

Catalyzing the Wise Use of Wetlands

in Myanmar: Efforts and Ways Forward



Bishnu B. Bhandari
Reiko Nakamura
Amado S. Tolentino, Jr.
Shiina Suzuki

Ramsar Center Japan

2014

Catalyzing the Wise Use of Wetlands in Myanmar: Efforts and Ways Forward

Prepared and published by Ramsar Center Japan (RCJ).

Copyright: 2014 Ramsar Center Japan

Edited by:

Bishnu B. Bhandari

Reiko Nakamura

Amado S. Tolentino, Jr.

Shiina Suzuki

This is the report of the 11 day long reconnaissance trip to Myanmar from 3-13 October, 2013. The study was supported by Keidanren Nature Conservation Fund (KNCF).

Available from

Ms. Reiko Nakamura

Secretary-General, Ramsar Center Japan

2-10-3 MinamiKugahara Ota-ku, Tokyo 146-0084, JAPAN

Tel: +81-3-3758-7927. Email: ramsarcj.nakamura@nifty.com

Table of Contents

What							Where
Abbreviations and Acronyms	---	---	---	---	---	---	iv
Definition of Common Terms	---	---	---	---	---	---	v
Executive Summary	---	---	---	---	---	---	vii
1.	Introduction, Objectives and Methods	---	---	---	---	---	1
2.	Legislative and Institutional Aspects	---	---	---	---	---	4
3.	Conservation Efforts	---	---	---	---	---	7
4.	Major Issues and Concerns	---	---	---	---	---	9
5.	Case Studies	---	---	---	---	---	11
6.	Voices of the People	---	---	---	---	---	19
7.	Findings and Discussion	---	---	---	---	---	21
8.	Conclusion and Suggestions	---	---	---	---	---	24
Reference	---	---	---	---	---	---	26
Annex I: Schedule	---	---	---	---	---	---	27
Annex II: Institutions and Persons	---	---	---	---	---	---	28

Citation: Bhandari, Bishnu B.; Reiko Nakamura; Amado S. Tolentino, Jr. and Shiina Suzuki (2014). *Catalyzing the Wise Use of Wetlands in Myanmar: Efforts and Ways Forward*. Final Report. Ramsar Center Japan.

Abbreviations & Acronyms

ASEAN	Association of Southeast Asian Nations
AWS	Asian Wetland Symposium
BANCA	Biodiversity and Nature Conservation Association
CAF	Central Asian Flyway
CBO	Community-based Organization
CEPA	Communication, Education, Participation & Awareness
DOF	Department of Fisheries
EAAFP	East Asian-Australasian Flyway Partnership
EIA	Environmental Impact Assessment
ESD	Environmental Conservation Department
ESD	Environmental Conservation Department
FD	Forest Department
FFI	Fauna and Flora International
GEF	Global Environment Facility
IID	International Institute of Development
ILDA	Inle Lake Development Authority
ILEC	International Lake Environment Committee
IUCN	International Union for Conservation of Nature
JICA	Japan International Cooperation Agency
KNCF	Keidanren Nature Conservation Fund
LTRCP	Long Term Rehabilitation & Conservation Project
LTRCP	Long Term Restoration and Conservation Plan
MAB	Man and the Biosphere
MBG	Makino Botanical Garden
MCG	Micro Capital Grant
MEAs	Multilateral Environmental Agreements
MERN	Mangrove and Environmental Rehabilitation Network
MOAI	Ministry of Agriculture and Irrigation
MOLFRD	Ministry of Livestock, Fisheries and Rural Development
NBSAP	National Biodiversity Strategy and Action Plan
MOECAP	Ministry of Environmental Conservation and Forestry
NCEA	National Commission for Environmental Affairs
NECC	National Environmental Conservation Committee
NGO	Non-Governmental Organization
NSDS	National Sustainable Development Strategy
NWCD	Nature and Wildlife Conservation Division
RCJ	Ramsar Center Japan
UNDP	United Nations Development Program
UNEP	United Nations Environment Program
UNESCO	United Nations Educational, Scientific and Cultural Organization

Definitions of Common Terms

ASEAN Heritage Park: ASEAN Heritage Park is a protected area designated by the members of ASEAN in South-east Asia to generate awareness, pride, appreciation, enjoyment and conservation through regional network of representative protected areas. The parks are selected based on criteria of educational value, representativeness, naturalness, high conservation value and legally gazetted area. --- *ASEAN Center for Biodiversity*

Biosphere Reserve: Biosphere reserves are areas of terrestrial and coastal ecosystems promoting solutions to reconcile the conservation of biodiversity with its sustainable use. They are nominated by national governments and remain under sovereign jurisdiction of the states where they are located. They are internationally recognized. Biosphere reserves serve in some ways as 'living laboratories' for testing out and demonstrating integrated management of land, water and biodiversity. Collectively, biosphere reserves form a world network called the World Network of Biosphere Reserves (WNBR). Within this network, exchanges of information, experience and personnel are facilitated. There are over 500 biosphere reserves in over 100 countries. ----- *Man & Biosphere, UNESCO.*

Conservation: Conservation is defined as the management of human use of the biosphere so that it may yield the greatest sustainable benefit to present generations while maintaining its potential to meet the needs and aspirations of future generations. Thus conservation is positive, embracing preservation, maintenance, sustainable utilization, restoration, and enhancement of the natural environment. --- *World Conservation Strategy, IUCN, 1980*

Environment Protection: Environmental protection refers to any activity to maintain or restore the quality of environmental media through preventing the emission of pollutants or reducing the presence of polluting substances in environmental media. It may consist of: (a) changes in characteristics of goods and services, (b) changes in consumption patterns, (c) changes in production techniques, (d) treatment or disposal of residuals in separate environmental protection facilities, (e) recycling, and (f) prevention of degradation of the landscape and ecosystems. --- *Glossary of Environment Statistics, Studies in Methods, Series F, No. 67, United Nations, New York, 1997*

National Park: National park falls in the Category II of the Protected Areas Category System. It is a large natural or near-natural area set aside to protect large-scale ecological processes, along with the complement of species and ecosystem characteristic of the area, which also provides a foundation for environmentally and culturally compatible, spiritual, scientific, educational, recreational, and visitor opportunities. Its objective is to protect natural biodiversity along with its underlying ecological structure and supporting environmental process, and to promote education and recreation. --- *IUCN Protected Areas Categories System*

Protected Area: A protected area is a clearly defined geographical space, recognized, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values.

--- *IUCN World Conservation Congress 2008*

Ramsar Site: Ramsar site is a wetland sites which is designated by the Contracting Parties for inclusion in the List of Wetlands of International Significance according to one or more Ramsar criteria such as fish, taxa, waterbirds, ecological communities or the site containing representative, rare or unique wetland types. --- *The Ramsar Convention*

Rehabilitation: Rehabilitation is the process of returning the property in a given area to some degree of its former state, after some process (human action, natural disaster, etc.) has resulted in its damage.

Restoration: Restoration is a process that helps to transform an area that has been impacted by human or natural activity to an area that can sustain native habitats. Restoring an area is a long process that requires an understanding of an area. Learning about the history of an area and its succession through time, will help determine how to restore an area. Success can be determined if the ecosystem can recapture its natural dynamics.

Sustainable Development: Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.
--- *The World Commission on Environment and Development*

Wetlands: Wetlands are areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six meters.
-- *The Ramsar Convention*

Wildlife Sanctuary: Also called habitat/species management area or reserve, it belongs to the IUCN Protected Areas Category IV. This category of protected area aims to protect particular species or habitats and management reflects this priority. Many protected areas under Category IV need regular and active interventions to address the requirements of particular species or to maintain habitats, but this is not a requirement of the category. Its primary objective is to maintain, conserve and restore species and habitats.
--- *IUCN Protected Areas Categories System*

Wise Use: Wise use of wetlands is the maintenance of their ecological character, achieved through the implementation of ecosystem approaches, within the context of sustainable development.
--- *The Ramsar Convention*

World Heritage Site: It is a property (such as forest, mountain, lake, island, desert, monument, building, complex or city) that is listed by the UNESCO as of special cultural or physical significance or having outstanding values. The World Heritage List is maintained by the international World Heritage Programme administered by the UNESCO World Heritage Committee composed of 21 state parties.
--- UNESCO World Heritage Committee

Executive Summary

The report is the result of a rapid reconnaissance visit made to Myanmar by the members of the Ramsar Center Japan from 3 to 13 October 2013. The report consists of main text with photos, definitions of common terms, abbreviations, reference and two annexes. Data and information were collected using a battery of research techniques and tools. The findings of the study and suggestions for the wise use of wetlands are briefly presented below.

