

**Full Length Research Paper****Human Development and Wetland Conservation Policy**Fikirte Demissie Tulu<sup>ab</sup> and Mare Addis Desta<sup>bc</sup><sup>a</sup>Department of Geography and Environmental Studies, Bahir Dar University, Bahir Dar, Ethiopia.<sup>b</sup>Ethiopian Institute of Architecture, Building Construction and City Development (EiABC), Addis Ababa University, Ethiopia<sup>c</sup>Department of Geography and Environmental Studies, Wollo University, Wollo, Ethiopia.**\*Corresponding author: Fikirte D.T.****Abstract**

Wetlands are estimated to cover about 4 to 6% of the world's land. Wetlands provide many important services to human society. They are also among the most important and productive ecosystems on the earth due to their functions and attributes. The focus of this paper is to review human development and wetland conservation policy. The research methodology involved a comprehensive and systematic review of existing literature, an interview, and case studies. Review of the cases reveals that wetlands have played a significant role in the growth of human civilizations and cultural development. In Ethiopia wetlands are distributed in different parts of the country, in almost all ecological and altitudinal ranges covering approximately 2% of its total surface area. But excessive drainage for various purposes such as agriculture and eradication of mosquito, filling for various purposes such as settlement, blocking Feeder Rivers, pollution and mining are among the activities that affect wetlands on site. Ethiopia lacks a specific policy on wetlands that enshrines wetlands of the land from deleterious actions that affect their contribution to the national development. In a nutshell, lack of a comprehensive wetlands policy and implementing law coupled with the absence of an institution duly empowered to issue and implement wetland laws and coordinate management activities is the underlying cause for the deterioration of the wetlands of Ethiopia. Therefore, it is recommended for the country like Ethiopia to Ratify Ramsar would enhance the concern for protection and wise utilization of wetlands and policy formulation.

**Key words:** Ramsar convention, Wetlands, Policy, Wise use, Drainage, Ecosystem, Services.**Introduction**

Ramsar Convention Secretariat (2013:1) defines wetlands as "a wide variety of habitats such as marshes, peat lands, floodplains, rivers and lakes, and coastal areas such as salt marshes, mangroves, and sea grass beds, but also coral reefs and other marine areas no deeper than six meters at low tide, as well as human-made wetlands such as waste-water treatment ponds and reservoirs". According to Mitsch and Gosselink (2000) wetlands are estimated to cover about 4 to 6% of the world's surface. Wetlands are a phenomenon of flat terrain that occurs everywhere such as in river basins, from the head waters to the floodplains and the coastal zones. They also frequently develop in steeper terrains as groundwater discharge points. The Groundwater fed steep wetlands adjacent to hilly terrain can provide valuable and unique habitats in an otherwise upland landscape. Most of the freshwater used by humans comes from groundwater and surface waters such as lakes, rivers and generally wetlands. Thus, wetlands have a great influence on the quantity and quality of freshwater that are available for human use (Shewaye 2008).

Wetlands provide many important services to human society (Yilma and Gebeh 2003). The value of the wetlands for fish and wildlife protection has been known for more than a century now, but some other benefits have been identified more recently (Mitsch and Gosselink 2007). They are also among the most important and productive ecosystems on the earth due to their functions and attributes (Turner *et al.* 2000, Mitsch and Gosselink 2007). So, globally, wetlands are under heavy pressure. Despite the increasing recognition of the need to conserve wetlands, losses have continued unabated (Abebe and Gebeh 2003).

In the past, wetlands have been considered as "wastelands", which harbor disease vectors and dumping sites for all sorts of wastes. Due to this, they were regarded as obstacles to human development and this has led to large-scale drainage and conversion for alternative uses without any regard to their ecological and socio-economic values. Therefore, drainage and reclamation of wetlands to convert them into agricultural fields, human settlement and industrial development is one of the biggest threats to wetland conservation and management (Dixon *et al.* 2001).

Increasing human populations and change from subsistence to commercial exploitation of wetland resources continue to exert increasing pressures on limited wetland resources, resulting in a decline of services and quality, as well as quantity of products derived from wetlands (Ramachandra 2001). Apart from fishing, wetlands support agriculture, transhumance herding of domestic livestock, and hunting of wild herbivores migrating in response to flooding pattern. In the recent past, commercially sensitive and economically exploitative attitudes of society have subjected these ecosystems to stress, in some cases leading to alteration and hampering of their functions and their ultimate destruction or disappearance (Adams 1993 and Ramachandra 2001).

**Materials and Methods**

To conduct this study mainly secondary data and few primary data was collected using interview. Hence, comprehensive and systematic review of existing literature is reviewed. More specifically, the review focuses on human development, wetland destruction and wetland use and conservation policies of different countries. Moreover, interview was conducted with a wetland scientist from Ethio-wetland and Natural Resources Association.

**Human Development and Degradation of Wetland Resources**

Wetlands have played a significant role in the growth of human civilizations and cultural development. This is true globally, where major pre-historic civilizations, including those on the Nile, Euphrates and Tigris, have emerged and developed (Abebe and Gebeh 2003). Mesopotamia, the Nile delta in Egypt, Alexander’s Macedonia in the Axios marshes, Rome by the Pontine Marshes, the Netherlands, London, and the German Hanseatic towns situated in the flood plains of vast deltas are a few examples. In distant continents like the Mekong delta, the marshes in Central Mexico, and the inner Niger delta in Mali should also be mentioned (Matthews 1993).

Nonetheless, throughout the whole of human history, wetlands have remained in disrepute (Mitsch and Gosslink 2007 and Matthews 1993). Drainage and reclamation have always been considered civilized actions. Thus, over thousands of years, and especially over the past few centuries and far into the twentieth century, most and the vastest wetlands (e.g. wetlands of Southern Europe (Figure 1); China (Figure 2); and Sri Lanka (Figure 3) have disappeared (Matthews 1993; European Communities 2007; McCartney et al. 2010). Therefore, the major threats to wetlands include pollution, human settlement, agricultural drainage, deforestation, and degradation of watershed, soil erosion, siltation and the diversion of water supplies (Mellese 2008).



