

## Biodiversity Strategy and Action Plan DPRK

- ovata*, *Epimedium koreanum*, *Eleutherococcus Enticosus* as medicinal;
- *Vitis amurensis*, *Actinidia argenta*, *Vaccinium uliginosum*, *Castanea crenata*, *Querecus sp.* As nuts;
  - *Spuriopinella calycina*, *Pteridium aquilinum*, *Osmunda japonica*, *Aralia elata*, *Platycodon grandiflorum* as wild edible greens;
  - *Trcholoma matsutake*, *Pleurotus ostreatus*, *P.cornucopiaen* as mushroom resource;
  - *Syringa dilatata*, *Thymus quinque costatus*, *Agastache rugosa*, *Ledum palustre* as spice plant.

Taxa	Endangered & rare species in DPRK	Species in CITES	
		Annex1	Annex2
Amphibian	9		
Reptile	13		
Aves	74	15	21
Mammal	28	4	7
Total	124	19	28

As for forest wild animals with economic value, we can take *Caprecolus caprecolus*, *Hydropotes inermis*, *Nemorhaedus goral*, *Sus scorfa*, *Lepus mandschuricus*, *Cervus nippon*, *Moschus moschiferus*, *Ursus thibetatnus*, *Meles meles*, *Nyctereutes procyonoides*, *Martes zibellina*, *Lutra lutra*, *Phsianus colchicus*, *Coturnix xoturnix*, *Tetrastes bonasia*, *Lyrurus tetrrix*. And in winter, ten thousands flocks of *Anatidae* fly along wetland at seaside of east and west seas. There distributed 185 species of fresh, brackish water and anadromous fishes including 65 species of *Cyprinidae* in freshwater. And are there 900 species of *Disces* and rich marine grasses and invertebrates with high industrial value such as *Haliotis gigantea*, *Stichpus japonicus*, *Echinoidea*, *Erimaculus isenbeckii*, *Neptunus trituberculatus*, *Chionoecetes opilio* in seawater of DPRK.

In the KES, 329 species of *Rhodophyta*, 130 species of *Rhaeophyta*, 87 species of *Chlorophyta* and in total 546 species of seaweeds are known. Among them, 309 species of seaweed have high economic values including 63 species with high medicinal value.

### 1.3 Threats to DPRK Biodiversity

#### 1.3.1. Threatened Status

##### 1.3.1.1. Threatened status for ecosystem

Destruction of ecosystems is being accelerated by natural disasters such as deforestation, soil erosion, deterioration of water quality, decrease of economic resources and also, flood.

#### Forest ecosystem

In DPRK, where mountains cover 80% of whole territory, forest ecosystem diversity takes important position in diversity conservation of the whole territory. Presently, the drastic loss of

forest area in DPRK is resulted by population increase and arable land expansion, forest fires and firewood use increase.

Forest area in DPRK was 821,1300ha in 1993, and in 1996, decreased into 818,3000ha. Particularly, the non-forest area is increased as 36,1000ha in 1993 and 38,0000ha in 1996. The destruction of forest brings changes of runoff and soil erosion, and this causes perturbation of river system and negative impacts on diversity of littoral ecosystem. Since the whole territory of the country shows district basin unit, forest management and diversity conservation in basin area are directly related with the diversity conservation of whole territory.

### **Water ecosystem**

The DPRK has high density of rivers and streams. July-August is rainy season for which it takes half of the annual precipitation. The circumstances threaten the water ecosystem on a continuous basis.

Presently, the DPRK has suffered damages from floods due to the frequency of heavy rains. This brought severe damages to the biodiversity of water ecosystem. Different from biota in marine or land, biota in freshwater is restricted its expansion for habitat area. Therefore, on the assumption that no passageways are well built in hydrological structures then, it will block the migration passageways of fish. In addition, the biota in freshwater will be suffered by eutrophication of life wastes of human when the rivers are blocked.

#### ***1.3.1.2. Threatened status for species***

The DPRK has high richness of animals and plants per area. Esp. about 10% of endangered species of Asian birds have habitat in our country. At present, 52 species of higher plant and 38 species of vertebrate are estimated as endangered and vulnerable species. And among 158 species of endangered and rare plants, 50 species are endemic, while 16 species are endemic for 159 species of endangered and rare animals. (Annex 2 and 3)

*Nipponia nippon*, distributed in DPRK has not been discovered since the end of 1970s and *Tadorna cristata* is thought to be extincted. *Grus japonensis* and *Platalea minor*, the rare species are also threatened by decrease of habitats.

Some species with high economic value are being gradually reduced, esp., in medicinal plant and marine animal. Especially, medicinal root and marine species such as abalone and sea cucumber that have high value for export are vivid with their abatement.

#### ***1.3.1.3. Threatened status for genetic resource***

We find great risks in gene resource of domestic plants and animals. If importance is being put mainly to the high productivity in crops, livestock and poultry then, it will bring result that traditional breeds and races acclimatized to a given local natural condition be laid aside. For example, reduction is found in traditional breeds and races that are of high harvest and of high standing ability in poor soil condition such as millet, sorghum, and Italian millet. Some traditional breeds and races of domestic plants and animals in the country are lost during the period of Fatherland Liberation War between 1950~1953.

Since the traditional breeds/races of crops and livestock are cultivated and bred in small scale, to establish fine system to collect and keep genes by establishing the state level gene-bank is raised as a principle task.

### ***1.3.2 The Factors of Threats to Biodiversity***

#### ***1.3.2.1. Population increase***

Population growth in DPRK is as follows:

19,060,000 in 1986  
20,960,000 in 1991  
21,210,000 in 1993  
21,510,000 in 1994  
21,820,000 in 1995  
22,110,000 in 1996

The population density of DPRK is 187 persons per square kilometre which is higher than China (119 per km<sup>2</sup>). If the population is continuously increased in this speed, the population of DPRK will be 30,000,000 in 2020. Increase of population will increase the use of bio-resources as well as impacts to the biodiversity.

#### ***1.3.2.2. Habitats destruction and over exploitation***

The soundness of wild plant and animal depends on the condition of habitat. The habitat loss reflects the biodiversity loss. The habitat has its loss from the development and over-exploitation of resources and flood damages. The habitats for wild animals and plants are affected by increase of fire wood use in local areas. Presently, local people solve most of fuel problems in forest resource.

The firewood use in locals comes to 7,200,000m<sup>3</sup> per year in 1996 that is 2.4 times much compare to the 1993. Therefore, to reduce the habitat loss of forest animals due to the destruction of forest resource, it suggests to lower the dependence rate on forest for firewood. The habitat destruction in DPRK also, depends on prevention of soil erosion.