1. The Union of Myanmar is characterized with several types of wetlands – coastal wetland, riverine, mangroves, lakes (both freshwater & saline), swamp forests, reservoirs and marshes. These wetlands are the major sources of food, water, transport and habitats for flora and fauna. Therefore, environmental conservation receives the highest priority in the Constitution of the Union of Myanmar. Currently, Environmental Conservation Law of 2012 is the important organic framework of law. Besides, major conservation efforts include an inventory of 99 sites, establishment of protected wetland areas, development of a long term plan for Inle Lake, dredging of lakes, Environmental Conservation Committee, preparation for designating more wetlands for the Ramsar list, proposal for the establishment of a Biosphere Reserve and so forth.
2. Bulging population, growing poverty and climate change could be attributed to the root causes of the loss and degradation of wetlands whereas the invasion of alien species, over-use of resources, siltation, reclamation and eutrophication are the immediate threats and challenges to their wise use and management.
3. The site visit of two Inle Lake and Moeyungyi wetland shows that during the past 70 years the former has shrunk by 40%. The lake faces grave threats of siltation, pollution, encroachment, heavy tourism and climate change. In the case of Moeyungyi wetland, further development has been affected by its tri-lateral jurisdiction and illegal cultivation of rice in the recently exposed area by local communities.

The suggestions made by the team includes establishing a wetland development authority, multi-stakeholder forum, developing a nation wetland policy, rescuing the sites with the tri-lateral jurisdiction and preparing participatory plan for their management.

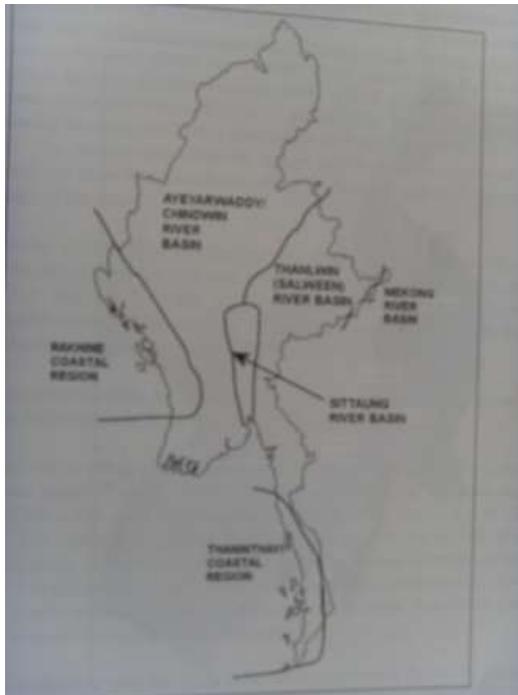
Catalyzing the Wise Use of Wetlands in Myanmar: Efforts and Ways Forward¹

Bishnu B. Bhandari, Reiko Nakamura, Amado Tolentino and Shiina Suzuki²

1. Introduction, Objectives & Methods

i. Introduction

Myanmar straddles four biogeographic regions: Sub-continental Asia, Palaearctic Central Asia, Indochina and Malaysia. The rich flora and fauna is the reflection of the overlap of these regions. Besides, Myanmar houses several river systems; **Ayeyawady/Chindwin, Thanlwin, Sittuang, Mekong** and others. The Ayeyawady is the river that flows southwards roughly through the center of the dry zone of Central Myanmar (**Davies et al. 2004**).



The Ayeyawady is the river that flows southwards roughly through the center of the dry zone of Central Myanmar (**Davies et al. 2004**).

According to *A Wetland Inventory for Myanmar* (2004: 45), the country can be divided up into 6 wetland regions; (1) Ayeyawady/Chindwin River Basin, (2) Thanlwin (Salween) River Basin, (3) Sittuang River Basin, (4) Mekong River Basin, (5) Rakhine Coastal Region, and (6) Thaninthayi Coastal Region.

These wetland region houses a diverse array of coastal ecosystems (coral reefs, seagrass beds, mud flats, sand flats, mangroves, bays, estuaries and sandy and rocky shores). Inland waters, which are freshwaters in nature, are associated with 3 major rivers; Ayeyawady/Chindwin, Thanlwin and Sittuang. These river systems house mangroves, swamp forests, lakes and marshes. These areas are flooded during

the rainy season, and give rise to the formation of wetlands after the rise subsides. They are fed by ground water discharge and have a direct influence on stream flow. For example, Inle Lake in Shan State is the site of ground water discharge and then acts as the site of recharge to the ground water at another.

¹ This is the report of the rapid reconnaissance trip made by the members of the Ramsar Center Japan. The participating members would like to offer their heartfelt thanks to Mr. Tin Tun, Director-General, Planning and Statistics Department, Ministry of Environmental Conservation and Forestry, Republic of the Union of Myanmar for his all-out support to the successful completion of the trip and KNCF for providing support to conduct the study in Myanmar.

² Correspondence address: Reiko Nakamura, Secretary-General, Ramsar Center Japan, 2-10-3 MinamiKugahara Ota-ku, Tokyo 146-0084, JAPAN. Tel: +81-3-3758-7927. Email: ramsarj.nakamura@nifty.com

Also found are several small permanently saline lakes and many seasonal wetlands in the central dry zone. Salinity increases progressively during the dry season. Due to lack of water in the dry season, particularly in the Central Dry Zone, many wetlands have been converted into reservoir to hold water during the dry season (**Davies et al. 2004** for detail information).

Indawgyi, Inle and Moeyungyi are famous natural wetlands as well as Important Bird Areas in Myanmar. Freshwater fish from the inland wetland has been the major protein food source of the people of Myanmar. A network of freshwater wetlands, rivers and adjacent wetlands are very important for water supply, transport and habitats for freshwater fish. These wetlands have been the source of bread and butter for the people of Myanmar. Their uses range from irrigation to transport, from gold panning to duck farming, from aquaculture to hydropower and from sand/gravel extraction to tourism (**Davies et al. 2004; Anonymous, nd; BirdLife International Asia Division, 2013**).



With the purpose of assisting the Administrative Authority of the Ramsar Convention for the implementation of the Convention on Wetlands in Myanmar, the Ramsar Center Japan (RCJ) in collaboration with the Keidanren Nature Conservation Fund (KNCF) has conducted the study to assess the overall status of wetlands and allied resources.

ii. Objectives

Within the framework of the overall objective mentioned above, the study has set up the following major objectives.

1. Review the overall status of wetlands, particularly their wise use, legal and institutional settings, cultural values, livelihood and so forth.
2. Share the experiences of Asian Wetland Symposium for the promotion of the Ramsar Resolution IX. 19 (*The importance of regional wetland symposia in effectively implementing the Ramsar Convention*).
3. Review the implementation process, problems and issues of the Ramsar Convention and the "*Project for the Promotion of Wetland Management in South-east Asia*".
4. Identify pragmatic ways and means to move forward the wise use and conservation of wetlands and resources.

iii. Methods

The Forest Department (FD) of the Republic of the Union of Myanmar was the contact point for the rapid reconnaissance trip. The trip consisted of 11 days from 3 to 13 October 2013. During this period, the team³ visited four places -Yangon, Nay Pyi Taw, Nyaung Shwe (Shan State) and Bago Township, Bago Region). The schedule of the team is presented in **Annex I**. The team met and discussed with 15 officials and individuals working in 9 different institutions on wetland conservation and management (**See Annex II: Institutions and Persons**). A bunch of tools and techniques such as desktop review of literature, meetings with government officials, non-governmental organization (NGO) representatives, wetland researchers, stakeholder workshop and direct observation were used to collect data and information for the report.



³ The reconnaissance team included Ms. Reiko Nakamura (Secretary-General, RCJ, Japan), Mr. Amado S. Tolentino, Jr. (Executive Governor, International Council of Environmental Law, Philippines), Dr. Bishnu B. Bhandari (President, Nepal Wetlands Society, Nepal) and Ms. Shiina Suzuki (Graduate Student, Sophia University, Japan)

2. Legislative and Institutional Aspects⁴

The Constitution of the Republic of the Union of Myanmar 2008 emphasizes *“Every citizen has the duty to assist the Union in carrying out the following matters: (a) preservation and safeguarding of cultural heritage; (b) environmental conservation; (c) striving for development of human resources; (d) protection and preservation of public property.”*

This provision in the highest or fundamental law of Myanmar is an affirmation of a prominent aspect of the newly emerged concept of environmental justice which means access to environmental information, education and awareness for effective people’s participation in the protection of the environment and sustainable development of its resources including wetlands.

Although no direct wetlands legislation could be found in the country’s corpus of environmental laws, a close examination of its natural resources and environment-related legislations reveal that the legal backbone of wetlands management could be found in, among others, its forestry laws -- Forest Law (Law No. 8/92,1992), Myanmar Forest Policy 1994, Protection of Wildlife and Wild Plants and Conservation of Natural Areas Law (Law No.6/1994), Aquaculture Law 1989, Marine Fisheries Law (Law No.9, 1990), Freshwater Fisheries Law (Law No. 1/91 1991), Pesticide Law 1990, Agricultural Policy 1992 and Conservation of Water Resources and River Law 2006.