**Fig 1.** Drainage is the main cause of wetland loss and degradation, especially in southern Europe (Source : European Communities, 2007)



**Fig 2.** Unconverted wetland Farmland (Sanjiang Plain in Heilongjiang Province, China)



**Fig 3.** Inspection of the dried riverbed of the Great Ruaha River at NG’iriama, Usangu Plains, Tanzania

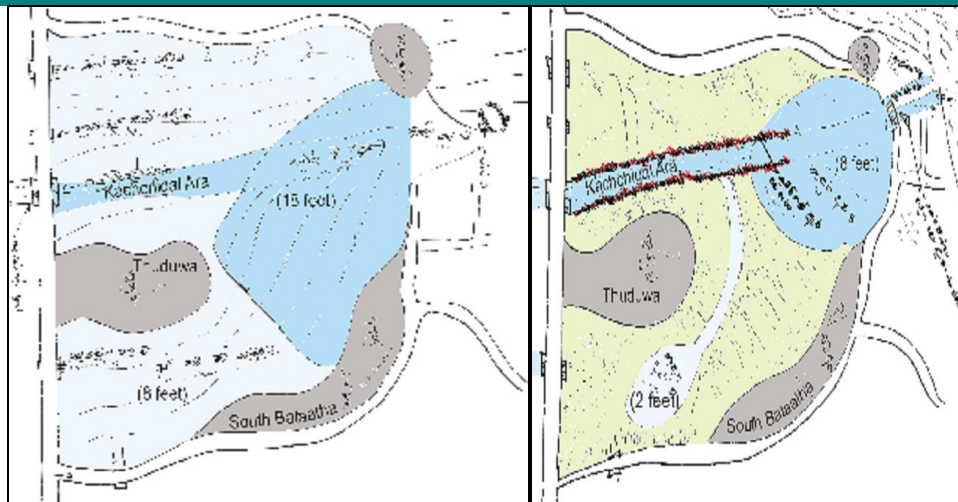


Fig 4. Resource maps as drawn by fisherman (a) wetland in the 1970s, and (b) wetland in 2001, Sri Lanka.

According to Ramachandra (2001), it is not surprising that the first sign of civilization is traced to wetland areas. The flood plains of the Indus, the Nile delta, and the Fertile Crescent of the Tigris and Euphrates rivers provided man with all his basic necessities. Water may be required for various purposes like drinking and personal hygiene, fisheries, agriculture, navigation, industrial production, hydropower generation, and recreational activities. The wide variety of wetlands, like marshes, swamps, bogs, peatland, open water bodies like lakes and rivers, mangroves, tidal marshes, and so forth, can be profitably used by humans for various needs and for environmental amelioration (Millennium Ecosystem Assessment 2005, Ramsar Convention Secretariat 2013; Abebe and Gebeh 2003). Ever-increasing population and the consequent urbanization and industrialization have mounted serious environmental pressures on these ecosystems and have affected them to such an extent that their benefits have declined significantly. Because wetlands are the most productive ecosystems in the world, by far outstripping some of the alternative uses to which they are subjected (Ramsar Convention Secretariat 2013; Abebe and Gebeh 2003). Wetland destruction and alteration has been and is still seen as an advanced mode of development, even at the government level. Wetlands and their value remain little understood and their loss is increasingly becoming an environmental disaster (Abebe and Gebeh 2003).

Furthermore, humanity continues to concentrate its population centers in coastal regions or in general on shorelines of standing and running waters. As humanity continues to grow and settle in such sites, coastal wetlands face an increasingly perilous future. As a result of human impacts, many coastal wetlands in the Western Hemisphere have already been lost. For instance, in Latin America and in the Caribbean Basin, pressures along the coastal zone currently are among the most serious problems facing natural resource management in the region. In the face of extraordinary external debt, rising populations, and widespread poverty, governments are attempting to expand agricultural and industrial production, while local inhabitants are using resources even more intensively to meet daily needs (Bildstein *et al.* 1991).

For centuries mankind has viewed wetlands as places to drain and convert to more obvious uses, such as agriculture. But the process had gone so far in the developed countries that the disappearance of wetlands was leading to undesirable consequences, such as, to the loss of groundwater reserves and the consequent need for irrigation, to flash floods, to shoreline destruction, to the accumulation of pollutants and to other subtle disturbances (Bakema and Mafabi 2003). Many useful plants and animals dependent on wetlands have disappeared with them. People interested in the conservation of waterfowl and fish were taking the lead in calling for a halt to wetland destruction in the developed countries. Losses were accelerating as extremely efficient machinery and techniques for draining wetlands were invented. The developing countries needed technical and financial assistance to avoid making the same mistakes, to treat their resources wisely (Matthews 1993).

The loss of ecosystem services of wetlands can have both economic and environmental consequences (Marti 2011). When human population increases to the point where the land is an urban-suburban sprawl, a wetland's functions can easily be overwhelmed with too much pollution or even too many bird watchers. In this circumstance wetlands are no longer effective in reducing floods, sequestering pollutants, or even supporting a diverse biota that is of interest to hunters, anglers, or bird watchers (Mitsch and Gosselink 2000). Approximately 50% of the world's wetlands have been lost in the past century alone. The major activities responsible for wetlands loss are urbanization, drainage for agriculture, and water system regulation. Development activities, like excavation, filling, draining, and so forth, are the major destructive methods resulting in a significant loss of wetland spatial spread throughout the country (Ramachandra 2001). Moreover, wetland loss and degradation has primarily been driven by land conversion and infrastructure development, water abstraction, eutrophication and pollution and over-exploitation. The continuing loss and degradation of wetlands are leading to reduction in the delivery of wetland ecosystem services, yet at the same time demand for these same services is projected to increase (McInnes 2007; Zedler and Kercher 2005).

