

- (1) Organize constant discussion between central organ, local administrative agency, and local communities that are responsible for natural protected area management and map out joint plan of protected area management.
 - (2) Select and train prepared members who are able to wage positive activity in conservation work of protected area, animals and plants among local populations.
 - (3) Make a model of business activities closely related to conservation, and generalize it, so that natural protected area should give benefits to local populations.
 - (4) Conduct education, publicity activity to local residents significance of natural protected area, and combine their necessary knowledge dissemination facilities with conservation management facilities.
- 3) Enforce scientific research work and monitoring work of protected area in natural protected area. Although not little scientific research works on natural protected area were conducted till now, regular investigation research work is insufficient. Thus, build spot research facility in natural protected areas and organize and conduct constant investigation study on animals and plants species, eco-environment and closely combine investigation research results with monitoring on protected area.

4.3.1.1.4 Map out preservation plan on the species of significance in biodiversity and improve conservation management work

- 1) According to criterion of danger degree of species state, decide the priority precedence and compile "Red data book"
Now, there is Centre for Nature Conservation in Academy of Science as professional institution for investigation and conservation of endangered or rare species in DPRK. As Centre for Nature Conservation collected and adjusted materials of endangered or rare species in DPRK, it is necessary to complete national "Red data book" and publish it. At the same time, several forms of materials (poster, booklet) should be disseminated to raise more social recognition on importance of conserving vulnerable or rare species.
- 2) Map out species preservation plan in *in-situ* and practice it. DPRK has global final district of habitation for white-bellied black woodpecker, and only breeding sites of 550 black-faced spoonbills in the work and wintering sites or transit areas of Red-crowned crane (*Grus japonensis*), white-naped crane (*Grus vipio*), hooded cranes (*Grus monacha*).

Global decreasing animals such as tiger (*Panthera tigris*), leopard (*Panthera leopard*), musk deer (*Moschus moschifera*) and otter are distributed and plants species including *Pentactina rupicola*, *Keumkangsania asiatica* which belongs to family in worldwide, are distributed. In this connection, it is important to improve habitat environment and strengthen conservation management work by mapping out conservation plan of species in *in-situ* which are of significance in biodiversity.
- 3) Manage species preservation facilities in *ex-situ*, and develop artificial breeding techniques of major species and enlarge conservation, proliferation work. As the population density is high and it is difficult to increase area of natural protected area, it is necessary to enforce work to remove and breed species bred in captive to nature by establishing species preservation measures in *ex-situ* for successful preservation of wild animals and plants species. To push ahead this work

successfully, artificial breeding facilities for endemic species, economic valuable species with vulnerable and rare species as its main content should be enlarged in zoos and botanic garden.

Now, Central botanic garden and Central zoos is small. In this condition, artificial breeding facility of vulnerable or rare species should be increased preferentially in Central botanic garden and Central zoos and artificial breeding facility should be gradually furnished in local zoos and botanic garden near by habitat.

At the same time, effective tissue culture, artificial breeding technology should be developed and line record system to prevent genetic homogeneity should be established. And issue points aroused in setting free species bred in captive should be investigated extensively and scientific research work to raise hit rate of natural restoration should be strengthened. And culture facility for breeding vulnerable or rare species in captive should be equipped in natural protected areas and enable it to contribute to preservation and rehabilitation work of species.

4.3.1.1.5 Establish preservation network system of national crops, livestock, germ and genetic resources.

- 1) Set up national gene bank and organize centre for utilization of genetic resources preservation. Presently, the crop genetic resources by kinds including grain vegetables, in given institutes under the Academy of Agricultural science, Tree gene resources in Forestry Branch, livestock gene resources in breeding farms under zoo technic Institute and Agricultural Ministry, and microbe gene resources are dispersed and preserved in several institutes.

As result, some difficulties are aroused in every units in effective preservation and utilization of genetic resources. In such a condition, setting up the national gene bank and smoothly conducting the preservation of genetic resources and building up comprehensive genetic resources data base.

- 2) Establish the preservation network system of crops, tree, livestock, microbe gene resources. As national establishment of gene bank could not solve the preservation work of gene resources, utilization committee for preserving genetic resources to fully provide the preservation and utilization of gene resources should be nationally established and strategy and action plan in utilization sectors of genetic resources preservation, should be mapped out. And raise the utility ate by establishing effective network system between preservation units of genetic resources and fully provide biological safety. At the same time, genetic resources.

4.3.1.1.6 Restore destructed ecosystem outside of natural protected area and establish the buffer zone and ecological corridor.

- 1) Restore destructed ecosystem outside of natural protected area and establish buffer zone. Recent natural disaster caused not little destruction of some natural protected area and ecosystems outside of natural protected area. In such a condition, enlargement of afforestation work on destructed forest is proposed as an urgent task. And it is important to raise more living profit of the district population by establishing buffer zone prospectively and applying effective complex management method of agriculture and forestry, agriculture forest tree in these areas.

