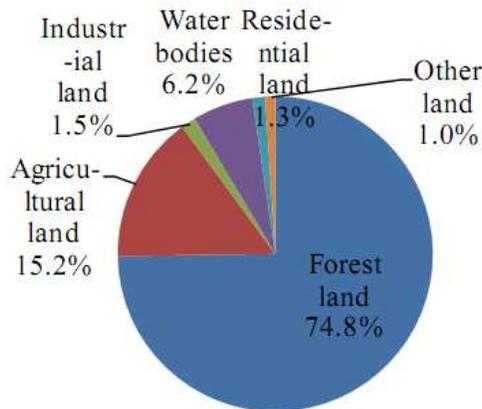


Figure 1. Land use in 2011

Recently, owing to the global warming, the forest limitation in northern highlands shows the rising trend and the distribution area of alpine plants is decreasing. As it is the highest area in DPRK, the changes in the main plant communities are observed in Mt. Paektu area. The limiting line of forest in Mt. Paektu Biosphere Reserve has been widened about 1,200m to the north and about 50m to the upside vertically and for the past 47 years.

The Analysis of the Landsat TM data in 1995, 2000 and 2006 identified the increase of *Abies nephrolepis-Picea jezoensis* community and *purple eulalia* community in Mt. Paektu and Taethaek areas (via the field survey of Samjiyon County on August 2010).

The distribution area of traditional alpine plants such as *Betula fusenensis*, *Ribes ussuriensis*, *Sabina sargentii*, *Rhododendron chrysanthum*, *Berberis koreana*, *Rhododendron brachycarpum* are decreasing in the northern highlands including ChailPeak.

In addition, *Salix rorida*, *Salix hallaisanensis* and *Betula gmelini*, known to be distributed in

the area lower than 1700m high above sea level, and about 10 species of birds in the area lower than forest limitation are found at Lake Chon of Mt. Paektu BR located in 2000m high above sea level.

The investigation on the annual ring of pine tree and Mongolian oak according to the altitude in Pukdaebong Mountain Range and Masikryong Range revealed that the rising speed of forest belt has reached to 2.1~3.7m in 10 years.

This resulted in the decrease of subalpine plant belt and *Abies nephrolepis*-*Picea jezoensis* forest belt and threatened the natural extinction of some species including *Taxus cuspidata* in this area.

And the wild berry tree, the traditional and economic species of Mt. Paektu BR is decreased in its distribution range according to the change of land cover of high tree layer.

8 species of middle and southern plant including *Lespedeza robusta*, *Acer ginnala* var. *divaricatum*, *Cynanchum japonicum*, *Eragrostis poaeoides*, *Limnorchish ologlottis*, *Pterygopleurum neurophyllum*, *Angelica distana*, *Aceru kurunduense* var. *pilosum* are added to the alpine plant list of northern area including Ryanggang Province and North Hamgyong Province.

Through the presumption on the change in the cultivation limit of subtropical plants when the annual mean temperature rises by 2□ according to the global warming, some scientists revealed that it would be possible to cultivate various subtropical plants in the coastal areas of the middle part and even in the North Hamgyong Province when the annual mean temperature in this area rises over 12-13□.

1.3 Main Threats to Biodiversity

The major threats to biodiversity in DPRK are the overuse of natural resources beyond the ecological limitation, esp. Impacts of soil and water loss by deforestation, habitat loss, the invasive alien species, environmental pollution and climate change.

1.3.1 Overuse of natural resources

The excessive use of bio-resources is the main threat causing negative impacts on biodiversity across the country, *inter alia* the decrease of forest area caused by over-deforestation.

In DPR Korea, the area of forest land accounts for 8927300ha (74.7% of the territory), which include 7643200ha of timber forest, 876,800ha of non-timber forest and the rest of non-forested

land.

The increase of non-timber forest is mainly caused by over-deforestation, reclamation of arable land for solving tense food problem and the increase in the use of timbers owing to the lack of rural energy.

The decrease of forest resources causes the loss of soil and water resource, so do the reclamation of sloping land into agricultural land and its unsustainable use.

According to the increase of treeless lands, the flooding of soil and sand causes the destruction of the river ecosystem, followed by negative impact on the coastal ecosystem as well.

It also causes the decrease of fishery resources inter alia, inland and coastal ones.

The main cause of decreasing marine resources is habitat destruction and over fishing.

The excessive collection of medicinal plants and wild animal hunting are also the threats to biodiversity conservation.

1.3.2 Habitat loss

The main factor that endangers wild species is the degradation or loss of habitats

The fragmentation of natural habitat and habitat loss decrease the number of endangered mammal species.

Degradation of forest ecosystems lead to habitat fragmentation and impact the survival of large mammals such as Brown bears (*Ursus aritos*) and the degradation of river ecosystem, threatens species such as European otter (*Lutura lutura*).

The wetland loss directly influence on the existence of large body waterfowls such as *Grus japonensis*, and *G. vipio*.

The habitat loss in freshwater deteriorates the biological productivity in water area by cutting the life cycle of freshwater fish.

1.3.3 Invasive alien species and environmental deterioration

The water pollution by industrial and household wastes causes the eutrophication of rivers, lakes and reservoirs and it negatively impacts on the biodiversity of waters.

The deterioration of water quality in rivers and streams has also the sequence influence on marine ecosystem.

At present, the rivers, lakes and reservoirs are polluted, and by which the biodiversity of water ecosystem is degraded due to the inadequate infrastructure of some cities and irregular operation of sewage treatment plants due to the energy shortage and old facilities.

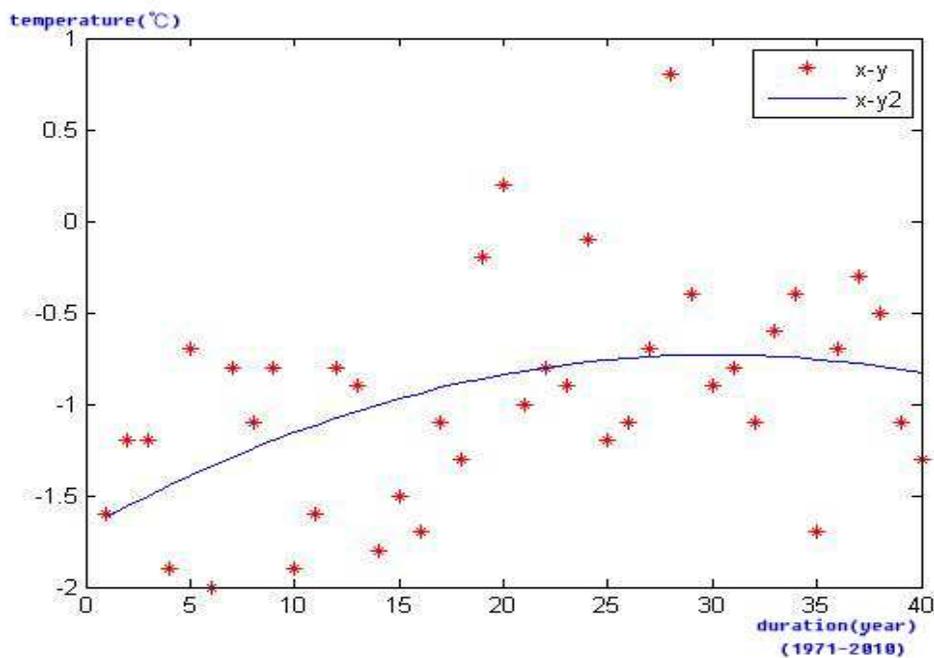
Invasion of alien species is one of the main causes of biodiversity loss.

Dryocosmus kuriphilus and *Matsucoccus pini* migrated from north and *Lecidomyia brachyntera*. *Lissorhoptrus oryzophilis* from south have greatly damaged the forestry and agriculture.

In addition to this, *Ambrosia artemisfolia* cited for plant becomes one of the serious challenges. Therefore, it is very important to pay great attention to establish the infrastructure for early discovery, rapid response, strict control and prevention of wide spread of alien species.

1.3.4 Climate change

The climate change and warming cause the negative impact to biodiversity and habitat change.



Picture 1: Change in temperature for the last 40 years around Mt. Paektu Biosphere Reserve (1971-2010)

Alpine ecosystems are the most sensitive to global warming, and the rise of forest zones by global warming has greatly damaged the typical alpine plants.

Lots of plant and animal species are in danger of extinction; 6 species in alpine and sub-alpine plant zone, 21 in north area and 4 in the middle are the most vulnerable to climate change and they

showed the decrease in their population.

The growing speed of 12 plant species are getting slow and the rate of seed germination becomes low due to the desertification by climate change.

The climate change also impacts on the distribution and migration of biological resources. Recently, *Ficus carica*, the sub-tropical fruit tree is successfully cultured in nature in the southern area of Sariwon and *Diospyros chinensis* known to be grown in the southern part of Kangwon Province and South Hwanghae Province are growing in the northern area including South Phyongan Province.

Lespedeza robusta, *Acer ginnala* var. *divaricatum*, *Taxus caespitosa*, *Eragrostis poaeoides*, *Platanthera hologlottis*, *Edosmia neurophylla*, *Angelica distana* and *Acer ukurunduense* var. *Plosum*, recorded only in middle and southern areas in the last period have been evaluated to be moved its distribution to northern area.

The temperature rising also threatened the wetland plants.

For example, *Nymphaea pygmaea* var. *minima*, the endemic plant, growing in the pool and pond has possibility to lose its habitat by frequent high temperature and drought.

The global warming has greatly damage the forest, agriculture and marine ecosystem causing the high temperature, drought, flood and forest fire.

1.4 Impacts of changes in biodiversity for ecosystem services and the socio-economic and cultural implications of these impacts

Biodiversity loss by over-exploitation of natural resources has adverse impact on the ecosystem service function and reduces the agricultural production and also the pharmaceutical industry of Koryo Medicine.

The loss of forest coverage reduces water infiltration, and increases soil erosion and land slidings.

Heavy rain and floods have become more frequent in recent years, possibly as a consequence of climate change, which resulted in the loss of thousands ha of agricultural lands which impact the people's life and agricultural production.

The overuse of forest resources and the further conversion of forests and steep slopes to agricultural production lead to soil erosion and water loss.

The water quantity of small and medium rivers and streams have been notably reduced which will cause the poor supply for irrigation, drink water and industrial water.

In particular, the water supply for agricultural irrigation is severely affected.

DPR Korea has about 900 species of medicinal plants of which the most widely used in pharmaceutical sector are 170 species. Therefore, the excessive use of medicinal resources can impact on the development of Koryo medical science, the traditional medical science of our country and even caused the decrease of some plants with economic value.

The loss of natural resources is found in medicinal plant and coastal animals; the distinct reduction is shown in medical herbs whose roots are used for medicine and in coastal animals such as *Haliotis gigantea* and *Stichopus japonicus*.

1.5 Future Changes for Biodiversity and their impacts

DPRK has set forth the goal to restore all destroyed forests within coming 10 years through the general mobilization in nationwide scale.

Nowadays a lot of trees are planted every year through an active and all -people campaign on the occasion of planting months in spring and autumn.

The whole ecosystem will have positive change if the forest ecosystem is restored which takes important part in biodiversity.

Great progress will be achieved in the protection of threatened species by improving their habitat through afforestation.

The highlighted function of forest including prevention of soil erosion, water infiltration and water purification will provide the improvement of soil quality of agro-ecosystem, increment of water quantity and safe agricultural production.