The DPRK boasts for developed topography of valleys for having many rivers and streams. And this provides animals and plants to inhabit generally in incline areas. When heavy rain comes, will bring the enormous erosion of soil followed by the disturbance of ecosystem. This requires long time for rehabilitation. The heavy rain results the amount of soil erosion which affects water ecosystem, tremendously. In addition, threatens are coming to the forest ecosystem from the expansion of forest fires in the period of spring dry season and invader insects such as *Cecidomyia brachyntera* and *Iceria spp.*

Over-use of resources becomes the leading cause for biodiversity loss. 800 species of herb are available for Koryo medicine, the traditional medical science of DPRK. However, much amount of herb resource has decreased, nowadays This bias appears more in the use of root for medicine. With the reduction of resources, the possible pick amount of medicinal herbs has been cut from 40,000t in 1984 to 24,000t in 1996.

The main cause of decrease of coastal marine resource in DPRK is laid to the over-exploitation of marine resource. Those sea urchin, sea cucumber, which were available about 7,200t per year in KES during the period of 1970~1975 have brought reduction of about 1/3 during the period of 1985~1990.

### *1.3.2.3 Climate variability*

The recent global warming, also, affects the DPRK biodiversity with distinct. According to the result of analysis of climate changes between 1910s and 1980s, the annual average temperature from 1900 to 1940 showed (0.2-1.6°C lower than average year that was) cold period while, from 1950 to 1980 showed (0.2-0.3°C higher than average year that was) warming. Especially, entering the 1990s, the annual average temperature is going up and the abnormal high temperature recorded in 1994 was the highest of climate observation ever since 1918. And 1990, 1995 and 1996 were the years of abnormal heavy rain season, whereas, 1997 was the year of drought.

The flood damages due to the heavy rains of 1995 and 1996 which were the result of abnormal climate change brought great losses to the ecosystems of agriculture, forest and rivers. For example, the flood damaged area of farmland covers an 359,000ha in 1995 and 297,659ha in 1996 and river ecosystem had great affection due to the damages of river banks. In addition, drought in 1997 brought 450,000ha of arable land damaged.

### *1.3.2.4. Other causes.*

We find some contributors to biodiversity loss from neighbours.

Acid rains from China move along the aerial current of Korean West Sea sky to the DPRK and may give adverse impacts to the country forest. The biodiversity of Amnok and Tuman rivers are greatly affected by the neighbours since these rivers are the international waters bounded with China and Russia. Beside, invader insects and contagious diseases also give impacts on country's biodiversity.

As mentioned above, the vital problem in biodiversity of DPRK is to take counter measures to eliminate the factors which destruct the ecosystem function of DPRK. Here, the target objective to conserve the biodiversity of the country is to prevent soil erosion resulting from heavy rain, landslide and flood damages. Therefore, the DPRK should take action to enhance the management ability for ecosystem in every aspects.

### *1.3.3. The Urgency of Biodiversity Conservation and Demand for its Sustainable Use*

Biodiversity conservation is closely related with resources necessary for the human existence, which is principle factor for the state security.

The government of DPRK took epochal measures including the expansion of protected areas for the implementation of the CBD adopted in UNCED in 1992. And the "Law of Fishery" is newly established and adopted action to supplement the GPLM with the biodiversity conservation. Yet, the DPRK has still many blocks in conserving biodiversity.

Population growth, destructive utilization of resources and frequent damages by flood have greatly

## **Biodiversity Strategy and Action Plan DPRK**

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affected biodiversity adversely throughout DPRK. Esp, the national geographical condition with high-pitched montane topography of DPRK shows that unless we pay attention to the biodiversity conservation, there will be severe adverse consequences.

Under such circumstances, it is urgent task for DPRK to establish the sustainable use system of bio-resources for the national economy. Consequently, here falls the necessity that broad mass should be enlightened with biodiversity conservation and sustainable use, so to improve the managing ability of bio-resource and open vigorous campaign.

## Chapert 2. Current efforts and assessment of Biodiversity Conservation In its sustainable use in DPR Korea

### 2.1. *In-situ* Conservation

#### 2.1.1 *Establishment of protected area*

##### 2.1.1.1 *History of establishment*

Protected area in nature including nature reserve is the most effective measure to conserve biodiversity. It is because that establishment of protected area itself aimed to hand over the rich and beautiful nature areas to next generations. Therefore, the in-situ conservation that is, nature protected area requires protection of valuable natural ecosystem and habitats for wildlife that can ensure the reproduction and evolution of living organisms in ecosystems and keep the energy flow, material cycling and ecological process in the system.

The first natural protected area in DPRK is Mt. Myohyang nature reserve that the great leader Kim Il Sung personally designated in April 1954. The great leader Kim Il Sung issued an Order to conserve relics, scenic spots and natural monuments and took state measure to protect 39 natural monument and relics at the popular Provisional People's Committee of North Korea in April, 1946. The great leader Kim Il Sung adopted the standing Committee decree of Supreme People's Assembly of DPRK "On protection and proliferation of useful animals and plants" in February 1959, and designated reserves in decision of the cabinet No.29. In July 1973, the great leader Kim Il Sung issued the DPRK President Order, No.1".

On strengthening more nature conservation work" and took measures to make fatherland more beautiful by newly fixing and well managing protected area in conformity with reality and positively use it in scientific and research work and youths. In 1976, the Government of DPRK declared the decision of readjusts nature protected area of the country. In DPRK, some of the Korean revolutionary sites where the great leader Kim Il Sung waged anti-Japanese armed struggle for the independence of the country to end the Japanese colonial rule. The establishment of special reserves in DPRK was started from the time when the great leader Kim Jong Il organized marching the revolutionary battle sites including Pochonbo, Samjiyon in Mt. Paekdu area as special reserves in 1959. The special reserves play the function of nature reserves as this include the vast areas of forest ecosystem.

DPRK, under the Governmental measures on several times, has established 6 natural reserves (among which, Mt. Paekdu Natural Reserve is included to MAB, UNESCO and registered as Biosphere reserve in 1987), 14 plant reserves, 14 animal reserves and 6 sea bird breeding reserves until 1994. The Government of DPRK has acceded to the convention on Biodiversity Conservation in 1995 and has done its best to increase the numbers and areas of natural reserves.

##### 2.1.1.2 *Categories and numbers*

There are now 2,428,600ha of protected areas counting 19.78% of the whole territory and among them, the area of nature reserves is 696,927 ha(5.68% of whole territory).

## Biodiversity Strategy and Action Plan DPRK

The location and area of natural protected area by types in DPRK are as follows.