According to the Millennium Ecosystem Assessment (2005), wetlands are the habitat that has been most affected by development and are being lost more rapidly than any other habitat in the world. Indeed wetland utilization itself results in both local and global impacts. Wetland conversion leads to a reduction in global-scale biological diversity as well as contributing to other global environmental change processes such as changes in the global carbon cycle. In turn, wetlands are impacted by the processes of global change (Adger and Luttrell 2000). As humanity continues to grow and settle in such sites, coastal wetlands face an increasingly perilous future. Humans impact coastal wetlands directly through (1) physical alteration, (2) the introduction of toxic materials, (3) enrichment with excessive levels of naturally occurring materials (including nutrients) and heat, and (4) the harvesting of native species and the introduction of exotic species (Bildstein *et al.* 1991).

Certain specific wetland types in Africa such as dambos, riverine wetlands and freshwater marshes are increasingly being used for agriculture and human settlement with little or no consideration for integrated planning or studies of their ecological/ hydrological functions and values to society at large. Similar threats are being experienced in wetland types such as the mangroves forests of West Africa which have been significantly reduced through rice cultivation and exploitation for wood.

Lastly, while food security continues to be a major goal for many African countries, a decision to map out different wetland types suitable for agriculture or other potential uses must be weighed against the potential costs. The costs are in terms of the role of wetlands in water security, other human needs and maintenance of national, regional and global biodiversity (FAO 1998; McCartney *et al.* 2010).

### ***Ecosystem Services and Functions of Wetlands***

The attitudes of people about wetlands have shifted enormously over the past several decades. At the time of the European migration, wetlands were regarded as nuisance barriers to travel and the expansion of settlement, and havens for dangerous predators and dread diseases (Leschine, *et al.* 1997). With industrial development and expansion of populations all over the world, trees and wetlands have had to be transformed into valued commodities through processes such as deforestation and filling of wetlands (Wattage and Mardle 2005; Wood 2001). Furthermore, wetland ecosystems, and particularly the ecological functions they provide (which are not bought and sold in markets), are typically undervalued in development decisions (Gawler 2002). However, the values of wetlands became more and more recognized that wetlands have a far greater importance for groundwater protection, regulation of the water cycle, water storage, water purification, and as an ecological basis for many forms of life, especially for fish (Wood 2001; Dixon and wood 2007). Wetland ecosystems, such as rivers, lakes, marshes, rice fields and coastal estuaries, provide many benefits that contribute to human well-being. These include fish and fiber, water supply, water purification, climate regulation, flood regulation, coastal protection, recreational opportunities and, increasingly, tourism (IWMI 2008).

Wetlands function as part of the landscape with or without the presence of humans. They have value because many of their functions have proved to be useful to humans. Wetlands do not just do one thing. They perform many processes simultaneously and therefore they provide a suite of values to humans. Optimizing for one is usually at the expense of another (Mitsch and Gosselink 2000).

Furthermore, the livelihoods of people living in, or on the borders of, wetlands often depend partially or entirely on wetland ecosystem services. Wetlands deliver a wide range of critical and important services. According to Ramachandra (2001) categorized values of wetlands occur at three levels of ecological hierarchy, namely, population, ecosystem, and biosphere. At ecological populations' level, wetlands provide food or fiber, which are the easiest values to estimate and agree on. Wetlands environment also provide pelts from muskrats, mink and beaver; waterfowl can be hunted or simply observed in wetlands. At the ecosystem scale, wetlands provide flood control, drought prevention, and water quality protection (Silvius *et al.* 2000; Zedler and Kercher 2005). These are referred to as ecosystem services because they synchronize most effectively the abiotic and biotic parts of the ecosystem. At the highest level, the biosphere, we know the least about values, and benefits accrue to the entire world (Mitsch and Gosselink 2000; Ramachandra 2001). Wetlands provide wide ecological and socioeconomic services. They also accommodate high biodiversity resource as they "borrow" species from both aquatic and terrestrial environments. They are, therefore, referred to as "Biological Supermarkets" (Shewaye 2008; Mitsch and Gosselink 2007). Moreover, wetlands are sometimes described as "the kidney of the landscape" because they function as downstream receivers of water and waste from both natural and human sources and have the capacity to retain excess floodwater during heavy rainfall that would otherwise cause flooding (Ramachandra 2001; Mitsch and Gosselink 2007). They stabilize waste supplies, thus ameliorating both floods and droughts. They also have been found to cleanse polluted waters, protect shorelines, and recharge groundwater aquifer (Mitsch and Gosselink 2007).

The values of wetlands are now recognized worldwide and have led to wetland conservation, protection laws, regulations and management plans (Mitsch and Gosselink 2007). The increasing recognition of the existence of environmental and social values of wetlands in the recent past has led to the need of shifting to a multi-attribute development system that recognizes those values as well as the traditional economic values (Wattage and Mardle 2005). Thousands of millions of dollars are spent each year in the industrialized world in order to restore the hydrological and biological functions which would be free of charge if wetlands had been conserved. Groundwater protection and water purification measures, in particular, swallow enormous sums. The re-establishment of formerly drained wetlands is therefore becoming more and more discussed. This is often considered as "expensive joke", but actually it is a very wise step towards a better economy in the future (Matthews 1993).

To conclude, wetlands have acted as important habitats for many ecological and socio-economic reasons, and continue to do so. The challenges for their conservation are vast and are unique to each case. Wetlands can provide a wide range of ecosystem functions, offering potential aesthetic, intrinsic, and monetary value (Marti 2011; Zedler and Kercher 2005).