Under the promoted organic farming in the country, the public awareness on the significance of agro-biodiversity will be helpful to the development of safe and sustainable agriculture.

The improvement of agricultural ecosystem in the coastal areas will be followed by the better feeding conditions for plankton and marine life and crop productivity will positively impact on biodiversity conservation of marine ecosystem by controlling the over exploitations.

Part II: The national biodiversity strategy and action plan, its implementation, and the mainstreaming of biodiversity

2.1 National Biodiversity Strategy and Action plan

COP 11 called for Parties to develop the national biodiversity targets using the global strategic plan and targets in accordance with the national priority and ability.

And it also requires for the Parties to review and modify the national strategy and action plan in line with the global strategy and report it to COP 12.

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

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 CBD.

After the 1st NBSAP developed in 1998, DPR Korea has still face the challenges such as the decrease in bio-resources, its unsustainable use and deterioration of ecosystem and environment, due to the continuous natural disasters and difficult economic conditions.

Under such circumstances, for the full implementation of the CBD, DPR Korea has taken several national measures and activities including the promotion of greening the whole country, the expansion of protected areas, improvement of watershed management and the development of agricultural production.

For further conservation and sustainable use of biodiversity, the Government of DPR Korea updated NBSAP with the support from UNEP in December, 2005 and September 2007.

The updated NBSAP had set out 3 priority areas and 20 targets for biodiversity conservation and its sustainable use in DPRK.

The updated NBSAP was a milestone for DPR Korea in implementing the requirements of the CBD, and contributed to promoting biodiversity conservation and sustainable development in DPR Korea through its implementation.

The National Conference on Land and Environmental Protection, held in April 2012 was the important occasion for people to enjoy the actual benefits from biodiversity through biodiversity conservation and its sustainable use.

The Respected Comrade **Kim Jong Un** issued the immortal work “On bringing about a revolutionary turn in land management as required by building the socialist powerful nation” on April 27, 2012.

The Respected Comrade **Kim Jong Un** put forwarded the following tasks;

- Prevent the soil loss by promoting the land protection and solve the food problem through land improvement
- Promote the afforestation of bare mountains within 10 years and improve the forest protection and management
- Strengthen the water management and marine resource
- Take measures to prevent the pollution
- Regularly investigate the animal and plant and their habitats
- Expand the protected areas and protect the threatened and rare animals and plants and measure taking for biodiversity conservation

The tasks set forwarded are the guidelines for biodiversity conservation and its sustainable use and the framework for the preparation of updated NBSAP mainstreaming the 2011-2020 Aichi targets

The Government of DPRK has reviewed the 2011-2020 global biodiversity strategic targets and updated NBSAP by setting the biodiversity targets and integrating the considerations for biodiversity conservation and sustainable use in line with the national situation.

2.2 Main Actions to Implement the Convention on Biological Diversity

2.2.1 National Legislations, Policies and Administrative institutions for Biodiversity Conservation and Its Sustainable Use

The main laws and regulations for biodiversity conservation and its sustainable use have been legislated in DPR Korea.

The main laws and regulations for biodiversity and its conservation had already mentioned in 4th national report and the legal framework for in-situ conservation has been established by promulgating “Law on Nature Reserve” which included the articles on the protection of ecosystem, wild animals and plants in 2009.

DPR Korea has enacted laws and regulations related to environmental protection and nature conservation in accordance with requirements of the developing situation in recent years, revised and supplemented them on several occasions and encouraged the activities for legal and administrative control over the illegal acts.

And, with the importance of the work protecting global environment, DPR Korea has acceded to several multilateral environmental conventions and actively cooperated with international activities under the close contact with international organizations (Table 2-1).

Table 2-1: Environmental conventions/protocols signed by DPR Korea

Conventions/Protocols	Date
United Nations Convention on Biodiversity	26 Oct. 1994
United Nations Framework Convention on Climate Change	05 Dec. 1994
Vienna Convention on the Protection of Ozone Layer	05 May 1995
Montreal Protocol on Substances that Deplete the Ozone Layer	06 May 1995
Stockholm Convention on Persistent Organic Pollutants	19 Aug. 2002
Cartagena Protocol on Biosafety	29 July 2003
United Nations Convention on Combating Desertification	28 Mar. 2004
Kyoto Protocol to the United Nations Framework Convention on Climate Change	27 Apr. 2005
Basel Convention on Trans-boundary Movements of Hazardous Wastes and their Disposal	2008.7.10
Nagoya Protocol on access to genetic resources and the fair and equitable sharing of benefits arising from their utilization	2012

2.2.2 Strengthening *in-situ* and *ex-situ* conservation

Recognizing the great importance of establishment and management of protected areas, DPR Korea issued “Law on Nature Reserve” in 2009 and established 63ha of Red crowned crane reserve in Anbyon Plain, Anbyon County, Kangwon Province in July 2010.

The 2020 biodiversity Strategic Plan adopted in COP 10 noted that by 2020, at least 17 percent of terrestrial and inland water, and 10 percent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and

seascapes.

In order to implement the global strategic plan, the Government has expanded the number and area of reserves and designed the reserve network based on the specific natural geographical conditions and the current status of ecosystem service function.

Activities for developing topography map, distribution map for rivers and streams, vegetation map, simulation map for plant community distribution respond to climate change in existing reserves and establishing new reserve networks in ecological gaps overlapping all maps by GIS have been undertaken.

As a result, 23 regional reserve networks including Mt. Paektu BR Network, Songjinsan Reserve Network, Mt. Chilbo Reserve Network, Chail Peak Reserve Network, Mt. Oga Reserve Network, Mt. Rangrim Network, Mt. Myohyang BR Network, Mt. Kuwol BR Network, Mt. Chuae Reserve Network, Mt. Taegak Reserve Network and Mt. Kumgang Reserve Network have been designed.

In particular, in the process of preparing “Periodic Review of Mt. Paektu Biosphere Reserve” in 2012, the current status of reserves were reviewed and the threats to protection and management of reserved, rational management methods and measures for reserve expansion were discussed.

The current status and challenges of coastal and marine biodiversity have been re-evaluated to establish 10% of water areas into protected waters and designating 220000 ha of coastal and marine water reserves within 12 miles centred on 15 Fish Resource Special Reserves are now planned and under discussion.

Biodiversity on Mt. Chilbo Natural Park was investigated and summarized via several meetings with relevant agencies and the nomination document was prepared and submitted it to UNESCO in September, 2013, and approved in June, 2014.

Restoration of Red crowned crane habitat in Anbyon

The population of Red-crowned crane (*Grus japonensis*) is about 2,700 in the world.

The Red-crowned crane used to overwinter in several places of the middle of Korean peninsula before 1970s of last century, but thereafter its distribution has gradually contracted to the narrow areas including the coastal areas of Ryongyon, Kangryong and Chongdan countries

and the estuary of the River Han at the west while Cholwon County at the east of the country.

In particular, its population wintering in Cholwon County is about 850, occupying approximately 77% of nationwide population.

The project “Restoration of Habitat for Cranes in Anbyon Plain and construction of community-based Protected Area” has been started since 2008 in cooperation with Birdlife International.

The project aims at demonstrating the community- based reserve management integrating the agriculture and sustainable development in local area through the restoration of habitat for Red crowned cranes, the threatened species of the world by encouraging the local people to protect the landed cranes and generalize it.

The project site is 100km² of Anbyon Plain in Anbyon County, Kangwon Province.

This area was the wintering area of Red crowned crane in the last period and there still Anbyon Namdae Stream. Some flocks stop over and fly to Cholwon.

The Red crowned crane in Anbyon Plain is designated as national natural monument (No.421) and 63 ha in Anbyon Plain was established as Red crowned crane reserve in July, 2010.

In order to attract Red crowned crane, 1 pair of Red crowned crane and crane decoys were used, and the favourable conditions such as leaving straws only cutting ears and watering in some fields were provided

The brochure “Let’s protect Red crowned crane” and article “To protect cranes” were distributed and they helped much to raise the public awareness of local people and school students.

And the activities to improve and protect the eco-environment of the local areas have been successfully undertaken; establish the production base for new organic fertilizer in the cooperative farm, introduced organic farming and agro-forestry management in slope land, plant the fast growing willows and feed grass in waterway to prevent the soil erosion and watershed management and these examples and experiences have been popularized throughout the country. Thanks to these efforts and activities, tens of Red crowned cranes have landed in this area where they passed away for about 20 years due to the habitat destruction and flew to the wintering areas since 2010 and their landing population is increasing year by year.



Live crane decoy Lured cranes

Based on these experiences, the Government and the relevant research institutions of DPR Korea are planning to introduce the advanced technology for habitat restoration and promoting the activities.

The NBSAP highlights the need and importance of Ex-situ conservation and the researches on ex-situ conservation of wild plant and animals have been actively

At present, Central botanical garden and Centro Zoo play important role in *ex-situ* conservation and provincial botanical gardens and zoos are the places to protect and learn about the endangered and endemic flora and fauna and the ex-situ conservation of agro-genetic resources and medicinal plants are actively promoted in nationwide.

The Central Botanical Garden has been achieved some successes in scientific research on ex-situ conservation and the reintroduction of species into the wild.

The Central Botanical Garden has performed the research and experimental works on the breeding of Korean endemic species of 1 genus, 1 species and the threatened species including Iris family which is decreasing in North East Asia.

At the Central Zoo in cooperation with the Institute of Zoology, State Academy of Sciences, progresses have been made in captive breeding of endangered species including goshawk(*Accipiter gentilis*), the national bird, Red-crowned crane (*Grus japonensis*), White-napped crane (*Grus vipio*) and White stock and returning them into the nature

According to the national plan, new animal hospital and aquarium were built equipped with modern facilities in 2011 and the nature museum is planned to be built in the Central Zoo.

Together with this, the provincial zoos are rebuilt and the numbers of captive breeding animals are growing.

The Plant Exhibition Hall and arboretum was newly built in Mt. Oga Nature Reserve in 2012 and 4000 of trees are growing in arboretum.

With the recognition of importance of in-situ conservation and ex-situ conservation, the activities to improve the functions of provincial botanical gardens including Samjiyon Botanical Garden and Mt. Oga Botanical Garden are now undergoing in great national concern.

Releasing the captive breeding animals into nature is further promoted in DPRK and as a result, 20 deer stock farms were built so far in 2012 and the number of *Cervus hortulorum* are increased into thousands.

In 2013, 10 000 of *Phasianus colchicus* and hundreds of *Capreolus capreolus* were released into mountain in North Hamgyong Province.

2.2.3 Intensifying biodiversity survey and monitoring

“Convention on Biological Diversity”, article 7 requests each Contracting Party shall identify and monitor the components of biological diversity important for its conservation and sustainable use and maintain and organize biodiversity, by any mechanism data, derived from identification and monitoring activities.

The NBSAP of DPR Korea highlights the need for developing wildlife inventories and monitoring them and the establishment of nationwide reserve network.

The Government has striven to undertake the regular survey on animals and plants and their habitats and take measures to protect the endangered and rare species.

The national wild animal and plant resource consensus was undertaken in 2008-2010 and the national forest resource consensus that undertake every 10 year was followed in 2010.

In Migratory Bird Reserves including Mundok Migratory Bird Observation Station, the regular investigation and research on the world threatened species such as Black faced Spoonbill (*Platalea minor*), Red crowned crane (*Grus japonensis*), Spoon-billed sandpiper (*Eurynorhynchus pygmeus*) have been conducted and the activities for protection and public awareness rising for the protection of these species are on-going.