Relevant to wetland management are Myanmar’s National Biodiversity Strategy and Action Plan (NBSAP) and the National Sustainable Development Strategy (NSDS). In fact, those two could serve well in formulating a national wetland management plan.



In connection with natural resources and environment-related laws in paragraph 2 above, it should be mentioned that experience of other countries shows that entirely new laws may not be required to cover the area of wetland management. (In Asia, Korea is the country which could be cited as having its own separate and specific wetlands law). Existing natural resources legislations could be interpreted/ or converted to useful tools for management of the different sectors of the environment including wetlands,

⁴ This section is authored by Amado S. Tolentino, Jr.

forests, air, water, marine areas, protected areas, wildlife and biological species, etc. Marginal amendments to those laws could also be done to incorporate wetlands management concerns.

The most important legal development in Myanmar with relevance to wetlands management is the Environmental Conservation Law 2012, an organic framework law which complements existing natural resources and environment-oriented laws as mentioned. Its Chapter IX on Conservation of Natural Resources and Cultural Heritage covers wetlands and the resources found therein when it provided that “ The relevant Government departments and Government organizations shall, in accord with the guidance of the Union Government and the Committee carry out the conservation, management, beneficial use, sustainable use and enhancement of regional cooperation of the following environmental natural resources: (a) forest resources; (b) land resources; (c) freshwater resources including underground water; (d) mineral resources; (e) agricultural resources; (f) fisheries resources; (g) marine resources; (h) natural ecosystems; (i) natural areas, wildlife, natural plants and biological diversity; (j) other natural resources stipulated by the Union Government.

The above-mentioned Environmental Conservation Law 2012 established an overall environmental policy, implementation procedures (environmental impact assessment) and coordination among the members charged with environmental protection for policy development, monitoring and feedback. It contains the guiding principles for environmental management and the use of the resources of the country including prevention of pollution.

Furthermore, the organic act mentions the importance of Myanmar’s environment from the point of view of scientific, historic, cultural and educational considerations. It is the fundamental law to regulate or prohibit any activity that may cause harmful effects on the environment or ecosystems or any other activity that might produce environmental impairments.

Of great significance is Chapter III of Myanmar’s Environmental Conservation Law 2012 which is about the formation of the Environmental Conservation Committee “with the Union Minister for the Union Ministry assigned by the Union Government as Chairman and with suitable members to conserve the environment of the Republic of the Union of Myanmar.”

Presently, the main government institutions charged with conservation and management of wetlands and their resources are the Ministry of Environmental Conservation and Forestry (MOECAF), Ministry of Agriculture and Irrigation (MOAI), and Ministry of Livestock, Fisheries and Rural Development (MOLFRD).

When the Environmental Conservation Committee called for by the Environmental Conservation Law 2012 is finally set up , those three ministries are naturally expected to be in the Committee. Take note, however, that the Committee is for the general environmental management of the natural resources and environment of Myanmar. Be that as it may, the Environmental Conservation Committee can create a Sub-Committee on Wetland Management at which the MOECAF, MOAI and MOLFRD will be the main members.

The Sub-committee on Wetlands Management can proceed with its tasks by creating two units: (i) The Legal Unit to be assigned to make an inventory, review and study of existing Myanmar wetlands-related laws for the purpose of strengthening those laws to make way for their effective implementation including multilateral environmental agreements (MEAs) or treaties to which Myanmar is a Party; (ii) the Scientific Unit will be the technical support to the sub-committee and to the Legal Unit considering the legal, technical and scientific nature of wetlands management. Members of the two units should come from government agencies with the right to call on NGOs and the academe for further support.

In this, the establishment of coordinating mechanisms among agencies principally charged with environment-related administration, e.g. Ministry of Education, Ministry of Health, Ministry of Works and Communications, Ministry of Defence, Ministry of Local Governments aside from MOECA, MAI, MOLFRD, is imperative to ensure effective environmental resources management including those of wetlands.

Very important is the use of Myanmar's NSDS to ensure proper environmental control and provision for maintenance of the kind of development desired, e.g. development in a controlled pace on account of the unique physical characteristics of the country.

Finally, the Environmental Conservation Committee (including the Sub-committee on Wetlands Management) should promote the implementation of scientific, legal and educational programs strengthening public awareness about the significance of the environment with a view towards protection and preservation of the environment particularly the wetlands against any source of environmental impairment.

As a recommendation, the Union of Myanmar should take the necessary steps to further obtain advisory services in the areas of (i) inter-agency coordination mechanisms for environmental systems management with the end in view of incorporating the environmental dimensions in the development efforts of the country; and (ii) effective implementation of its commitments to MEAs, in particular, the Ramsar Convention on Wetlands.

3. Conservation Efforts

A cursory look shows that the Union Government has done a lot of conservation works on wetlands in Myanmar. Indeed, no stone has been left unturned. Some selected efforts have been summarized as below.

1. The Survey and the publication of the document titled “*A Wetland Inventory for Myanmar*” in 2004 has included about 99 wetlands representing all wetland regions in the country. This publication provides the basic information on the overall status of wetlands in Myanmar (**Davies *et al.* 2004**).
2. According to the **Ramsar Sites Information Service**, Myanmar designated Moeyungyi Wetland Wildlife Sanctuary as the first Ramsar site in 17/11/2004 and the accession came into force in 17/04/2005. The Ramsar Administrative Authority is the FD under the MOECA. Currently, Dr. Nyi Nyi Kyaw, Director-General of Forest Department serves as the national focal point for the Ramsar Convention.
3. According to the National Biodiversity Strategy and Action Plan (NBSAP), the following protected areas have been declared as the protected wetlands (**UNEP/MOECA/GEF, 2011:40-41**). These areas are managed by FD and NWCD as shown in the bracket.
 - i. Taunggyi Bird Sanctuary (16 sq. km. Shan State, managed by Nature and Wildlife Conservation Division (NWCD))
 - ii. Pyin-O-Lwin Bird Sanctuary (127 sq. km. Kachin State, managed by FD)
 - iii. Wethikan Bird Sanctuary (4 sq. km. Magway Region, managed by FD)
 - iv. Inle Lake Wildlife Sanctuary (641 sq. km. Shan State, managed by NWCD)
 - v. Moeyungyi Wetland Wildlife Sanctuary (104 sq. km. Bago Region, managed by NWCD)
 - vi. Indawgyi Wetland Wildlife Sanctuary (815 sq. km. Kachin State, managed by NWCD)
4. In order to provide guidance, advice and suggestions, the Union Government has established a high level inter-ministerial Commission, called National Commission for Environmental Affairs (NCEA). The NCEA is the central management agency to oversee environmental conservation in Myanmar. Its mission is to ensure sustainable use of environmental resources and to promote environmentally sound practices in industry and in other economic activities. It is supposed to formulate broad policies, prepare environmental legislation for pollution control, monitoring and enforcement, promote environmental awareness and liaise with international organization in environmental matters. Since 2005, NCEA is headed by the Minister of MOECA and the Director-General, Planning & Statistics Department serves as member-secretary to the Commission (**UNEP/MOECA/GEF 2011**). Recently, NCEA has been upgraded to Environmental Conservation Department (ECD) (**Personal Communication with Dr. Naing Zang Htun, 2013**).
5. In order to consolidate the environmental conservation activities, the Union Government has formed another national level committee called Environmental Conservation Committee (ECC, erstwhile National Environmental Conservation Committee) and is chaired by the Union Minister of the MOECA. It consists of 21

members from 19 ministries. Its functions include (1) addressing the environmental problems in rivers and wetlands due to unsustainable land use, (2) implementing environmental conservation activities in industrial zones and civil areas, (3) developing policies, principles, rules and regulations for environmental matters, and (4) strengthen the awareness of environmental matters. **(UNEP/MOECAP/GEF, 2011:29)**.

