

**CONSERVATION AND MANAGEMENT OF DEGRADED LAKE CHILWA
WETLAND AND ITS THREATENED WATERBIRD SPECIES IN ZOMBA,
MALAWI.**

FINAL REPORT

BY

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TABLE OF CONTENTS

Table of contents.....	1
Abbreviations.....	4
Chapter One.....	5
1.0 Introduction.....	5
Chapter Two.....	6
2.0 Study site.....	6
2.1 Social and economic value of Lake Chilwa and its Wetland.....	6
2.2 Specific objectives.....	7
Chapter Three.....	8
3.0 Methods.....	8
Chapter Four.....	9
4.0 Results and Discussions.....	9
4.0.1 Carry out reconnaissance survey to the study area.....	9
4.0.2 Conduct environmental education and awareness campaigns.....	9
4.0.3 Mobilise local communities and stakeholders to form active working groups	10
4.0.4 Train selected local communities and stakeholders on income generating activities.....	12

4.0.5	Lobby the Government to gazette Lake Chilwa a protected area.....	13
Chapter Five.....		14
5.0	Conclusion and Recommendations.....	14
5.0.1	Conclusion.....	14
5.0.2	Recommendations.....	15
Chapter Six.....		16
6.0	References cited.....	16

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ABBREVIATIONS

CBNRM	: Community Based Natural Resource Management
DNPW	: Department of National Parks and Wildlife
e.g.	: For example
i.e	: That is
NSO	: National Statistics Office
STA	: Senior Traditional Authority
TA	: Traditional Authority
WBMCs	: Water Bird Management Committees
WCs	: Wildlife Clubs

CHAPTER ONE

1.0 Introduction

Conservation and management of the degraded Lake Chilwa Wetland and its threatened waterbird species is an action plan directed at fulfilling the main obligations of the Ramsar Convention that is maintaining the ecological character and making wise use of the natural resources at the site.

Lake Chilwa Wetland is an important habitat for wildlife, but is also immensely valuable for the people who use the diverse and abundant natural resources found in it. In 1995, Lake Chilwa and its associated wetland dried up completely as a result of unsustainable water use and other natural resources such as over-exploitation of waterbird species. This dramatic event caused much suffering in the area and demonstrated clearly how important Lake Chilwa and its wetland are to the livelihood of the people (Malawi Government, 2001).

Further, Lake Chilwa Wetland is an important complex ecosystem where physical, biological and chemical components interact to perform a wide range of functions such as water storage, storm protection and flood mitigation, shoreline stabilisation and erosion control, ground water discharge and recharge, water purification, retention of nutrients, retention of sediments and pollutants and stabilisation of local climate such as rainfall and temperature.

Lake Chilwa Wetland is a cradle of biological diversity. It provides water and primary productivity upon which countless species of animals depend for survival. It supports high concentrations of birds, mammals, reptiles, amphibians, fish and invertebrate species which provide tremendous economic benefits. Some of these economic benefits include: water supply, fisheries, agriculture (i.e. rice and vegetable production), timber production, wildlife resources (e.g. waterfowl), building material (e.g. thatch grass), fodder, transport, recreation and tourism opportunities (Malawi Government, 2001).

Despite these tremendous economic benefits, most people which live around Lake Chilwa Wetland consider it as a wasteland and continues to be among the world's most threatened ecosystem, owing mainly to ongoing drainage, conversion, pollution and over-exploitation of it resources. This is true because Lake Chilwa Wetland is surrounded by a large and relatively poor (human) population which depends upon natural resources for survival (National Economic Council, 2005; NSO (2006)).

CHAPTER TWO

2.0 Study site

Lake Chilwa is a tropical lake without an outlet. It is located in South-eastern Malawi (latitude 15° 30' S and longitude 35° 30' E). It is one of the most densely populated wetland in Africa, with 163 persons/km² in the catchment, and 77,000 people living in the wetland itself (NSO, 2006).