The census on Black faced Spoonbill were conducted in 32 investigation sites of 11 areas in

Korean West Sea coastal area on August and September , 2011-2012 and the population and their distribution were recorded.

During 3 years from 2009-2011, the survey on freshwater fish resource was undertaken and identified the total resources amount and changes in each province and its cause and as a result produced e-publication “Freshwater fish in DPRK” and distributed it for scientific research and education .

The research project on the assessment of biodiversity in wetland ecosystem completed in 2012 developed the inventory of wetland plant and waterfowls in main wetland of our country.

DPRK has built data base with the investigation results on plant and animals and habitats and share the information by enhancing the function of Biodiversity CHM.

Biodiversity CHM has built the database on in-situ and ex-situ conservation, invasive alien species, threatened species according to the 4th National 5 Year Development Plan on Science and Technology and promoted the regular updating of database by establishing the national network connecting with relevant agencies, research institutions, gene bank and Biosafety Management Centre.

Considering the world trend and specific national condition, the forest fire warning assessment system and forest fire repression decision supporting system by GIS were developed and introduced in capacity building of firebreak system in Mt. Paektu area and effectively used into practice since 2010.

In addition, as an effective tool for biodiversity monitoring and prediction, it planned to establish the forest biodiversity long-term monitoring stations in the key areas of biosphere reserves and is promoting the regular investigation to predict the changes in forest diversity.

2.2.4 Strengthening the conservation and sustainable use of components of biodiversity

Sustainable use of biological components is vital to sustainable development of agriculture, fishery and forestry and takes important position in supplying the human health, eco-environmental protection and the energy demand in future.

Therefore, the Government of DPR Korea has put forward the policy for afforestation and gardening of the whole country and push forward the activities to restore the destroyed ecosystem

in nationwide scale.

The Government of the DPR of Korea has prepared the “Long-term National Plan for Forest Development (1990-2020)” and 10 Year Plan for Forest Development based on the survey assessment on the current status of forest through the national forest resource census in 2008-2009.

Recently, DPR Korea has promoted the activities to realize 500 000ha of afforestation and 150 000ha of agro-forestry management.

The Government set forth the agro-forest management as an important economic strategy for food problem, restoration of the destroyed forest ecosystem and sustainable development of economy and was successful in generalizing the experiences in the whole country.

DPRK has revised and supplemented the article 19 of “Law on forest” and issued its enforcement regulations and organized and operated administrative institutional framework from national, provincial, county levels—non-standing consultation body and standing executive body. It also controls all pilot plots of agro-forestry and promotes this activity in nationwide and all-people movement.

The effectiveness of agro-forestry has been demonstrated in Suan County in close cooperation with the local people and it has become a model in forest land-use and afforesting and landscaping of the whole country.

The agro-forestry management has integrated into General Mobilization for Land Management Plan and performed it in all-people movement as the main objective for land management activities in spring.

As a result, 30 000ha were planted in agro-forestry management pilot plots in 2013.

The Ministry of Land & Environmental Protection has introduced the advanced technology for agro-forestry management from the other countries in cooperation with several international organizations.

The 3rd and 4th National Workshops on Agro-forestry Management held in August 2011 and 2013 and the “International Workshop on Forest and Landscape Restoration” in March 2012 provided very good opportunities to exchange the information and sharing the ideas for the development and introduction of agro-forestry technologies, helpful for forest eco-environment and people’s livelihood.

Sustainable development of agriculture

The DPR Korea is a mountainous country covering over 80 % of the whole territory and agricultural land only takes account 15.2% and most of the farmlands are greatly impacted by the adjacent forest areas.

For the food security and people's livelihood, the Government has taken national measures to increase the production of organic fertilizer by developing livestock and introduce the cycling production system combined with agriculture and livestock to every unit and encourage them to improve the soil without depending on chemical fertilizer, controlling pest insects and increasing the productivity of agriculture and livestock.

It also put forwarded the seed revolution policy and double cropping revolution policy and tries to raise the land use rate by breeding and introducing high yield seed suitable for double cropping and expand its area.

Demonstration on organic farming combined with agricultural production structure and agro-biodiversity has undertaken in every province and some local areas including Kangwon Province are very active in introducing organic farming.

The large scaled land rezoning and natural waterway making has promoted and the independent fertilizer production bases were built and reconstructed.

In addition to this, the cyclic production system has widely introduced and the livestock breeding farms are modernized.

Sustainable development of fishery

In DPR Korea which is washed by three seas and has dense distribution of rivers and streams, establishing sustainable marine production system by increasing the marine resources while protecting the water area ecosystem takes an important place in the development of economy and in improving people's livelihood.

The Government has taken national measures to develop the freshwater fish farming and marine culture and successes are achieved in the development of fishery in recent years.

It also strengthened the survey on marine resources, formation and protection of fishery resources and took measures for fishing rule and fishing ground using regulations in scientific and rational way.

In the last period, the marine fishery resource has rapidly reduced by over exploitation of some seashells including sea cucumber and ear shell with high export value and since then, the fishery

scientific research institutions and fisheries have developed artificial breeding and fish ground making technologies.

In this context, DPRK has promoted to disseminate the developed technologies for the increment of freshwater and marine fishery and restore the inland water and marine ecosystems and increase the number and size of reserves.

2.2.5 Prevention and control of invasive alien species

Emphasizing the importance to early prevent the spread and threat of invasive alien species, the COP 10 proposed the measures including controlling the invasion route such as export and import, transportation, establishment of early discovery and rapid response system, strengthening the regional collaboration, management of invasive alien species in river area and public awareness raising and information dissemination.

DPR Korea 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). At the moment, Central Epiphytotic Prevention Centre and Central Epizootic Prevention Centre under the Ministry of Agriculture are the principal organizations in charge of this work.

Following the expansion of external exchanges and trade in the DPRK, the invasion and spread of alien species pose a critical problem.

The Government of DPRK has consistently directed its efforts to early discovery and rapid response system for the prevention of damages by the invaders to agriculture, stockbreeding, forestry and human health and also to thorough relief and prevention of their spreads.

At present the quarantine work is undertaken in 26 border passes, trade ports and goods stations but the invasion from South Korea through DMZ poses a serious problem.

The typical alien species that invaded through South Korea include *Matsucoccus pini*, *Lecidomyia brachyntera* and *Lissorhoptrus oryzophilis* *Dryocosmus kuriphilus* which effected several wheat and barley fields in Ryanggang Province is from China.

There are 32 species in the DPRK that belong to the weed quarantine category.

Cecidomyia brachyntera Schrage, appeared in early 1960 and periodically in 1970, 1980 and

1990 showed the reduction in 2000 but regenerated in 2005, and seriously damaged south Phyongan Province, North and South Hwanghae Provinces and Kangwon Province at the end of May 2008.

Matsucoccus pini appeared for the first time in North Phyongan Province in 1970 reduced in the late 1990s but expanded again since 2005.

Recognizing the importance of spread and threat of invasive alien species to biodiversity conservation and eco-environment, MAB National Committee of DPRK updated the inventory and conducted assessment on those species in 2012 followed by the publication and dissemination of “Inventory and Impact Assessment of Alien Plants in DPRK” to raise the public awareness on invasive alien species in 2009.

In 2013, the Institute of Biodiversity, State Academy of Sciences has updated the invasive harmful insect quarantine inventory and included it in alien species database.

It can prevent the damage from pesticides with its correct criteria as the invasive harmful insect quarantine inventory was developed.

What is important in preventing the damage from invasive alien species is to strengthen a step further the abilities of border quarantine units and perform a real time survey of outbreak, spread routes, fluctuations in the spreads in the regions prone to invasions and carry out extermination of the alien species thereby removing the threats to biodiversity.

2.2.6 Strictly controlling pollution and ecological damage

The DPRK’s government has consistently pursued the policy of environmental protection, especially taking thorough measures of preventing environmental pollution in order to protect its nature, make the country more beautiful and to protect the health of its people.

The government legislated the measures to control the air and environmental pollution in several laws including “Law on City Planning” (2003), “Law on Preventing Pollution of Taedong River” (2005), “Law on environment Impact Assessment”(2006), “Law on Wastes Handling”(2007).

To prevent air pollution, the government has made the factories and enterprises that generate pollutant gases and dust to install dust arresters and ventilation facilities, and regularly maintain and modernize them and took measures to relocate such factories and plants out of cities and residential areas.

Since 2009, all the factories and enterprises introduced the management system combined with eco-environment technology and production and strictly prevent the environmental pollution and in 2011, new wastes handling method by eco-engineering green purification was developed and introduced.

The DPR of Korea has relatively abundant water resource, but 20% of water resource has reduced due to frequent flood, drought and forest destruction by climate change.

The portion of quantity of water use in quantity of water resources has increased from 11.2% in the 1990's to 18.6% in 2000 for economic development and growth of population (Figure 2-1). Portion of water use in 2008 was 30% for industry, 62% for agriculture and 8% for life (CBS, 2011).

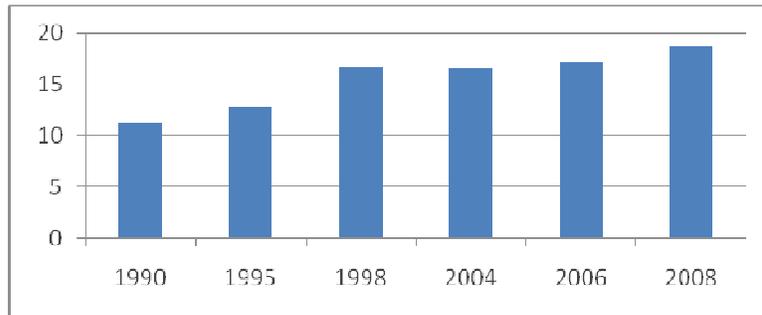


Figure 2-1: Share of water use in water resources (%)

In 2008, the government established the “Integrated Management Plan for Land and Environment in the Taedong River” to improve the water quality, prevent flood damage, and supply water and electric power to different branches of the national economy.

River improvement projects have included dredging the riverbed to remove accumulated pollutants, bank stabilization, wastewater treatment capacity building, water quality monitoring, periodic water exchange with clean upper stream water, and tree planting in riparian zone. Taedong River water quality has been temporarily improved.

Recently, DPRK is directing much effort to developing green purification technology including the use of *Pistia stratiotes* and widely spreading the successes gained in this field.

Using *Pistia Stratiotes* to improve river water quality

Research in the DPR of Korea has shown that the cultivation of *Pistia stratiotes* in rivers can play an important role in improving water quality in degraded river systems. The plant is also an excellent fodder for livestock. Recently the plant has been cultivated in a limited area in Potong River in Pyongyang City from early April to late October and used as fodder in nearby farms. These trial cultivation areas are expected to be increased as further evidence supporting the strategy is collected.

The Government has taken measures for establishing the waste management system and heightening reuse and recycling of wastes and encouraging the development and use of renewable energies, such as solar energy, wind power, bio-gas for heating and cooking.

In 2012, Potonggang Organic Compound Fertilizer Factory was newly built which produce good quality of organic fertilizer by handling the sediments and fly ash from sewage treatment plant and sludge in Potong River and it contributed to agricultural production and environmental protection.

2.2.7 Strengthening the management of genetic resources

Protecting gene resources and making efficient use of them take an important place in the biodiversity convention.