6. Myanmar straddles two flyways; East Asian-Australasian Flyway Partnership (EAAFP) and Central Asian Flyaway (CAF). The Government has approved to apply for the membership to EAAFP and the FD is preparing the application.
7. The government with support from Biodiversity and Nature Conservation Association (BANCA) is collecting basic information on the Gulf of Moattama, which is a wintering area for the spoon-billed sand piper, a globally threatened species. The Fauna and Flora International (FFI) is conducting community consultation in order to nominate Indawgyi for Ramsar listing **(Meeting with NWCD)**.
8. Likewise, the Government with support from UNESCO has already proposed Inle Lake as the first Biosphere Reserve **(UNDP-Myanmar, 2012)**.
9. Similarly, International Union for Conservation of Nature (IUCN) is developing a concept note on 7 protected areas including Moeyungyi Wetland Wildlife Sanctuary and Indawgyi Wildlife Sanctuary for improving education center and bird-watching tower.
10. Makino Botanical Garden (MBG) of Japan has signed a Memorandum of Understanding with FD for technical support to the improvement of the Natmataung National Park in Chin State.
11. The Environmental Conservation Law, formulated and enacted in 2012, gives priority to the formulation of Environmental Impact Assessment (EIA) procedure, one of the components to safeguard the environment of the area. The procedure was supported by the Asian Development Bank and is under reviews by the relevant ministries.
12. Myanmar does not yet have a National Wetland Policy but the wetland concerns have been included in the National Biodiversity Strategy and Action Plan (NBSAP), in which one of the actions is a five year action plan towards sustainable freshwater resources **(UNEP/MOECAP/GEF, 2011:93)**.
13. Every protected area is required to patrol the area and conduct community awareness program.
14. With regard to institutional set up, the MOECAP, the Ministry of Agriculture and Irrigation (MOAI) and the Ministry of Livestock, Fisheries and Rural Development (MOLFRD) are the major players in the conservation and management of wetlands and their resources. The NWCD of the MOECAP is responsible for the protection of national parks, reserve and sanctuaries, whereas the MOECAP concentrates its activities in watershed protection and management. The MOAI plays a vital role in the management of water resources, especially in the use of water and wetlands for irrigation in the Central Dry Zone, in the creation of new wetlands and in the expansion of agricultural activities. The MOLFRD has jurisdiction over all aquatic and semi-aquatic organisms in inland and coastal waters, and has important role in preventing the over-exploitation of wetland resources **(Davies et al. 2004:44)**.

4. Major Issues and Concerns

The conservation values of the wetlands have not been fully recognized yet in land use planning. As a result, a large percentage of wetlands and mangroves have been either lost or degraded. The remaining also are exposed to many threats such as over extraction of resources, presence of alien invasive species, siltation, salinization, eutrophication, illegal settlement and so forth (Davies *et al.* 2004:44; UNEP/MOECAP/GEF, 2011:93).

With regard to the loss of natural resources in the biodiversity hotspots, MOECAP/GEF (2011) has identified major root causes as the combination of many factors –

1. Bulging population growth (more demand for resources and increased resource utilization), fast economic growth and increasing consumption and integration into global economy
2. Growing poverty, low capacity, lack of environmental safeguards, lack of comprehensive land-use policy and plan, undervaluation of resources, and lack of grassroot support for conservation
3. Climate change and its variability

Because of these causes, we can see the changes on the ground, which are as follows.

1. Over-exploitation of natural resources (plants, fishes, animals)
2. Habitat degradation and loss (i. logging, ii. shifting cultivation, iii. farm area expansion, iv. infrastructural development, v. pollution, vi. plantation, vii. invasive species).

However, immediate threats that are responsible for the loss and deterioration of wetlands, as presented in the publication *A Wetland Inventory for Myanmar* (2004), are summarized in Table 1.

Table 1: Major Issues, Examples and Underlying Causes

Selected Issue	Examples	Underlying Causes
1. Invasive Species	<ol style="list-style-type: none"> 1. In reservoirs and lakes 2. Tilapia displaces local fishes 3. Grass carps eats vegetation 	<ol style="list-style-type: none"> 1. Lack of awareness, and consequences of the introduction of new species 2. No EIA
2. Over-fishing	<ol style="list-style-type: none"> 1. In oxbow and floodplain wetlands mostly in Ayeyawady river 2. In dry season, totally fished out 3. Use of poisons and blocking fishes into floodplain 4. Electro-fishing, use of car batteries, poisoning 5. Leasing fisheries 	<ol style="list-style-type: none"> 1. Poor law enforcement 2. Poverty & population pressure 3. Lack of appropriate management
3. Silt deposition	<ol style="list-style-type: none"> 1. In many wetlands in Central Dry Zone 2. In Inle Lake 3. Deforestation & overgrazing in catchment and slope 	<ol style="list-style-type: none"> 1. Deforestation at the catchment 2. No alternate source for fuelwood 3. Overgrazing 4. Erosion and landslide
4. Desiccation & Salinity	<ol style="list-style-type: none"> 1. In reservoirs (Yem Yet In, salinity @ 19 ppt), dry up in the dry season 2. Leaching of salt from rocks 	<ol style="list-style-type: none"> 1. Natural process 2. Canal not repaired periodically 3. Improper management of water

	<ul style="list-style-type: none"> 3. High evaporation 4. Problem for irrigation & drinking water 5. Too much extraction of water and no repair of canals. 	
5. Drainage & Reclamation	<ul style="list-style-type: none"> 1. When water recedes, cultivation of rice and other crops 2. Bunded & drained permanently in Khule In & Yem Yet In 3. Incremental loss of wetlands 4. Conversion to shrimp in mangroves 	<ul style="list-style-type: none"> 1. Ignorance about the values of wetlands 2. Profit from conversion
6. Trapping & poisoning of birds	<ul style="list-style-type: none"> 1. Capture of birds using snares or nets 2. Poisoning of ducks 	<ul style="list-style-type: none"> 1. Law enforcement poor
7. Over harvesting of Resources	<ul style="list-style-type: none"> 1. In mangroves & coastal areas like Ayeyawaddy Delta, Rakhine and Thaninthyin 2. Cutting of trees for fuelwood, charcoal & house construction 3. Turtle egg collection 4. Settlements 	<ul style="list-style-type: none"> 1. No alternative to resources
8. Eutrophication	<ul style="list-style-type: none"> 1. In Inle Lake, flow of fertilizers from floating garden and the surroundings 2. Domestic sewage 3. Use of mercury in gold panning in some places 4. Natural process like in winter in Indaw and Indawgyi Lakes through the overrun of stratified lake water and thus poor deoxygenated water and rich in hydrogen sulphide and thus fishes die. 	<ul style="list-style-type: none"> 1. Use of fertilizers & pesticides 3. Direct domestic sewage & no treatment

Source: Based on information from Davies *et al.* (2004).

5. Case Studies

5.1 Inle Lake Wildlife Sanctuary



Inle (erstwhile Inlay) Lake Wildlife Sanctuary (erstwhile Inlay Wetland Wildlife Sanctuary) is situated in Nyaung Schwe, Southern Shan State. It was declared as Wildlife Sanctuary in 1985. The lake is the 2nd largest freshwater lake in Myanmar after Indawgyi and receives water from 29 rivers and streams, of which only the four are perennial and the rest are seasonal. It is an ASEAN Heritage Park⁵ providing added value of technical and financial support, information sharing among groups and providing education (Sein, 2013). It is also included in the tentative list of UNESCO's World Heritage Site. The lake has been already proposed as a UNESCO Biosphere Reserve. Its added value is that it takes into consideration catchment level, harmonized relationship between man and biodiversity, local participation, cultural values and buffer zone. The lake is the main water reserve for Law Pi Ta hydro power plant and is a major tourist area. The lake is also the source of livelihood for the lake-dependent people, *Intha*. Still there are some settlements inside the lake.

The development of the lake began in 1915 introducing cropping system. Some of the important development works are presented in Annex III.

⁵ An ASEAN Heritage Park is established to generate greater awareness, pride, appreciation, enjoyment and conservation of the ASEAN region' natural heritage through regional network of representative protected areas. The designation as a ASEAN Heritage Park is both a heritage for, and a responsibility of, the country. The criteria used for this purpose are (i) educational value, (ii) representativeness, (iii) naturalness, (iv) high conservation value, and (v) legally gazette area.

According to the **UN-Habitat (2013)**, the total area of the Inle Lake watershed is about 2167² miles and covers 9 townships -- Nyaung Shwe, Taunggyi, Hopon, Shwe Nyaung, Kalaw, Pinlauig, Phe Khon and Pindaya. As mentioned earlier, the lake is recharged by 29 lakes, of which the four are perennial and the remaining 25 are seasonal. The perennial rivers are Namlat stream, Kalaw (or Thann Daung) stream, Yay Pei' (or Nei Gyar) stream and Bilu (or Indein) stream.

According to a study by UN Habitat (**2013**) bathymetric parameters of the lake is summarized in Tale 2 below. Within the period of 70 years, the area of the lake has shrunk by almost 40% and the length by almost 70 %. The depth also has decreased by 40%. Water is not suitable for drinking purpose because of the use of fertilizers and pesticides in the surrounding region, including the floating garden. The major reason of water coverage shrinkage is due to siltation, which is caused by deforestation, intensive farming, shifting cultivation and haphazard land use practices at the catchment area. This has been further accelerated by climate change and its variability.