Lake Chilwa wetland was over 2,400 km² in last decades and 32% of the catchment area is in Mozambique. Around 2005, the size of the wetland declined significantly to 1,750km² as a result of loss of habitats to subsistence agriculture as 10% of the wetland is under cultivation (Van Zegrene, 1998; Malawi Government, 2004).

Lake Chilwa is very shallow, averaging to 1-2 metres in depth with a maximum depth of 5 metres. Being shallow, it is prone to drying. The shallowness of the lake, its periodic drying and saline nature determines its unique assembly of flora and fauna (Malawi Government, 2001).

2.1 Social and economic value of Lake Chilwa and its wetland

Lake Chilwa's economic value is very considerable. The average yield of water bird (waterfowl) species which are trapped or shot and sold for food is estimated at US\$0.25 million per year much of which accrue to the local people. The average fish yield of 10,000 million is very considerable (Malawi Government, 2006).

There are also nine rice irrigation schemes in the Lake Chilwa wetland of which Domasi (Mpheta) is the largest. The benefit of the Domasi rice scheme is US\$1.2 million shared between 2,165 farmers, yielding an average income of US\$552 per person per year, ten times as much as ordinary smallholder farmers (Malawi Government, 2001).

Because of these socio-economic activities, it was realised that the actual size of the wetland ecosystem had been reduced from the original size of 2,400 km² to 1,750 km². These activities have also led to loss of suitable breeding and resting habitats for water birds and mammals. The number of bird species was reduced from 164 to 108 species due to over-exploitation for local consumption and sale. Other bird and mammals species were being killed without any proper reason because they were believed to be pests of crops. As a result, many species were threatened while others have become extinct.

As Lake Chilwa wetland supports forty-one species of palearctic migrant birds and fourteen species of intra-African migrant bird species, it was thought it wise that the integrity of the wetland should be restored in order to create a suitable environment which could attract more species of water birds and boost the reproduction of fish species in the lake for the benefit of the current and future generations.

2.2 Specific objectives of the project

The following objectives were developed and implemented in order to promote increase in reproduction of water bird, mammal and fish species in and around Lake Chilwa Wetland and to address environmental degradation that were taking place in the area:

- a) Conduct environmental education and awareness campaigns on the multiple benefits of the ecosystem and sensitize the communities on the dangers of destroying the wetland and natural resources;
- b) Integrate the local communities in natural resources and wetland ecosystem management;
- c) Mobilize local communities and stakeholders to form water bird management committees (WBMCs) and wildlife clubs to rehabilitate the degraded wetland and halt the killings of birds;
- d) Train selected communities on bee keeping, guinea fowl rearing, nursery establishment, tree seed multiplication and sustainable harvesting of natural resources and
- e) Lobby the Malawi Government to give Lake Chilwa Wetland ecosystem legal status to ensure sustained and improved management and conservation.

CHAPTER THREE

3.0 Methods

The outlined objectives in section 1.2 were achieved through:

- Organising and conducting sensitization meetings,
- Organising and conducting environmental education and awareness campaigns (organising drama, traditional dances and songs, production of leaflets, and posters), organising competition, c
- Conducting short training courses and organising consultative meetings and one day workshop.