- 2) Promote the creation of ecological corridors between national protected areas in afforestation plan by planning it. To fully decrease the influences by habitat destruction up wild animals and plants including influences by global warming, the ecological corridor between natural protected areas should be set up. Include this work in afforestation plan and national land development programmes.

4.3.1.1.7 Practice biodiversity monitoring plan by mapping out it

To Monitor and control if various regulations related to biodiversity conservation have been fully conducted or not, and evaluate the economic loss by biodiversity loss, remove and decrease the negative influences affecting biodiversity, systematic biodiversity monitoring plan should be set up and practised.

Biodiversity monitoring plan includes monitoring on forest, monitor on land use. monitoring on index species and habitat monitoring on aquatic utilization, monitoring on pollution, monitoring of management.

4.3.1.2 Action related to sustainable use

4.3.1.2.1 Develop forestry considering biodiversity

Restore forest destructed by forest fire, flood damage, drought and over exploited use in a short period, and provide sustainable use of forest resources by setting up comprehensive measures to raise biological productivity of forest.

In this context, conduct following action:

Restore the forest land with no tree including naked mountain, and forest with low productivity, in a short span of time proceed plan to increase forest biological productivity with timber production as its main content by mapping out it.

- Raise the soil fertility of dry, infertile forest land and take comprehensive measures to prevent forest soil erosion.
- Accelerate the afforestation work and satisfy the demands for firewood.
- Comprehensive plans to increase biological resources of forest including law materials for paper, oil, and wild fruits, medicinal plant, mushrooms, should be mapped out and promoted in accordance with peculiarity of regions.
- Map out and practice cyclic felling promoted in log production.
- Decrease amount of consumption of timber increasing utilization in log production and timber processing to the maximum.

4.3.1.2.2 Protect agricultural biodiversity and accelerate development of nature cyclic type agriculture

- Most of agricultural land of DPRK are situated in river basins and neighbored with forest. In such as condition, biodiversity preservation of agriculture ecosystem is in close relation with other neighbouring ecosystem. And, agricultural biodiversity conservation is closely connected with preservation of crop seeds breeds which has been homed down historically.

- For sustainable development of agriculture, it should developed in environment preservation type agriculture, nature cyclic type agriculture.

In this connection, important activities are as follows:

- To establish strict monitoring system on the utilization of agricultural land resources.
- To prevention soil loss and measure to raise soil fertility.
- To establish eco-agriculture, nature cyclic type model farms.
- To introduce organic farming method and techniques of biological fertilizer.
- To introduce of method of complex management of agricultural forest, agricultural wood forest.
- To traditional genetic resources.
- To afforest fuelwood in flat area and its sustainable use.

4.3.1.2.3 Develop fish industry in the form of nature managements by intensifying aquaculture work of aquatic fauna and flora

To maintain biological productivity in marine aquatic area, biodiversity of marine ecosystem should be protected.

The major reason that present total fish productivity is being decreased, is that conservation of aquatic environment and over exploited use were not controlled properly.

Necessary activities related to this are as follows:

- To enlarge and develop aquaculture of aquatic animals and plants.
- To improve of management on aquatic area with high productivity.
- To restore the fish ground of which environment was deteriorated, and thoroughly prevent aquatic pollution.
- To assess inland and aquatic resources exactly and establish national system for development of resources management type fish industry.

Particularly, map out the comprehensive development plan of marine aquatic area and closely onnect this developing plan with biodiversity and, accordingly, establish new aquatic area anagement system.

4.3.1.2.4 Accelerate the protection and proliferation work of medicinal plant and provide sustainable use of Koryo medicine resources.

To fully provide development of Koryo medicine, the traditional medicine, and increasing demands on medicinal plant

- Exactly decide the quantity of collecting medicinal, plant on the basis of evaluation of medicinal plant resources.
- Enforcement of legal legislation in utilization of medicinal plant.
- Enlargement of artificial cultivation of medicinal plant resources with high demands.
- Establishing preservation system of medicinal plant genetic resources in In-situ and ex-situ, etc., will be major activity.

4.3.1.2.5 Intensify rest work and develop ecotourism.

Conduct following activity to fully provide rest work and eco-tourism.

- Completion of spot facility for rest and ecotourism, particularly, consolidation of facility which do not give damage to biodiversity.
- Training and intensification personnel in the of rest and ecotourism.
- Acceleration of mapping out spot activity plan on rest and ecotourism.
- Establishment of publicity and facility operation system that rest and ecotourism should not give negative effects to biodiversity.

4.3.1.2.6 Establish comprehensive measures to prevent influences by exotic species

Conduct following activity to prevent negative influences of exotic species affecting biodiversity

- Investigation research and assessment of influences affecting distribution of exotic species, actual state of habitat, and ecosystem
- Comprehensive research on introduction work of exotic species including agriculture and forest, etc.
- Remove harmful exotic species.
- Strict control of exotic species introduction to area for nature conservation.

4.3.1.2.7 Map out and promote effective environment assessment on activities which will affect biodiversity

Following action will have to be done to establish environment impact evaluation procedures on all activities which will affect biodiversity.