Table 2: Change in Bathymetric Parameters of the lake between 1937 and 2007

Parameters	1937 ⁶	2007	Change in %age
Total area	104 ² miles	63 ² miles	-39.4%
Length (North to South)	36 miles	11 miles	-69%
Length (East to West)	--	4 mile	-
Maximum Depth	20 feet	12 feet	-40%
Shallowest Part	12 feet	6 feet	-50%

Source: UN-Habitat (2013)

According to **UN-Habitat (2013)** the lake bed got silted up to 2 meter during the past 10 years and sediment in-flow is currently about 476 m³/ sq. km/year. The total sedimentation is 268,293 tons/year from 4 major perennial steams, the highest amount of sediments coming from Namlat stream (**See Table 3**). The study also estimates that the total sedimentation from 29 streams could well exceed 500,000 tons/year.

Table 3: Silt Deposit in Inle Lake area

Streams	Ton/year
Namlat stream	1,04,000
Kalaw stream	56,000
Yay Pei	19,000
Bilu Stream	89,293
Total silt deposit	2,68,293

Source: UN-Habtat 2013

⁶ According to the Brochure of the Norwegian Foreign Ministry et al. (nd).

A survey done in 2007, as quoted in UN-Habitat (2013), has reported the land use pattern in the lake. About 38% (24² mile) of the total area of 63² mile is under open water and only 24% (15² mile) is used for floating garden. The rest of 38 % (24² mile) is covered by floating vegetation, settlements and other form of gardening and farming (Table 4).

Table 4: Distribution of Land Use in Inle (2007 Survey)

Type of Coverage	Area (in mile)	%age
Water Surface	24 ² mile	38%
Floating Garden	15 ² mile	24%
Floating vegetation	13 ² miles	21%
Others	11 ² miles	17%
Total Area	63² miles	100

Note: Others include settlements, farming, etc.

Source: UN-Habitat, 2013

3. Characteristics of Inle Lake



1. Intha people: The lake people, who live in the lake, are called **Intha**, and have been living there generations. Their main occupation is fishing, along with weaving, silverware making and blacksmithing. They also collect fibers from lotus and make cloth. Other groups, who live in the lake, according to Than (nd:2) are Pa-o, Danu, Taungyo, Shan and Bamar. Fishing and gardening on the lake are the main sources of their livelihood.

2. Leg-rowing: Leg-rowing is a special tradition of the Intha peoples. Nowhere in Myanmar does this tradition prevail.

3. Floating Garden: The people grow tomato in a special structure on the lake on garden called floating garden.

Floating garden is a traditional technology and practice of the Intha people. **Butkuns and Su (2001)** reported the tomato gardening comprises two-thirds of the region’s agriculture and the remaining one-third consists of flower, vegetables and sugarcane. Tomato is the main crop and is grown in off-season (in rainy season) to cater to the needs of country. Other crops that are grown in the garden are (1) tomato, (2) cucumber, (3) garlic, (4) onion, (5) cabbage. The methods of building a floating garden, as mentioned in **Than (nd)**, is presentd in Box “B. Soil from the lake bed is used to cover it and then seedlings planted. The thickness of the bed would go up to



1-1.54 m or as long as it can float. These beds are tied with bamboo poles from the side. We were told that such soil from the bottom of the lake is highly fertile and fertilizers are not used in the garden. But **Tanner (2103)** reports that pesticides are used, which directly goes to water (See Box B).

Box B: Building of a Floating Garden in Inle Lake

Floating cultivation is successful traditional technologies and practice of the Intha peoples. Floating islands are formed from coarse grasses, reeds, sedges, and other aquatic vegetation, some of which grow submerged while others have floating runners with aerial parts well above the water surface. The dead parts of aquatic and marsh plants become entangled together and are bounded by bog mosses and algae into expanses of fen which float freely.

There are built into blocks, which are generally 2 m wide and up to 180 m long. The remainder of the decaying aerial portion is burnt out. Black silt from the bottom of the lake is carried by flat boats and spread over it to the extent the bed is not sunk but still floating. Then floating islands are towed into position and anchored with bamboo poles.

The floating islands thus become a growing medium for planting fruits, flowers, vegetables, and other cash crops from which a lot of income is derived by the Intha. The floating islands can be used up to about 15 years or as long as the submerged mattress can hold its buoyancy. The sunken mass of decayed material has to be taken out of the lake bottom and put back on the land. However, the practice of farming on floating cultivation also encroaches into the diminishing area of the lake, since over time, the floating beds become solid ground and it is one of the adverse effects.

Source: **Than (nd:2)**

4. Phaung Daw Oo Pagoda Festival: The festival takes place every year on the full moon day of October (19 October in 2013) (Tanner, 2013). It begins from Phaung Daw Oo Pagoda, which houses 5 holy Buddha statues gilded with gold leaf. These statues are taken around the lake in a “golden boat” and a special boat team of “leg rowers to row the barge”. It takes 18 days for a circumambulation of 21 sacred sites around the lake. In some sites they only worship and offer foods, while in some places they spend night. We were told that in Nyaung Shwe, they spend 3 nights. According to Reuter, these statues are believed to be brought there by the King of Bagan in the 11th century.



Phaung Daw Oo Pagoda is situated at the northern side of the lake and the southern portion remains still pristine. Likewise, there is a **Nga Hpe Kyaung (Jumping Cat Monastery)**. As the name indicates, cats were used by monks to jump over the hoops. But these days, cats are no longer used. Monastery is the residence for monks, where they conduct studies, recite and chant prayers, and produce educational materials.

5. Rich in endemic fishes: The lake is famous for endemic species of fish. Some 41 fish species are found, of which 16 are endemic. They account for 40% of Myanmar’s endemic fishes. **Butkuns and Su (2001:1)** report that Inle Carp, *Cyprinus carpiointha*, is the main fish of Inle and is the cultural symbol of the Intha people. **Pyone (nd)** mentions that Inle Lake houses several species of gold fish.

1. Long Term Restoration and Conservation Plan for Inle Lake

2. The MOECAAF (2013), also as quoted in UN Habitat (2013), with technical assistance from UN-Habitat and financial support from the Norwegian Government conducted a comprehensive study for 5 months and prepared a **Long Term Restoration and Conservation Plan (LTRCP)** for Inle Lake in 2013. The document is comprehensive and is the first of its kind on Inle Lake. The overall framework of the LTRCP of Inle Lake, which is self-explanatory in nature, is presented in Annex IV.

According to the Plan, major factors that are responsible for the deterioration of the lake are siltation, deforestation, pollution, encroachment, invasion of water hyacinth, poor public awareness, lack of coordination, heavy tourism, and climate change and its variability. Although fertilizers are banned in the area the farmers do use pesticides in their floating garden, which directly goes to the water. **Tanner (2013)** estimates that about 30,000 tourists visit the place

and Nyaung Shwe is the hive of small hotels and tourist facilities. It is a big pressure to the lake resources.



During our reconnaissance trip, we also observed large dredgers removing water hyacinth from the channel.

2. Inle Lake Conservation and Rehabilitation Project: UNDP Myanmar is engaged in a project called Inle Lake Conservation and Rehabilitation Project. The Project is funded by the Norwegian Government. The Project receives advice and guidance from a National Committee, where the Minister of Shan State is also the member. Its logical framework is found in UNDP (2012a).

According to the Norwegian Ministry of Foreign **Affairs et al. (nd)**, the overall objective of the Project is to “restore the environment stability of the Inle Lake with the improvement of the quality of life of local communities. Its immediate objectives are (1) to contribute to better planning and sustainable management of the natural resources, (2) to identify the model villages in all different zones so as to advocate the other organizations and participate in implementing such models in other villages, and (3) to promote environmental governance through community-based organization (CBOs) with the increased awareness of all the stakeholders.

According to the above source, the Project covers about 71 villages from 3 townships – Nyaung Shwe, Kalaw and Pindaya. These villages represent villages from remote, buffer and core zones. Its thematic areas are concentrated into 5 areas, which are (1) Environment and Forestry, (2) Agriculture, Livestock and Fishery, (3) Soil Conservation including conservation agriculture (contour soil and stone bund, gully and soil storage dam, small check dam, small gully check, contour hedge-work, grass-strips, cut-off drain (4) Knowledge Sharing, and (5) Environmental Activities Mainstreaming National and Regional Development Plan.

According to the UNDP’s Annual Report (**UNDP, 2012b**) the project implementation is based on Micro Capital Grants (MCG), which provides opportunity to NGOs and Community-based Organization (CBOs) in order to enhance their capacity in long term operational sustainability for conservation and community development. The UNDP Project has supported the Micro Finance Institution (MFI), which is



working well. Local people take loan, not only from this organization, but also from money lenders and the government bank. The key informants in Ine Lake told us that shifting cultivation, *Taungya* is practiced in the hills and the owner take about 3-4 crops; 1st year = rice, 2nd year = mustard, 3rd year = lintel and 4th year = fallow. In some places, they use the cycle of 5 years. This practice is one of the causes of siltation in the lake. It was also mentioned that tomato farmers need periodic loans to support their activities. They take loan from tomato trader without any interest. The repayment is in the form of “buy back” arrangements or by cash.