CHAPTER FOUR

4.0 Results and discussion

4.0.1 Carry out reconnaissance survey to the study area

The project team visited the study site from 10th to 25th January 2006 with aim of sensitizing local communities and stakeholders (i.e. water bird hunters, farmers, fishermen, Forestry and Fisheries personnel) living in and around Lake Chilwa Wetland to inform them about the project, the aims of the project, expected outputs and to seek their support which could help to effectively implement the activities of the project and build the human capacity at grassroot and national level. The visit also aimed at sensitizing local communities about the importance of Lake Chilwa Wetland and the need to conserve it. Following this visit, six sensitization meetings (Fig.1) were conducted in forty-two villages in six traditional authorities (T.As) of Mposa, Mwambo, Chikowi, Kumtumanji, Nazombe and Mkumbira. One hundred farmers, 258 water bird hunters, 160 fishermen, 3 Fisheries personnel, 2 Forestry personnel and 250 local communities including 38 traditional leaders were sensitized on the importance of Lake Chilwa and its Wetland ecosystem. These groups of people were sensitized that wetlands such as Lake Chilwa in Malawi are vital because they rich in biodiversity, important for water storage, they protect storm and floods, they stabilise shoreline and control erosion, they recharge water, discharge water, purify water, retain nutrients, sediments and pollutants, and stabilize local climate conditions such as rainfall and temperature. People were also informed that wetlands provide tremendous economic benefits such as water supply, agriculture, timber production, building materials, wildlife resources (e.g. waterfowl), transport, recreation and tourism opportunities. It was pleasing to note that many people especially local communities, bird hunters and farmers were impressed with the sensitization meetings that were held in the areas as many of them openly confessed that they did not know that wetlands do provide this kind of valuable resources. They further reported to the project team that they were viewing wetlands as wastelands and that was why they were not taking part in any conservation efforts of this important wetland. They assured the project team that they were ready to work with them as the team would help them in promotion of availability of the wetland resources especially the delicate water birds for the present and future generations.

4.0.2 Conduct environmental education and awareness campaigns

In order to strengthen environmental education and awareness campaigns among local communities and stakeholders in the project area, environmental education and awareness campaigns were conducted through organising drama, traditional dances and songs (Fig. 2a,b). Further 1,500 posters and 2,000 leaflets containing environmental and biodiversity messages were produced and distributed to local communities and stakeholders. The messages contained in the posters and leaflets were in English and local language (Chichewa). The posters and leaflets were intended to strengthen peoples' knowledge on the uses and importance of the wetland. This was done to assist those people who could not understand English to also benefit from the important messages which were about the importance of conserving the wetland, the lake, water bird species, fish and other natural resources which are found

in and around the wetland. Drama, traditional dances, bands and songs were organised to take environmental messages to schools, communities and stakeholders (Figs.2a,b). These activities that were carried out in the project site had assisted teachers in primary and secondary schools and also religious communities to include environmental issues in their school curriculum and preaching in the districts. This would also help in strengthening peoples' knowledge on the management and wise use of the natural resources. In addition, local communities and stakeholders in the project site fully understand the importance of environmental management and the dangers that are associated with over-exploitation of natural resources such as waterfowls and other bird species (Fig. 3) including fishes and degradation of the wetland ecosystem. The results of these activities included active participation of different types of people in the management and conservation of the wetland and its biological diversity. People were voluntary joining the drama, local bands and participated in dancing and singing as one way of sensitizing other people and take environmental messages to their colleagues in the area so that they should also take part in the management and conservation of the wetland and its biodiversity.

4.0.3 Mobilise local communities and stakeholders to form active working groups.

The project team visited Lake Chilwa Wetland from mid to end April 2006. The aim of the visit was to meet and brainstorm with bird hunters, local communities, stakeholders, teachers and pupils, mobilize and lobby them to join the project team in the fight against over-exploitation of the water bird species and environmental degradation in the wetland ecosystem. To attain this objective, ten consultative meetings and eighteen workshops were organised and conducted in the project area. Participants were taught about the importance of sustainable management and conservation of the wetland and its biodiversity. At each meeting and/or workshop, participants were asked to form WBMCs and wildlife clubs (WCs) whose objective was to protect and jealously safeguard water bird species, rehabilitate strategic degraded habitats around Lake Chilwa Wetland where water birds nest and breed and also to establish bird sanctuaries in strategic points around the wetland. At the end of the consultative meetings and workshops, it was noted that fifteen waterfowl and water bird management committees (WBMCs) (Fig.12a,b) were formed around Lake Chilwa Wetland. These include Issa, Mtila, Khuzumbz, Masinde, Mposa, Mpheta, Namasalima, Khanda, Mbalu, Kathebwe, Chiwale, Chiwalo 2, Chisoni, Ngotangota and Chingoma (Fig.5). In addition to WBMCs, nine WCs were established around Lake Chilwa Wetland. It was pleasing to note that about 62 women joined these committees and clubs and some of them were elected as Secretaries and Chairpersons. These senior posts that some women hold encouraged other women to join these groups such that by the end of 2006, another forty women joined the established WBMCs and 100 pupils with the majority of girls joined the WCs. Another factor which boosted the increase of participation of women in management and conservation of water bird species and Lake Chilwa Wetland was competition which was organised and conducted in the study area (Fig.10). This attracted many people, young and old to take part in the project activities.