- Map out and promote environment impact evaluation plan
- Training specialists who can smoothly conduct environment impact assessment work.
- Send guide book for environment impact evaluation to all developing departments and thoroughly establish system that propose environment effect evaluation report before development.
- Make regulation land detailed regulation on environment effect evaluation work.
- Raise awareness of population environment impact assessment work and strengthen dissemination work of all sorts of knowledge necessary to it.

4.3.1.2.8. Take measures to prevent environment pollution which threatens biodiversity

It is important to thoroughly prevent environment pollution threatening biodiversity including forest destruction by acid rain and water pollution by life waste.

Activities to prevent environment pollution threatening biodiversity are as follows:

- Exact establish standard of preventing pollution on atmosphere, water and soil. Particularly, establish strict standard to prevent pollution separately on protected areas and keep it thoroughly.
- Establish comprehensive record system on polluting materials and thoroughly equip facility to prevent pollution and make polluting materials not to emit to nature.
- Go on study measures to prevent pollution and disseminate good experiences of preventing pollution.

4.3.1.2.9 Take measures on biotic safety

Following activity should be conducted to fully provide bio-safety.

- Map out and promote experiment guideline to ensure safety in experiment stage. When gene formulation is going to be used in nature condition, conduct environment impact evaluation work by objects.
- Make and implement guideline on the utilization of gene formulation technology in medicaments food: stuff, agriculture, forestry, fishery and mining industry.

4.3.1.2.10 Restore destructed ecosystem and improve basin management by mapping out comprehensive, national basin plan

Recent year, not little district ecosystem in DPRK received flood damage 80% of territory is mountainous topography, and water speed river and stream uprising is fast and density river network, and border of basin with explicit topography, and hydrological condition, the rehabilitation of destructed ecosystem and afforestation and water conservancy work should be promoted in combination with improvement work of basin management.

Major activities related to this are as follows:

- Reconfirm sphere of region which will be damaged by flood in future.
- Put priority to restoration of damaged area by flood and complete rehabilitation in a short period. Take measures to restore forest ecosystem destructed by artificial interference including damaged region by forest fire and no agree forest.
- Widely apply measures of soil erosion including composition of grass plates which cost low expense.
- Train able specialists for mapping out basin management plan.
- Complete afforestation techniques of basin in accordance with biodiversity conservation and promote complete afforestation proposal so that techniques for keeping much water in basin forest should be raised.
- Build model of biodiversity-related comprehensive basin management in Chongchon river basin and generalize it.
- Promote above proposals and plans in close combination with work which will be conducted during the month for protection of land environment in spring and autumn.

4.3.1.3 Action on benefit - sharing

4.3.1.3.1 Determine quantity of economic values of biodiversity in given regions in mapping out national land use plan and enable much amount by be profit of given regions.

Fixing quantity of economic values of biodiversity, becomes important possessing materials in preventing potential, and in land and aquatic area survival biotic resources giving away immediate profit from the profit by significant development And as local population receives much profits of biological resources, this profit should be sustainable form.

Following activities are necessary related to this.

- Conduct fixing quantity of economic value of biodiversity in given regions in the of mapping

out national land programme.

- Enforce local authority on utilization of biological resources in a given region.
- Encourage development research and circulation of local special products using biological resources.
- Activate the action to bring local population to see immediate and perspective on profits conservation and sustainable utilization of biological resources.

4.3.1.3.2 Appraise highly the super models in biodiversity conservation and sustainable use and generalize it.

It is important to widely introduce and publicize fine officials and generalize its models by finding out good models in protection and proliferation of useful animals and plants, afforestation, planting oil-bearing forests, cultivation of medicinal plant, and propagation work of fishery resources, etc., and conducting political and substantial evaluation on it.

In this work, it is important to positively encourage traditional knowledge, initiatives, practical activity in conformity with peculiarity of given regions.

Particularly, training many local technicians, and experts who know actual state well on a given regions, as biodiversity experts should be put efforts.

4.3.1.3.3 Establish national database and information network for biodiversity conservation and set up information exchange mechanism.

In making policy for biodiversity conservation, exact and sufficient biodiversity information should be provided and should use it effectively.

Thus, national data base should be built up by collecting dispersed materials from biodiversity sectors, an international information exchange facility should be provided.

Action related to this are as follows.

- Accelerate the accumulation of information by promoting survey research for biodiversity conservation.
- Make unique national data regulation premising introduction of geographical data system.
- Enlarge information network to be involved to data base and set up national information network system.
- Build up special information exchange facility for material exchange with other country on biodiversity.
- To fully provide collection, evaluation, and providing on biodiversity, build national biodiversity information centre.

4.3.1.4 Common measure related to conservation and sustainable use

4.3.1.4.1 Include biodiversity conservation to the planning, unification work of national economy and proceed it.

Developing economy under the unified guide of state in a planned manner, is natural demand of socialist economy in DPRK. Thus, all plans of biodiversity sectors including forest utilization plan

in forestry, fishery, health public etc, composing woodland plan, coastal culture plan, fishing plan, utilization and cultivation plan of medicinal plants, conservation of nature reserve protection and proliferation of useful animals and plant, and scientific research activity and training personnel plan should be included in national economic plan.