The government of DPRK has prepared the strategic plan to collect, preservation and sustainable use of genetic resources in the field of agriculture, livestock, forest, medicinal herb and microorganism and strengthened the institutional capacity and reinforce the existing gene bank.

A lot of crop and livestock suitable for the climate and natural features of the country were bred and introduced in the fields of agriculture, livestock and light industry.

Recently, with the development of agricultural science, good breed variety with high yield and strong disease resistance were introduced a lot and it caused the deterioration of agricultural genetic resources and even in danger of extinction.

Therefore, the cultivation of traditional indigenous species is encouraged in local areas together with the introduction of high yield varieties.

The establishment of the national genetic resource information system to effectively use for economic development, people's livelihood and protection of eco-environment and its operation are now undertaking.

In Academy of Agriculture, researches on the development of generic resource information system, assessment on the character of superior genetic resource of Korea larch were successfully performed for the effective use and management of crop resource and with the help of these successes the agricultural genetic resources are designated and managed in scientific way.

And the Pyongyang Vegetable Institute has built database on over 10 000 breeding materials and their characters that contribute to the computerization of vegetable genetic resources and national genetic resource management.

The GMOs bred in DPRK are now under strict checking and monitoring of the National Bio-safety Management Center and the activities for measure taking the bio-safety of GMO, their monitoring and assessment and management of genetic resources are undertaking.

“Perpetual chrysanthemum” was designated as the first genetic plant of DPRK in 2013.

2.2.8 Improving scientific research and training

DPR Korea concentrates efforts and turns much state investment on biodiversity conservation and environmental protection related research, considering scientific and technical development as a vital problem relating to future destiny of the nation

The SAOS organized the Institute of Global Geographical Information (IGEI) and Institute of biodiversity in 2011 and the SHMA newly organized the Institute of Climate in 2012 for the further development of researches on eco-environmental protection.

Great efforts were put into biodiversity conservation, restoration of degraded forest ecosystem, development of bio-safety technology in biodiversity key areas in biodiversity research.

During the period of the 3rd 5-Year Plan for Development of Science and Technology (2008-2012), several national research targets related to biodiversity conservation and its sustainable use have been successfully obtained and their results were applied into practice and showed its effectiveness.

Table 2-2: Major projects of the 3rd 5-Year Plan for Development of Science and Technology (2008-2012)

№	Project title	Executive institutions
1	Protection of ecosystem in the main reserves	IGEI, SAOS

№	Project title	Executive institutions
2	Study on assessment, protection and sustainable use of Biodiversity in major wetlands in DPR Korea.	IoB, SAOS
3	Changes in Natural Environment of Mt. Paektu BR	IGEI, SAOS
4	Study on recovery measure of destructed forest ecosystem.	Institute of Forest Management, MLEP
5	Study on effects of forest eco-environment conditions on development of major forest pests, and prediction and forecasting methods.	Institute of Forest Conservation MLEP.
6	Development of navigation intelligent system and coastal eco-environment information system.	KIM II Sung University
7	Study on protection and sustainable use of endangered and rare species in the area of Mt. Paektu.	KIM II Sung University
8	Study on assessment system for forest fire risk by 3S technology.	IGEI, SAOS
9	Establishment of system for forest ecological monitoring by 3S technology.	IGEI, SAOS
10	Establishment of integrated agricultural production system with the main stress on organic fertilizer.	Institute of Crop Culture and Institute of Pedology, AAS
11	Study on improvement and introduction of land protective farming method technology.	Institute of Pedology, AAS
12	Study and introduction of method for management and disposal of municipal solid waste.	Institute of City Management, SAOS
13	Study on energy saving by solar energy in rural households.	ITE, SAOS
14	Introduction of biomass energy technologies using agricultural by-products.	SAOS, SCST and Kimchaek University of Technology

The research project on the protection of ecosystem in the main reserves undertook the ecological assessment and the dynamic change of forest land cover and develop the zonation method and reserve management information system.

For the implementation of 2020 Biodiversity target to expand the reserve to 17% of land and inland water, the ecological assessment Mt. Paektu BR and the comparative study with other reserves were undertaken and designed the network connecting the adjacent animal and plant reserves by eco-corridor centring Mt. Paektu.

The research “On the assessment on the eco-environmental changes in forest ecosystem by climate change in Mt. Paektu Biosphere Reserve” was successfully implemented with UNESCO-MAB Young Scientists Award in March 2011-March 2012 to assess the impact and vulnerability of biodiversity by climate change in Mt. Paektu Biosphere Reserve and developed the

adaptation measures.

In addition to this, the following research projects were undertaken to take the adaptation methods and measures for restoration of degraded forests, climate change and vulnerable ecosystem; “On the landscape ecosystem planning for restoration of degraded forest”, “Biological control of caterpillar by white fungi pesticide”, “Agro-forestry as a method of sustainable forest management”, “Climate change and natural ecosystem conservation in DPRK”, “Light substrate mesh pot seedling production technology in forest restoration” and “Biological control of caterpillar by BT biological pesticide”

Dissemination and exchange of new technology in DPRK are very vital in biodiversity conservation, and SCST, KGFST, KNCU and GPSH play important role in dissemination and exchange of new technology.

The Korean Nature Conservation Union organized the national seminar on the topics of biodiversity conservation, reserve management and environmental impact assessment involving officials, scientists, teachers and local staff in August - September every year.

The Korean General Federation of Science and Technology organized 26th, 27th, 28th General Festival on Science and Technology and National workshop on Biology and other several seminars on fishery, agriculture, livestock breeding and forestry

In recent years, workshop on cyclic production system of stockbreeding and agricultural production Grand People’s held in Grand People’s Study House, 22-23 February 2010 and 29 November - 2 December 2011 were the good opportunity to share and popularize the successes and experiences achieved in the establishment of cyclic production system and its development.

The international training on environment was held in Pyongyang in 13-18, May 2010 and the officials and experts from relevant agencies including MLEP, MOA, SCST, Academy of Agricultural Science and Pyongyang Horticulture Bureau. During the training course, topics on environmental protection and the future prospect organic farming in DPRK were discussed and the lectures on the status of environmental improvement in some other countries and the successes achieved in organic farming were presented.

The on-going 4th 5 Year Plan for Development of Science and Technology (2013-2017) is greatly contributing to the powerful nation building, improvement of people’s livelihood and development of national economy based on the sustainable use of natural resource by developing

the research on biodiversity conservation.

2.2.9 Enhancing public participation and education

Public awareness rising and popularizing the information concerned with biodiversity conservation and its sustainable use is the key issue in promoting the social support and active public participation for the implementation of national policy.

In DPR Korea, mass media including TVs, newspapers and popular magazines, etc., hold very important place in public awareness on biodiversity.

In the period of 2010-2013, “Rodong Sinmun” published articles related to biodiversity and environment 1-2 times a week every year such as “Global warming threatening human survival” and “Impact on eco-environment by climate change and its prevention measures” and other newspapers including “Pyongyang Sinmun”, “Chong yon Jonwi” and “Minju Joson” carry lots of public awareness articles such as “Let’s plant lot of good trees”(2 March 2010), “Bring about the turn in land management with patriotic passion” (April 9, 2012).

“Popular sciences”, “World of sciences” and “Youth’s life” which are the main magazines in the country and “Nature conservation”, “Land Management”, “Forest science”, the scientific and technical magazines carry lots of articles such as “Importance of biodiversity and its conservation”, “Agricultural biodiversity and organic farming”.

Tens of public awareness rising books and scientific books were published such as “Seedling technology”(2010), “Organic farming technology guideline”(2011), “Eco-environmental protection”(2012), “Eco-engineering technology for forest building”(2012) and “Biodiversity Conservation and Its sustainable Use”(2013)

Environmental education and training through TV channel is one of the most effective and powerful means for public awareness.

At present, together with all the channels including Central TV Broadcasting, Education and Culture, Mansudae, “Ryongnamsan” channel has been newly developed and telecast articles and news on environment and biodiversity nearly every week.

Typical programs telecasted in 2012 are Korean documentary film “Nature reserve in Mt. Oka”, scientific and educational film “Let’s plant good trees much”, “History of climate”, scientific and

technological news “Household solar cell”, special editorial “Eco-city in future” and “Future challenges of the earth”, etc.

In particular, television broadcasts, newspapers and popular magazines telecast and present various topics of introductory programs on the main occasion of the general mobilization period for land administration and global commemoration days such as “World Environment Day” (June 5), “World Biodiversity Day” (December 29), “World Water Day” (March 22), “World Wetland Day” (February 2), “World Forest Day” (March 21).

On 22 May, 2010, the national workshop on the topic of “Biodiversity, Development and Poverty Reduction” was conducted and every year, on the occasion of celebrating this day, workshops and other activities were taken place and they were screened and presented through TV and media.

2.2.10 International cooperation

DPR Korea 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 fulfil obligations as specified by these conventions.

It has successfully implemented several projects related with biodiversity and environmental protection by strengthening the multilateral cooperation with international organizations including UNDP, UNEP, UNESCO and EU.

The advanced technologies and concepts for biodiversity conservation and management have introduced with the financial support during the project implementations which greatly contributed to the biodiversity conservation and its sustainable use in DPRK.

Table 2-3: Major cooperation projects related to biodiversity

No	Project title	Duration	Supporting organization
1	Enabling Activity for the Preparation of 4th National Biodiversity Report to CBD	2012	UNEP
2	Watershed Management Planning	2010-2012	UNDP
3	Sustainable Rural Energy Development (SRED)	2010-2014	UNDP
4	Small Wind Energy Development and Promotion in Rural	2010-2013	UNDP

№	Project title	Duration	Supporting organization
	Areas (SWEDPRA)		
5	Agriculture and Natural Resource Management	2010-2011	EU
6	Food Security and Improvement of People's livelihood in slope land	2009-2011	EU
7	Capacity building for supporting integrated environment, public health and farming materials supply	2011-2013	EU
8	Building up the database on flora and fauna of reserves in DPRK	2010-2011	UNESCO
9	Environmental protection of alternative feed for stockbreeding by cultivation of high-value protein-grass in sewage.	2011	UNESCO
10	Assessment on freshwater fish resource in DPRK	2013	UNESCO
11	Establishment of purification system of dyeing wastes by fly ash	2013	UNESCO
12	Improved Seed Production for Sustainable Agriculture (ISPSA)	2011-2014	UNDP /FAO
13	Support for socio-economic development in rural area	2012-2014	UNDP
14	Restoration of ecosystem impacted by climate change and capacity building of local people	2012-2015	UNDP
15	Reducing disastrous risk by afforestation	2013-2015	UNDP

The project “Slope Land Management in Suan County” and projection water hygiene (2012-2014) 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 implementation demonstrated the agro-forestry management on slope land and generalized its experience throughout the country and 3rd and 4th national workshops on agro-forestry management were held.

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.

2.3 Sectoraland cross-sectoral integration of biodiversity consideration

Conservation and use of biodiversity involves many departments and sectors. This part covers

biodiversity integration into relevant sector planning and main actions and measures taken for the implementation of these plans in DPR Korea.

2.3.1 Forest sector

The government has set forth the forest policy to protect and breed the forest resources and enhance its function for land, water and environment and promoted it by integrating the tasks for afforestation and landscaping of the whole country and the forestation of damaged forest within 10 years.

The Forest Department under the MLEP promoted the forest management department and the institutional measures for enhancing its authority and function and raising unity and effectiveness of conservation and management of forest resources was taken.