### *Wetlands' Wise Use and Conservation Policies and Strategies*

Historical settlement patterns have concentrated along the coastline and interior waterways creating pressure to infill or otherwise degrade wetlands. Today waterfront properties tend to carry higher real estate values. The economic and other benefits of wetlands are often not directly measurable or recognized until they are lost. These factors have led to wetland conservation goals being in direct conflict with short-term individual economic goals. Only in cases of extreme wetland loss (such as our coastal marshes) or related environmental events (such as flooding related to storm surges), does the functional value of wetlands become apparent to the general public (Amezaga *et al.* 2002).

People have managed wetlands naturally for thousands of years. More than half of the world's population still depends on modified and intensively managed wetlands that provide rice and fish. However, in the quest for rapid economic growth, man focused greater attention on terrestrial resources and started considering wetlands as impediments to development. After large areas of natural wetlands in all parts of the world were totally lost by drainage and land-fills or were highly degraded by other human activities, the values and functions of natural wetlands are now being rediscovered. Mankind has been concerned with the use, management and conservation of wetlands since the beginning of civilization. It is only in recent decades that an emphasis on exploitation and modification for greater economic returns has caused much damage to the wetlands and management has been considered to be necessary. Now, there are different groups of people with interests in wetlands for various reasons and each group has a different role to play (Gopal 1991).

Conservation can be regarded as the medium- to long-term maintenance and protection of natural environments and the quality of their biological diversity. Maintenance and protection of the natural environments also includes ensuring the continued operation of ecological systems, such as the hydrological system and the atmospheric system. However, conservation does not mean that nothing can be used or changed. It includes the sustainable use of natural resources so that benefits can be obtained by people, without destroying those resources or undermining the functioning of ecological systems (Abbot & Afework Hailu 2001).

The great importance of wetlands for the conservation of the natural environment has gradually become known only over the past decades (Amezaga *et al.* 2002). Ornithologists were the first to support wetland conservation, because they wished to maintain the diversity of migratory waterfowl. Thus, the proposal for an international treaty to conserve wetlands first emanated from ornithological circles. The name of the Ramsar Convention to this day bears the appendage "*Epecially as waterfowl habitats,*" although, even in those days, twenty years ago, ornithologists looked much further ahead (Matthews 1993).

The degradation and loss of wetlands is more rapid than that for other ecosystems. Similarly, the status of both freshwater and, to a lesser extent, coastal species is deteriorating faster than that of species in other ecosystems. Wetland-dependent biodiversity in many parts of the world is in continuing and accelerating decline (McInnes 2007). Therefore, in 2 February 1971, Ramsar Convention on Wetlands of International Importance especially as Waterfowl Habitat is agreed and signed by representatives of 18 nations meeting in the Iranian town of Ramsar ([www.ramsar.org](http://www.ramsar.org)). In October 1996, it has been decided as 2 February as World Wetlands Day. This year February 2014, the 18th annual World Wetlands Day is celebrated round the world with the theme of "*Wetlands & Agriculture*", in recognition of the UN's International Year of Family Farming. As to the Ramsar Convention Secretariat (2013) as of December 2013, 168 nations have joined the Convention as Contracting Parties, and more than 2,170 wetlands around the world, covering over 207 million hectares, have been designated for inclusion in the Ramsar List of Wetlands of International importance.

Wetlands are the only single group of ecosystems to have their own international convention. The call for wetland protection gained momentum in the 1960s, primarily because of their importance as habitat for migratory species. The Ramsar Convention, which came into force in 1975, is an inter-governmental conservation treaty, where a framework for international co-operation was provided for the conservation of wetland habitats to ensure their conservation and wise use. On a national level many countries have installed national parks and nature reserves to preserve wetlands. Governmental and non-governmental listings of threatened species ('Red Lists') have added another measure to help protect wetland species from a changing wetland environment (Turner *et al.* 2000).

Most countries have indirectly helped wetlands in their physical planning at national, regional and local government levels. National environmental policies have also constrained the process of change in wetlands by encouraging the maintenance or restoration of clear water, maintaining the original hydrology, and fighting the problems of acid rain or the fragmentation of the ecosystems (Schulte-Hostedde *et al.* 2004). As many wetlands are of international significance and in this sense a global heritage, their protection should also be the responsibility of the international community buttressed by a new Global Ecological Framework to strengthen measures such as the Ramsar Convention (Turner *et al.* 2000).

Wetlands all over the world are threatened in spite of various international agreements and national policies. A failure of information and lack of understanding of the multitude of values associated with wetlands is largely due to the complexity and 'invisibility' of spatial relationships between groundwater, surface water and wetland vegetation. In addition, there have been policy intervention

failures, notably a lack of consistency among policies in different areas (e.g. economic, agriculture, environment, nature protection, physical planning) (Turner *et al.* 2000).

Increased awareness about the adverse environmental and socio-economic consequences of the unwise exploitation of wetlands has resulted in worldwide calls for the sustainable management of fragile resources. However, the sustainable use of wetland resources has increasingly proven to be an extremely difficult and frustrating task in many developing countries. At international level, the protection of wetlands is clearly reflected in the Ramsar convention. This convention plays an important role in facilitating the protection of wetlands of international significance. However, the full protection of the remaining wetlands in Kenya and in all other countries can only be achieved through implementation of management strategies at national or sub-national levels (Mironga 2005).

The Convention on Wetlands (Ramsar, Iran, 1971) is an intergovernmental treaty whose mission is “*the conservation and wise use of all wetlands through local, regional and national actions and international cooperation, as a contribution towards achieving sustainable development throughout the world*”. The concept of ‘wise use’ of wetlands recognizes the need to integrate conservation and development. It is acknowledged that, rather than simply protecting wetlands from all change, human development often necessitates alterations to wetland ecosystems. But, the ‘wise use’ concept advocates that, before any such changes are made, the processes that sustain the ecosystems need to be closely examined. Especially important is the need to identify and consider the value placed on wetland services by the people who use them directly. The 3rd Ramsar Conference of the Contracting Parties (COP3, 1987) defined the wise use of wetlands as: “*their sustainable utilization for the benefit of humankind in a way compatible with the maintenance of the natural properties of the ecosystem.*” As part of its definition of the wise use of wetlands, COP3 also defined “*sustainable utilization*” as: “*human use of a wetland so that it may yield the greatest continuous benefit to present generations while maintaining its potential to meet the needs and aspirations of future generations*” (Ramsar Convention Secretariat 2010).