In this context, it is important to include biodiversity in planning, unification work of national economy. Precedence order of biodiversity conservation shall be fixed by combining national immediate profit with perspective profit of state properly, and enable it to fit together with national economic departmental plan and developing plans of local economy.

4.3.1.4.2 Include biodiversity conservation in national land development programme and make and generalize models of conservation and development.

It is important to integrate biodiversity conservation in national land development programme, the unified, comprehensive and long-term plan of land construction.

Following actions related to this will be promoted.

- Include biodiversity conservation in mapping out national plan, plan of major districts, regional plan in national land development programme.
- Relevant connection will be provided by priority integrate biodiversity conservation in national land development programme, and remove duplication of investment in utilization of land and aquatic area.
- Build models of biodiversity conservation by mapping out national land development programme integrated with conservation and sustainable development on Chongchon river basin and Daedong river basin.
- Re-examine national land development program of Rajin-Sonbong district and raise the rate of biodiversity conservation.
- Strengthen training personnel on biodiversity conservation in sectors of mapping out national land development programme.

4.3.1.4.3 Strengthen scientific research work on biodiversity

To strengthen scientific research works on biological diversity conservation and sustainable use of national economy, properly fix and promote research assignment and steadily improve training personnel and scientific research means.

Department of fundamental research work on biodiversity will promote following parts in focally point.

- Systematic research work on biodiversity and constant renovation of biodiversity inventory.
- Monitor biodiversity changes and clarify affection to it and study for establishment of rational preservation measure.
- Raise the rates of biodiversity conservation in teaching schedule of environment protection at universities.
- Set up training school specializing in training personnel of biodiversity sector, in Kim Il Sung University and Kim Hyong Jik University for education.
- Establish school of in service training for biodiversity conservation for present officials in and

management college.

- Enhance the capability of economic management officials by including teaching schedule for biodiversity conservation to university of national economy.
- Organize lecture and training course for biodiversity conservation in peoples Grand Study House.
- Raise the rates of training biodiversity experts in training procedures of doctoral institute of educational ministry and Academy of sciences.

Accelerate following activities to strengthen the mass publicity and educational activity for biodiversity conservation.

- Establish mass publicity plan for biodiversity conservation in Natural Conservation Union.
- Rise the awareness of economic management officials on biodiversity by establishing system or disseminating information data and news related to biodiversity conservation.
- Widely disseminate the knowledge on biodiversity through newspaper, magazine, radio, and television.
- With title "Biodiversity Conservation" organize writing, painting and taking story, etc., for children.
- Equip scientific knowledge dissemination room of biodiversity conservation in students and children's Palace of Pyongyang and every provinces, and operate it.
- Build national Nature Museum.
- On the occasion of memorial day related to international environment protection including "The day of biodiversity", organize all sorts of discussion, workshops and conduct dissemination activity of publicity articles.

4.3.1.4.4. Take proper measures to increase investment of biodiversity conservation.

In view of strained financial circumstances as a result of recent successive natural disaster and economic difficulties, take measures in consonance with actual condition.

Accelerate following activities related to this.

- Decide present and prospective state budget needed for biodiversity conservation and its sustainable use.
- Decide local budget on biodiversity conservation
- Concentrate investment on priority object of biodiversity conservation
- Improve quality of export goods by organizing comprehensive analysing evaluation work on all exports of form land products and prevent loss of resources in trade by coordinating exports on the basis of usable quantity of resources and additionally put its profit to biodiversity conservation.
- Regulate export items which can give negative influences to biodiversity conservation in exports of biological resources.
- Eliminate investment waste by having obligation to propose environment impact assessment paper before all development. Strengthen substantial incentives on fine units of biodiversity conservation and sustainable use.

4.3.1.4.5. Strengthen local and international cooperation for biodiversity conservation

As global environment protection work including biodiversity conservation have lots of problem that one country cannot solve, strengthen local and international co-operation in this sector.

In this connection, accelerate following activity.

- Examine all international conventions related to "Convention on Biological Diversity" and promote entry, ratify of "Convention on Wetland of International Importance Especially as Waterfowl Habitat"(Ramsar convention), which is proposed as an urgent problem from natural geographical situation of our country.
- With this, regulate exports for animals and plant species noted in annex of "Convention on International Trade in Endangered Species of Wild Fauna and Flora" (Washington convention).
- Provide performance of the "Convention on Migratory Bird Protection" (in 1987) with Russia previously ratified, and proceed ratification of migratory protection convention with China.
- Strengthen more south operation in biodiversity conservation and its sustainable use sector.
- To strengthen local co-operation of biodiversity protection sectors related to development of Tuman river delta area, encourage joint research with DPRK, China, and Russia.
- To prevent forest destruction by acid rain, positively promote local cooperative plan of this sector by participating in this.
- Strengthen more bilateral co-operation with neighbouring country in biodiversity conservation sector.

