



Integration for Biodiversity in Myanmar

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1. Introduction

Myanmar reported¹ that Myanmar is committed to promote the conservation and sustainable use of biodiversity in activities in all sectors of society and the country is also committed to the more effective implementation of these objectives so as to significantly reduce the rate of loss of biodiversity by 2010 national level. Being a signatory country to CBD, some government and non-government organizations are getting involved in biodiversity conservation through their work implementation.

Pertaining to the environmental conservation in Myanmar, there are two main organizations formed in 1990 and 2004, and they are NCEA (National Commission for Environmental Affairs) and Environment Conservation Committee. The former act as focal point for international environmental conventions/protocols and the latter focuses on internal environmental protection.

2. Some measures on biodiversity conservation

All bio-diversity related government agencies and NGOs have been making efforts to conserve biodiversity in Myanmar.

Agricultural sector

Myanmar is an agro-based country and the Ministry of Agriculture and Irrigation plays an important role in food supply to the country while conserving biodiversity. Myanmar people had recognized the value of plant genetic resource (PGR) even before modern agricultural technology was introduced to the country. Collecting and conserving PGR is the main task of the Ministry's research centre Department of Agricultural Research (DAR) and more than 3,000 accessions of local rice varieties had been collected and conserved by the rice division long before seed bank was established. Likewise, other crop divisions maintained germplasm of oilseeds, food legumes, maize and other cereals, fibre and horticulture crops. In-situ conservation of mango and medicinal plants had begun in the 1980s.

To prevent the landraces from genetic erosion as well as for the crop research in the future, crop germplasm collection was conducted in cooperation with international agencies. In 1966, 1,426 strains of local rice varieties and nine kinds of wild rice were collected under joint plans for mutual benefit of Myanmar and the IRRI from the Philippines. Since 1973, rice germplasm collection was again launched in cooperation with the IRRI. The collected varieties were conserved by growing in the field every year, which cost money, time and land area. To protect the loss of varieties occurred as results of weather, diseases, hybridization, etc, seed bank was established in cooperation with JICA in 1990.

Agricultural legislations

¹ Myanmar (2009). Fourth National Report to the United Nations Convention on Biological Diversity, Ministry of Forestry, National Commission for Environmental Affairs, Nay Pyi Taw, March 2009, 108 pp.

To protect environment and biodiversity, the Ministry of Agriculture and Irrigation (MOAI) has enacted the following laws and some are in draft stage.

Pesticide Law - Covers the use of pesticides -Enacted in 1990

Plant Pest Quarantine Law - To prevent quarantine pests from entering Myanmar -Enacted in 1993

Fertilizer Law - To manage the use of fertilizers - Enacted in 2002

The Seed Law - To maintain quality and the use of seeds - Being drafted

Law on Biosafety - To manage GMOs - Being drafted

Enactment of the above-mentioned laws also raises awareness on biodiversity conservation among the people of Myanmar.

Uncontrolled use of pesticides may cause serious environmental impacts on human, animals, agriculture, fisheries and so on. Under the Pesticide Law (1990), a National Pesticide Registration Board (NRB) serves as the advisory body for pesticide registration and issues import permit on recommendation of the technical committee.

The main objectives the Plant Pest Quarantine Law (1993) are:

- To quarantine plants entering Myanmar,
- To suppress the spread of quarantine pests,
- To carry out, if necessary, disinfections treatment of plant or plant products to be explored, and
- To issue phytosanitary certificate.

The Fertilizer Law (2002) covers organic and inorganic fertilizers as well as Bio-fertilizers with beneficial organisms such as bacteria or fungus. Currently the seed law is still under the process for promulgation. However, before enacting the law, “National Seed Committee” (NSC) was formed and is an authority for matters on import and export of seeds. Thus, committee or technical subcommittee of NSC could play an important role for managing biosafety even before National Bio-safety Framework or law is enacted.

In addition to conserving biodiversity through enactment of relevant laws, the Ministry is also encouraging farmers to conserve soil and promote organic farming throughout the country.

