

Socio-economic values, threats and legal protection aspects of wetland ecosystem in Afar region, Ethiopia

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Abstract - A large Proportion of household (96%) were found to be dependent on Meteke Wetland. 90% respondents replied that their family members go to the wetlands every day for various reasons. Selling mattress and reed took the loin share sources of livelihood which was followed by collection of wood for household energy, house constriction and furniture making. Majority (45%) of the households had incomes within the range Birr 1001 to birr 1500, followed by(20%) birr 501 to birr 1000. About 92% of households had no educational background. The amounts of waste being dumped directly into the wetland by Car washing and urban settlement were increasing. Expansion of urbanization were growing towards the wetland areas.76 % of the households stated that the wetlands were shrinking in size.8 % of the households stated that the wetlands were expanding while 6 % of the households evaluated the wetlands as being not detect any change and 10% of the households evaluated the wetlands as fluctuating. The possible causes for shrinking the wetland provided by 80% of the respondents were the decrease in vegetation cover, expansion of urbanization in the areas, the increase use of water while another 20 % did not know the reason behind the shrinking. With respect to vegetation cover over time on the wetlands concerned, the survey indicated that the majority of households (77 %) said that the vegetation cover on the wetlands were decreasing while 9 % of the households felt that the vegetation cover was increasing but still another 14% would not detect any change on the wetlands. Large proportion of respondents replied that over-exploitation(70%) of the wetland resources, Lack of Awareness, Information and Research Work on Wetlands(60%), Lack of appropriate government policy implementation in wetlands(35%) were onsite, offsite and underlying causes contributing to the wetland degradation and loss respectively. During this study, it was also understood that there were no any local mechanisms in place to conserve the wetland.

Key words - Wetland, Values, Threats, Conservation

I. INTRODUCTION

Background and Justification

Wetlands, either in their natural state or under wise use principles provide ranges of ecological and socio-economic benefits contributing in one way or another towards food security and poverty reduction. The role of wetlands is unique and vital with respect to food security as they save lives of humans, livestock and wildlife in dry season and drought time [1]. Individual wetlands can be extremely important in supporting high numbers of endemic species; for example, Lake Tanganyika in Central Africa supports 632 endemic fish and other animal species [2]. Wetland edge springs are usually the only reliable sources of water both for domestic use and livestock especially in the dry months of the year, when many streams dry up [1]. The value of wetlands ranges from tangible subsistence use and direct benefit such as providing drinking water, recreation etc to intangible benefits for the continuity of the life support system[3].Despite the diversified socio economic and ecological value of wetlands, they are regarded as wastelands and continue to be depleted at an alarming rate throughout Ethiopia [4]. Wetland loss aggravates climatic disturbances by increasing carbon build up in the atmosphere.As Ethiopia is prone to desertification and recurrent drought the effects of wetland loss could be more visible in complicating the situation locally [5]

The causes of wetland degradation include unwise use and the conversion of wetlands for agriculture, the expansion of human settlement, industrial pollution, pesticides and fertilizers and water diversion and the construction of dams [4].Generally ignorance and lack of awareness, draining for agriculture, over exploitation like the case of Lake Alemaya, deforestation of their watershed, siltation, erosion and urbanization can be mentioned as major threats to wetlands in Ethiopia [6]

There is increasing anthropogenic disturbances, notably through agriculture, settlement, intensive grazing, expansion of huge infrastructures and brick making are changing in to mosaic of small habitats [7]. Wetlands continue to be degraded or lost at an alarming pace due to agricultural expansion, over grazing, unsustainable water extraction, urbanization, pollution etc [1]

With the currently growing threats, it is necessary intervening to save the unique ecosystem of the wetlands. Unless conservation measures are applied, the wetlands are at risk of complete degradation and may disappear in few years to come. Decision makers cannot take wetland management decisions based on intuition alone. They need facts and values to make informed decision. Though, other types of values are also useful, economic values are vital in making economic choices[8].

Conditions that enhance wise use such as community management plans, stakeholder participation mechanisms and awareness or training undertakings in wetland management are not institutionalized and as a result not materialized [5].