In the mean time, these committees have drawn up regulations controlling the hunting of water birds, in particular, the waterfowl in their areas, and have assumed responsibility for enforcing these regulations, including the imposition of penalties for

non compliance. These by-laws need to be officially ratified and given legal status at district levels. However, WBMCs have management objectives which aim at:

- a. Sustaining the optimum yield of waterfowl for food and sale through:
 - i. Prohibiting shooting of birds during their breeding season (in mostly January to May).
 - ii. Prohibiting all hunters of birds, both by shooting and trapping in the main breeding areas (Fig. 3).
 - iii. Protecting the habitat, especially in the waterfowl and other birds breeding areas, by prohibiting fires and wanton cutting down of trees and reeds.

- b. To fulfil the obligations of the Ramsar convention through:
 - i. Creation of nature reserves i.e protected areas free from any human disturbance, especially hunting, and to appoint and train wardens to after these areas.
 - ii. Provide legal protection through the Wildlife Act for endangered and vulnerable species of birds.

So far, thirteen waterfowl sanctuaries have been designated where waterfowls and other birds could nest and breed (Fig.5). This arrangement has resulted and promoted increase in the population of water bird species in the area through natural reproduction and immigration. Preliminary bird observation census has estimated an increase in the population of water bird species by 5% by the end of last year and a further increase of 8% by June 2007. This is a tremendous improvement in the management and the conservation of water bird species in the area.

It has also been observed that as a result of this project intervention, the rate of wetland resource clearing for irrigation farming (i.e. rice cultivation), bird hunting, fishing during off seasons, cutting down of small trees for fish curing and encroachment of wetland has significantly declined. It is, therefore, hoped that the whole wetland ecosystem will recover from anthropogenic pressure in next few years. It is also anticipated that the populations of both plants and mammals will increase as a result of these project interventions as human-wildlife conflict has significantly gone down.

Local communities and stakeholders were also sensitized on protection of water catchment areas, water conservation, sewage disposal and water quality, water monitoring, services of the Ministry of water supply and Development, WBMCs, CBNRM, urban water supply and rainwater –community based small earth dams. People were taught the importance of protection and conservation of upper catchment and that water should be conserved by building check dams and polders. It was also agreed by all stakeholders and local communities that polluter pays principle should be established in district authorities and laws and regulations should be enforced through fines to the district. It was also agreed that local by-laws should be established and implemented. People were also sensitized on proper use of agro-chemicals in the form of a “Growers Code of Conduct” as agro-chemicals have negative impact of the quality of water which eventually have negative impact on the survival of flora and fauna that are found in Lake Chilwa and its wetland (Malawi Governmnet, 2001).

4.0.4 To train selected local communities, WBMCs and stakeholders in bee keeping, guinea fowl rearing, nursery establishment, tree seed multiplication, management and sustainable harvest of natural resources.

Consultative meetings with bird hunters, fishermen, subsistence farmers, representatives of WBMCs and WCs including some selected local communities were organised and held in 42 villages around Lake Chilwa Wetland. The aim of the meetings were to mobilize these groups of people and representatives of WBMCs, WCs and local communities to form groups so that they should be trained in viable income generating activities such as bee keeping, guinea fowl rearing, management of their enterprises, processing of their products, storage, packaging and marketing skills. These income generating activities were conceived simply because during the onset of the project, many local communities including bird hunters, fishermen and subsistence farmers informed the project team that people were exerting much pressure on the wetland and its biological resources because they had no any alternatives which could help them to generate income and provide them with food. It was carefully thought that the introduction of these interventions would help to offset unnecessary pressure that people was exerting on the wetland and the biological resources to meet their livelihoods.