**Table 6. List of Protected Areas in DPRK**

No	Name	Location	Area	Year of Establishment
1	<u>Biosphere Reserve</u> Mt. Paekdu B. R	Samjiyon county, Ryanggang Prov.	132,000	1989
2	<u>Nature Park</u> Mt. Kumgang N.P.	Kosong , Kumgang county, Kangwon Prov	60,000	1995
3	Tongchon N.P.	Tongchon county, Kangwon Prov.	4,000	1995
4	Solbong N. P.	Gosan county, Kangwon Prov.	1,400	1998
5	Songdowon N.P.	Wonsan city, Kangwon Prov.	500	1995
6	Mt. Chilbo N.P.	Myongchon county, N. Hamgyong Prov.	30,000	1995
7	Bonpo N.P.	Rajin Sonbong city	5,000	1996
8	Lake Bujon N.P.	Bujon county, S. Hamgyong Prov.	4,100	1995
9	Mt. Paekun N.P.	Yonggwang county, S. Hamgyong Prov.	2,000	1995
10	Mt. Myohyang N.P.	Hyangsan county, N.Pyongan Prov.,	16,000	1995
11	Lake Yonpung N.P.	Hichon city, Jagang Prov.	5,000	1995
12	Lake Kumsong N.P.	Anju city, Gaechon city, S.Pyongan Prov. Nyongwon county, Pekchon county, S. Pyongan province	14,000	1995
13	Mt. Guwol N.P.	Unryul county, Samchon county, Anak county, S. Hwanghae Prov.	20,000	1995
14	Monggumpo N.P.	Ryongyon county, S. Hwanghae Prov.	3,000	1995
15	Mt. Jangsu N.P.	Sinwon county, Jaeryong county, S. Hwanghae Prov.	3,000	1995
16	Sokdam N.P.	Byoksong county, S.Hwanghae Prov.	2,500	1995
17	Lake Sohung N.P.	Bongsan county, Rinsan county, N. Hwanghae Prov.	3,800	1995
18	Mt. Jongbang N.P.	Sariwon city, N. Hwanghae Prov.	2,000	1995
19	Mt. Daesong N.P.	Pyongyang city	2,000	1995
20	Wau Island, N. P.	Nampo city	5,000	1995
21	Lake Taesong, N.P.	Nampo city	2,000	1995
22	Pakyon N.P.	Gaesong city	3,200	1995
23	<u>Nature Reserve</u> Mt. Paekdu N.R.	Samjiyon county, Ryonggang Prov.	24,000	1959
24	Mt. Kumgang N.R.	Gosong county, Kumgang county, Gangwon Prov.	7,600	1976
25	Mt. Chilbo N.R.	Myongchon county, N. Hamgyong Prov.	5,000	1976
26	Gwanmo peak N.R.	Gyongsong county, N. Hamgyong Prov.	5,000	1993
27	Mt. Myohyang N.R.	Hyangsan county, N. Pyongan Prov. Hichon city, Jagang Prov.	7,000	1954
28	Mt. Guwol N.R.	Samchon county, Unryul county, S. Hwanghae Prov.	1,000	1976
29	Mt. Oga N.R.	Hwapyong county, Jagang Prov.	5,000	1995
30	Mt. Rangrim N.R.	Rangrim county, Jagang Prov.	6,000	1995

## Biodiversity Strategy and Action Plan DPRK

	<u>Landscape(scenic beauty)</u> <u>Reserve</u>			
31	Lake Supung L.R.	Sakju county, Changsong county N. Pyongan Prov.	27,300	1995
32	Lake Manpung L.R.	Chonma county, N. Pyongan Prov.	3,940	1995
33	Lake Taechon L. R.	Daegwan county, Taechon county, N. Pyongan Prov.	12,500	1995
34	Ryongmun-Paekryeng L.R	Gujang county, N. Pyongan Prov.	5,000	1995
35	Lake Jangyon L. R.	Orang county, N. Hamgyong Prov.	1,880	1995
36	Onpo L.R.	Gyongsong county, N. Hamgyong Prov.	3,000	1995
37	Mt. Songjin L. R.	Rajin-Sonbong city, Undok county N. Hamgyong Prov.	4,000	1995
38	Lake Jangjin L. R.	Jangjin county, S. Hamgyong Prov.	6,000	1995
39	Riwon L. R.	Riwon county, S. Hamgyong Prov.	800	1995
40	Lake Sam L. R.	Rakwon county, S. Hamgyong Prov.	900	1995
41	Mt. Duryu L. R.	Danchon city, S. Hamgyong Prov.	8,546	1995
42	Hodo peninsula L. R.	Kumya county, S. Hamgyong Prov.	3,400	1995
43	Lake Unpa L. R.	Unpa county, Jaeryong county, N. Hwanghae Prov.	5,930	1995
44	Gangryeng peninsula L.R.	Gangryeng county, S. Hwanghae Prov.	2,000	1995
45	Lake Pungso L. R.	Pungso county, Ryanggang Prov.	4,500	1995
46	Hwangsuwon L. R.	Kim Hyong Jik county, Ryanggang Prov.	2,900	1995
47	Lake Wonbong L. R.	Paekam county, Yonsa county, Ryanggang Prov.	6,000	1995
48	Wiwon Reservoir L.R.	Wiwon county, Jagang Prov.	7,000	1995
49	Lake Unbong L. R.	Jasong county, Jagang Prov.	7,650	1995
50	Songwon Reservoir L.R.	Songwon county, Gopung county, Jagang Prov.	9,000	1995
51	Lake Rangrim L. R.	Rangrim county, Jagang Prov.	6,000	1995
52	Lake Jangjagang L.R.	Sijung county, Manpo city, Jagang Prov.	7,600	1995
53	Sambang L. R.	Sepo county, Gangwon Prov.	4,000	1995
54	West Sea Barrage L.R.	Nampo city, Unchon county S. Hwanghae Prov.	8,000	1995
	<u>Plant Reserve</u>			
55	Maengsan Black Pine Tree P. Reserve	Maengsan County, S. Pyongan Prov.	40	1959
56	Yangdok Mushroom P.R.	Yangdok county, S. Pyongan Prov.	1,653	1976
57	Sinmido Plant R.	Sonchon county, N. Pyongan Prov.	1,830	1959
58	Hwangpo Mansam P. R.	Rangrim county, Jagang Prov.	7,650	1976
59	Jangsangot P. R.	Ryongyon county, S. Hwanghae Prov.	2,580	1959
60	Mt. Suyang P. R.	Haeju city, S. Hwanghae Prov.	1,900	1976
61	Mt. Myolak P. R.	Rinsan county, N. Hwanghae Prov.	3,440	1959
62	Mt. Duryu P. R.	Chonnae county, Kangwon Prov.	3,500	1976
63	Mt. Chuae P. R.	Sepo county, Gosan county, Kangwon Prov.	2,900	1996
64	Chailbong P. R.	Bujon county, S. Hamgyong Prov. Pungso county, Ryanggang Prov.	2,460	1976
65	Unmandae, Sinuidae P.R	Hwadae county, N. Hamgyong Prov.		
66	Paekam Ganjang swamp P. Reserve	Paekam county, Ryanggang Prov.	17 900	1976 1993
67	Jonchon gasiogalpi P.R.	Jonchon county, Jagang Prov.		
68	Kumya Seaside P.R.	Kumya county, S. Hamgyong Prov.	340 120	1993 1993