Some measures to protect agricultural biodiversity

Central dry zone of Myanmar is very arid with extreme climatic conditions due to very low rainfall (with an annual rainfall of less than 600 mm) and poor water retention of soil. As a result of these factors, there is a very hot weather with an intense rainfall in a short period and long periods of drought thereby causing soil erosion, decrease in soil fertility, and reduction in crop yields and crop failure. Thus, Land

Use Division of Myanmar Agriculture Service launched the activities such as construction of check dams and hedge row terracing for soil conservation and soil fertility improvement, extension education for water harvesting, and formation of income generation groups for on-farm, off-farm and non-farm activities to relieve pressure on land and environment in cooperation with UNDP/FAO.

Moreover, the Department of Agricultural Research has established research stations at different ecological zones for the in-situ and on-farm conservation of local plant genetic diversity. Soil biodiversity is enhanced by organic farming practices, bringing beneficial effects such as recovery and rehabilitation of degraded soils, improved soil structure and water infiltration.

Well-managed organic agriculture leads to more favorable conditions at all environmental levels. Sustainable agricultural practices are given as priority for farmers. Sustainable agriculture promotes agricultural biodiversity, which is crucial for food security and rural livelihood. Rice and cereal crops are the largest genetic resources and other genetic resources such as a variety of peas, beans, cotton, tubers, fruit plant species and vegetable plants are of important sources of food. Various agricultural crops under the category of cereals, oilseeds, pulses, industrial crops, kitchen crops and fruits and vegetables are annually cultivated and conserved in the entire nation. An array of research activities on rice, peas and beans, physic nut, job"s tears, and other field crops has been conducted by the agricultural research department for conservation of plant genetic diversity.

Myanmar recognizes the value of PGR for the present as well as for the future as they are very important to attain food security and sustainable agricultural production in Myanmar. From 1998 to 2002, 22 missions were completed, 2,434 accessions collected, and 12 States and Divisions (86% of states and divisions) visited.

A total of 23 crops descriptors were prepared by 2002. These species are rice, maize, wheat, buckwheat, finger millet, pearl millet, common & little millet, sorghum, chickpea, cowpea, lima-bean, black-gram, green-gram, pigeon-pea, soybean, lentil, groundnut, sunflower, sesame, sunflower, jute, cotton and yam. From 1997 to 2002, a total of 1,414 PGR accessions have been multiplied, characterized and evaluated. To date, 10,108 accessions are preserved in short-term storage while 9,905 accessions are in medium-to long-term storage.

Educational sector

The role of educational sector to integrate with biodiversity is fundamentally important as it deals mainly with conservation of biodiversity by future generation through education. The majority of young people in every country involve with literacy and further educational processes, knowledge about the living things contain in their school lessons as animal and plant science.

Since the primary levels, school children have to learn about the science subject pertaining to plants and animals and they have come to learn how plants and animals live, reproduce and their role for the benefit of mankind.

Beside, nowadays, they are to learn what the consequences of disturbed ecosystem are.

Syllabuses and curriculums of basic and higher education also contain studies about the environment, about the diversity among the plants and animals as well as among the microorganisms. Therefore, biodiversity conservation in education sector is done through teaching, doing research activities and conduction of EIA.

The following programs are being conducted within the department and with the other organizations from the country and abroad.

- Lectures, seminars and workshops focused on biodiversity conservation/ environmental impact assessment
- Lectures on Environmental Study, Conservation and Management give ideas to improve the biodiversity conservation and to avoid/minimize adverse impact on biodiversity
- Seminars and workshops are conducted based on the actual data and analyses from the field surveys to make decisions to avoid/minimize adverse impact on biodiversity

Researches conducted are mostly focused on biodiversity and its conservation directly or indirectly. Records on the species diversity of invertebrate animal in an area are essential since the existence of these animals is the indicator of the habitat of that region. (eg. Presence of dragon flies and fire flies in clean water habitat, absence of tadpoles in contaminated water.)