Globally, there are over 890 Ramsar sites covering more than 60 million hectares, of which 72 sites are in Africa. These wetlands can be viewed as demonstration sites for the implementation of Wise Use concept. Ramsar promotes total watershed management as the best way to ensure the retention of methods and the services they provide. It can be argued that the greatest need for conservation and wise use of wetlands in Africa lies outside of designated protected areas (FAO, 1998). Moreover, wetland protection is the responsibility of provincial and municipal governments. Natural wetlands perform a variety of hydrologic and ecologic functions (e.g. water quality improvements, flood control, habitat), these areas should be protected from the impacts of water regime changes on upstream properties to ensure such functions are maintained. Informed decision making can only happen if all the relevant data are available, considered, and accurate (Schulte-Hostedde *et al.* 2004).

Significant negative change in ecological and hydrological character is occurring in permanent rivers, permanent freshwater marshes, sandy shores, permanent fresh water lakes, and brackish lagoons wetland types, both inside and outside Ramsar sites. This is attributed to poor land use practices in the catchment/watershed area, including unsustainable farming practices which lead to soil erosion and consequent siltation of wetlands; excessive use of fertilizers leading to eutrophication; and increasing use of pesticides which are transported downstream to the wetland sites. Large scale development projects such as the damming of rivers for hydroelectric power generation and irrigation projects, and the introduction of alien water species to fresh water lakes have also impacted on these wetland types (FAO1998).

A win-win scenario is where a wetland intervention results in measurable benefits to both humans and nature. When resources become scarcer, people have incentives to regulate use. In the short term, there will often be winners and losers, and losers may need to be compensated. Strategies for wise use mean taking the long-term view, and devising outcomes where all stakeholders can be winners. Experience shows that creative negotiation and trust are vital to create win-win situations (Gawler 2002). Because wise use, management and restoration of wetlands should help to build opportunities for improving people’s livelihoods, particularly for wetland-dependent, marginalized and vulnerable people. Wetland degradation affects livelihoods and exacerbates poverty, particularly in marginalized and vulnerable sections of society (Ramsar Convention Secretariat 2010).

Generally, the wise use of wetlands is impractical if the people who make use of them are not involved in one way or another. The involvement of such people and knowledge of their values is the basis for the implementation of wise use strategies. If many of the causes of wetland degradation and loss are of socio-economic origin, then social and economic factors need to form the crux of wise use programmes (Abebe and Gebeh 2003).

### ***Wetland Conservation Policy in Developing Countries***

Wetland environments support human populations and economic activities over wide areas, and represent a productive resource in a region of rising population and considerable poverty (Adams 1993). Wetlands act as sponges during dry periods of the year; they regulate run-off and recharge groundwater resources, and they purify water supplies (Mironga 2005). Their capacity to store water means they are able to support livelihood strategies, such as fishing, pastoralism and agriculture, as well as providing craft materials, clean drinking water and medicinal plants. People’s long association with wetlands means that indigenous systems of wetland management and utilization are to be found throughout the developing world (USAID 2008).

Throughout the developing world, local people have a long association with wetlands, and as a result, local institutions and institutional practices have developed which have sought to sustain the multiple benefits from wetlands (Dixon and Wood 2001). Local institutions are usually rooted in community social capital, rather than external, top-down decision-making processes, hence

they are dynamic, flexible and responsive to societal and environmental change, and have been regarded as important 'buffering' mechanisms that promote sustainability and resilience at the environment and society interface (Maconachie *et al.* 2008). In the Third World entire populations depend essentially upon wetlands (Matthews 1993). Wetlands are becoming increasingly recognized as important natural resources in developing countries because of their ability to fulfill a range of environmental functions and produce a number of products that are socially and economically beneficial to local communities (USAID 2008).

Despite the global recognition of the importance of wetlands as key livelihood resources, there have been conflicting approaches by African states to these areas, which predominantly either see them as areas to protect for environmental reasons or to use for commercial agro-development. State preferences for such single land-use, characterized by intensive cultivation or conservation sites, are often directly at odds with local preferences for mixed, multiple-use wetland regimes which can meet a variety of local needs and are potentially more sustainable. Although government policies on wetlands frequently embrace the rhetoric of '*multi-stakeholder participation*' in wetland management for local, national and international sustainable development agendas, rarely has the debate involved any serious discussion of local community needs or the institutional arrangements developed by communities to achieve these goals (Maconachie *et al.* 2008 ).

People in rural Africa depend heavily on various natural resources, and any decline in these, whether through restricted access or a diminishing resource base, is likely to affect local livelihoods negatively. Competing interests over resources constitute a threat to availability and access, and thus to livelihood security. In many parts of Africa in particular, agricultural use of wetlands has increased as more and more people have been forced to seek new livelihood strategies, as a result of environmental degradation of other farmlands and population pressure. Wetland agriculture, especially where drainage structures and water management are involved, is a prime example of a natural resource management activity requiring such coordinated effort. Customary multiple-use wetland regimes are based on experience built up over generations by local communities (Maconachie *et al.* 2008).

Government policies that have failed to recognize the significance of local wetland management practices, and indeed the wider value of wetlands, have also stimulated the intensification of wetland agriculture, in an attempt to create more economically productive land. Whilst a Malthusian perspective would argue that such degradation is unavoidable, alternative perspectives in recent years have drawn attention to the ability of local people themselves to adapt their natural resources management (NRM) systems to changes taking place, enabling resources use to remain sustainable (USAID 2008).