It was reported that the lake area is under the jurisdiction of the Wildlife Sanctuary area and all the activities should be done as per the rules and regulations of the protected area. However, the rule does not apply in the case of fisheries, which is under the jurisdiction of the Department of Fisheries (DOF) that permits fishing through the process of annual auction. Because of this arrangement, many fish ponds have been constructed on the north and west sides of the lake. In some of these ponds, they breed Tilapia, a prolific breeder and a strong rival to local species. The Tilapias enter into the lake during the time of flooding. Likewise, the African Catfish, introduced earlier, are also bred in cage culture in some of these ponds. Both tilapia and African Catfish were introduced about 10 years ago by DOF but are now banned in the area.

(2) Moeyungyi Wetland Wildlife Sanctuary

Moeyungyi (erstwhile Mo Yin Gyi) Wetland Wildlife Sanctuary is the first and only Ramsar site in Myanmar. Its headquarter is in Bago town, Bago division. It was acceded to the Ramsar list in 2005. It is under the management jurisdiction of the NWCD of the FD.

The Sanctuary has covered areas belonging to Bago and Waw Townships (Bago Division), east of the Yangon-Mandalay Highway. Its altitude is circa 10 masl. The Sanctuary occupies about 10,000 ha (40 sq. miles). It is a small reservoir constructed in 1904 (primarily bunding) for floating logs from the forests. The reservoir also supplies water to about 7,500 ha of paddy fields.

The Sanctuary is surrounded by 17 villages that has a total population of about 50,000, who rely on the resources of the sanctuary for their livelihoods.

Major inflows to the Sanctuary are Pyin Bon Chaung (River), Wanbei In Chaung and Phayalay Chaung, whereas outflow goes to two rivers; Zwebat Chaung and Kabin Chaung through its 3 sluice gates at the east. The Sanctuary consists of numerous wetlands such as permanent



shallow water, permanent marsh, exposed mud land and shrubby wetland vegetation. These wetlands are very important for resident and migratory waterbirds.

The land use around the catchment is agricultural with rice being mainly grown.

The Sanctuary has been the ground of economic activities such as fishing (including eel and Tilapia fish), harvesting aquatic plants, rice cultivation, cattle and buffalo grazing and duck-raising. Concerning its functions, the wetland is probably important in maintaining groundwater level during the dry season, whilst it acts as flood storage area in the wet season.



Current management problems arise from illegal activities (electro-fishing, conversion of newly exposed areas for rice fields, buffalo grazing and bird hunting). Besides, there are some threats such as rapid spread of species like *Mimosa pigra* and water hyacinth.

6. Voices of the People

- 1) The NWCD has adopted people-centered approach, emphasizing primarily on community involvement and participation in wetlands. Local people who rely on natural resources do not get any support from outside. That is the reason why, they are the first target in our activities. Community engagement is already in place in Indawgyi wetland. Now the major concerns for the Division are to upgrade the Division's capacity, increase resources and expand networking.

---- *Dr. Naing Zaw Htun, Assistant Director, NWCD*

- 2) In order to ensure and enhance the collaboration among various stakeholders in Inle Lake, a Lake Development Authority (LDA) should be established, which should be autonomous with its own mandate. Experiences of successful authorities like International Lake Environment Lake (ILEC) of Japan, and Chilika Development Authority and Loktak Development Authority of India should be taken into consideration while making such decision. A quick visit to these areas would be an advantage. In this regard, the UNDP-Myanmar Project is considering the holding of a workshop in the beginning of next year. However, without any commitment from the higher level, this idea should not be pushed forward.

--- *U Htun Paw Oo, National Project Manager
Inle Lake Conservation and Rehabilitation Project*

- 3) The proposal of designating Inle Lake as a Biosphere Reserve is a good idea as it broadens the scope of the Sanctuary up to the catchment level. It provides an opportunity to prevent sedimentation from the rivers. The tag of ASEAN Heritage Park on the Sanctuary offers an opportunity for information sharing, cross-learning and possible technical support and enhances its access to regional ASEAN network.

--- *U Sein Tun, Park Warden Inle Lake Wildlife Sanctuary.*

- 4) Floating gardens have been practiced in Inle lake for generations. This has been one of the means of livelihood for the Inthas. The soil from the bed of the lake, which is rich in nutrient is used to grow tomato. Therefore there is no need of adding fertilizers to the bed. But pesticides should be used to control disease and insect infestation. Since tomato is grown in the rainy season, it brings more income to the farmers. Therefore, the technical support for reducing pollution would be highly helpful and useful.

--- *A Tomato Farmer, Nyaung Shwe*

- 5) The period from April to June is a breeding season for fish. This is the critical time we have to be careful, not to make any error that affects the breeding population of fish. Therefore, fishing is not allowed in the lake. Without making any alternative livelihood means for fishermen, it would be futile to strictly implement this restriction.

--- *A Participant in the Stakeholders Workshop, Nyaung Shwe*

6) The MOECAF is interested in, and willing to, nominate the Gulf of Moattam as the second Ramsar site. This is the wintering ground for the globally threatened spoon-billed sand pipers. BANCA has already collected necessary information for Ramsar Information Sheet. However, a tremendous opposition is coming from the Ministry of Transport, the Ministry of Energy, and the Ministry of Mining as they plan to construct port, build oil refinery and develop the area into a mine respectively. Because of this kind of vested interests, the proposal has not moved forward. Nor, has there been any effort towards its solution.

---- *U Maung Maung Pyone, Member, BANCA*

7) Illegal activities such as fishing and hunting continue in parks, reserves and sanctuaries. Villagers heavily rely on resources of the Sanctuary. People are grazing their cattle and buffaloes inside the protected areas. People are illegally cultivating rice inside the Sanctuary. The park does not have adequate resources. Nor, do they have adequate staff to deal with the situation. Therefore, the protected areas need both technical as well as financial support. The sanctuary people should sit together with villagers to thrash out the solutions. Likewise, they should also discuss with their fellow wardens, have the first-hand visit of the parks and learn the strategy they have adopted to solve their own problems.

---- *Dr. Thein Aung, Vice-Chairman, Myanmar Bird and Nature Society*

8) Siltation in Inle lake is a perennial problem. It is growing year by year. Yet, no effort has been made to prevent and stop the process. The action should take place ranging from the site to the catchment level. Recently, MOECAF has prepared a comprehensive LTRCP for inle lake with support from UN-Habitat and relevant stakeholder. The plan attempts to address many issues including that of siltation.

---- *U A Myat Thin, National Coordinator, UN-Habitat*



7. Findings and Discussion

In this section, major findings are presented, followed by a short discussion on each of them.

- 1) The 2011 NBSAP has integrated the concern of wetlands in its plan of action, which is inclusive but broad in scope. Wetlands are of priority areas and needs to be addressed immediately and systematically. It needs to be more specific, focused and issue-based. Therefore, we strongly recommends the implementation of the suggestion made in the book, *A Wetland Inventory for Myanmar (2004)*, which are mentioned in the Conclusion and Suggestion Section.
- 2) Our discussion with the staff of the NWCD and the two other sanctuaries (Inle Lake and Moeyungyi) clearly demonstrates that wetland sanctuaries are facing a number of problems but the principal one is the low capacity of the Division as well as the sanctuary. Without a capable manpower, wetlands can't be managed and conserved.



Therefore the team is of the opinion that major efforts should be made to upgrade the overall capacity of the staff in the Division as well as the sanctuary.

- 3) As water recedes within the Moeyungyi Wetland Wildlife Sanctuary, the newly-exposed areas in the Sanctuary are used by local communities for cultivating rice. According to our discussion with the park warden these cultivators are marginal farmers struggling for survival, not for commercial purpose. They have been practicing this tradition for generations. The Sanctuary has not been successful in controlling them. This is because of poor law enforcement, coupled with low resources and lack of staff. The Sanctuary can't patrol the area by both boat or on foot when there is low water. Because of this, local communities have been growing rice for generations. Therefore, in order to show goodwill to the local peoples and avoid any direct conflicts, the Sanctuary should begin an innovative approach of issuing license for rice cultivation in these exposed areas, if it does not affect the total biodiversity of the area. Licenses could be issued only to those

who abide by rules and regulations of not using any fertilizers and pesticides in these fields or, those who do the organic farming. We were told that these farmers do not use any manures in these fields as soil is highly fertile. In case the rice cultivation affect the biodiversity, then the Sanctuary staff should sit together and develop a new kind of rapport and goodwill with local communities who have been growing rice inside the Sanctuary.