EIA surveys include monitoring of the impacts of human and natural disasters on the affected regions or areas which usually suffer from ecosystem imbalance and its consequences.

Projects for the conduction of EIA by researchers from the Yangon University are as follows;

- Monywa copper mine
- gold mine project
- TOTAL gas pipeline project
- Yeywa Hydropower project
- Discharge of industrial wastes into ponds, lakes and rivers etc.

Besides, Yangon University enthusiastically participated in execution of EIA in initial stage of establishment of Htamanthi Hydro-power project. Environmental Impact Assessment on Flora of Htamanthi Hydro-power and Multipurpose Dam was conducted by the scientists of Botany Department in cooperation with other organization and Ministries in the 2006. The assessment proves that type of forest in the Htamanthi area is semi-evergreen type. In the study area 516 species belonging 97 families were identified and the species density was calculated. Among them 8 species were included in the IUCN Red list of Threatened Species and mitigation for these species was suggested.

Some research titles and outcomes concerning with biodiversity conservation and sustainable utilization by Department of Botany are;

- Phytosociological study for conservation and restoration of mangrove vegetation in the Ayeyarwady Delta.
- A Phytosociological Study of Vegetation on Kelatha Mountain, Belin Township, Mon state.
- Geobotanical study on Plant community and accumulation of trace elements in plants and soils with special reference to Khwe Aik Taung, Heho, Southern Shan State ☐ Geo-botanical study on the associated plant species and relationship of plants and rocks and mineralization in Taung Ni Taung area Kyauk Pa Daung township, Mandalay Division
- Diversity of plant species in the Letpadaung hills and their socioeconomic status in some villages located in the vicinities

Forestry sector

The Forest Department under the Ministry of Forestry is responsible for biodiversity conservation in general, and Nature and Wildlife Conservation Division under the Forest Department is responsible for the establishment of protected areas network and wildlife management of the country in particular. Biological resources conservation has been taken into Myanmar tradition since early days as prohibition of hunting in religious sites, establishment of sanctuaries for some animal species were in existence in the country. Until now, it is one of the national priorities in the country as protection of the entire environment including biodiversity is identified as an important imperative in Myanmar forestry legislations. Laws covering the control of trade and protection of wildlife had been enacted and amendments made from time to time. In 1879, “The Elephant Preservation Act” was promulgated and amended in 1883. In 1881, Burma Forest Act was promulgated and amended in 1902. Wild animals and their parts were declared as forest produce. Specific legislation to protect wildlife was enacted in 1912 under, “The Wild Birds and Animals protection Act 1912.” The department is also implementing its conservation work based on the 30-year forestry master plan to ensure sustainable forest management.

The forestry and wildlife conservation legislations currently in use are presented below.

- Forest Law
- Forest Policy
- Protection of Wildlife and Wild Plants and Conservation of Natural Areas Law

The new wildlife legislation as against the old has assumed the modern approaches in biodiversity conservation.

The objectives of the 1994 law are;

- to implement the policy concerning the protection of wildlife and wild plants
- to implement the policy concerning the conservation of protected areas
- to conserve wild plants, wildlife, nature and migratory birds in accord with the standards set by the international Conventions acceded by the Government
- to protect and conserve endangered wildlife species and wild plants their habitats,
- to contribute research on natural sciences, and
- to protect wildlife and wild plants by establishing zoological gardens and botanical gardens.

The Law has greatly widened the scope of protection for wildlife including birds and mammals. The 1994 wildlife legislation declares complete protection for 39 mammals, 50 birds and 9 reptile species, normal protection for 12 mammals, 43 birds and 6 reptiles species; and seasonally protected species including 2 mammals and 13 birds. For conservation of biodiversity, mangrove ecosystems and fragile mountain ecosystem about 1 marine national park, 36 wildlife sanctuaries and 6 national parks areas have been established in Myanmar.

Therefore the law stipulates to establish scientific reserves, national parks, marine parks, nature reserve, wildlife sanctuaries, national heritage sites, etc. so that to conserve wildlife, wild plants in perpetuity.