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 [5]

To ensure conservation and sustainable use of its wetland resources, Ethiopia has environmental, water resources and agricultural policies dealing with the wetland issues, if not have self-standing wetland policy [9]

However, implementation of wetland management strategies received little attention. The public nature of wetlands and lack of consistency among government policies in different sectors such as economics development, environment protection, physical planning are some of the challenges for implementation for wetland management [10]

Objectives

The general objective of the study were to assess the overall socio- economic values, threats, and legal protection of wetland ecosystems in Afar region. The specific objectives were:

- To identify the socio-economic values of wetlands in Afar region
- To identify the driving forces for wetland degradation and forward possible overcoming mechanisms in the region
- To assess wetland programs and appropriate management practices for the wise use of those natural resources

II. METHODOLOGY

Description of the Study Area

The Afar Regional State is located in the North Eastern part of the country bordering with Tigray region and Eritrea in the North, Oromiya region in the South, Somali region in the South East, Amhara region in the South west, Tigray region in the North west and with Djibouti republic in the East, respectively. It has an area of 95,265.67sq.km. The region is divided in 5 administrative zones (named in number), consists of 29 Woredas. The largest zone is Zone 1 which covers 34.58% of the regional area and the smallest one is zone 5, it cover 5.78 % of the region area. The population size of the region is 1,411,092 and out of this 86.6% reside in rural area and 13.4% [11]. The study area were conducted in Gewane wetlands/MetekeWetland near to Gowane town.

Sampling and Methods of Data Collection

A total of 120 respondents were interviewed using simple random sampling techniques. Both primary and secondary data were conducted to achieve the objectives. The relative importance and their associated wetland services were measured using money as a common denominator. According to [12] monetary and financial valuation will be characterized by, direct market valuation, indirect market valuation, and survey based valuation. In order to explore the management and utilization of wetlands in the region and to identify their major threats, the different wetlands in the Region were observed personally and important findings were recorded.

Data Analysis

In this phase, all collected information and data which was gathered in previous phase using different methodologies were analyzed. Descriptive statistics were applied to analyze percentage, arithmetic mean, and graphic presentations. Qualitative analyses were applied to analyze information obtained from focus group discussions. Different case studies that were done before were incorporated for add values of the wetlands in the region and interpretation of the results.

III. RESULT AND DISCUSSION

Socio-economic values of Meteke wetland

A large Proportion of household were found to be dependent on Meteke Wetland. Selling mattress and reed took the loin share sources of livelihood which was followed by collection of wood for household energy, house constriction and furniture making (figure 1). The lives of people in Meteke wetland is related to the activities associated with wetlands. The evidences of this study suggested that wetland in this area serve the needs of the people in one-way or other at various levels (individuals, family, community, and village). This is because the overwhelming majority of the households (96) covered by the questionnaire survey stated that they had livelihood directly linked to the wetland. Thereby, which their livelihood is linked to the wetlands is perceived in many ways. For instance, it was found that 16% of the respondents were engaged selling water from the wetlands, the Wetland provides some of the water supply for Meteka town and is a significant source of water supply for the population around the wetland. 18% were engaged in collection of wood for household energy, house constriction and furniture making. 11 % were engaged charcoal sale. 20 % were engaged with mattress and reed sale. 10% was found engaged in daily collection for their household demands. There are also 13% whose livelihoods are dependent on grass sale particularly for horse owners. 10 % were engaged with Car washing business. 2% were engaged with hot spring business.