4.3.2. Priority projects

Priority projects are determined in accordance to biodiversity conservation, sustainable use, benefit sharing and general measures of the country through the preparation of 27 action plans and its options for biodiversity conservation.

Priority projects are reviewed from the present and prospective point of view in order to provide biodiversity conservation and sustainable use.

Priority projects are classified into 3 categories to make easier in comparing the size of the projects. The budget for 1st class is over 5 million \$, 1-5 million \$ for 2nd class and 1 million \$ for 3rd class.

4.3.2.1. Priority projects on biodiversity conservation

Project 1:

Title: Country Study: Biodiversity Inventory and Assessment

Objectives: To promote the completion of the list of biological resources.

To take general assessment of bio-resources

Justification: Under the circumstances that national strategy and Action Plan on Biodiversity is prepared without country study, there is a need to assess comprehensively, on the biodiversity of the country.

Activities:

- To survey on numbers, distribution and status of species of fauna and flora and

microorganisms by regions where research is less done.

- To prepare regional plant community classification table.
- To organize systematic survey on structure and function of main ecosystems.
- To survey and assess the threatened status of biodiversity.
- To assess economic value of biodiversity.
- To prepare and publish nearly completed bio-resource inventory and evaluation report on biodiversity.

Implementing Agency: Academy of Sciences

Stakeholder: Ministry of Education

Timing: 4 years

Budget: Category 3

Project 2

Title: Capacity Building for Biodiversity Monitoring.

Objective: To strengthen the capacity of biodiversity monitoring and damage control.

Justification: Major difficulties arising in the monitoring and control of adverse impacts to biodiversity are lack of biodiversity monitoring system and of capacity, equipment and experiments.

Activities:

- To establish monitoring system on forest fire.
- To complete monitoring network system on pollution and blights.
- To establish strict monitoring system on over use of natural resources, destruction and damage to biodiversity.
- To supplement and complete laws and regulations to strengthen biodiversity conservation.

Implementing Agency: Ministry of Land and Environment Protection.

Stakeholders: Ministry of Public Security, People's Committees of every Cities (counties), and Provinces

Timing: 2 years

Budget: Category 2

Project 3

Title: Establishment of National Nature Reserves

Objective: To establish full protection and management system on former protected areas and newly expanded nature reserves.

Justification: There are lack of necessary trained staffs and facilities to manage the protected areas that are newly established. And existing nature reserves and protected areas are not at full protection and management.

Activities:

- To redefine the boundaries of newly expanded nature protected areas.
- To identify the goal of protection and management of each nature reserves.
- To equip with new management facilities to protect and manage major nature reserves and allocate necessary managing staffs.

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- To establish specialized organs for management of nature reserve under Ministry of Land and Environment Protection.

Implementing Agency: Ministry of Land and Environment Protection
Stakeholders: Ministry of Public Security, People's Committees of each Cities (counties), Provinces, Academy of Sciences, Ministry of Forestry.
Timing: 2 year
Budget: Category 3

Project 4

Title: Management of Mt. Paekdu Biosphere Reserve

Objective: To work out and implement protection and management programme to protect typical ecosystems in Mt. Paekdu Biosphere Reserve which is registered as an international biosphere reserve.

Justification: Since Mt. Paekdu Biosphere Reserve is registered as an international biosphere reserve in 1989, the State Academy of Sciences had proceeded a comprehensive study on it and is under systematic survey of forest ecosystem. However, protection and management plan acceptable to biosphere reserve is not prepared yet, and several issues are raised in its protection and management.

Activities:

- To strengthen systematic survey and research on ecosystem of Mt. Paekdu Biosphere Reserve.
- To integrate infrastructure on protected areas for the management of Mt. Paekdu Biosphere Reserve.
- To develop new management plan of nuclear zone, buffer zone and multi-use zone.
- To increase ability and capability of expertise for administrative officials and local managers.
- To strengthen joint study with between the scientists of DPRK and China.

Implementing Agencies: Ministry of Forest, Academy of Sciences.
Stakeholders: People's Committee of Ryanggang Province, General Bureau of Revolutionary Site
Timing: 5 years
Budget: Category 2

Project 5

Title: Biodiversity Conservation of Mt. Myohyang

Objective: To protect peculiar biodiversity of Mt. Myohyang Nature Park, and improve its management capacity.

Justification: Mt. Myohyang is internationally significant area. Especially, Mt. Myohyang is abundant with many wild animal and plant species.
As eco-tourism is expanded in the area, it is necessary to establish a sound system for biodiversity.

Activities:

- To re-examine the management plan on parks including eco-tourism development plan and buffer zone development plan.

- To survey and monitor biodiversity regularly.
- To establish publicity facility to increase awareness on biodiversity and prepare curriculum for public propagation and education.