Trade sector

The Ministry of Commerce has prohibited exportation of ivory, drought cattle of buffaloes, cows, elephants, horses and rare animals and their products by the notification of 10/99 since 1999.

This helps reduce the loss of elephant and drought cattle population as ivory and animal products trade within the country and neighboring countries has great negative impact on the said animal population. Institute of Global Environmental Strategies (IGES) reports (2008) that illegal wildlife trade within the country and neighboring countries is threatening the biodiversity existence in Myanmar.

Health sector

Ministry of health is conserving traditional medicinal plants in 9 herbal gardens covering 120 hectares in different regions of the country. The traditional medicine is based on medicinal plants and it is included in learning session for medical students. The government of Myanmar has already established the Department of Traditional Medicine and the gardens are managed by the Department. As of 2008, a total of 1,524 species of medicinal and useful plants has been recorded and of those 908 species are medicinal plants. The medicinal plants are of great importance for treating six major diseases of diabetes, hypertension, tuberculosis, malaria, diarrhea and dysentery.

Mining sector

Ministry of Mine has enacted the following legislations so as to prevent loss of biodiversity in the mine-areas. The Myanmar gemstone law (1995) provides to prevent deforestation and water or soil pollution due to mining activities.

The Myanmar Pearl Law (1995) prevents extinction of oysters in Myanmar coastal areas.

Livestock breeding and fishery sectors

Ministry of livestock breeding and fishery has enacted the following legislations so as to prevent loss of biodiversity in these sectors.

The Animal Health and Development Law (1993) has objectives for the health and development of animals. It contains provisions for preventing of dangers to animal feeds, infectious diseases and cruelty to animal.

The Law Relating to the Fishing Rights of Foreign Fishing Vessels (1989) provides for sustainable development of fisheries sector. It prohibits fishing of foreign fishing vessels without permit, keeping on board the fishing vessel, explosive substances, poisons, chemicals and other substances not permitted for use in fishing, carrying out fishing by those means, fishing in the fishing grounds or using fishing implements or fishing in the periods not permitted in the license.

The Myanmar Marine Fisheries Law (1990) is a major law for conservation of marine environment and sustainable development of marine fisheries in Myanmar. It prohibits keeping on board the fishing vessel, explosive substances, poisons, chemicals and other dangerous substances not permitted for use in fishing, disposing of living aquatic creatures or any material into fisheries waters to cause pollution or to harass fishes and other marine organisms, collecting any marine products without license.

The objectives of Freshwater Fisheries Law (1991) are to further develop the fisheries, to prevent the extinction of fish, safeguard and prevent the destruction of freshwater fisheries waters, to obtain duties and fees payable to the State and to manage the fisheries.

The Territorial Sea and Maritime Zone Law (1997) empowers the State with the authorities and powers for protection and conservation of marine environment, and for control of marine pollution etc. in the territorial sea, continental shelf and exclusive economic zone.

Science and technology sector

The Ministry of Science and Technology has been implementing an integrated team-work research on bio-fertilizer and bio-pesticide development. The ministry's special team is trying to exploit and conserve microbial diversity which is important for scientific, industrial and social development. The research team is also focusing on research studies dealing with the isolation, identification and utilization of environmentally important micro-organisms for process such as waste water treatment, bio-degradation of pesticide residues and preparation of bio-degradable plastics. These research activities will help reduce the loss of biodiversity as it protects the environment to an extent.

Sustainable development: Myanmar Agenda 21

As a follow-up to UNCED, the Government of the Union of Myanmar adopted the following policy on 5 December 1994 with the aim to establish sound environment policies in the utilization of water, land, forests, mineral, marine resources and other natural resource in order to conserve the environment and prevent its degradation.

Regarding with biodiversity integration in Myanmar sustainable development, the policy states as, "The objective of Myanmar's environment policy is aimed at achieving harmony and balance between these through the integration of environmental considerations into the development process to enhance the quality of life of all its citizens. It is the responsibility of the State and every citizen to preserve its natural resources in the interests of present and future generations. Environmental protection should always be the primary objective in seeking development".