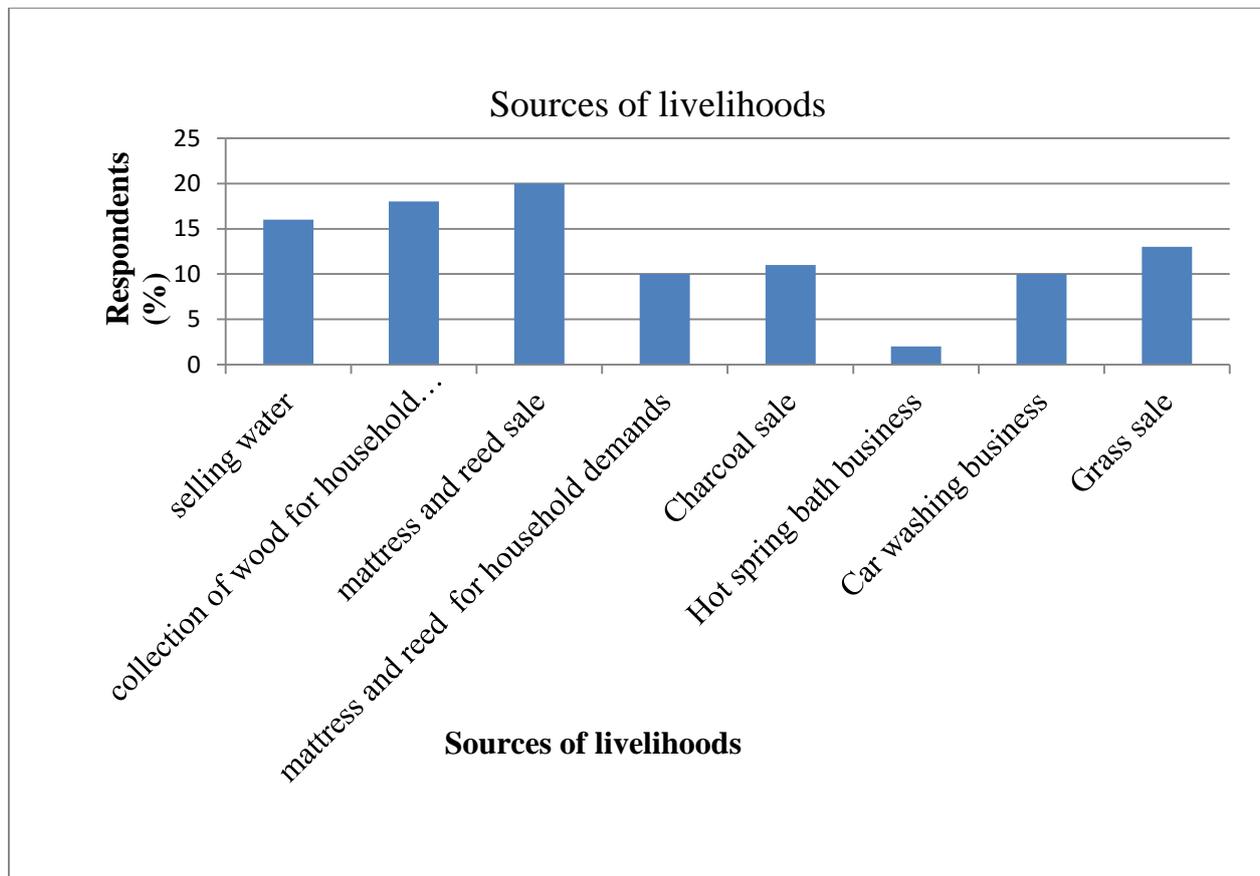


Figure 1: Sources of livelihoods which are linked withWetland

As we can see from the above figure about 96% of respondents sources of livelihoods were entirely depend on the wetland. This could be in the form of daily labors mainly on small scale charcoal production (figure 2), reeds for house roofing (figure 3), water for consumption and sell, Car washing (figure 5), Hot spring bath business (figure 6), collection of grass and fuel wood and making various types of mattress for sale (Figure 4).



Figure 2: Charcoal production for sale



Figure 3: Reeds production for sale

As we can see from the figure 2, local people produce charcoal from *Prosopis juliflora* species of the wetland and bring along both sides of the main road of the town for sale. This practice is not only enhance the income of the local people but also control the wide spread of the invasive species of *Prosopis juliflora*. However some respondents think that there are also charcoal productions from other woody species other than *Prosopis juliflora* species. This could be an alarm ring for community or local leaders to control those practices closely. Production of Reeds is also another product used for different purposes. In the study area they were used as a roof and for fencing. Similar to market place of charcoal, Reeds were found along both sides of the road of the town for sale (figure 3)



Figure 4: Mattress production for sale



Figure 5: Wetlands for Car washing businesses

As indicated in figure 4, mattress is most commonly used for sleeping purpose in hot areas. A single mattress costs 130 to 150 birr. It is used as insulator for strong heat emitted from the floor during sleeping. As indicated in figure 5 wetlands were used as source of water for car washing businesses. There were about ten different associations performed this business in different site. Though the business enhance the income of local community, the returned car washing waste water to wetland may have long term negative impact to the wetland. This may require further research.