Such measures as establishment of forest fire monitoring system and harmful insects management system on basis of real-time warning system, enhancement of laws and regulations for protecting forest from over-cutting, establishment of advanced seed selection and breeding system, planting hybrid young trees with high economic value, creation of firewood forest and massive planting trees campaign, the active measures are being taken.

10-year plan for afforestation to restore degraded forest of 2,000,000ha with hybrid young trees was developed and under implementation.

The trees were planted in all people campaign; 800,100,000 trees on mountains and sides of roads and railways in 2011 and the good hybrid seedlings on 2800ha of young trees yard, and in spring 2013, trees were planted on 100,000ha in nationwide scale.

By planting the good hybrid trees with high economic value on all over the country, the afforestation area was much increased, and in flood-stricken areas including Amnok River and Chongchon River, the trees were widely planted.

In Pisan Cooperative Farm, Anbyon county, Kangwon Province, by planting the fast growing good breed willow(*Salix andersoniana*) on riversides and around the village, flood damage and soil loss were prevented and firewood problems were solved. By following the example of this farm, the plantation of willow (*Salix andersoniana*) on flat areas has been actively conducted.



Picture 2-1: Good breed willow (*Salix andersoniana*) in Pisan-ri, Anbyon County, Kangwon Province.

The well-organized forest management system has been established from centre to province, city and county, and the forest conservation and afforestation have been conducted through mass education and dissemination of scientific and technical knowledge.

By using mountains in a comprehensive way, the government has developed the wood product, stockbreeding, fruit farming and sericulture and set forth to provide the raw materials for industry by forming economic forest as an important policy and combined it organically with local overall-development.

The government tries its effort to turn the mountains into treasure ones and demonstrate the model for sustainable development of local economy and improvement of people's livelihood by protecting the forest biodiversity.

Food Security in Slope and Improvement of Peoples Livelihood

The Ministry of Land and Environment Protection successfully implemented the project "Food Security in Slope and Improvement of People's Livelihood" in cooperation with EU in November 2009-April 2011.

The projected sites were Kaechon city, South Phyongan Province and Ongjin County, South Hwanghae Province.

Before the project, landslides and flood damage by forest degradation were increased and

over-exploitation of natural resources and disordered crop cultivation on slope decreased crop production and affect harmful impacts to people's livelihood.

The project aims at the improvement of livelihood and food security by using slope economically efficient and ecologically safe by introducing agro-forestry management and contribution to supply rural energy by introducing bio-energy, to improve forest management and capacity building of the experts and technicians in the field of forest.

In agro-forestry management area, the economic valuable trees suitable for local specific features are planted in multilayer, and to raise production per area, benefits and to increase yield, intercropping area of maize and bean were increased to more 20% than before the project and dry-field rice cultivation area was increased to 14%.

For the safe food production, the green manure crops were cultivated to improve the fertility and protection of soil and the cycling production system was established by combining the introduction of bio-gas digestion with *Trichogramma* production.

Every home could save 1t of cooking fuel and produced organic fertilizer of 7t per year by installing 6 m³ of methane gas tank, and improved livelihood by producing 200kg of vegetables a year in 30 m²-40 m² of household green house.



2.3.2 Agriculture sector

The Government of DPR Korea, consistently adhering to the agriculture-first principle, put forwards policy on radical turn in potato farming and bean growing policy and the development of agricultural science and technology focused on food production as the basic strategy to solve food problem.

The goal of the Government putting forward attainment of self-sufficiency in food as basic principle is to solve food problem basically and to regularize food supply for residents by producing 7,000,000t of grain in 2015.

The Government of DPR Korea actively contributes to realization of action plan of the World Summit Conference for Food Safety and the UN MDGs by developing the Juche methods of farming to ensure stable yield through the scientific and technical farming appropriate to climatic and soil condition of the country, biological features of crops and geographical characteristics of the field, and by strengthening material and technical support to rural areas.

The organic farming combined with agricultural production structure and agricultural biodiversity has been demonstrated in every province and the farms introducing organic farming method by mud snail that improve the soil fertility and pick the weeds out are increasing day by day.

The experiences in introduction of organic farming on large scale

In Kangwon Province, widespread use of highly effective organic fertilizers such as humid acid fertilizer, amino acid micro-compound fertilizer and Hookbosan fertilizer have been promoted.

In addition, the rural village have used *Pistia stratiotes* as the feed for livestock.

The cyclic production system of *Pistia stratiotes* and fish culture-livestock-excrement-*Pistia stratiotes* has been introduced on large scale.

The province appointed Pisan Cooperative Farm, Anbyon County as model of organic farming and Hwasan Farm as model of cyclic production system and generalized their experiences throughout the province.

All the leading officials in province are encouraged to be in the van of introducing organic farming and it has become as the provincial work.



Organic farming



Following the example of Taedonggang Fruit Farm that established cyclic production system of fruit culture and livestock-breeding, several farms are introducing the cyclic production system in accordance with their specific conditions.

Such technologies for water saving, crop cultivation, crop growing simulation to evaluate the growth and yield of crop in different climate and soil condition, amount of fertilizer applied and damage by harmful insect, effective pesticide and insecticide have been developed and introduced.

The biological agricultural chemicals such as “Myongrok”, “Kwangrok”, “Kwangyu-1”, “Chongrok-1” and “Celandine agricultural chemicals”, were developed and introduced in Anak, Chongdan and some other counties in South Hwanghae Province and Jungsan County, South

Phongan Province in 2010-2013 and contributed to agricultural production.

The Government of DPR Korea takes active measures such as construction of gravity waterways, reclamation of tideland, land rezoning, river improvement, afforestation for erosion control, planting of windbreak forest, field terracing projects, soil fertility improvement, reclamation of cold and humidity land, protection of land and others in order to solve food problem by one's own efforts through increase of agricultural production.

The Paekma-Cholsan waterway and Miru waterway all over the country provide sufficient irrigation water for several hundreds of thousands hectares of farmland.

2.3.3 Fishery

In DPR Korea which is washed by three seas and has dense distribution of rivers and streams, establishing sustainable marine production system by increasing the marine resources while protecting the water area ecosystem takes an important place in the development of economy and in improving people's livelihood.

The government of DPRK increased seafood production with sea fishing, and together with this, indicated developing cultural fishery by expanding aquaculture in possible water areas and developing fish farming as the strategic targets for sustainable use of marine resources.

The public awareness on conservation and sustainable use of marine resources was raised and freshwater fish farming was expanded, and the aquaculture and cultural fishery stations were built in east and west seas and the foundation for expanding conservation and sustainable use of coastal marine resources were provided by introducing scientific ecological engineering.

The strict system and rules for sustainable use of marine resources within the ecological limits of coast and sea ecosystem are being established and the officials in the field of fishery have been educated to have correct understanding and awareness on biodiversity conservation and sustainable use and legal control are being reinforced.

Breeding young fishes at the fish farms and releasing them into fishponds, rivers and lakes and making artificial and natural feeds in different ways are actively promoted.

The activities to increase fish resources in lakes, reservoirs, rivers and water ways are being vigorously driven forward by setting it as a goal to breed and release billions of good breed young fishes with high productivity every year.

In particular, the cultivation of sturgeon (*Acipenser sinensis*) was succeeded and made it possible to protect and proliferate it from the extinction of danger by breaking through the world advanced levels from securement of breeding fish, feed production, spawn collecting technology to incubation method.

The measures are taken to prevent the pollution in lakes, rivers and reservoirs.

In April and July, the Marine Resource Protection Months, the activities to propagate the knowledge to protect the coastal resources including shellfish, sea-ear and seaweed and the controlling by the supervisory offices have been reinforced.

2.3.4 City administration sector

Cover plants, including turf, are being used to make the whole country gardening.

Recognizing the importance of planting new variety of turf in realizing gardening the whole country, ministries, central institutions, factories and enterprises of all over the country had developed detailed plan for making green area, and conducted this works as all people campaign and as a result, 2,300,000ha of lawns were created on streets, villages, parks and pleasure resorts.

The officials and peoples in Pyongyang City planted turf on 700,000ha in spring with mass movement, and South Phyongan Province, North Phyongan Province and Jagang Province formed million hectares of green area after having several times of demonstration on new variety of turf with technical guidance.

In addition, the Turf Research Branch equipped with modern technology was founded in the suburb of Pyongyang City in 2013 under the personal proposal and direct guidance of the Respected Marshal **Kim Jong Un**.

Now the institute is conducting the researches to breed new strains of turf with long green period, strong resistance to cold and stamping and enjoyable effects and to complete their fertilizing and cultivating methods.

In addition, the institute find all of wild turf adapted to the climatic and soil conditions of our country and turn them into cultivable one and improve excellent strains of turf and introduce them.

2.3.5 Education sector

The Government of DPR Korea has adopted the Law “On the enforcement of the universal

12-year compulsory education” in 6 sessions of the 12 Supreme People’s Assembly on September 25, 2012, reflecting the requirements of education development to information economy era for building powerful nation.

Education system in DPR Korea

Education system in DPR Korea consists of formal educational system and various systems of part-time study while working. In common education, the universal 11-year compulsory education composed of 1-year of pre-school education and 10-year of school education is enforced, at present, and the universal 12-year compulsory education goes into enforcement from 2013-2014 school year. Higher education is composed of regular system of higher education and higher educational system of part-time study while working. Factory college, farm college, fishermen’s college, factory higher specialized school, educational system by correspondence and others belong to the system of part-time study while working.

In DPRK the education for environment protection is being reinforced in the secondary general education and the education on biodiversity is being conducted under the framework of the environmental protection education.

In 1-2 year of primary school education lessons to study nature account for 2.7% of total lessons, and 7.8% in third year and 7.3% in fourth year.

In the middle school, the biology accounts for 5.8% and geography accounts for 4.3% of total lessons.

In 6th year of middle school, the biology involves ecosystem problems and the geography deals with environment protection problems by linking knowledge learned.

In general higher education, to raise the education quality for biodiversity, the teachers in this field take part in short re-education training course and the activities to raise the quality of education of teacher-training institutions are being conducted.

To make the contents of education rich and bring up students to be useful talents, the new educational methods are created and indoor/outdoor education closely combined.

Botanical gardens and arboreta play important role not only as protected bases, but also as learning place of scientific knowledge that provide regular opportunities for public outreach and contact with living plants. Every day, thousands of people visit the Central Zoo and Botanical Garden and broaden their ideas on animal and plant. The students and visitors go camping, school

excursion and exploration to the Biological Reserves and Natural Parks including Mt Paektu, Myohyang and Chilbo and broaden the practical knowledge on nature and ecology.

It has made significant progress in organizing workshops and providing research plans and public education materials related to plant diversity and conservation. In the period of preparing a report, such as “Base of Soil Ecology”(2012), “Plant Taxonomy Dictionary”(2012), “Applied Ecology”(2010), “Basic Fish Environmental Ecology”(2011) and “Dictionary of Forest Technical Terms”(volume 1, 2; 2010, 2011), many books are published and distributed for the professional education and capacity building of local staffs.

2.3.6 Other sectors

The government has adopted a national long-term energy strategy and ensure the sustainability of environment by minimizing the environmental impact by development and production of energy and increasing the energy efficiency and encouraging the renewable energy use.

In order to achieve the goal, the Government promotes the development of wind power, geo-thermal and bio-energy by maximizing existing generating capacity and constructing new hydroelectric power stations.