Myanmar Agenda 21 was adopted in 1997. The purpose of Myanmar Agenda 21 is to mobilize and focus national efforts to achieve sustainable development. The policy strategies and actions on social, economic and environmental dimensions are clearly depicted in the agenda.

There are seven measures mentioned in the agenda to ensure environmental conservation in the country. The first deals with sustainable land use, the second related to fresh water resource management, the third concerned with rational development and utilization of mineral resources, the fourth connected to SFM (Sustainable Forest Management), the fifth for biodiversity conservation, the sixth is to manage coastal and marine ecosystems systematically and the final measure for Conservation of Myanmar's rich cultural heritage. For biodiversity conservation, the measure states as follows;

"Conservation of the rich biodiversity of the country through strengthening and expansion of protected areas and improved management". Biodiversity conservation is therefore integrated into the sustainable development activities of Myanmar.

Myanmar National Sustainable Development Strategy (NSDS)

Myanmar has drafted a National Sustainable Development Strategy (NSDS) in 2006 in line with the UN's mandate of Article 162 of WSSD, Johannesburg, 2002 which notes that "States should take immediate steps' to make progress in the formulation and elaboration of national strategies for sustainable development and begin their implementation by 2005".

NSDS will uplift the quality of life of Myanmar citizens; in other words, to alleviate poverty. Three pillars: environment, economics and social aspects are identified in Myanmar NSDS. The environmental perspective of Myanmar's NSDS comprises eleven areas. Of those, biodiversity conservation is one of the areas:

Strategy for biodiversity conservation as shown in Myanmar NSDS is as that Ministry of Forestry acts as lead institution and relevant departments and agencies are as collaboration institutions.

BOX. 1. Environmental perspectives of Myanmar NSDS

- a. sustainable forest resources management;
- b. biological diversity conservation;
- c. sustainable freshwater resources management;
- d. environmental quality management and enhancement;
- e. integrated management of land resources;
- f. sustainable management of coastal, marine and island ecosystems;
- g. sustainable tourism development;
- h. sustainable development and utilization of mineral resources;
- i. sustainable agriculture, livestock and fisheries development;
- j. sustainable energy production and consumption; and
- k. sustainable industry, transport and communication development.

Myanmar NSDS noted that the country has a high potential for establishing an effective and integrated protected area system before forested areas largely fragmented, and lose their ability to provide adequate ecosystem services. It urges to increase protected areas system from present 7.3 % to 10 % without delay in year 2010 at the latest. There are 9 proposed protected areas with 22,843 km² covering 3.36% of the total country's area. Moeyingyi Wetland Wildlife Sanctuary has been listed as one of the wetlands of international importance in ASEAN countries (ASEAN SOE 2005).

3. Myanmar commitment to MEA (Multilateral Environmental Agreement)

Myanmar has signed some international 32 environmental agreements and some regional agreements until at the end of 2008. Of those, 7 international agreements and some regional agreements are more related to biodiversity conservation.

Being a member to those conventions, protocol and working with those organizations also reflect that biodiversity conservation is one of the national priorities in Myanmar.

Besides, Myanmar is cooperating with some international organizations for biodiversity conservation and some of those organizations are Asian Elephant Specialists Group (AESG), Global Tiger Forum (GTF), Washington Park Zoo, Whale and dolphin conservation society in UK, and with some different governmental organizations.

4. Rural development scheme for income generation and upgrade livelihood

Border area & national race development program initiated in 1989 and developmental areas cover transport, communication, education, health, electricity supply and agriculture & livestock raising.

Integrated rural development in the third 5-year plan (2001-06) increases rural income through other sources will help reduce the loss of biodiversity across the country. A total of 28 developmental zones has been set up throughout Myanmar and developmental activities are being carried out. This is true particularly in border areas where biodiversity is rich and diverse.