Figure 6: Wetlands as hot spring bath business



Figure 7: The grazing values of Wetlands

As indicated in figure 6 both natural hot spring baths are part of the wetland and are owned by local youth community association. Many people came from different part of the country to take a bath. It costs 10 birr per head. People believe that they will be free from nervous, muscle and mental problem after they take few days bath.

The grazing value of the wetland was also investigated (figure 7). When asked how frequently they took the livestock to the surrounding wetlands for grazing, 100% of the households reported that they take them every day. This showed that livestock rearing is entirely dependent on the wetlands under study as they are the main source of grasses and water. Furthermore, when asked how close they live from the wetlands concerned, 100% of the households surveyed answered that they are living very close (within 5 minutes walk) from the wetlands.

In terms of economic characteristics, the yearly average earn of household from economic activities linked to wetland ranged from less than Birr 500 to more than birr 1,500 and less than Birr 3000. However, the majority (46%) of the households had incomes within the range Birr 1001 to birr 1500, followed by (20%) birr 501 to birr 1000 (figure 8).

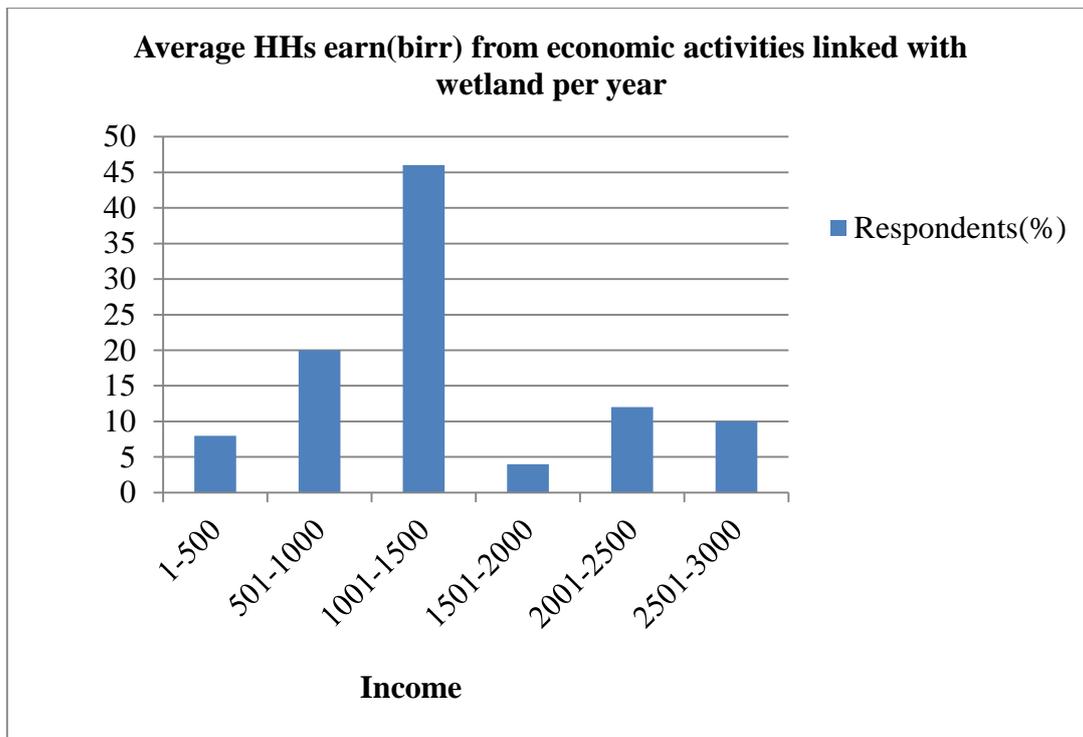


Figure 8: Average Households yearly income from wetland

As can clearly be observed from the figure 8, all of the heads of households (100%) could easily be considered poor as their average daily income is calculated to be below Birr10 per day (around 0.6 U.S. Dollars per day). Apart from the economic benefit from the wetlands 60% of the households reported that they were Fetching water for consumption and animal drinking and 22% used water from the wetlands for sanitation purposes (e.g. washing clothes and bathing), while 8% enjoying the view (figure 9). All of the cattle horses and other animals are entirely dependent on the wetlands for drinking in addition to grazing.

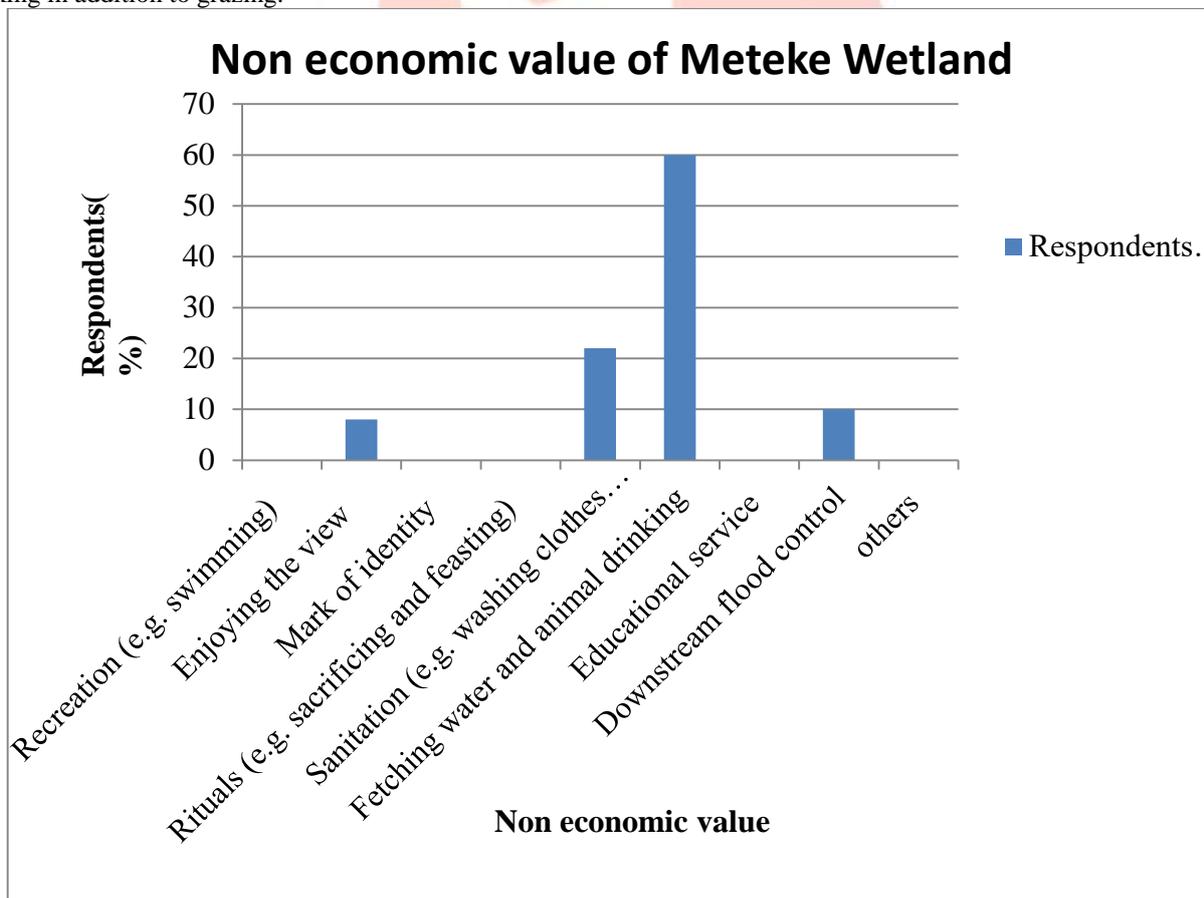


Figure 9: Non economic value of wetland

Threats to Gewane/Meteke Wetland

Heads of households were asked how often they go to the wetlands, and 90% replied that their family members go to the wetlands every day for various reasons. This survey result therefore indicate that each member of the households were subject to activities in and around the wetlands in one-way or another.