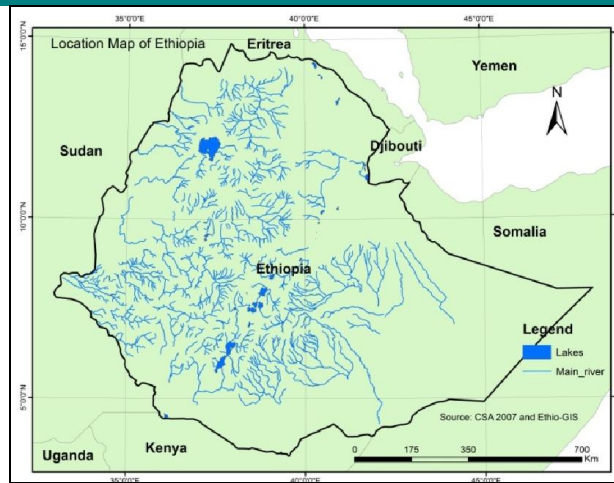
Of critical significance for wetland management is the way in which the social capital and relationships of reciprocity that exist between farmers are reshaped by more powerful actors, and affect the character and strength of community-based institutions. The co-ordination of activities within a community remains critically important to the management of wetland resources, where one farmer's actions directly affect another's. In this respect, the formation or existence of institutions that governs management behavior is particularly vital, and reflects the need for co-ordination of activity in working towards a particular goal, which could probably not be fully achieved by individuals alone. Wetland management, particularly resource access and control, is shaped by the intersection of various institutions and the relationships of power and authority that exist between them (Maconachie *et al.* 2008).

Most development projects can have a significant impact on floodplain environments and very often these impacts seem in large part negative. The impacts are particularly severe because knowledge on the part of engineers, economists and other planners about the ecology and human use of wetlands in Africa remains limited (Adams 1993). Quantifying and evaluating wetland conservation benefits in a way that makes them comparable with the returns derived from alternative uses can facilitate improved social decision making in wetland protection versus development conflict situations (Turner *et.al* 2000).

Generally, largely the historical losses of wetlands have been least in the developing nations of the world but future wetland losses will be greatest. It is in these countries where the traditional association between human communities and wetland ecosystems has been retained most firmly and intimately that the subsequent loss of human values will be greatest. However, the implications of the policy, which relies on substantial funds for mitigation and rehabilitation schemes, are of debatable relevance to the poorer nations of the world. The traditional conservation view has been to protect wetlands because of their unique, rare or endangered flora and fauna (Maltby 1991).

#### **Wetland Conservation Policy in Ethiopia**

Ethiopia is a country in North-Eastern Africa lying between 8° 00' N and 38° 00' E. Its area covers an estimated 1,127,000 Km<sup>2</sup> of which some 7,444 Km<sup>2</sup> is covered by water (Abebe and Gebeh 2003; Figure 5). In Ethiopia, local institutions have developed both in recent decades in response to land reform and increased access to wetlands, as well as in previous times before the 20th century under traditional institutional arrangements governing local natural resources. These institutions have developed rules concerning 'best management practices' in wetlands, to ensure that drainage is coordinated and wetland use is managed in a way which prevents serious environmental damage (Maconachie *et al.* 2008).



**Fig 5.** Lake and Main River map of Ethiopia

The Ethiopian wetlands are distributed in different parts of the country, in almost all ecological and altitudinal ranges covering approximately 2% of its total surface area (EPA 2004). The Dallol depression which is located at about 110m below sea level flourishes with wetlands such as Lake Afdera (salty lake). Swamps, lakes and riverine ecosystems are also distributed in central highlands, rift valley areas and mainly in the southwest borders of the country. The country lacks wetland database as comprehensive wetland study has not been carried out yet. The existing estimations of its extent are based on some general environmental assessments. One of the latest wetland assessments is the inventory which was undertaken by the Federal Environmental Protection Authority. This assessment has documented 43 wetlands from the southern (partly following the rift valley line), western (partly from Jima and Gambela line), central and northern parts of the country. Wetlands in the north-eastern, eastern, south (in the Bale, Arsi line), south (in Kafa, Maji line), west (in Ben Shangule line) and in border areas were not assessed (Shewaye 2008).

Moreover, Ethiopia possesses a great diversity of wetland ecosystems (swamps, marshes, floodplains, natural or artificial ponds, high mountain lakes, and micro-dams) as a result of the formation of a diverse landscape subjected to various tectonic movements, a continuous process of erosion, and human activities. The different geological formation and climatic conditions have endowed Ethiopia with a vast group of water resources and wetland ecosystems, including 12 river basins, 8 major lakes, and many swamps, floodplains, and man-made reservoirs, with a total annual surface runoff of about 110 billion cubic meters (USAID 2008). With the exception of coastal and marine-related wetlands and extensive swamp forest complexes, all forms of wetlands are represented in Ethiopia. These include alpine formations, riverine, lacustrine, palustrine and floodplain wetlands (UNESCO 2004). However, wetland resources of Ethiopia are not fully documented, it is known that they represent a significant micro-environment in many parts of the country and there is also obvious gap of wetland data in the country (Shewaye 2008; Wood 2001).

The need for wetland resources is increasing with the growing population of Ethiopia and associated shortage of raw materials such as fuel wood, water, grass, agricultural land etc, in the uplands. Excessive drainage for various purposes such as agriculture and eradication of mosquito, filling for various purposes such as settlement, blocking Feeder Rivers, pollution and mining are among the activities that affect wetlands on site. There are also off site problems which originate outside the wetland and affect wetlands. For instance, siltation of wetlands due to accumulation of silt eroded from degraded uplands. Build up of silt has changed the characteristics of several wetlands in the country and opened way for land use change. Among wetlands which have been converted to dry lands due to siltation and unregulated water abstraction is Lake Alemaya (Brook 2002).