Implementing Agencies: Ministry of Land and Environment Protection.
Stakeholders: Academy of Sciences, N. Pyongan Province and Jagang Province.
Timing: 3 years
Budget: category 2

Project 6

Title: Wetland Conservation of Estuaries of Chongchon River, Kumya River, Tuman River and Taedong Bay.

Objectives: To take measures to protect and manage wetland of internationally important areas for migratory bird protection in estuaries of Chongchon river, Kumya river, Tuman river and Taedong bay.

Justification: Chongchon river estuary (S. Pyongan Province) and Taedong Bay (Taetan and Ongjin county, S. Hwanghae Province) of the Korean West Sea, Tuman river estuary (Rajin, onbong city) and Kumya river estuary (Kumya county, S.Hamgyong Province) take great significance as a transit site and wintering site for migratory birds of north and east of Asia.

The government has designated wetland of these areas as national migratory bird (wetland) reserves in 1995, however, its protection and management are not well done and its infrastructure is in absence.

Activities:

- To examine a plan of developing 4 wetland reserves and equip with on-site facilities to protect and manage 4 migratory bird (wetland) reserves and survey it regularly.
- To evaluate elements of threat to waterfowl's living and take measures to mitigate it.
- To expand sound habitat for waterfowls, restore destroyed ecosystem and establish demonstration site for wise use of wetland.
- To make research on wetland conservation and train personnel to manage wetland.
- To increase awareness of local people on wetland conservation.

Implementing Agency: Academy of Sciences, Ministry of Land and Environment Protection
Stakeholder: People's Committee of city, county, and provinces
Timing: 4 years
Budget: Category 2

Project 7

Title: Promotion of Management of Fishery Resource Reserve

Objectives: To protect fish resources and improve its management capacity.

Justification: Though 11 fish reserves in territorial waters and 15 in marine are designated, there is still no infrastructure of it and its protection and management is not well done.

Activities:

- To establish infrastructure on main fish reserves.
- To make up management regulations for fish reserves and strictly keep it.
- To monitor and observe, regularly, the biodiversity and its changes of fish reserves.
- To increase awareness of local people on fish reserves that take great significance.
- Increase ability and capability of personnel who manage fish reserves.

Implementing Agencies: Ministry of Land and Environment Protection, Ministry of Fishery.

Stakeholders: Academy of Sciences, Ministry of Public Security.

Timing: 4 years.

Budget: category 2.

Project 8

Title: Publication of "Red Data Book" and Protection of Endangered and Rare Species.

Objectives: To strengthen protection of endangered, rare and endemic species including Sansam (*Panax schinsing*), *Keumkangsanica asiatica*, *Rheum coreana*, black-faced spoonbill (*Platalea minor*), crane and *Nemorphedus goral* (*Amur goral*).

Justification: For plants there are 10 endangered species, 42 vulnerable species and 75 rare species, and 157 endangered and rare species of animals distributed in our country. It is, therefore necessary to survey regularly the populations and changes in nature and take measures to protect the species and their habitat. However, Red Data Book is still not yet published.

Activities:

- To publish Red Data Book which notes present status of endangered and rare species.
- To prepare protection plan for to-be-protected species in emergency.
- To establish field facilities for protection in order to protect and increase species to be protected in emergency in its habitats.
- To survey, regularly, the changes of quantity of endangered and rare species.
- To increase public awareness on the importance of endangered and rare species protection.

Implementing Agencies: Academy of Sciences, Korean Natural Conservation Union.

Stakeholders: Ministry of Land and Environment Protection, Ministry of Education.

Timing: 3 years

Budget: Category 3

Project 9

Title: Capacity Building of *Ex-situ* Conservation especially in Botanical Gardens and Zoos

Objectives: To strengthen the capability of preserving endangered, rare and endemic species in botanical gardens and zoos.

Justification: Though artificial breeding of endangered, rare and endemic species is carried out in Central Botanical Garden and Central Zoo at present, the captive facilities are not good enough and have some technical problems.

Activities:

- To prepare strategy of species preservation in botanical gardens and zoos.
- To re-equip with artificial facilities in botanical gardens and zoos and expand its size.
- To introduce advanced technologies to protect endangered and rare species.
- To set up database of collected species.
- To strengthen cooperation with botanical gardens and zoos of other countries.

Implementing Agencies: Central Botanical Garden, Central Zoo.

Stakeholders: Academy of Sciences, Ministry of Land and Environment Protection.

Timing: 4 years.

Budget: category 2.

Project 10

Title: Establishment of Gene Bank

Objectives: To establish a national gene bank to preserve genetic resources and develop a database for crop germ-plasm.

Justification: At present, gene resources are preserved and used in several institutes under Academy of Sciences, however, preserving facilities are not properly provided.

Activities:

- To establish a national gene bank and develop a data base for gene resources.
- To establish expert panel to organise and study the gene resources and provide linkage between sectors in gene resource utilization.
- To strengthen capability of preservation and utilization of gene resources.

Implementing Agency: Academy of Sciences.

Stakeholder: Ministry of Agriculture.

Timing: 5 years.

Budget: Category 1.