The models to ensure clean environment and improve local people’s livelihood by introducing solar and geothermal power heating system are increasing and generalizing their experiences to the whole country.

In particular, the researches to use solar and wind energy are being actively conducted and the Solar Energy Equipment Centre produces water heaters and introduces them in rural area as a model which achieves great economic profits.

2.3.7 Overall assessment of progress in implementing NBSAP

The DPRK, according to updated National Biodiversity Strategy and Action Plan, established the system to restore degraded ecosystem and use natural resources sustainably and conducted the works to develop forest, agriculture, fishing industry and so on and give people practical profits, and made a certain advances since 2008.

-The legal and regulatory system for biodiversity conservation and sustainable use has been reinforced and the management capacities of authorities and local management institutions have

been further upgraded.

-New Reserves and scenic spots have been established and protected and 23 local reserves network was designed and the plans to expand reserve area and establish national reserve network system have been prepared.

-According to the policy of the DPRK on forest protection, forestation and rational use of forest resources, the forest area of the country increased.

-The model farms introduced organic farming methods increased and generalized their good experiences to the whole country actively. The cycling production system combined with agriculture, stockbreeding and fruit culture has been introduced.

- The cooperation and abilities for biodiversity conservations and sustainable use were reinforced in relevant ministries, institutions, universities and research institutions the and the public enthusiasm for and interest of participation in conservation have been considerably upgraded.

- The number and populations of national key protected animals and plants are stable and some even going up, with their scope of distribution expanding and quality of habitats constantly improving.

Chapter 3. Progress towards 2020 Aichi Biodiversity Targets and contributions to the 2015 Targets of the Millennium Development Goals.

3.1 Progress in the Implementation of 2020 Biodiversity Strategic Plan and Aichi Biodiversity Targets.

DPRK is taking significant steps towards achieving the Aichi Biodiversity Targets.

Strategic target A: Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society

Target 1: By 2020, at the latest, people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably.

- Land management and environment protection including afforestation were promoted in nationwide and all people campaign and the public awareness on biodiversity conservation improved through these activities.
- Youth and students are educated and popularized with policy, scientific and technical knowledge and common sense on biodiversity, environmental protection, land management by opening new *RyongNamSan*-channel and making new scientific films.
- Articles related with biodiversity conservation and sustainable use is reported on newspapers including *Rodong Sinmun* once or twice a month, on journals once a month.
- Many books for public awareness including “Biodiversity conservation and its sustainable use” were published and disseminated.
- A number of biology and geography lessons are increased in primary and middle schools, in senior middle school ecological and environmental problems are dealt with.
- According to new 12-year compulsory education system, in the 1st year in junior middle school, biology textbook is newly compiled into “natural science” makes students understand biology and nature in their lives more widely and deeply than before.
- Short training courses for officials in ministry and central agencies and local officials, short training concerned with environment and biodiversity conservation and national workshops are organized for capacity building.
- Camping, school trips and explorations to Biosphere Reserves including Paektu, Myohyang

and Chilbo and Natural parks and visits to botanical garden and zoo were mobilized to provide good opportunities for public and primary and middle school and university students and visitors to contact with nature and acquire practical knowledge

Target 2: By 2020, at the latest, biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems.

- Integrating biodiversity conservation and sustainable use into the Master Plan for Land Development (MPLD) and mainstreaming it in national economy planning is being promoted.
- Biodiversity conservation and sustainable use are referred and integrated into the national strategies for agriculture, energy and land degradation and the cooperation among the stakeholders are being reinforced.
- Integrated biodiversity conservation issues into sectoral plans of national economy of forest, agriculture, fishing and *Koryo* medicine that mainly use biological resources.
- Research projects on biodiversity conservation and evaluation of was adapted as one of the focal task of the 5-Year Plan for Scientific and Technical Development and successfully conducted.
- “Environment and Climate Change Outlook of DPRK”, “DPRK’s 2nd National Communication on Climate Change”, “Capacity building for statistics for Millennium Development Goals”, throughout implementing these projects, the capacity of the Central Bureau of Statistics is strengthened and statistical data bases are firmly established.
- Throughout successful implementation of projects such as “Food Security in Slope Land and Improvement of Peoples Livelihood”, “Sustainable Rural Energy Development”, the local people were aware of the value of biodiversity and encouraged to participate in biodiversity conservation activities by conserving the local biodiversity and making the people enjoy the benefit in their real life.

Target 3: By 2020, at the latest, incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio economic conditions.

The positive incentive measures for biodiversity conservation and sustainable use in DPRK are related with “the movement of winning the title of land and environment protection model county” and are being undertaken in the way that the excellent cities, counties, institutions, enterprises, individual officials and citizens are held in national esteem and political and material aspects.

One example of economic incentive measures is subsidies from government and local government, used for making of model in biodiversity conservation and sustainable use that mentioned above.

For restoration of destroyed forest, DPRK government is driving forward the capacity building of nursery trees in central and local levels with the state budget.

Recently, Korean Nature Conservation Union established “Korea Nature Conservation Fund” to stimulate the nature conservation activities.

In DPRK, various incentive measures are being taken, for example, as social incentive measures, the excellent actions including wild animals and plants conservation and “trees planting teams” are given national commendation and the excellent persons in seminars and symposiums were awarded official commendation and prize.

-In rural areas, people are using biological gases for heating and cooking, therefore, the improvement of rural eco-environment and farmer’s life are being promoted.

Target 4: By 2020, at the latest, Governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production and consumption and have kept the impacts of use of natural resources well within safe ecological limits.

- DPRK integrated the principles of ecological sustainable use into laws, policies and plan of environmental fields including Law on Environmental Protection and adapted the measures mitigate or reduce the negative impacts to land and environment.
- In 2006, “Law on Environmental Impact Assessment” was enacted to pre-evaluate the impacts of several national economy sectoral plans to environment.
- To fully carry out Environmental Impact Assessment, works for choosing assessment elements, establishing index system and making correct reports according to right assessment methods, are being progressed.
- All development objects are strictly keeping to the state standards which have already been formulated for the prevention of environmental pollution.

- Regional assessment of the adverse impact to ecological health, security and ecosystem services are being conducted to promote the environmentally sound development of the region.
- The public education and awareness on environmental assessment, ecological assessment including Environmental Impact Assessment, are being actively implemented as a prerequisite for the voluntary observance of state laws and regulations.

Strategic target B: Reduce the direct pressures on biodiversity and promote sustainable use.

Target 5: By 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced.

- The DPR Korea government has put forward the strategic policy for afforestation and gardening of the whole country. The restoration of degraded ecosystem has been promoted in nationwide and all-people campaign.
- By 2015, the introduction of the agro-forestry management in 150,000ha and the forestation in 500,000ha has been strenuously undertaken.
- 10-years plan for 2,000,000ha of forestation with hybrid young trees has established and its implementation has been being strenuously undertaken.
- Every year 100,000ha of reforestation with hundreds million of trees is being undertaken, in 2012, 1570,000 ha and in spring of 2013, 100,000ha of reforestation were undertaken.
- The successful implementation of projects including “Restoration of crane habitat at Anbyon” and “watershed management plan” helped the prevention of the destruction and fragmentation of natural habitats and restoration of forest.
- The research “On the assessment, conservation and sustainable use of biodiversity in wetlands of DPRK” was conducted and the priority order of wetlands conservation was decided, the recommendations for wise use of wetland have been developed and presented.
- Followed by the national census on wild animal resources in 2008-2010, the national forest investigation was conducted in 2010 which is planned to be performed every 10 years.

Target 6: By 2020 all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches, so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no

significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits.

- In fishery, there is a definite conversion from catching fishery into cultivating one with great emphasis on the conservation of Inland water and coastal biodiversity.
- In order to sustainably use the fishery resources within the ecological limits of coastal and marine ecosystem, strict systems and orders are established and legal regulations are being reinforced.
- The fishing industry is developing in the direction of protecting and increasing the coastal non-migratory fishes by improving the fishing structure.
- The habitats for marine animals such as fries, trepans, and ear shells are now providing.
- In DPRK, April and July are set as “Marine Resource Protection Month” and in this period by implementing the activities to prepare spawning condition and control fishing, the principles of marine resource protection are explained to the people and encourage them to participate in the conservation and propagation.
- The measures to prevent polluted sewage to flow into natural water area are being taken.
- During 3 years (2009-2011) freshwater fish resources investigation was conducted and the changes in total amount and province resources are scientifically explained.

Target 7: By 2020 areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity.

- In all provinces of the whole country, visit to model farms that introduced organic farming, are being conducted, a number of organic farms are being increased.
- The production system of non-virus potato seed was established and the potato farming on high land was progressed and the area of preceding potato farming on flat land was markedly increased.
- By using peat, the farms produce humid acid manure to make arable lands fertile and increase a per hectare yield.
- Many bio- agricultural chemicals including “*Myongrok*” and ”*Gwyangrok*” have been introduced in line with the realities of our country to increase agricultural production.
- In rural areas, focusing on bio-gas, solar energy and wind energy, the projects for the development of rural energy are implemented by realizing the bio-gasification for heating and cooking and to improve farmers’ livelihood and eco-agricultural environment.

- Forest land area is increased thanks to the wise forest policy for the forest protection, forestation and rational use of resources.
- The government expands the tree nurseries to increase the production of nursery tree. During the period of the general mobilization for land construction in both spring and autumn every year, the forestation is progressed on a large scale.
- Through the successfully implemented projects for protection of forest resources including watershed management project, the activities to prevent damage from flooding and loss of water and soil were undertaken.
- The Government set agro-forestry management as the important economic strategy to restore the degraded forest ecosystem, further eco-environmental conservation and sustainable development of the economy and introduced it into the whole country.
- Recently, the government has taken measures to survey the marine resources in scientific way and protect marine resources and keep the fishing rules and fishing ground order.
- Marine products such as ear shell, trepan and some shellfishes were over-exploited, because of high export value of them. As a result, their resources were rapidly decreased. The artificial proliferation and the technology of making fishing ground of these species have been developed by the marine science research institutes and fishery stations.

Target 8: By 2020, pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity.

- To prevent air pollution, the government has made the factories and enterprises that generate pollutant gases and dust to install dust arresters and ventilation facilities, and regularly maintain and modernize them and took measures to relocate such factories and plants out of cities and residential areas.
- To prevent the pollution of rivers, lakes and sea, the capacity of sewage treatment plant is being expanded and the equipments are being updated.
- In 2008, the government established the “Integrated Management Plan for Land and Environment in the Taedong River” to improve the water quality, prevent flood damage, and supply water and electric power to different branches of the national economy.
- DPRK is directing much effort to developing green purification technology including the use of *Pistia stratiotes* and widely spreading the successes gained in this field.
- The “National Implementation Plan for the Stockholm Convention on Organic Pollutants”

has been formulated in 2008 specifying a strategy and action plan, institutional framework, education and public awareness activities for the phase-out of toxic agricultural chemicals and the government encourages organic farming.

- Knowledge on the prevention and disposition of pollutants is disseminated through media and public awareness activities, and the activities for creation and generalization of a model unit are being conducted.

Target 9: By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment.