## Biodiversity Strategy and Action Plan DPRK

	<u>Animal Reserve</u>			
69	Donggye A. R.	Paekam county, Ryanggang Prov.	9,880	1959
70	Daehung A. R.	Pochon county, Ryanggang Prov.	10,360	1959
71	Kumsok A. R.	Dongsin county, Jagang Prov.	12,406	1976
72	Mt. Danga A. R.	Dongchang county, N. Pyongan Prov.	2,830	1976
73	Mt. Chonbul A. R.	Yonggwang county, Sinhung county, S. Hamgyong Prov.	6,904	1976
74	Mt. Sasu A. R.	Jongpyong county, S. Hamgyong Prov.	2,270	1976
75	Yangam A. R.	Pyonggang county, Kangwon Prov.	2,804	1976
76	Mt. Daegak A. R.	Goksan county, Sinpyong county, Suan county, N. Hwanghae Prov.	3,246	1976
77	Mt. Hakbong A. R.	Ichon county, Kangwon prov. Tosan county, N. Hwanghae Prov.	2,671	1993
78	Chonghakdae A. R.	Jonchon county, Dongsin county, Jagang Prov.	6,967	1993
79	Songwon A. R.	Songwon county, Jagang Prov.	4,800	1993
80	Mt. Obong A. R.	Yontan county, Suan county, N. Hwanghae Prov.	2,937	1993
81	Huisaekbong A. R.	Rangrim county, Jagang Prov. Huchang county, Ryanggang Prov.	16,000	1993
82	Dryocopus javensis A. R.	Rinsan county, Pyongsan county, Bongchon county, N. Hwanghae Prov.	9,960	1993
	<u>Seabird Reserve</u>			
83	Is. Unmudo Seabird R.	Jongju city, N. Pyongan Prov.	85	1976
84	Is. Daegamdo S.R.	Jongju city, N. Pyongan Prov.	25	1976
85	Is. Sonchonrabdo S.R.	Sonchon county, N. Pyongan Prov.	20	1976
86	Is. Tokdo S.R.	Onchon county, S. Pyongan Prov.	10	1976
87	Is. Sonbongal-som S.R.	Rajin-Sonbong city,	25	1959
88	Is. Tongchon-al-som S.R.	Tongchon county, Kangwon Prov.	24	1959
	<u>Migratory Bird (Wetland) Reserve</u>			
89	Kumya Migratory Bird (Wetland) Reserve	Kumya county, S. Hamgyong Prov.	2,000	1995
90	Mundok M. B. W. R.	Mundok county, S. Pyongan Prov.	3,000	1995
91	Ryongyon M. B. W. R.	Ryongyon county, S. Hwanghae Prov.	2,000	1995
92	Chongdan M. B. W. R.	Chongdan county, N. Hwanghae Prov.	1,000	1995
93	Sindo M. B. W. R.	Sindo county, N. Pyongan Prov.	1,000	1995
94	Ongjin M. B. W. R.	Ongjin county, S. Hwanghae Prov.	1,000	1995
95	Unryul M. B. W. R.	Unryul county, S. Hwanghae Prov.	800	1995
96	Chonapo M. B. W. R.	Tongchon county, Kangwon Prov.	700	1995
97	Dongjong Lake M.B.W.R.	Tongchon county, Kangwon Prov.	800	1995
98	Kwangpo M. B. W. R.	Jongpyong county, S. Hamgyong Prov.	2,000	1995
99	Orangchon M. B. W. R.	Orang county, N. Hamgyong Prov.	1,500	1995
100	Sonbong M. B. W. R.	Rajin-Sonbong city.	3,200	1995
<b>Total sum</b>			<b>671336</b>	

\* If areas of 5 Nature Reserves(Mt. Paekdu, Mt. Kungang, Mt. Chilbo, Mt. Myohyang, Mt. Kuwol) with Nature Park, Bisphere Reserves are excluded, it will be 626,736ha in all.

## Biodiversity Strategy and Action Plan DPRK

No	Name	Location	Area	Year of Establishment
101	Rajin Bay M. R. S. R.	Rajin-songbong city (Songjin Bay-Is. Daejodo)	2,400	1996
102	Pohang Bay M. R. S.R.	Chongjin city, N. Hamgyong Prov. (Ryongje Bay-Sajin Bay)	800	1996
103	Hwangjin Bay M. R. S. R	Myongchon county, N. Hamgyong Prov. (Buksu Bay.-Mudung dong)	500	1996
104	Sinchang Bay M. R. S. R	Bukchon county, N. Hamgyong Prov. (Ryonggodan-Ryongam Bay)	700	1996
105	Riwong Bay M. R. S. R.	Riwon county, S. Hamgyong Prov. (Chongryong Bay-Usonggal Rock)	2,500	1996
106	Yanghwa Bay M. R. S. R.	Sinpo city, S. Hamgyong Prov. (Saekjakdan- Gacheung got)	1,600	1976
107	Rakwon Ear Shell, M. R. S.R.	Rakwon county, S. Hamgyong Prov.	2,400	1976
108	Sean Oyster, M. R. S. R.	(Siamdan) Chonnae county, Munchon city, Kangwon	1,700	1996
109	Munchon Saksaki bM. R. S. R.	Prov.(Songjong Bay) Munchon city, Kangwon Prov.	300	1996
110	Kosong Bay Coast. N.R.	(Yemjuchon fishing ground-Silpochon fishery)	1,200	1996
111	Ongjin(laver) R.	Kosong county, Kangwon Prov. (Kosong Bay Aquatic Area)	1,200	1996
112	Dungsagoz Coast N. R.	Ongjin county, S. Hwanghae Prov. (Sagot)	1,200	1996
113	Is. Mhabdo Coast N. R.	Kangryong county, S. Hwanghae Prov. (Dungsagoz)	1,200	1996
114	Ocha Coast N. R.	Ongjin county, S. Hwanghae Prov. (Mahabdan)	1,000	1996
115	Oruji(Sea-cucumber) N.R.	Ryongyon county, S. Hwanghae prov. (Jangsanri uoiyangsu) Jangyon county, S. Hwanghae Prov. (nearby Paetory)	750	1996
<b>Total sum</b>			<b>19,450</b>	
No	Name	Location	Area	Year of Establishment
116	<u>Freshwater Marine Resource Reserve</u> Chongchon river silverfish S. R.	Gaechon city, S. Pyongan Prov.(Sambong-workers district Ryonghwari, Anju city)	400	1976
117	Jangja river freshwater S.R.	Sijung county-Jangja river reservoir bank, Jagang Prov.	520	1996
118	Donggyesu char S.R.	Doggye Workers District, Paekam county, Ryanggang Prov.	270	1976
119	Mayang Resevior Mayang trout S.R.	Musan county, N. Hamgyong Prov.	300	1976
120	Jangjin River Hucho-islikawai S. R.	Jangjin ub-Jangjin Lake-Soksa ri, S. Hamgyong Prov.	480	1976
121	Dokji River(salmon, trout) S. R.	Lower stream of Dokji River, Kumya county, S. Hamgyong Prov.	300	1976
122	Ryesong River, Turtle S.R	Daepyong ri-Chimgyo ri, Singye county, N. Hwanghae Prov.	200	1976