Likewise, the Department of Irrigation regulates water into the reservoir in the Sanctuary, especially in the winter season whereas the Sanctuary needs water even in the winter season. This means that there is a conflict of interest between the Irrigation Department and the Sanctuary. In the absence of water, the wetland get deteriorated and thereby causing the loss of biodiversity. This needs to be solved by initiating dialogue between the local authorities of the Department and the Sanctuary. They should come up with a plan to create a win-win situation.

- 4) We discovered that over 15 stakeholders are directly involved in different activities in the Inle Lake Wildlife Sanctuary. However, there is no mechanism to bring them together and discuss the issues that directly affect them. Therefore, we came to a conclusion that a multi-stakeholder forum should be established for these stakeholders to involve them directly and coordinate their activities in the sanctuary. This mechanism might allow them to raise their voices and accommodate them in the planning, programming and implementation of the program in the wetlands. Likewise, to deal with the issue of conflicts among diverse organizations and coordinate wise use activities, the team suggests the implementation of the suggestion mentioned in the LTRCP of Inle Lake, i.e. the establishment of a wetland development authority for Inle Lake. This might provide a momentum for the restoration of the wetland in Nyaung Shwe.

In order to prevent any kind of pollution in the lake, the use of natural pesticide, *Azadirachta indica*, and organic farming should be encouraged. In this regard, more information can be found in BANCA (2011).

- 5) Communities such as fishermen or tomato growers around the wetland are relying on lake resources and doing their best for the protection of resources on which they depend for their livelihood. However, they are not involved in any decision making process. Therefore, a cooperative or an association would prove to be a good mechanism, where they can make their voice heard in the decision making process. This mechanism would also be useful to obtain their active involvement and participation. This would provide them opportunities for equal access for the conservation and sustainable development of the resource in the Inle Lake.
- 6) Tri-lateral jurisdiction of a wetland is a good arrangement for the protection of wetlands but it should be reviewed in light of the wise use of the wetlands. For example, the biodiversity of Moeyungyi wetland is affected by the regulation of water supply by the

Irrigation Department in winter and fish composition of Inle Lake has been affected by the fishing contract given by the Department of Fisheries. The conservation of these areas is the responsibility of the FD. There are always conflicts of interest among these agencies. The team is of the opinion that the jurisdiction of these wetlands should be in the hands of one agency so that the conservation goal can be met without any compromise. Therefore, the concerned authorities should sit together and come to a consensus for an overall sustainable utilization of the wetland site.

8. Conclusion and Suggestions

The report is the result of our discussion with key officials of the FD, park wardens, wetland experts, key informants, review of literature, and interaction with stakeholders in Inle Lake. The process was further enhanced by the rapid visits of Inle Lake at Nyaung Shwe and Moeyungyi Wetland Wildlife Sanctuary at Bago town, the only Ramsar site in Myanmar. Our findings lead us to conclude that despite resource constraints and low capacity of the implementing agency, Myanmar has done a lot in the conservation of wetlands and associated resources such as the joining the Ramsar Convention, establishment of several wetland sanctuaries, process of involving stakeholders in the wetland planning and implementation, developing an overall plan of the Inle Lake and even proposing a Lake Development Authority for Inle Lake. The works, initiated by the MOECAAF, on the land use policy and a proposal to set up a lake development authority for Inle Lake, are highly commendable as it attempts to look at the wetlands at its totality. And there are many forward-looking projects and programs undergoing in the country. Certainly, the wetland authorities and organizations of Myanmar deserve a special congratulation. The team would like to offer the relevant authority “good luck” with their mission for their conviction and commitment for the cause of wetlands in Myanmar.

The team is also of consensus that wetland conservation can be further catalyzed in Myanmar, should it get some additional support or resources. The present problems that have been obstacles in the promotion of wetland conservation and sustainable uses of resources in the country can be transformed into a window of opportunities if an integrated approach is taken into account. Therefore, the team would like to make the following suggestions to expedite the process of conservation, restoration and management of wetlands in Myanmar.

1. Organize a national level workshop so as to consolidate, document and disseminate works undertaken in wetland management.
2. Establish a high-level autonomous (with high mandate) Wetland Development Authority at the national level and its unit at each wetland sanctuary as well as in the nationally significant wetland site.
3. Develop a national wetland policy and strategy for sensitizing policy makers, planners, law makers and political leaders.
4. Upgrade the overall capacity of the FD and sanctuaries, especially through technical support, training, collaborative works and exchange program.
5. Create a favorable environment to implement the recommendations - formation of a National Wetland Committee, set up of a Scientific Advisory Committee, Development of a National Wetland Action Plan, and Formulation of a National Capacity Development Program - as mentioned in the 2004 document “*A Wetland Inventory for Myanmar*”-.
6. Establish stakeholder-centered platforms such as multi-stakeholder forum, fishermen’s cooperative and tomato farmers association both in Inle lake Wildlife Sanctuary and Moeyungyi Wetland Wildlife Sanctuary. These actions would raise the concerns, involvement and participation of stakeholders towards the wise use of wetlands and facilitate their access to the management of wetlands.
7. Compile, publish and disseminate the scattered works on Inle Lake, which has been done by various organizations including those prepared by UN-Habitat with support

from the Norwegian Government. The document would be highly useful to users and stakeholders.

8. Develop a participatory management plan for Moeyungyi Wetland Wildlife Sanctuary in a similar fashion like in Inle Lake Wildlife Sanctuary.

Reference

- Annonym (nd). *Wetland Conservation in Myanmar*. CMS/CAF/Inf.14
- Bird and Nature Conservation Association (BANCA) (2011). *Completion Report of the Integrated Multistakeholder Ecosystem Approach at Inle Lake (Myanmar) Based On Zoning Principles and Integration of Eco restoration and Agro farming Practices*. On <http://www.apfedshowcase.net/sites/default/files/FInal%20Report,%20Myanmar%202010.pdf> accessed on 9 October 2013
- BirdLife International Asia Division (2013). *Project for the Promotion of Wetland Management in South-East Asia*. A Report of the Ministry of the Environment , Government of Japan.
- Butkuns, Steve and Myint Su (2001). *Pesticide Use Limits for Protection of Human Health in Inle Lake (Myanmar) Watershed*. Olympia: Living Earth Institute.
- Davies, Jon, Anthony C. Sebastian & Simba Chan (2004). *A Wetland Inventory for Myanmar*. Tokyo: Ministry of the Environment, Japan.
- MOECAF (2013). *Long Term Restoration and Conservation Plan for Inle Lake, Southern Shan State*. Yangon: UN HABITAT and Norwegian Ministry of Foreign Affairs (In DVD-R), also a PowerPoint presentation.
- Norwegian Ministry of Foreign Affairs, MOECAF and UNDP (nd). *A Brochure on Inle Lake Conservation and Rehabilitation Project*. Myanmar
- Pyone, Maung Maung (2010). *Ecosystem-based Adaptation for Intha People in Myanmar*. A PowerPoint Presentation, BANCA and APED Project.
- Tanner, Paul (2013). World Heritage Site. On line <http://www.worldheritagesite.org/sites/t825.html>, accessed on 9 October, 2013.
- Than, Mu Mu. *Community Activities Contribution to Water Environment Conservation of Inle Lake*. Accessed on 10 October 2013. Irrigation Department, Myanmar. On line <http://www.wepa-db.net/pdf/0712forum/paper38.pdf>
- Tun, Sein (2013). *Current Education and Public Awareness Activities in Inle Lake Wildlife Sanctuary*. PPT Presentation, ASEAN Heritage Park Workshop, Philippines.
- UND Habitat-Myanmar (2013). *Proposed Long-term Restoration and Conservation Plan for Inle Lake*. A PowerPoint Presentation made at the Multi-Stakeholder Consultative Workshop by U Myat Thin (Organizer: Ministry of Environmental Conservation and Forestry, 12 September 2013).
- UNDP-Myanmar (2012a). *Inle Lake Conservation and Rehabilitation Project*. Myanmar.
- UNDP-Myanmar (2012b). *Annual Report on Inle Lake Conservation and Rehabilitation Project*. Myanmar
- UNEP/MOECAF/GEF (2011). *National Biodiversity Strategy and Action Plan*. Nay Pyi Taw: UNEP/MOECAF/GEF.
- Union of Myanmar (2012). *Environmental Conservation Law*. Nay Pyi Taw, Myanmar