Project 11

Title: Protection of Black-faced Spoonbill and *Chinese Egret*.

Objectives: To protect fully, the globally threatened Black-faced spoonbill and *Chinese Egret*.

Justification: At present, it is estimated that the number of Black-faced spoonbill in the world is about 550 and 2,500 of *Chinese Egret*. The habitats of these two threatened species are identified to be inhabitant islands in the Korean West Sea. Therefore, it is a great responsibility for DPRK to protect these species.

Activities:

- To survey, regularly the habitats and breeding population of Black-faced spoonbill and *Chinese Egret* and proceed ecological study on it.
- To develop artificial breeding of black-faced spoonbill and *Chinese Egret* and proceed ecological study on it.
- To prepare and implement the artificial breeding plan of Black-faced spoonbill and *Chinese Egret* outside their habitats.

- To increase public awareness to protect Black-faced spoonbill and *Chinese Egret*.

Implementing Agencies: Academy of Sciences, Central Zoo.

Stakeholders: Ministry of Land and Environment Protection.

Timing: 3 years.

Budget: Category 3.

4.3.2.2. Priority projects on sustainable use

Project 12

Title: Restoration of Degraded Forest Ecosystem by Tree Planting.

Objectives: To restore destroyed and damaged forest due to natural disaster in recent years, as soon as possible, and increase diverse tree seedlings to 1-1.5 billion.

Justification: 80% of land is mountainous in DPRK and it rains heavily in summer due to low atmospheric pressure occurring from down river of Janggang in China which brings some damages to adjacent agro-ecosystem and forest ecosystem. It is, therefore, necessary to produce tree seedlings for afforestation in short time.

Activities:

- To prepare and promote restoration options for damaged forest ecosystem.
- To modernize 10-tree seedling nursery farms for afforestation of 2 million ha.
- To enhance research work in tree breeding and seedling nursery.
- To increase the capabilities of local forest managers in these regions.
- To establish ecological corridors in destroyed ecosystem to link protected areas.

Implementing Agencies: Ministry of Land and Environment Protection, Ministry of Forestry.

Stakeholders: People's Committee of local government, Academy of Sciences.

Timing: 3 years.

Budget: Category 2.

Project 13

Title: Demonstrations for eco-farming and Recycling Use for Agricultural Resources.

Objectives: To provide agro-ecosystem diversity and ensure a sustainable use for agricultural resources by establishing demonstrations for eco-farming and recycling agriculture that are suitable to local geography and ecological features.

Justification: Soil appropriate for agriculture in DPRK is limited and its fertility is not high due to lack of organic resources. Besides, there is a great danger of threat of soil erosion due to seasonal and regional partiality of precipitation distribution. Therefore, it is necessary to establishing eco-farming demonstrations, in order to mitigate above mentioned threat.

Activities:

- To prepare strategy and action plan for eco-farming and recycling agriculture.
- To maintain biodiversity in agricultural ecosystem and take measures to increase the fertility of cultivated land.
- To introduce organic agricultural method and effective bio-chemicals.

- To introduce management system of agro-forestry and combined agro-forest- livestock.
- To develop grassland in accordance with geographical features.
- To establish biological exterminating method of blight.
- To popularise the theory and technology of eco-agriculture.

Implementing Agency: Ministry of Agriculture.
Stakeholders: Academy of Sciences, Ministry of Land and Environment Protection.
Timing: 5 years.
Budget: Category 1.

Project 14

Title: Protection and Increase of Fishery Resources and Biodiversity of Freshwater and Marine
Objective: To make sustainable use by protecting and increasing fishery resource with high productivity and economic value, which takes great part in solving people's food problem, and meanwhile to protect water environment.
Justification: Increase of biological productivity of territorial waters and sea is prerequisite for improving the people's diet. However, fish resources are decreased due to changes in marine condition and lack of managing capability for resources. Therefore, it is necessary to strengthen the protection and increase of marine resources and eco-environment of waters.

Activities:

- To survey the status of fish resources in freshwater and near seas, regularly.
- To establish hatchery for anadromous fish including salmon and trout, and increase of releasing rate.
- To modernize summer seed planting place of seaweed.
- To take comprehensive survey for eco-environment of waters where productivity has declined.
- To develop capacity building of technicians on mariculture.

Implementing Agency: Ministry of Fishery.
Stakeholders: Academy of Sciences, Ministry of Land and Environment Protection, Ministry of Public Security.
Timing: 6 years.
Budget: Category 2.

Project 15

Title: Protection and Increase of Koryo Medicines Resources.
Objectives: To use sustainably the main medicinal plants used in Koryo medicines.
Justification: Despite the demand for Koryo medicine is being increased, the eco- environment for herb resource is being destroyed. There are other factors that bring herb resource reduce, so that the medicine does not meet its demand in market.

Activities:

- To prepare protection strategy of Koryo medicine resources.
- To improve management level for herb protected area.

- To investigate appropriate place for artificial cultivation for herb resources.
- To create 6 projects for herbal production construction.
- To enhance public awareness on herbal protection and its sustainable use.