Wetland cultivation is a reality in many parts of Ethiopia, with wetlands sometimes providing up to 100% of the food supply during dry summer months (Marti 2011). Ethiopia is a country that is better known for recurring droughts and extensive dry lands. This notion presents the impression that the country has minimal water resources not to mention its potential of providing millions of m<sup>3</sup> of water to other neighboring countries. On the contrary, Ethiopia is rich in water resources that are exemplified by various types of wetlands (UNESCO 2004).

Ethiopia lacks a specific policy on wetlands that enshrines wetlands of the land from deleterious actions that affect their contribution to the national development. The government has expressed its promise to protect the environment in different policy documents such as the Constitution and Environment policy. However, various competing national priorities such as expansion of agricultural areas to increase food production, resettlement of landless people and investment activities in wetland areas are accelerating wetland loss in different areas (Shewaye 2008; Dixon and Wood 2007).

Federal and regional government policies and laws are silent regarding protection of wetlands that are important in preserving the balance of the ecosystem. Consequently wetlands have been allocated to farmlands in many places (ECSNCC 2011). Even though Ethiopia is not signatory to the convention on wetlands, a significant proportion of its wetlands qualify as wetlands of international



importance. Thirty-one sites, which are important bird areas, are potential sites that could easily fulfill candidacy as wetlands of international importance (UNESCO 2004).

The Ramsar convention has not been signed by Ethiopia and so there is no related legislation. The conservation strategy of Ethiopia (CSE) and the water resources management policy are the only formal government policy statements to make mention of wetland (Wood 2000; UNESCO 2004). However, they address them indirectly focusing them as regulators and of water quality in the CSE, and for their biodiversity and assimilative capacity against pollution in the Water resource management policy. Hence, it is clear that at the national level wetland are not on the policy agenda in their own right. Indeed, it might be said that there is a policy vacuum when it come to the consideration of wetlands in their own right (UNESCO 2004).

According to Wood (2000) there is little attention given specifically to wetlands in their own right in Ethiopian government policies and legislation. This is due to wetlands are small ecological niches which have not attracted much attention from policy makers unlike major ecological areas and their resources such as forests, arable land and pastures. However, at lower level mainly the community, there is evidence of policies specifically designed for wetlands, for instance to protect wetlands for reed production or for cultivation rather than allowing open access for cattle grazing. The sustainability of wetland management is facilitated in many areas by the presence of local institutions specifically formed to co-ordinate and empowers wetland management activities. Whilst most are relatively recent, being associated with the expansion of wetland cultivation since the 1960s, investigations have shown that there are traditional institutions for wetland management in some parts of Illubabor which have long history (Dixon and Wood 2001; Dixon and Wood 2007).

Many of the Ethiopian policy, legal and strategic documents do not directly mention wetlands. However, conservation, management and wise utilization of natural resources have been touched by many documents. The F.D.R.E. Constitution does not make a direct reference to wetlands. Since wetlands are part and parcel of natural resources, it would be appropriate to consider constitutional provisions which deal with natural resources and the environment. The Environmental Policy of Ethiopia (1997) is made with the overall policy goal to improve and enhance the health and quality of life of all Ethiopians and to promote sustainable social and economic development through the sound management and use of natural, human made and cultural resources and the environment as a whole so as to meet the needs of the present generation without compromising the ability of future generations to meet their own needs.

The Environmental Policy specifically deals with water resources in its section 3.4. Under this section, policies regarding wetlands are:

3.4. b. To recognized that natural ecosystems, particularly *wetlands* and upstream forests, are fundamental in regulating water quality and quantity and to integrate their rehabilitation and protection into the conservation, development and management of water resources;

3.4.d. to promote the protection of the interface between water bodies and land (e.g. lake shores, river banks and *wetlands*)

3.4.g. To subject all major conservation, development and management projects to the environmental impact assessment proves and to include the costs and benefits of protecting watershed forests, *wetlands* and other relevant key ecosystems in the economic analysis of such water projects.

As can be seen from these specific policy elements, wetlands are fundamental ecosystems for the regulation of the quality and quantity of water resources, before starting any activity that could affect wetlands, EIA must be conducted and the economic values of wetlands must be considered. Similarly, some NGOs have identified wetlands as key resources and they have developed policies to support communities using them as an alternative to forest clearance (Shewaye 2008).

A key informant interview undertaken with Mr. Shewaye (a wetland scientist in Ethio-wetland and Natural Resources Association), reveals that despite the noble efforts of his organization to formulate and institutionalize wetland policy in Ethiopia, little attention is given to wetland policy formulation in Ethiopia.

The Ethiopian Water Sector Policy 2001 is issued with the belief that an appropriate water resources management policy for the sector will enhance the development of the country's water resources to make optimum contribution to an accelerated socio-economic growth. The policy does not mention wetlands in its contents. However, it gave meaning to wetlands in its glossary part, where wetlands are defined in exactly the same way as in the Ramsar Convention (MoWR 2001). Moreover, River Basin Councils and Authorities Proclamation no. 534/2007 mention wetlands in article 5, "Water Resources" means the availability, both in quantity and quality of surface and ground water in a river basin including aquatic ecosystems and wetlands.

On the other hand, Ethiopia has participated in Ramsar Regional and COP Meetings as observer and maintains good communication with the Ramsar Bureau. Using the financial support from the Ramsar Bureau, the Federal Environmental Protection Authority (FEPA) has organized Accession Workshop which took place on March 18-19, 2004 in Addis Ababa, Ghion hotel. Key governmental and non-governmental organizations working in the Federal and Regional States have participated on the National Consultative Workshop (EPA 2004). As per the Proceedings of the workshop, consensus has been reached that the Ethiopian Government should ratify the Ramsar Convention and in line with the convention's requirement a National Committee was formed to identify the first Ethiopian Ramsar site. Accordingly, the National Committee selected Abijata-Shalla as the first Ethiopian Ramsar Site (Ababu 2008).