## Biodiversity Strategy and Action Plan DPRK

123	Rimjin River <i>Gonoprokopterus mylodone</i> , S. R.	Bukpo ri, Tosan county-Jonghak ri, Jangpung county, Kaesong city.	210	1976
124	Daehung char, <i>Brachymystax</i> <i>lenok</i> S. R.	Rangrim ri, Daehung ri, Daehung county, S. Pyongan Prov.	200	1976
125	Daedong River Ponghwa turtle S. R.	Ponghwa Lockage, Gangdong county- Wonhung ri, Samsok district, Pyongyang	300	1976
126	Daedong River Mirim (carp, cornet fish) S.R.	Mirim Lockage-Rungrado, Pyongyang	115	1996
127	Dokribdongsu Mayang trout S. R.	Lower reach of Wonbong Reservoir, Ryanggang Prov.	400	1996
<b>Total sum</b>			<b>3,395</b>	

If natural protected areas of DPRK are divided according to criteria of protected area (from I to V) of IUCN, they are as follows.(Table 7)

**Table 7. Classification of natural protected areas of DPRK**

Criteria of IUCN		Protected Areas	Numbers	Area(ha)
1.	Strict Nature Reserve !	1 N.R. except Mt. Paekdu	8	60,000
		Nature Reserve	21	167,900
2.	Nature Park	20 N.P. except Mt. Kumgang	291	51,191
3.	Natural Monuments	Nature Parks	12	19,000
		District which preserved N. M. Special Reserves		
4.	Wild Biological Reserves	Plant Reserves	14	29,330
		Animal Reserves	14	94,071
		Seabird Reserves	6	189
		Migratory bird(wetland) Reserve	12	19,000
5.	Landscape(Scenic beauty)Reserves	23 places except Lake Supung Landscape Reserve	24	147,646
<b>Total</b>				<b>588927</b>

According to the classification criteria of IUCN, I-III types of Natural protected areas of DPRK are 298,691ha, and 290,236ha of IV-V types, and 588,927ha in all counting 4.8% of the whole territory. If square measures except Nature Reserve area of Mt. Paekdu Biosphere Reserve, are added, reaches 696,927ha.

There are 12 Inland Marine Resource Reserve(3,395ha), Nature Reserve(91,475ha) of city and county which belong to VI type of criteria of IUCN and 1,406,803ha of all Reserve forest including, Reservoir Forest Reserve and Hygienic Forest grown for scenic beauty and 200,000ha of Special Forest Reserves, city park, etc., 30,000ha of protected areas, totally, 1,731,673ha of land protected areas and 15 coastal fishery Resource Reserves(19,450ha) are established as conservation area.

### 2.1.1.3 Geographical distribution and areas

Geographical distribution of DPRK is divided into plant, animal and soil distributions. And it is

## Biodiversity Strategy and Action Plan DPRK

classified into highlands, northern lands, middle land, and middle coastland considering climate, topographical causes. Northern highlands with Kaema plateau, Paekmu plateau as its main, is the area that includes whole parts of Ryanggang province and some parts of Yensa County, Musan County, N. Hamgyong Prov., Jangjin County, Bujon County, S. Hamgyong Prov, Rangrim County, Jagang prov, Daehung County, S. Pyongan Prov.

The average height is above 1,300m, and subarctic coniferous forest including deodar forest distributed in the 2,000M regions of Mr. Paekdu North highlands are divided into 5 districts of Mt. Paekdu district and Gwanmobong (Peak) district, Huchang-Samsu district, Pungsan-Pungso district, Rangrim-Bujon district.

Northern parts includes most area of North and South Hamgyong Province, some regions of North Hwanghae Province, and most regions of Jagang Prov, North and South Pyongan Provinces. Northern regions are divided into 12 districts of Tuman River Midstream, Sonbong-Gyongsong district, Mt. Chilbo district, Hochon-Kumgol district, Riwon-Sinhung district, Munchon-Rakwon district, Mt. Duryu-Yodok district, Mt. Oga district, Kanggye-Mt.Seungjok district, irae bong(Peak)-Chonma district, Mt.Myohyang district, Yangdok-Mt.Maengsan district.

Middle area is divided into 4 districts of Is. Bidansom-Jongju district, Pyongwon-Onchon district, Sariwon-Singye district, Chugaryeng-Changdo district including plain area of North and South Pyongan provinces and Inland areas of N.Hwanghae province and Kangwon province. Middle coast area belongs to comparatively wild region in DPRK, and its animal distribution is with plenty of south type species.

Middle coast region is divided into 4 districts of Mt.Kuwol district, Ryongyon-Baechon district, S. Hwanghae prov., Hodo peninsula-Tongchon district, Mt. Kumgang district of S. Hamgyong Province and Kangwon province.

The square measures of natural protected area and its, rates according to geographical distribution are as follows.(Table 8)

**Table 8. Geographical Area rates of nature protected areas in DPRK**

Biogeography		Area (1,000ha)	Areas of protected Area(1,000ha)	Conservation Area Rates (%)
Region	District			
I. Northern highlands	1. Mt.Paekdu Dist	345.5	148.4	42.95
	2. Gwangmobong(peak)Dist	721.9	15.8	2.19
	3. Huchang-Samsu	346.2	0	0
	4. Pungsan-Pungso	427.2	7.4	1.73
	5. Rangrim-Bujon	977.8	48.2	4.93
II. North region	6. Tuman River Midstream Dist	386.7	0	0
	7. Sonbong-Gyongsong	755.4	15.3	2.0
	8. Mt.Chilbo	203.8	31.5	15.4
	9. Hochon-Kumgol	305.7	8.5	2.78
	10. Riwon-Sinhung	631.0	9.7	1.54
	11. Munchon-Rakwon	168.3	5.2	3.08
	12. Mt.Duryu-Yodok	310.7	3.5	1.12
	13. Mt. Oga	365.8	12.7	3.47

## Biodiversity Strategy and Action Plan DPRK

	14. Kanggye- Mt.Seungjok	569.6	23.6	4.14
	15. Biraebong-Chonma (peak)	651.9	34.5	5.29
	16. Mt.Myohyang	590.5	57.7	9.77
	17. Yangdok-Maengsan	894.9	21.9	2.45
III. Middle regions	18. Is.Bidansom-Jongju Dist	325.4	2.9	0.89
	19. Pyongwon-Onchon	488.6	12.0	2.45
	20. Sariwon-Singye	752.5	17.3	2.29
	21. Chugaryong-Changdo	773.4	11.1	1.43
IV. Middle coastal Region	22. Mt.Guwol dist	224.3	33.8	13.83
	23. Ryongyon-Baechon	773.4	35.6	4.60
	24. Hodo peninsula - Tongchon	101.9	4.8	4.71
	25. Mt. Kumgang	163.3	64.7	39.62

### 2.1.2 Management for protected area

#### 2.1.2.1 Policies, Legislation and enforcement

DPRK took measures to systematically extend natural protected area after designating Mt. Myohyang District as special Reserve in 1954.