Implementing Agency: Ministry of Public Health.

Stakeholders: Ministry of Land and Environment Protection, Academy of Sciences.

Timing: 4 years

Budget: Category 2.

Project 16

Title: Afforestation of City Environment.

Objective: To increase quality of biodiversity of city environment by harmonizing parks, recreation ground and forest within cities with forests outside cities.

Justification: It is impossible to provide people with appropriate environment suitable to people's health without promoting afforestation in high dense cities.

Activities:

- To prepare the national strategy of city afforestation.
- To develop a design for rational distribution of city greenery and diversify composition.
- To improve the capacity of breeding farm and seed farm to afforest city.
- To create tree sapling farms.
- To improve the management of city greenery.

Implementing Agency: Ministry of Land and Environment Protection, Ministry of City Management.

Stakeholders: Academy of Sciences, People's Committee of Local Government.

Timing: 5 years

Budget: Category 2

Project 17

Title: Demonstration for the Sustainable Development and Biodiversity Conservation in Chongchon River Basin by Setting up Buffer Zones.

Objective: To generalize methodology by establishing a model for biodiversity conservation and sustainable development including the designation of buffer zone in Chongchon River basin, one of the heavy rain areas.

Justification: Mt. Myohyang natural park is located in the Chongchon River basin and Mundok migratory bird (wetland) reserve is situated at the lower part of the river.

Chongchon River area is the main habitat for silver fish. The basin is surrounded with industrial areas with high precipitation, hence, there is a great danger of damage due to flood. Therefore, it is of national significance to combine eco-environmental protection and sustainable development.

Activities:

- To take a comprehensive survey on biodiversity in Chongchon River basin.
- To prepare comprehensive development plan for Chongchon River basin which integrates biodiversity conservation.

- To establishment Mt Myohyang Nature Park and manage buffer zones.
- To protect fishery resources in Chongchon River.
- To afforest Chongchon River basin.

Implementing Agency: Ministry of Land and Environment Protection, Academy of Sciences.

Stakeholders: Ministry of Forestry, Ministry of Education, Ministry of Agriculture

Timing: 4 years

Budget: Category 2.

4.3.2.3. Priority projects on benefit - sharing

Project 18:

Title: Establishment of National Biodiversity Information Centre.

Objectives: To establish national biodiversity information centre and biodiversity databases and to collect and exchange scientific data on ecosystem, gene and species resources and habitats.

Justification: At present, biodiversity relevant data are dispersed and it is not scientifically analyzed, hence unable to use it effectively. To establish biodiversity database and operate information networking, it is needed to establish a national biodiversity information centre.

Activities:

- To establish a new national biodiversity information centre.
- To collect all the scattered biodiversity relevant data and file it up properly to use it by GIS.
- To train experts to establish databases and operate the information system.
- To promote use of biodiversity databases in policy-making.

Implementing Agency: Ministry of Land and Environment Protection

Stakeholders: Academy of Sciences, Ministry of Agriculture, Ministry of Forestry, Ministry of Fishery, Ministry of Public Health.

Timing: 4 years.

Budget: Category 2.

4.3.2.4. Priority projects on general measures

Project 19

Title: Development of Local Biodiversity Conservation Plan

Objective: To develop specific local plan on biodiversity conservation and sustainable use and incorporate biodiversity into local economy and to develop socio development plan and land management plan.

Justification: Since biodiversity has regional characteristics, it is important to develop some special local biodiversity plan which accord with local conditions and reflect the National Economic Development Plan.

Activities:

Biodiversity Strategy and Action Plan DPRK

- To prepare some provincial level plans on biodiversity conservation and sustainable use.
- To identify local significant area for biodiversity conservation in provincial plans and develop provincial plan on nature reserve construction.
- To collect data and information on status of bio-resource use in provinces.
- To take measures to conserve bio-resources and its proliferation in local/provincial level.

Implementing Agency: People's Committee of Provinces.
Stakeholder: Ministry of Land and Environment Protection.
Timing: 1 year
Budget: Category 3

Project 20

Title: Development of National Biodiversity Training Programme.
Objectives: To train scientists, technicians, administrative officials, and local officials and reserve managers, in order to ensure biodiversity conservation and sustainable use and to strengthen enabling activities.
Justification: The scope of biodiversity conservation and its sustainable use is too large, hence, it is very important to be aware of national status and international trend. At present, the management level in the existing reserves is very low and it is significant to the staffs. And it is also needed to train local people how to conserve biodiversity.

Activities:

- To establish 3 biodiversity-training centres in selected universities and institutes under the Academy of Sciences.
- To equip with facilities in training centres
- To develop series of training materials.
- To organize regular training courses.
- To allocate qualified teachers, technicians, and managers.
- To send young people to study abroad.
- To invite foreign experts to give lectures.

Implementing Agencies: Ministry of Education, Academy of Sciences.
Stakeholders: Ministry of Land and Environment Protection, Korean Nature Conservation Union.
Timing: 5 years.
Budget: Category 3.