Generally, Ethiopia has not yet ratified the Ramsar Convention and that has its own negative effects on the protection and sustainable utilization of wetlands. Because by Ratifying the Ramsar Convention, countries get benefits such as financial, technical, expertise and other assistances in identifying, protection, sustainable utilization in relation to wetlands. Moreover, ratifying Ramsar would facilitate the implementation of other international conventions such as the Convention on Biological Diversity. It is clear that ratifying any international legal instrument imposes some obligations on the ratifying country. Such obligations, however, do not affect the sovereign rights of nations. For instance, if Ethiopia ratifies the Ramsar Convention, it does not mean that it would forfeit its rights and powers over its wetlands (Ramsar Convention Secretariat 2013). Therefore, lack of a comprehensive wetlands policy and implementing law coupled with the absence of an institution duly empowered to issue and implement wetland laws and coordinate management activities is the underlying cause for the deterioration of the wetlands of Ethiopia (Shewaye 2008).

### ***Case Summary of Wetland Management and Policy: The Ugandan Experience***

Uganda is located in East Africa. Before 1986 the wetlands of Uganda had faced a number of problems such as drainage of Wetlands, introduction of new crops (like rice), pollution especially from copper mining activities, over-harvesting, reclamation for industrial developments, and human settlements in swampy areas (unplanned settlements e.g. slums). However, in 1986 the Government imposed a ban on large scale drainage of wetlands due to the negative consequences of such drainage which had already been observed in Southwestern Uganda. This was a stopgap measure intended to last until a proper policy was put into place. This was followed by the establishment of the National Wetlands Conservation Programme in 1989 which was charged with the formulation of a National Wetlands Policy (Ntambirweki 1998).

In Uganda, management of wetlands is of key importance because 10% of Uganda's Land area is covered by wetlands. The wetlands are spread throughout the country. Uganda acceded to the Ramsar Convention on 4th March, 1988 and the Convention entered into force on 4th July 1988. Uganda, therefore, was under an obligation to implement then convention in her national laws (Ntambirweki 1998).

The Uganda National Wetlands Programme (NWP) story starts in 1986, when the then new Movement Government under President Yoweri Museveni, placed a ban on further wetland drainage until a policy on the sustainable use of wetlands could be developed. This position was the government's reaction to widespread and uncontrolled drainage of wetlands in the west of the country, which started to affect water availability during the dry season and allegedly changing the micro-climate in affected districts (Bakema and Mafabi 2003).

According to Bakema and Mafabi (2003), three years later, the National Wetlands Programme's first phase started with technical assistance from IUCN. The sole purpose of this phase was to develop a National Wetlands Policy. In subsequent years, it became clear that a much wider, multi-pronged approach was required to achieve the goal of sustaining Uganda's wetland resources. Through experiences over the last ten years, the NWP has identified six key strategies that must be pursued more or less simultaneously to achieve sustainable wetland management. These are:

- create an awareness and appreciation of wetland functions and values at all levels of society;
- develop a knowledge and understanding of wetland stocks and the ecological and hydrological processes of wetlands;
- develop a knowledge and understanding of the socio-economic uses of wetlands;
- develop a wetlands policy, legislation and wise use criteria, and incorporate or harmonize wetland issues in other laws and policies;
- develop an institutional framework and capacity for wetland management in the government and civil society; and
- develop best practices for sustainable resource use and wetland system management.

For the NWP, the vision has evolved over the last ten years with increasing insights gained during programme implementation. Today, it emphasizes the importance of wetland appreciation, and a commitment to sustainable wetland management to benefit the people of Uganda and its environment (Bakema and Mafabi 2003).

Generally, Uganda has spent ten year to develop its wetland policy by using different strategies and methods. Because without the support of local users, politicians and institutions for sustainable wetland management, laws and policies will have no serious impact on the state of the wetlands in a country.

### **Lessons for other Countries**

From the review made important lessons are drawn for the countries that do not have wetland policy and don not ratify the Ramsar convention. The lessons drawn are:

- developing a public education plan on the importance of the wetlands,
- Encouraging NGOs and interested institution that works on the wetland management,
- Strengthening local/community concerns for the wetlands a case in Illubabor, Ethiopia,
- assigning agencies and organizations to conduct research, make inventories and conduct evaluations and monitoring of wetlands,
- establishing efficient and effective mechanisms for the co-ordination and collaboration of stakeholders involved in wetlands utilization and management, at national, local and user levels and
- Ratifying Ramsar would enhance the concern for protection and wise utilization of wetlands and policy formulation.

## Conclusion

Wetlands are estimated to cover about 4 to 6% of the world's land. Wetlands are a phenomenon of naturally flat terrain. Wetlands occur everywhere in the river basin, from the head waters to the floodplains and the coastal zone. Wetlands have historically been regarded as wastelands, which harbor disease vectors. Therefore, they were regarded as an obstacle to human development and this has led to large-scale drainage and conversion for alternative uses without regard to ecological and socio-economic values.

On the other hand, the attitudes of people about wetlands have shifted enormously over the past several decades. However, the values of wetlands became more and more recognized that wetlands have a far greater importance for ground water protection, regulation of the water cycle, water storage, water purification, and as an ecological basis for many forms of life, especially for fish. Wetlands do not just do one thing. They perform many processes simultaneously and therefore they provide a suite of values to humans. Moreover, worldwide, wetlands are known for their ability to support a large human population and hence, sustainable utilization of wetland resources is very important. Therefore, its conservation needs effective legislation, which takes into account the diverse nature of wetlands and is supported by effective enforcement and resources. Moreover, the legislation must take into account the needs of wetlands and the requirement of all the sectors that use them otherwise the destruction may continue by reasons such as development and population increment.

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