Annex I: Schedule

- Day 1 (3 October):**
- Arrival of the team at Yangon
 - Meeting with Mr. Htun Paw Oo, National Project Manager, Inle Lake Conservation and Rehabilitation Project
 - Travel to Nay Pyi Taw and stay at Aureum Palace Hotel
- Day 2 (4 October)**
- Meet with the Ransar Focal Points and Officials of Nature and Wildlife Conservation Division
 - Visit to Gem Museum, Safari Camp and Oat Par Ta Thanti
 - Stay in Nay Pyi Taw
- Day 3 (5 October)**
- Travel to Shan State with the Park Warden
 - Interaction with Stakeholders at Inle Lake Wildlife Sanctuary
 - Stay at Remember Inn in Nyaung Sche
- Day 4 (6 October)**
- Observation of the lake by boat
 - Return to Nay Pyi Taw
 - Stay at Aureum Palace Hotel, Nay Pyi Taw
- Day 5 (7 October)**
- Drive back to Yangon
 - Visit to, and boating in, Moeyungyi Wetland Wildlife Sanctuary
 - Stay at Yoma Hotel, Yangon
- Day 6 (8 October)**
- Meeting with Mr. Htun Paw Oo, UNDP Myanmar
 - Meeting with Myanmar Bird and Nature Society, BANCA & MERN
- Day 7 (9 October)**
- Meeting with the UNESCO Head
 - Dinner meeting with National Project Manager, UNDP-Myanmar
- Day 8 (10 October)**
- Meeting with National Coordinator, UN Habitat-Myanmar
 - Wrap up meeting
- Day 9 (11 October)**
- Visit to the Yangon University, Yangon
- Day 10 (12 October)**
- Free and cultural tour of Yangon
- Day 11(13 October)**
- Departure

Annex II. Institutions and Persons

The institutions and persons contacted during the trip to Myanmar are alphabetically presented below. The date is given in the bracket.

1. BANCA (Biodiversity and Nature Conservation Society), Mr. Maung Maung Pyone, Member & MERN (Mangrove and Environment Rehabilitation Network) (8 Sept. 2013)
2. Forest Department, Dr. Naing Zaw Htun, Assistant Director, Nature and Wildlife Conservation Division (4 Sept. 2013)
3. Forest Department, Mr. Pye Soe Aung, Range Officer, Nature and Wildlife Conservation Division, (4 Sept. 2013)
4. Forest Department, Mr. Zin Phyo Han Tun, Range Officer, Nature and Wildlife Conservation Division (4 Sept. 2013)
5. Inle Lake Wildlife Sanctuary, Mr. Sein Tun, Park Warden (4-6 Sept. 2013)
6. Inle Lake Wildlife Sanctuary, Mrs. Sein Tun, Forest Officer (5-6 Sept. 2013)
7. Inle Lake Wildlife Sanctuary, Mr. Wai Yai Phyo, Range Officer (5-6 Sept. 2013)
8. Moeyungyi Wetland Wildlife Sanctuary, Mr. Khim Maung Hla, Park Warden (7 Sept. 2013)
9. Myanmar Bird and Nature Society (Htoo Foundation), Dr. Thein Aung, Vice-Chairman and Consultant, Htoo Foundation, (8 Sept. 2013)
10. UN Habitat-Myanmar, U Myat Thin, National Coordinator (10 Sept. 2013)
11. UNDP-Myanmar, Mr. Htun Paw Oo, National Project Manager, Inle Lake Conservation and Rehabilitation Project (3, 8, 9 Sept. 2013)
12. UNDP Myanmar, Mr. Saw Doh Wah, M+E Officer, Inle Lake Conservation and Rehabilitation Project (3 Sept. 2013)
13. UNESCO Myanmar, Mr. A Moe Naing, Programme Officer, Inle Lake Conservation and Rehabilitation Project (9 Sept. 2013)
14. UNESCO, Myanmar, Mr. Umar Sardar Alam, Head, (9 Sept. 2013)
15. Yangon University, Prof. Myint Thu Myaing, Law Department (on Telephone), (8 Sept. 2013)

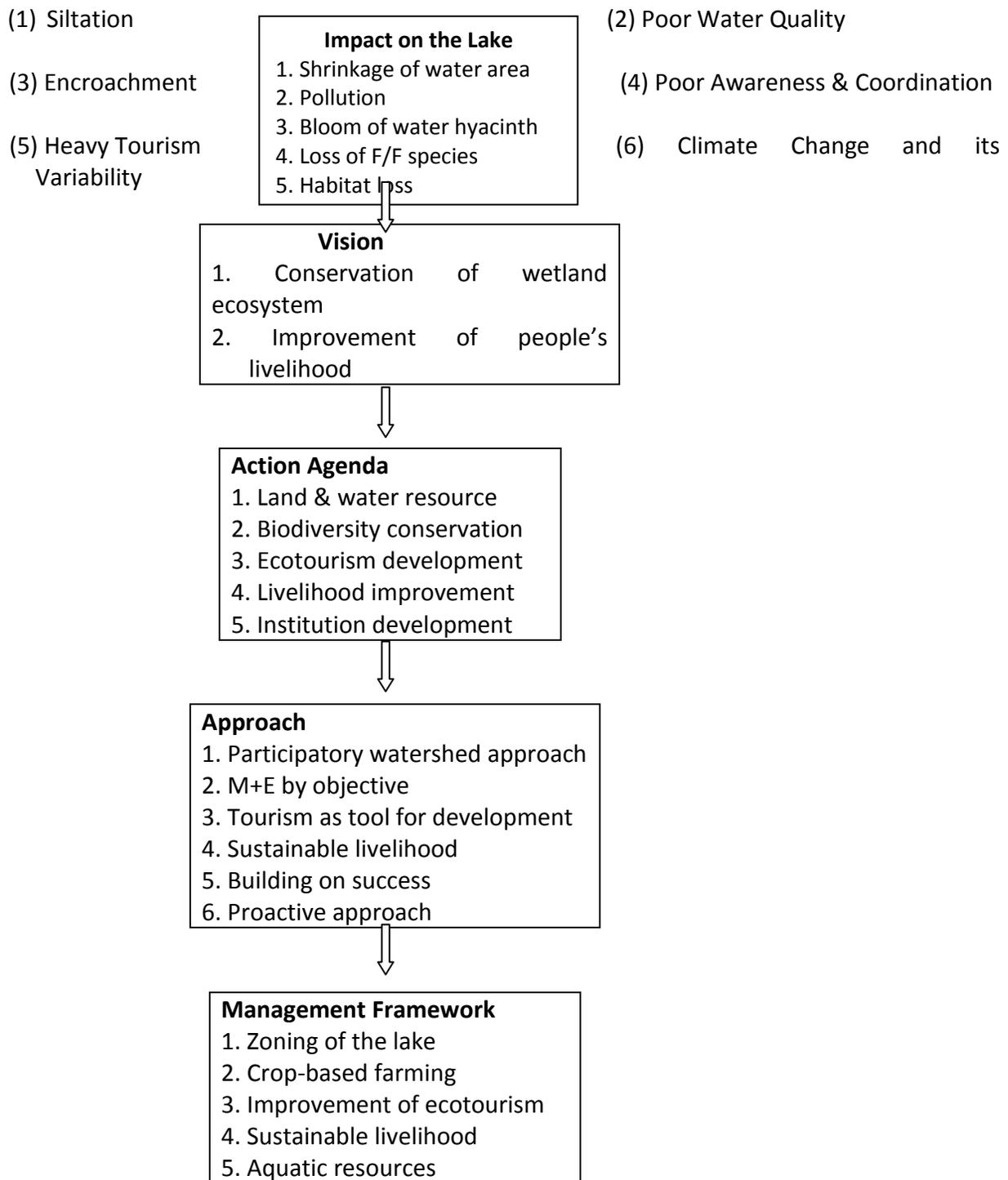
Annex III. Chronology of Development in Inle Lake

Chronology of Development in Inle Lake

- 1915 Agriculture Department initiates cropping designs in Taunggyi and Nyaung Shwe townships
- 1937 First survey of the Inle Lake and Soil Conservation Unit set up
- 1947 Public Awareness Measures taken
- 1951 Shan State Soil Protection Act No: 1 enacted
- 1962 Soil Conservation Unit disbanded
- 1985 Notification of Inle Lake as a Protected Area
- 1992 Catchment Level Efforts initiated
- 1996 Included in the tentative list of UNESCO World Heritage Site
- 2003 Declared as ASEAN Heritage Park
- 2008 Second bathymetric study conducted
- 2010 Visit of the President and prescription of major actions
Endorsed the Five-Year Action Plan (2010-2015)
- 2012 UNDP Myanmar implements Inle Lake Conservation and Rehabilitation Project
Workshop on Social Mobilization and Beneficiaries in Kalaw Township
UNESCO mission visits the lake
- 2013 Nomination of the lake to the Biosphere Reserve network

Source: UN-Habitat, 2013 and other sources

Annex IV. Overall Framework of LTRCP of Inle Lake



Source: MOECAP (As quoted in UN-Habitat 2013)