- DPR Korea 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 DPRK government has consistently directed its efforts to early discovery and rapid response system for the prevention of damages by the invaders to agriculture, stockbreeding, forestry and human health and also to thorough relief and prevention of their spreads.
- In 26 of the frontier bridges, the trade ports and the freight stations, the boundary inspection of animals and plants has been being conducted.
- The national measures to early detect and control the invasion epizootic disease of livestock are being taken.
- The National Non-permanent Committee for Emergency Quarantine has the functions of the eradication and prevention of propagation based on early warning.
- The book “Inventory and Impact Assessment of Alien Plants in DPRK” was published and disseminated to raise the public awareness on the alien species in 2009. After that, in 2012 the inventory was updated and the impact was assessed.

Target 10: By 2015, the multiple anthropogenic pressures on coral reefs, and other vulnerable ecosystems impacted by climate change or ocean acidification are minimized, so as to maintain their integrity and functioning.

- The 2nd National Communication on Climate Change made in 2012 emphasised the needs to do research and long-term observation on assessment of the vulnerability and impacts on

forest and marine ecosystem by climate change, the coastal area management and sustainable development of habitats.

- The active measures for restoration of destroyed forest by flood, drought, forest fire and illegal cutting and sustainable development of forest resources are being taken. (refer to 2.2.4, 2.3.1)
- Researches on the conservation and sustainable use of inland water and wetland ecosystem are adapted as the national focal tasks and are being undertaken, the research findings are introduced into practice. (refer to 2.2.8, 2.3.3)

Strategic target C: Improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity.

Target 11: By 2020, at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscape and seascapes.

- “Law on Nature Reserve” (2009) and “Law on Landscape” (2010) were proclaimed and in July 2010, 63ha was designated as crane reserve in Anbyon.
- Several thematic maps including Vegetation Cover Map of Nature Reserve are overlapped by GIS, and thereby, the ecological spaces are found and defined as new reserves.
- 23 regional reserve networks including Mt.Paektu Biosphere Reserve Network have been designed.
- The current status and challenges of coastal and marine biodiversity have been re-evaluated to establish the 10% of water areas into protected water area and designating 220 thousand ha of coastal and marine water reserves within 12 mile centring 15 Fish Resource Special Reserves are now planned and under discussion.

Target 12: By 2020 the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained.

- By adopting “Law on Nature Reserve” (2009) and “Law on Landscape” (2010), the establishment and management of reserve are legally assured and the favourable conditions to prevent the extinction of threatened species are provided. (for detail data, refer to 2.2.3)
- By successful implementation of project “Restoration of Anbyon crane habitat and

construction of community- based reserve”, tens of Red crowned cranes have landed in this area since 2010 where they passed away for about 20 years due to the habitat destruction and flew to the wintering areas and their landing population is increasing year by year.

-With the recognition of importance of Central Zoo and Central Botanical Garden in protection of endangered species, the activities to rebuild and expand the Central Zoo is proceeded under the government invest and support and the provincial zoos including Wonsan Zoo Botanical Garden also have been updated to increase number of animals.

-The State Academy of Sciences is updating the “Red Data Book” about threatened species including critically endangered species in DPRK in collaboration with the relevant agencies.

Target 13: By 2020, the genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species, is maintained, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity.

-The government of DPRK has prepared the strategic plan to collect, preserve and sustainably use genetic resources in the field of agriculture, livestock, forest, medicinal herb and microorganism and strengthened the institutional capacity and reinforce the existing gene bank.

-A number of high yield crops and live stocks suitable for the climate and natural features of our country have been bred and introduced and the microorganism strains have been developed and used.

- For the scientific management of gene resources, the national gene resources information system based on data-base has been established and the activities to improve its dissemination and operation are being conducted. (for detail data, refer to 2.3.7)

-Every city and county cultivates the medical plants in the area of hundreds hectares and the area is about 43,000ha all over the country.

Strategic target D: Enhance the benefits to all from biodiversity and ecosystem services.

Target 14: By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and

vulnerable.

- By hastening the afforestation and gardening of the whole country, the degraded forest ecosystem is restored, and through its restoration, ecosystem service function has been reinforced. (refer to 3.1)
- The principal projects for forest ecological protection, restoration and watershed management have been implemented and the model to prevent flood damage and soil loss, to improve watershed environment and to increase local ecological and socio-economic benefits is created and its experience have been disseminated.
- The researches on conservation, restoration and sustainable use of wetland have been conducted.

Target 15: By 2020, ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and to combating desertification.

- The government has put forwarded the forest policy to afforest and breeding of forest resources and enhance the environmental conservation function of forest for land and water and promoted it.
- The measures have been taken for sustainable use and restoration of forest damaged by flood, drought, forest fire and illegal cutting.
- The institutions in the field of land and environment protection and the institutions, enterprises and organizations having responsible forest have established the seed selection and breeding system and increased the production of young trees.
- To prevent the soil erosion on the treeless land and slope land, the mixed forest is formed and the afforestation for erosion control is conducted to protect foot of mountains with steep gradient, and terraced fields on slope with steep gradient are built, and advanced agro-forestry technology is actively introduced.

Target 16: By 2015, the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization is in force and operational, consistent with national legislation.

- The DPRK ratified the “Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization” as a treaty power in 2012 and has

commenced its implementing.

- The activities to develop the regulations for Access to Genetic Resources and their Fair and Equitable Sharing of Benefits are now in promotion.
- The capacity for assessment of genetic resources and its value has been built and the measures for completing the collection and conservation system of genetic resources are being taken.

Strategic target E: Enhance implementation through participatory planning, knowledge management and capacity building.

Target 17: By 2015 each Party has developed, adopted as a policy instrument, and has commenced implementing an effective, participatory and updated national biodiversity strategy and action plan.

The DPRK updated the National Biodiversity Strategy and Action Plan in 2007 and has commenced its implementation since 2008.

The government is now updating the national biodiversity targets to achieve 2020 Global biodiversity strategy plan adapted in COP 10 in 2010.

Target 18: By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels.

The traditional knowledge have strictly protected under the legal protect system for intellectual property including “Law on Invention” and “Law on Copyright”.

“Law on Agriculture” regulated that all institutions and enterprises, citizens must conserve good indigenous species and 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.

The government has taken the measure to find out the local special product and encourage the local people to use the traditional knowledge in crop cultivation, storing and processing which contribute to the progress in biodiversity conservation, especially, genetic diversity

conservation.

Women and local authorities are encouraged to participate in maintaining and dissemination of traditional knowledge.

Target 19: By 2020, knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied.

- The government pays the national interest to researches for biodiversity conservation and sustainable use and supports them. They are adapted as one of the focal tasks of the 3rd 5-Year Plan for Scientific and Technical Development and are being conducted to achieve valuable scientific and technical successes supporting biodiversity conservation.
- The Biodiversity CHM has been established and the national biodiversity data base has been built, and by connecting it with the national network and share information with related agencies and promote the regular operation.
- The government has strengthened biodiversity conservation education in the education field and actively conducted public education and awareness on biodiversity-related issues through TV, radio and other mass media, festivals, celebrations and other various occasions hundreds times every year.
- In the National Workshop of science and technology on the protection of natural environment, 150 of paper in 2010 were presented and 300 in 2012, 180 in 2013. In the National Workshop of science and technology on forest, 130 of paper were presented in 2013.
- The government has reinforced multinational and bilateral cooperation to implement the obligation to CBD and has being achieved good successes. (see 2.3.10)

Target 20: By 2020, at the latest, the mobilization of financial resources for effectively implementing the Strategic Plan 2011-2020 from all sources and in accordance with the consolidated and agreed process in the Strategy for Resource Mobilization should increase substantially from the current levels. This target will be subject to changes contingent to resources needs assessments to be developed and reported by Parties.

- The DPRK government has considered the environment protection and biodiversity conservation as vital matters for the future of nation and has increased investment in this field. The government has increased investment on biodiversity conservation and pushed

forward the afforestation and gardening of the whole country including planting trees through all-people movement, and made tree nursery every province, city and county and provided trees to drive forward the restoration of damaged forest.

-Recently, Korean Nature Conservation Union established “Korea Nature Conservation Fund” to encourage the activities for nature conservation.

3.2 Progress toward achievement of 2015 Millennium Development Goals

In May 2011, the DPRK government issued Progress Report on Implementation of Millennium Development Goals. The report pointed out the progress made in achieving MDGs by 2010.

The Development Goals of DPRK are mainly aimed at raising the people’s living standard, improving education and public health service, promoting gender equality in the overall socio-economic life and providing people with a more favourable environment of living.

To systematically improve the people’s standard of living is always the supreme principle of government.

The implementation of National Biodiversity Strategy and Action Plan is related with the achievement of Millennium Development Goals. The biodiversity conservation contributes not only to MDG Goal 7 for the ensuring sustainable development of environment but also directly or indirectly to other 7 Development Goals.

Great achievements have been made in meeting the MDGs in the DPRK owing to the great efforts of the Government for improving the people’s living standards.

The government has achieved goals including achieving full and rational employment, ensuring compulsory education, promoting gender equality and so on ahead of the time. Other goals are expected to be achieved by 2015.

As mentioned in Chapter 1, the biodiversity provides conditions for human survival and material foundation for social and economic sustainable development.

The efforts made by the government towards biodiversity conservation have contributed significantly to the achievement of Millennium Development Goals.

Certainly DPRK is still facing challenges in fully achieving MDGs in biodiversity loss, environmental pressure and over-use of biological resources.

The DPRK will continue to implement scientific researches for improvement eco-environment and biodiversity conservation and sustainable use and will make unceasing efforts to build an economic power and achieve Millennium Development Goals through nationwide and all-people movement.

3.3 The experiences learned in the implementation of convention in DPRK

3.3.1 The experiences

Firstly, the biodiversity conservation should be conducted through nationwide campaign, under the participation of mass, in connection with economic development and improving the people's standard of living.

The DPRK consider biodiversity conservation as the important problems relevant to economic development and improving the people's standard of living, and reflect it in the socio-economic development plan and conduct it.

The biodiversity conservation is integrated into sectional plans of forest, agriculture, fishery and Koryo medicine that mainly use biological resources, and the plans for establishing system and process of biodiversity conservation and sustainable use with formation of resources have been drawn up and have been being conducted. By implementing the biodiversity strategy and action plan in close relation with the Master plan for land Development, the general mobilization for land construction in every year plays an important role in improvement of land management and biodiversity conservation.

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.

Hereafter also, it is important to further raise awareness level of mass to biodiversity conservation, to update the national biodiversity conservation and action plan in accordance with requirements of developing reality and to take various socio-economic incentive measures for biodiversity conservation and sustainable use.

Secondly, the biodiversity conservation should be conducted by the strict legal regulation.

Biodiversity-related legislations were widely promoted and popularized to the public and the measures were taken to strengthen the law observance in the whole country. And the excellent institutions in law observance have honoured and generalized their examples. And it is important to

reinforce legal regulation to units that are pressuring biodiversity through over-extraction and environment pollution.

Thirdly, the demonstration for biodiversity conservation and sustainable use and its generalization should be actively performed and the ecotourism areas should be established.

It is necessary to create and introduce the model for getting practical socio-economic and ecological benefits by improving local ecosystem and reserve management, conserving biological resources and sustainably using it.

Fourthly, the progressive local ecological technology should be developed and introduced.

Now, the government of DPRK gives the priority to the restoration of deteriorated forest ecosystem and wetland ecosystem, and tries to apply the ecosystem approach, the integrated management plan of the local ecosystem for the conservation and sustainable development of land, water and biological resources.

Fifthly, the national biodiversity monitoring system should be established.