The great leader comrade Kim Il Sung taught that mountains, sea and rivers in our country are the precious thing, and therefore, the mountains should be thickly wooded, and lots of various beautiful birds and animals should be lived and the crowd of fishes in rivers and the sea should be swarmed by the thousands.

Main policy for protected area in DPRK, are first of all to decide nature reserve, special reserve, animals and plant reserves, and preserve natural environment of reserves in their original state and thoroughly protect and well equip them. Next, with improvement of management for protected areas, it is to enable people to rise as one in building up fatherland more beautiful by doing scientific research work and youth education work in Nature-Reserve and animal and plant reserves.

Management for protected areas in DPRK, the legal base is provided by several time's decree and decision of Administration council including "Standing Committee decree of Supreme People's Assembly "On protection and proliferation of useful animals and plants "In February 1959. Particularly, the article of the Law on Environment of DPRK" indicates that natural environment reserve and Special Reserves should be preserved in their original state and management of protected area should be improved and strengthened by investigating and monitoring the changes of the weather, hydrology, animals and plants, and topography in protected areas.

Administrative Council of DPRK took countermeasures to control the actual state of ecosystem and its changes and conduct suitable management in addition to it, by comprehensively conducting monitoring the previously established protected areas in 1995 and newly established protected areas in every 10 years in future as the work of expanding protected areas and improving its management places an important position in biodiversity of the country. In this connection, share responsibility of the central agencies and municipalities which are responsible for managing protected area till now, were enabled to be clarified.

#### 2.1.2.2 Institutional and Personnel status

## Biodiversity Strategy and Action Plan DPRK

Protected areas of DPRK are managed by Ministry of Land and Environment Protection, Ministry of Forestry, Ministry of Culture, and Academy of Sciences. Natural protected area managed by Ministry of Land and Environment Protection are 80 and some 4,800 management members are engaged in this. The numbers of management members by protected areas are as follows. (Table 9)

**Table 9. Management numbers by major natural protected areas**

No	Name	Numbers of members(person)
1	Mt. Myohyang Nature Park	632
2	Mt. Kuwol N. P.	855
3	Mt. Chilbo N. P.	120
4	Mt. Kumgang N. P.	200
5	Mt. Sohung N. P.	93
6	Mt. Yenpung N. P.	30
7	Mt. Jongbang N. P.	220
8	Mt. Oga Nature Reserve	330
9	Lake Taesong N. P.	95
10	Tongchon(Lake Sijung) N. P.	179
11	Etc	4,616
<b>Total</b>		<b>7,280</b>

### *2.1.2.3 Researches and monitoring*

Researches on actual state flora and fauna in protected area and ecosystem are conducted by Academy of Sciences. Particularly, as Academy of Sciences conducted comprehensive researches on districts of Mt. Paekdu. "A series of Mt. Paekdu" is published. Comprehensive researches on major protected areas like Mt. Chilbo, Mt. Oga, Mt. Myohyang, Mt. Kumgang, Mt. Kuwol were conducted till now, and recent investigations on major wetland like Mundok, Kumya, Ryongyon are being systematically organized and conducted.

On the basis of it, the comprehensive re-evaluation for protected areas were conducted during 1991~1994. However, systematic researches on the whole protected areas of the country are in the lack state. Monitoring on natural protected areas are not smoothly organized except some regions. In this connection, being based on researches on animals and plants, ecosystems for protected areas, the establishment of state monitoring system is proposed as an important task.

### *2.1.3 Assessment for establishment and management of protected areas*

#### *2.1.3.1 Main achievements*

The Government of DPRK has reevaluated the nature reserves of the country for the implementation of Agenda 21 and Convention on Biodiversity Conservation, adopted at UNCED in 1992. Reevaluation was done considering the distribution of vegetation, species of animals and plants,

especially, the endemic species of the country and those of global significant already surveyed in research institutes to define whether the nature reserves are distributed for the well-protection of the biodiversity of the whole country.

Through the re-evaluation, main habitats of migratory birds in Mt.Rangrim area, Mundok and Kumya have been supplemented, and the areas of reserves that are been supplemented, and the areas of reserves that are believed not to be enough for the function of ecosystem and unsuitable for the protection of animal and plant species have been expanded. In addition to this, some of the nature reserves have been renamed as nature parks for the development of eco-tourism of the country. However, the continuance of habits for animals and plants in protected areas are considered in this work.

### ***2.1.3.2 Main gaps***

First, under the condition that many areas are newly established as nature reserves and their areas are expanded, there are still gap in taking comprehensive countermeasures for appropriate management and identifying the objectives of other relevant organizations and increasing their awareness. Especially, preparations are not well arranged to give benefits to its local people and make them actively participate to the management of protected areas.

The main problems are :

#### ***Poor regulations for nature reserves.***

The main law on the management of nature reserves in DPRK is the Law on Environment Protection, issued in 1986. In order to fully implement the Law on Environment Protection, the regulation of the management of reserves must be included to its implementation regulations and each regulations must be fully completed according to its characteristics.

At present, most of the newly established nature reserves do not its management regulations. As a result, the protection and management of nature reserves are not effectively done. Furthermore, there is no authority system to coordinate the work of departments in the existing regulations for reserve management. Therefore, it is very difficult to have consensus on ideas between the relevant departments and solve issues arising over the reserves.

#### ***Poor management capacity of nature reserves.***

Most of the newly established nature reserves do not have institutes for its management, as a result, budgets are not provided and hence, management is poorly done. At present, reserves are managed by professional managers and ranger, But, most of the managers do not possess professional education on management of reserves so their quality is very low. Due to the lack of fund, field research stations and facilities for monitoring eco-environmental changes have not been established and because of this, the problem of scientification of reserve management and high management level are to be solved. Furthermore, there are no facilities for educating local people to understand the value of reserves and encouraging them to participate to the management of reserves.

#### ***Deficiency of connection and controlling between Central Agency and local administrative organs in managing development and protected areas.***

According to the demands of actual development that protected areas rapidly increased, the

problems to enlarge the department which is responsible for protected areas, in Ministry of Land Environment Protection, and enhance its functions, are proposed. As there is no such counter measures, the control for development which is going to conduct in and around the protected areas, have not been done yet. Under the condition that the nature reserves are expanded, it is an urgent task to make various options including the development of eco-tourism through which the local people benefit considerably without any inconvenience to their life.

### *Lack of international connection*

In case that protected area is regionally of internationally significant, cooperation for it should be organized, and we should try to necessary cooperation through international organizations.

## **2.2 Ex-Situ Conservation**

*Ex-Situ* conservation of wild plant and animal is also important as well as in-situ conservation. Botanical gardens and zoos should play an important role in conserving extinct individual species of animal and plant in nature and species with economic value including medicinal plants. It should also play a special role in educating people, especially the youth, to love the nature and protect animal and plant, and with the methodology of sustainable use of biological resources.