In total, 25 groups comprising 100 women and 115 men were trained in bee keeping and management (Fig. 6), guinea fowl rearing and marketing skills of their products. The results have shown that about 80% of these people trained had started harvesting good and high quality honey (Fig. 7) which fetches a lot of money at the local market. Similarly, other people had started rearing guinea fowl and one guinea fowl is one average sold at £7.25 and this has assisted many farmers, fishermen and bird hunters to abandon rice cultivation, and also fishing and hunting activities. These activities have also contributed greatly to the increase in number of water bird and fish populations and other biodiversity in and around Lake Chilwa Wetland. Part of the funds realised are used for conservation and management of the Lake Chilwa and its Wetland. Further, reduction in wetland cultivation followed by reduction in rate of deforestation on the upland areas has resulted in decrease of soil erosion, siltation and degradation of the wetland. This in the long run would bring sanity in the waters of the lake which eventually can be ideal for fish reproduction.

The project team also organised and conducted a week long training workshop on nursery establishment, management, tree seed collection, seed propagation, seedling management and sustainable management of natural resources. Sixty-three people participated and benefited from this workshop. Among those people who attended the workshop included traditional leaders, representatives of WBMCs and school pupils (Fig. 8). It has been observed that after the participants had acquired the relevant skills and knowledge in seed propagation, many WBMCs and traditional leaders have raised a good number of tree seedling which were Lake Chilwa wetland site adaptive. Some of the seedlings were planted in wetland degraded sites and other seedlings were sold to generate income which could be used to purchase additional nursery facilities and this would eventually boost the seedling production to be planted in many degraded areas in order to stabilise soil erosion and maintain moisture in the soil.

4.0.5 To lobby the Government to give Lake Chilwa Wetland a legal status to improve management and conservation of water bird species.

The project team organised and conducted ten consultative meetings in villages surrounding Lake Chilwa Wetland. The aim was to sensitize and brainstorm with local communities, traditional leaders and stakeholders on the need of gazettement of Lake Chilwa and its wetland as a protected area. Forty-two traditional authorities and 300 representatives of local communities and stakeholders were consulted to solicit their views regarding this issue. It was pleasing to note that over 90% of the people consulted were in favour of declaring Lake Chilwa Wetland a protected area as it supports many species of plants and birds. It is also a suitable habitat breeding nesting ground for the threatened waterfowls which are important for socio-economic development of the country. It was also agreed that in order to fulfil the requirements of the Ramsar Convention, there was need to set aside some areas of the wetland as a reserve. A possible site that was identified by stakeholders and some local communities was the Limbe Marsh, in STA Chiwalo's area which has also been declared as a bird sanctuary.

Following this, a one day consultative workshop was organised and conducted at Hippo View Lodge in Liwonde, Machinga. The workshop was attended by traditional leaders, governmental officials, church leaders and teachers (Fig. 9). One of the outputs of the workshop was that participants agreed overwhelmingly with the idea of giving Lake Chilwa Wetland a legal status. In this respect, participants asked the project team to write the DNPW to draft a policy to be forwarded to the parliament for consideration so that it could eventually be enacted in order to accord Lake Chilwa Wetland a legal status. Participants also strongly felt that the State of the Environmental Studies of Lake Chilwa and its wetland lists of birds, plants and animals are sufficient to make listing as protected species. The write has been written and the lists of species have been documented and submitted to the Director of DNPW for review and approval by the Wildlife Research and Management Board and gazettement in the Schedule of Protected Species should be done by the end of this year (2007). The Gazette update schedules of protected species under the National Parks and Wildlife Act (1994) and Forestry Act (1996) provide special protection for designated species, based on their threatened status or rarity (Malawi Government, 2001).