The government of DPRK pays great attention to biodiversity conservation and make certain advance in evaluating the main causes of biodiversity loss every county.

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.

3.3.2 The further activities at national and global level

Implementing the NBSAP, in particular, Strategic Plan for biodiversity 2011-2020 and the Aichi Targets, the DPRK, and, will give priority to the followings aimed at strengthening biodiversity conservation and sustainable use at national, local and global level in the future.

1. To ensure marine resources conservation and sustainable use by developing integrated coastal ecosystem management technology and sharing and introducing the experiences learned.
2. To develop and introduce the pollution prevention technology to protect biodiversity loss and ecosystem services function by pollution.
3. To establish the monitoring systems on invasive alien species on national, regional and global level and prevent their invasion.
4. To conduct afforestation, restoration and prevention of the deterioration of forest to mitigate climate change.

5. To increase numbers and areas of nature reserve by designation the area with rich biodiversity as reserves and establishing Reserve Management Network and develop the management method for biodiversity conservation and sustainable use.
6. To protect national and global threatened species, cooperation with neighbour nations and international organizations are strengthened to improve and maintain the conservation status of threatened species.
7. To provide and develop the advanced technology and material and technical foundation to protect endemic species and gene diversity.

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 on Environment (NCCE), DPR Korea
Name and title of contact officer	Mr. Kim Yong-U National Focal Point in charge of CBD
Mailing address	Jungsondong, Central District, Pyongyang, DPR Korea, P.O. Box 44
Telephone	850-2-18111 (381 8370)
Fax	850-2-381 4660
E-mail	
CONTACT OFFICER FOR NATIONAL REPORT (IF DIFFERENT FROM ABOVE)	
Full name of the institution	State Academy of Sciences (SAOS), DPR Korea
Name and title of contact officer	Mr. Kim Myong-Gon Senior Official, Bureau of International Cooperation for Science, SAOS, DPR Korea
Mailing address	Ryonmot-dong, Sosong District, Pyongyang, DPR Korea
Telephone	+850-2-18111/ext. 341-8544
Fax	+850-2-343 2100/4410
E-mail	airangip@star-co.net.kp
SUBMISSION	
Signature of officer responsible for submitting national report	Secretary General, NCCE
Date of submission	October, 2016

B. Information on the preparation of the report

The State Academy of Sciences, authorized by the DPRK National Coordinating Committee for Environment (NCCE), took care of the preparation for the 5th National Report of the DPRK to CBD.

The NCCE was responsible for overall coordination and oversight of the preparation of the 5th National Report

The preparation of 4th National Report has started since 2012 and the information was collected and desk-top studies and review were performed.

The preparation of the 5th 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 December 3, 2013 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 5th 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 December 5, 2013 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 second and third National Reports on Biological Diversity of DPR Korea, international and national project reports, research results and other relevant publications.

3. Drafting the 4th National Report

The 2nd Expert and Compilation Group meeting was held on February 7, 2014 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, MLEP and other relevant agencies and research institutes.

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

The meeting was held on February 25, 2014 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 5th National Report was submitted to NCCE on March 5, 2014 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 Statistical Bureau
- Korean Nature Conservation Union
- Korean General Federation on Science & Technology

Appendix II. Further sources of information

1. Code of Laws of the 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 Chu Yon 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 Son et al, Catalogue 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 Ju 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 Ki 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. Kungang, 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

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

“Mokran” which can explore the 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. In 2011, the database on “The “Animals and Plants of the Main Nature Reserves” was built and developed into CD which distributed to the relevant agencies, universities and secondary schools and contributed to strengthening the exchange and cooperation with other countries. For the implementation of 3rd 5-Year Development Plan for Science & Technology (2008-2012), the Centre for Biodiversity, State Academy of Sciences has completed 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.

“Manbyongcho” 2.0 on the distribution of medical plants in DPRK was developed and widely used. In Mt. Paektu BR, the images of plant, animal and landscape together with the necessary knowledge and information on the plant were collected in database in Paektu Exhibition and the information service system on plant in Mt. Paektu BR “Manbyongcho” was established so as to be used for sustainable development of education.

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. Studies are carried out to evaluate the rareness and threatening of plants well-known at home and abroad. The Institute of Botany is now undertaking the researches to classify and assess the current status of the threatened species based on the world criteria to update the Red Data on plant.

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 3rd 5-Year Development Plan on Science and Technology.

Research projects such as “On the protection of ecosystem in the main natural reserves”, “Biodiversity conservation, assessment and sustainable use in wetland”, “On the changes in natural environment in Mt. Paektu BR”, “On the changes in forest productive potentiality and distribution of plant community by climate change” were conducted to exactly assess the impact of climate change to forest production and plant community and take the measures.

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 15 percent of each of the world’s ecological regions effectively conserved.

Recently, with the importance of in-situ conservation, DPRK issued “Law on Nature Reserve” in November 2009 and “Law on landscape” in 2010.

The government has taken several measures to effectively manage 879,275ha of protected areas, occupying 7.2% of the territory.

Meanwhile restoration of various ecosystems has been enhanced through implementing the key ecological projects such as natural forest resources protection, forest ecosystems and wetland ecosystems including watershed management and forest resource protection.

Target 5. Protection of 50 percent of the most important areas for plant diversity of each ecological region protected with effective management in place for conserving plants and their genetic diversity.

Nearly all of the key areas for plant diversity in DPRK were designated as reserves and managed. 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. The activities to establish the new reserves were undertaken by overlapping the several thematic maps of the existing reserves and finding the ecological gaps and as a result, 23 regional reserve networks were designed.

Target 6. At least 75 percent of production lands managed consistent with the conservation of plant diversity.

DPRK have not yet reached at 75% of production lands managed consistent with the conservation of plant diversity. At present, DPRK has established national strategic framework for the development of agro-forestry management and tries to introduce it into 150 000ha.

According to this strategy, the agro-forestry management technology which provides the sustainable use of tree, crop, medical plants and wild edible plants has introduced in many places 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. 75 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 threatened species of East Asia including our country are 3 species of LR ((*Neottinathe cucullata*, *Goodyerea reens*, *Lilium duricum*), 2 species of EN (*Pseudostellaria sylratica*, *Viola westeri*) and 5 species of VU (*Taxus cuspidata*, *Lilium hausonii*, *Gastrodia elata*, *Rhododendron micanthum*, *Brasenia schreberi*).

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.

Target 8. At least 75% of threatened plant species in ex situ collections, preferably in the country of origin, and at least 20 per cent available for recovery and restoration programmes.

The Central Botanical Garden has 6500 species of plants and performs the research and experimental works on the breeding and preservation of threatened species with high economic and scientific value are now promoted. In particular, it has attached the importance to the protection and propagation of 1 genus, 1 family plant and threatened species which show the decrease in North East Asia and DPRK as well.

In 2012, the Plant Exhibition and Arboretum were newly built in Mt. Oga Nature Reserve and 4000 trees are growing there. With the importance of ex-situ conservation, the activities to enhance the function of provincial botanical gardens including Mt. Oga Botanical Gardens and Samjiyon

Botanical Garden and equip them with modern facilities have promoted under the deep concern of the government.

Target 9: 70 per cent of the genetic diversity of crops including their wild relatives and other socio-economically valuable plant species conserved, while respecting, preserving and maintaining associated indigenous and local knowledge.

The preservation of varieties of indigenous crops and livestock are responsible for the Academy of Agricultural Science and Ministry of Agriculture. The agricultural crops are preserved in gene bank at the Institute of Crop Variety under the Academy of Agricultural Science and the fruit at the Institute of pomology, vegetables at Central Institute of Vegetable, live stocks at the Institute of Livestock Breeding under the Academy of Agricultural Science.

And the breeding farms under the Ministry of Agriculture plays important role in preserving the agricultural genetic resources. 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 control the cultivation of LMO.

Target 10: Effective management plans in place to prevent new biological invasions and to manage important areas for plant diversity that are invaded.

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.

The government pays great attention to early discovery, rapid respond and strict controlling of spread and prevent the damage from invasive alien species to agriculture, livestock breeding, forestry and people’s health.

In 2009, a book “Inventory and Impact Assessment of Alien Species in DPRK” was published and the inventory was updated in 2012.

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

There are about 900 medicinal herb species out of which 170 are actively used in traditional Koryo medicine and the typical medicinal plants are barrenwort, *Schizandra chinensis*, milkweed, *Crataegus pinnatifida*, wild ginger plant, liquorice, and so on.

To prevent the loss of wild medicinal herbs, the Government of the 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: All wild harvested plant-based products sourced sustainably.

Efforts are being made to cultivate the medical plants including Insam (*Panax ginseng*) and *Schizandra chinensis*.

The total cultivation area of medical plants in DPRK is about 10000ha and the numbers of cultivated medicinal plants are almost 80species. 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: Indigenous and local knowledge innovations and practices associated with plant resources maintained or increased, as appropriate, to support customary use, sustainable livelihoods, local food security and health care.

The traditional knowledge have strictly protected under the legal protect system for intellectual property including “Law on Invention” and “Law on Copyright”.

“Law on Agriculture” regulated that all institutions and enterprises, citizens must conserve good indigenous species and 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.

The government has taken the measure to find out the local special product and encourage the local people to use the traditional knowledge in crop cultivation, storing and processing which contribute to the progress in biodiversity conservation, especially, genetic diversity conservation.

Women and local authorities are encouraged to participate in maintaining and disseminating traditional knowledge.

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

DPRK has paid more importance on biodiversity conservation in education and Plant biodiversity knowledge has become an important element of national science popularization programmes, and is disseminated to the public through TV, radio, newspapers and other media

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.

Thanks to the newly built Mt. Oga Botanical Garden with thousands of plant specimen, the visitors can broaden their ideas on plant.

Institute of Botany, State Academy of Sciences sent hundreds of plant specimen to Mangyongdae Revolutionary School which contribute to the education and a lot of books and journals have published and distributed to raise the public awareness on biodiversity.

The officials in local governmental authorities and people are encouraged to understand the importance and advanced technology for biodiversity conservation and participate to the biodiversity conservation activities through several types of environmental education and public awareness activities.

Target 15: The number of trained people working with appropriate facilities sufficient according to national needs, to achieve the targets of this Strategy.

The education program followed general education steps has incorporated the educational contents on the importance and needs of biodiversity conservation.

According to new 12 year compulsory education system, the biology textbook was newly edited into “natural science” and give deep and broad knowledge for students and help them to understand biology and nature in their real life.

Short-term training for officials in relevant ministries, central and local governmental agencies, short term training and national workshops have been organized for the capacity building of officials and experts.

Target 16: Institutions, networks and partnerships for plant conservation established or strengthened at national, regional and international levels to achieve the targets of this Strategy.

DPRK has established National Coordinating Committee on Environment involving MLEP, SAOS, Ministry of Agriculture, Ministry of Education, Ministry of Forestry, Ministry of Culture, Ministry of Finance and other relevant agencies and coordinates and cooperates with the concerned agencies for the implementation of Convention.

In May 2012, the research results and information on biodiversity of Mt. Paektu Biosphere Reserve were informed and the joint research plan in future was discussed at the East Asia Biosphere Reserve Network Meeting.

And in 2011, it was discussed with the Institute of Shenyang Applied Ecology, Chinese Academy of Sciences to have a joint field survey and research on Mt. Paektu BR and Changbaisan BR and publish the book “Plant of Mt. Paektu” as a result.