### **2.2.1 Ex-situ conservation of wild plants**

Botanical garden and arboretum play an important role in conserving plant diversity. DPRK has built Botanical Garden of 20 ha at the foot of Mt. Taesong in Pyongyang in 1959, It has built small sized botanical gardens in every cities of provinces, and also in Samjiyon county, Ryanggang Province around Mt. Paekdu area for the protection of alpine plant species.

There are botanical gardens in significant district in view of biodiversity (Mt. Oga, Ongjin, Yangdok etc). Thus, in present 1998, DPRK have national 14 province botanical garden, 3 arboretums, and 21 city, county level flower garden. It is estimated that about 8,500 plant species are cultivated in the Central Botanical Garden at present, of which 2,500 species are native ones. The Central Botanical Garden, preserves 4,000 species of valuable plants, presented to the Great leader Kim Il Sung and the Great leader Kim Jong Il from the Presidents and individuals of foreign countries and over-sea compatriots.

Among them, Kimilsunglia from Jakaruta Botanical Garden, Indonesia and Kimjongillia by Japanese Gardener are preserved and widely cultivated. At present, an arboretum of 100 ha, is built near the Central Botanical Garden. Arboretum, with the aim to preserve 2,500 species in near future, proceeds with its work to collect and preserve saplings. The Central Botanical Garden also has science hall for public education and plant specimen hall with the capacity of preserving 200,000-plant specimen (present proserving species number: about 150,000)

### **2.2.2 Ex-situ Conservation of wild Animals**

DPRK has established Central 200 of 100ha at the foot of Mt. Taesong, Pyongyang in 1959 and local zoos in every cities of provinces. The largest zoo in local area is Wonsan Zoo in Songdowon city, Kangwon Province.

At present, the total number of animal species in Central zoo is 650, among which 180 species are mammal, 260 species are bird, 50 species are reptile and amphibian, and 160 species are fish. Animals, presented by Presidents of foreign countries including African countries, individuals and managers of foreign countries are now breeding captive in the Central zoo. The species number is 180. The Central zoo has succeeded in breeding rare animals not only in our country but also the other countries (breeding of Indian elephant, tiger, wolf, Red-crowned crane). In the near future, the Central zoo will be improved and expanded newly expecting 65 ha of natural zoo.

### **2.2.3 Seed Bank**

It is an important task of biodiversity conservation to establish the preservation system for plant species and animal cell. At present, seed Bank is partly organized in post-graduate course of Agricultural science under the Academy of Science, the Cell Bank is being tried to newly organize. And the standard of preservation is not yet high. In such a condition, it will be necessary to build state Seed Bank, and provide close relation with Seed banks organized before, and by strengthening capacity of this establish the preservation system at the even of seed and cell of rare species in the country.

### **2.2.4 Assessment of ex-situ conservation**

Central zoo, arboretum and Botanical Garden are of adequate size for *ex-situ* conservation of wild animals and plants. Therefore it is important to strengthen capacity of its management and species preservation.

For this, information management of preserved species must be improved and it will be the first phase for strengthening the capacity of management and species preservation. The information on species must be data-based by computer and should be available for effective-use needed for increasing the capacity of species protection system network. In addition to it, great attention should be paid to the study on breeding of endangered and rare species in DPRK.

Central Botanical Garden should reproduce the world rare family plants such as *Pentactina rupciola*, *Kumgang asiatica* and economic species with high medical values. Central zoo should promote the breeding program of endangered and rare species such as Red-crowned crane, Black-faced Spoonbill, *Egretta cuolophotates*, and re-pasturage increased populations to nature.

To strengthen the ex-situ conservation, programs should be promoted to provide reproduction centres by establishing botanical gardens and zoos within the main nature protection areas. Above-mentioned programs should proceed in close relation with the Central Botanical Garden and zoo. Works should be done linked with International Species Registering System (ISIS) which is preparing International Species Book to prevent breeding of same specie from the family.

It is necessary to expand aquarium for enhancing the role of zoo, DPRK has rich species with economic value in marine and many rare species in freshwater. The biology in fresh water is greatly influenced when its distribution is narrowed and the quality of habitat is poor.

Therefore, the aquarium shall be the centre in promoting breeding program of endangered species in freshwater. In order to fully carry out such works, the budget should be provided for modernizing the equipment of breeding and species preservation in Central Botanical Garden,

arboretum and zoo, besides, budget should also be provided to equip breeding centres in natural habitat. It is difficult to strengthen enabling activity with only entrance fee and incomes from it.

### 2.3. Sustainable use

#### 2.3.1 Agriculture

##### 2.3.1.1 Actual statute

Agricultural land of DPRK is 2,103,000ha, which accounts for 77.1% of land area. Among them, dry field is 998,000ha(47.4% of agricultural area), 587,000ha of paddy field (27.7% of agricultural land area), 160,000ha of fruit field (7.5% of agricultural land area) and mulberry tree and industrial crops have been cultivated in the areas.

The per *jongbo* yield of grain was 7.6 ton of rice, 6.5 ton of maize in the highest crop year, however, the flood damage of 1995, 1996 and drought of 1997 have brought rapid decreased, therefore only 2.5ton of rice in 1996, and 1.4 ton of maize were harvested. The total grain output of 1997 as 2,865,000ton and it as the insufficient state in general. In such a condition, the problem of ensuring high and stable harvest is proposed as an important task in agriculture field.

In this connection, the most important problems of raising fertility of agricultural land, developing and introducing seeds in consonance with climate and soil condition and prevent soil erosion of sloping field are proposed. Particularly, from topographical and climatic speciality of DPRK of which 80% of land are mountains, the problem of preventing soil loss is proposed as an urgent task.

##### 2.3.1.2 Conducted work

Ministry of Agriculture in DPRK mapped out strategy and action plan for sustainable agricultural development and agro-eco environment conservation in 1998, as agro-eco environment is proposed as an important problem the work to get high and stable harvest in agriculture.

Strategy and action plan includes locality of agricultural land, there dimensional use of agricultural land by double-cropping, inter cropping cultivation, plant breeding distribution and improvement of cultivation techniques, introducing organic farming method fro raising soil fertility, safe water supply, establishment and intensification of eco-agricultural models.

Ministry of Agriculture, have conducted the work of intensify production of complex microbe fertility to raise crop harvest, and took a series of measures to preserve genetic resources of crops and livestock ("Crop seed test regulation" (1992) " Seed livestock management regulation (1992) and its detailed regulations). Particularly, ministry of Agriculture arable land destructed by flood from 1995~1996 to be restored mainly.

##### 2.3.1.3 Assessment

In DPRK, recent natural disaster, decrease of food production and insufficient agricultural materials including fertility, farming machines have brought decrease of food production. As an urgent measure for this, we received various co-operation including foods from

international organization and other countries. Square measures titled land of grain (rice, maize) is only 0.056ha. Rice-field is mainly at flat area, and paddy field is most distributed at sloped land and among them, sloping field above 16E reaches 200,000ha. As forest is near by sloping field in general, destruction of forest ecosystem affects agricultural ecosystem.