CHAPTER FIVE

5.0 Conclusion and Recommendations

5.0.1 Conclusion

The project has revealed that Lake Chilwa and its wetland support a variety of water birds, in particular, the waterfowls, plants and animals. It was revealed that these biological resources particularly waterfowls are under threat as a result of unsustainable exploitation for food and sale as the human population which surround this important ecosystem is poor and live below a poverty line where 95% of the population live on less than US\$1 a day (National Economic Council, 2005). The illiteracy rate in most of the districts which surround Lake Chilwa and its wetland is around 83% as many people like to go fishing in the lake and kill and trap water birds for food and sale (NSO, 2004).

High population growth coupled with illiteracy and poverty force people to over-exploit the biological resources and cause serious wetland degradation through rice farming. These activities had been noted to have negative impact on the survival of the species of the water birds, plants and animals and also loss of suitable habitats for palearctic and intra-African bird migrants.

However, it has been significantly noted that project interventions that were introduced in and around Lake Chilwa and its wetland have led to increase in the number of populations of waterfowls and other water bird species. There has been also an increase in fish stocks as many people have fully understood the importance of complying with off season regulation since it helps the fish to reproduce. The project has also contributed to establishment of bird sanctuaries, and nature reserve around Lake Chilwa Wetland. Since the inception of this project, there has been notable decrease in rate of deforestation in the upper, middle and lower lands and loss of suitable habitats for water birds as many people have stopped practising rice and vegetable cultivation in the wetland which had caused environmental degradation in and around Lake Chilwa and its Wetland. There has been notable decrease in these detrimental human activities because many local communities and stakeholders who were directly depending of the wetland resources were trained and given necessary skills which had helped them to venture into viable alternative income generating activities such as bee keeping, guinea fowl rearing, tree seed propagation (Fig.11) and marketing skills. These interventions have helped to offset pressure that was exerted on the resources for livelihood.

Sensitization, awareness and environmental education meetings that were conducted in many villages surrounding Lake Chilwa and its Wetland have helped to change the strange behaviour of local communities and stakeholders who were looking at Lake Chilwa Wetland as a wasteland. Since people have fully understood the tremendous benefits of this wetland, they voluntarily joined the implementation team and supported it until it came to an end. In the mean time, the WBMCs and WCs that were established in various parts of the wetland are managing and conserving the biological resources. They are also enforcing the regulations and by-laws that were formulated to protect the threatened water birds, plants and animals for the benefit of the present

and the next generations. Most importantly would be the gazettment of the Wildlife Act which help to give Lake Chilwa and its wetland a legal status and by virtue of these all water bird species, plants and animals will also be protected. This will eventually help to bring long lasting solution to nature conservation at Lake Chilwa Wetland.

5.0.2 Recommendations

- i. For this successful management and conservation of the Lake Chilwa Wetland to continue forever for the benefit of our sons and daughters, there is great need to develop monitoring programmes. These monitoring programmes will help in future to determine what effect the use of wetland resources and management interventions have on the wetland site.
- ii. There is great need to have the Lake Chilwa basin Authority which should comprise voting members from Machinga District Assembly, Zomba District Assembly, Phalombe District Assembly, Wildlife and Environmental Society of Malawi, Environmental Affairs Department and the Department of National and Wildlife. This Authority should be responsible for monitoring changes in ecological character of Lake Chilwa Wetland and review and give proper guidance on a work plan to be developed by WBMCs before implementation.
- iii. There is great need to explore and identify more alternative income generating activities (IGAs) for waterfowl hunters and fishermen during the closed season must form crucial part of such activities.
- iv. There is great need to introduce bird watching tours to the bird sanctuaries established in order to generate more money for the management and conservation of the wetland ecosystem.

CHAPTER SIX

6.0 References cited

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