In such a condition, to raise productivity and stability of agriculture it is important to prevent soil erosion of mountains by putting great effort to afforestation and water conservancy work with work of raising soil fertility systematically by developing stock breeding and to intensify three dimensional use of agricultural land introduction of agro-forestry complex system, agricultural land.

In this connection, it is important to conduct comprehensive assessment on agro-ecosystem biodiversity of country and to establish and generalize eco-agriculture, models of resources cyclic type agro-culture. And it is important to strengthen preservation, exploration and introducing measure coinciding with climatic and soil condition of DPRK. In this connection, the work of providing close relation between sustainable agriculture development strategy and biodiversity strategy and action plan in DPRK, are promoted.

### **2.3.2. Forest**

#### **2.3.2.1 Actual state**

Forest land in DPRK is 8,906,000ha, which accounts for about 73% of land area, among them, 8,183,000ha of tree forest land, 380,000ha of no tree forest land and the rest is no forest land and other area. No tree forest land was 361,000ha in 1993 and estimated to be more increased because of floods during 1995, and other causes.

DPRK is planning reforestation 200,000ha of forest till 2005, and 3,310,000ha of forest till 2020 to protect forest resources and provide comprehensive and sustainable use, 110,000,000m<sup>3</sup> forest accumulation will be were increased till 2020 and accordingly 287m<sup>3</sup> of accumulate 2000 per ha will be raised. And producing timber in the principle of cyclic felling, and the work to enable felling one tree and planting 10 trees are being promoted.

Presently, 800,000ha of firewood afforestation and 250,000ha of oil-bearing tree forest including 50,000ha of *Evodia Daniellii Benn* afforestation are being conducted in forest sector aiming at the year of 2002, to and afforestation work in flood damaged regions including Amrok river and Chongchon river are being promoted.

#### **2.3.2.2. Conducted work**

Government of DPRK sent order to wage vigorously afforestation of firewood in 1992 (order number 54, November 1992) and took measure to smoothly solve firewood problem of village regions within a few years. In 1993, government took nation-wide measure to accelerate afforestation work of forest of oil-bearing trees and industrial trees and decision decisively increased the sapling production, to the level of 800,000,000 trees a year for the present and raise to above 1,120,000,000 trees by the year 1998.

Forest department have planted about 100,000ha(total 399,000ha) of trees every year and some 3,000ha of firewood were more afforested. And, according to national tree planting and afforestation policy, the works of increasing kinds of trees and diversify nation-wide forest are being positively promoted. And the work for protecting and proliferating useful animals are being simultaneously promoted and the work of survey and research the distribution by regions, resources quantity, method of proliferation on wild animals and birds living in DPRK and the work to provide living environment and breeding conditions of useful animals are being vigorously waged on a mass-scale.

Recent years, forest department achieved some successes in the work of restoring destructed forests by floods.

### **2.3.2.3 Assessment**

The area of forest land in DPRK reaches 73% of land area, however, the accumulation per ha is not high. Therefore, the demands for timber needed in various sectors of national economy are not being fully provided. And production capacity of sapling is not high and there are not many kinds of trees to be produced. In such a condition, to accelerate the national afforestation, tree planting work, to raise the producing capacity of sampling to above 1,100,000,000 trees and to diversity kinds of trees simultaneously.

At the same time, the work of improving wild mountains and naked mountains near population region and forest wit low productivity to the forests with diversified kinds of trees, economic useful and high productivity, will have to be accelerated. Particularly, decisive measure is needed to improve basin management in view of actual state of flood damage in recent years and the work of preventing soil erosion of forest is proposed as and important task in afforestation. And the work of protection and proliferation work of useful animals will be accelerated with diversification of forest.

### **2.3.3. Fishery**

#### **2.3.3.1. Actual state**

Positive protection and proliferation of fish resources is proposed as an important task in developing national economy and raising people's living by increasing production of marine products. However, the production of marine products of DPRK have not been raised in recent years.

It is because that myongtae resources, the major production fish species, have not been increased for changes of ocean and it decrease of it. Meanwhile, the coast of DPRK has about 20,000ha of right soil for natural sea culture and 100,000 ha of suitable land for artificial breeding, however, only 10,000ha scale of nursery have been built because of insufficient sea culture materials for recent year's economic difficulties. Also inland productivity of marine products is no high thoroughly protecting aquatic environment and preceding.

In such a condition, the protection and proliferation work of fish resources the work of increasing production of marine products is proposed as an important task.

### **2.3.3.2. Conducted work**

In 1995 DPRK have promulgated DPRK the general "fishery law" which have regulated the protection and utilization of fish resources and have promoted the work which comprehensively readjusts the fish resources reserve in 1996. At the same time, in 1996, the government took measures to put great efforts to composition and proliferation of coastal sedentary fish resources in nation-wide improve the discipline of fishing industry and fishery management in compliance with demands of "fishery law" and preceding resources composition work before producing.

To fully provide this work, fishery association committee(non-standing) is organized. The proliferation plan of fishery resources in all units using fishery resources will be practised by state on the basis of this organized work and strict system is established the rights of fishery utilization should be if these plans are not conducted with this, the work for inland fish resources of is strengthened protection and proliferation and its utilization are strengthened. In 1997, the state ordered to develop nation wide nursery(Order No 44, in August, 1997) and enabled to wage the work of building new nursery farm and simultaneously took measures to raise productivity of lake, reservoir, aquatic area of rivers and streams.

### **2.3.3.3. Assessment**

DPRK has favourable aquatic condition for fishery development and have profound nursery experiences. Particularly, previously provided Coastal culture ground raised the production quantity 100~150ton of sea wed, 50ton~60ton of sea tangle(laminariales), 100~150ton of oyster, and have lots of prepared technical forces. In such a condition, it is important to increase the investment on fishery department and increase of present coastal culture ground into 5 times scale.

Now, as artificial proliferation and nursery techniques of marine animals and plants are being researched and developed deeply in present fishery department, if enlargement of comprehensive adjustment and developing work if coastal fishing ground, esp., the improvement of management work of fishery resources reserve, and the biodiversity conservation of inland ecosystem and enhancement of biological productivity are positively pushed ahead and whole fish industry are diverted into resources management type fish industry considering biodiversity conservation, the aquatic environment of DPRK will be smoothly provided and production of marine products will be systematically raised.

### **2.3.4. Koryo medicine (Traditional medicine)**

#### **2.3.4.1. Actual state**

Koryo medicine, traditional medicine of DPRK has long tradition.

Presently, the task to combine Koryo medicine with medicine is proposed for health administration of people. Koryo Medicine Production Management bureau, Ministry of Health is in charge of production of Koryo medicine in DPRK.

There are Koryo medicine resources prospecting corps, Koryo medicine resources designing office, and Korean Koryo medicine technical Centre under the Koryo medicine management bureau. And 12 numbers of medicinal plant farm which specialize medicinal plantation and 210