The amount of waste being dumped directly into the wetland by activities around the wetland is increasing. This is posing increasing threat even to that part of the wetland which has for long been protected, even during the rainy season, from the inflow of waste and effluent discharges. But with the growing level of activities around wetland the increase pressure of demand for waste disposal, waste discharges of varying toxicity and chemical composition have found their way into the wetland. The process of dumping untreated waste into the wetland will, if unchecked, diminish the use value of the wetland.

The disposal of waste into the wetland has also the effect of understanding fishery development, thus threatening the sustainability of the livelihood of local fisherman. Local fisherman are finding it increasingly difficult to fish along the shores of the wetland as they used to do in the past.

The local fishermen recall that in the past, the wetland was relatively clear even during the rain season. At present, the wetland, appears to have high levels of silt and waste, most of which originates from activities in and around the town.

Pollution of wetland, weather by Car washing or urban settlement has serious implications for the livelihood of the people of the region as a whole. The wetland, if polluted, may, however, be unsuitable for this purpose. Nor would it be able to support a growing fish population.



Figure 7: The disposal of waste into the wetland

When the households were asked for their opinion on the overall human impacts, nearly 92 % of the households judged that human activities had no any undesirable effects on the wetlands.

Furthermore, when asked as to how they evaluated the status of the wetlands in their lifetime, 76 % of the households stated that the wetlands were shrinking in size. 8 % of the households stated that the wetlands were expanding while 6 % of the households evaluated the wetlands as being not detect any change and 10% of the households evaluated the wetlands as fluctuating.

When assessed their understanding with respect to the possible causes of the shrinking, the possible causes provided by 80% of the respondents were the decrease in vegetation cover, expansion of urbanization in the areas, the increase use of water while another 20 % did not know the reason behind the shrinking.

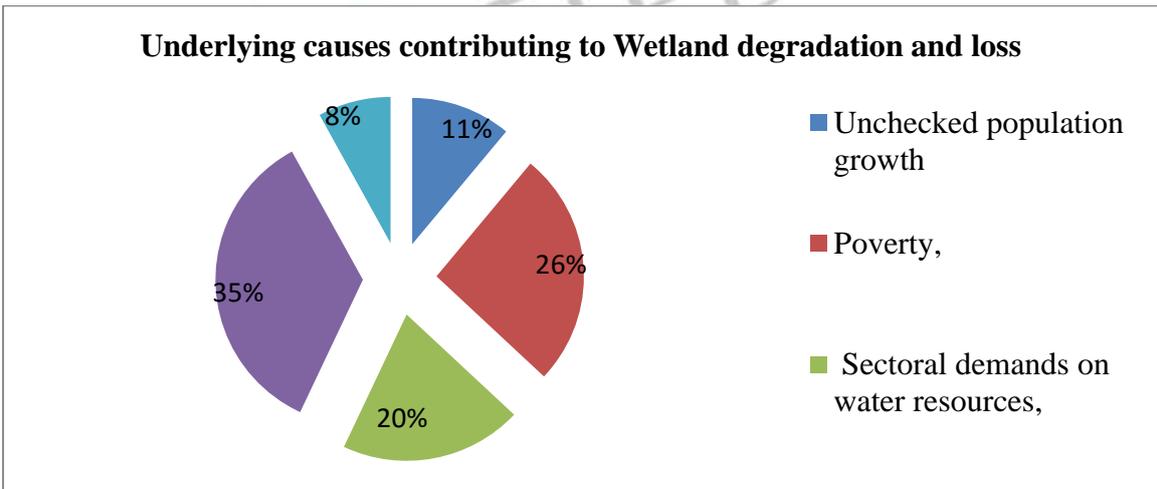
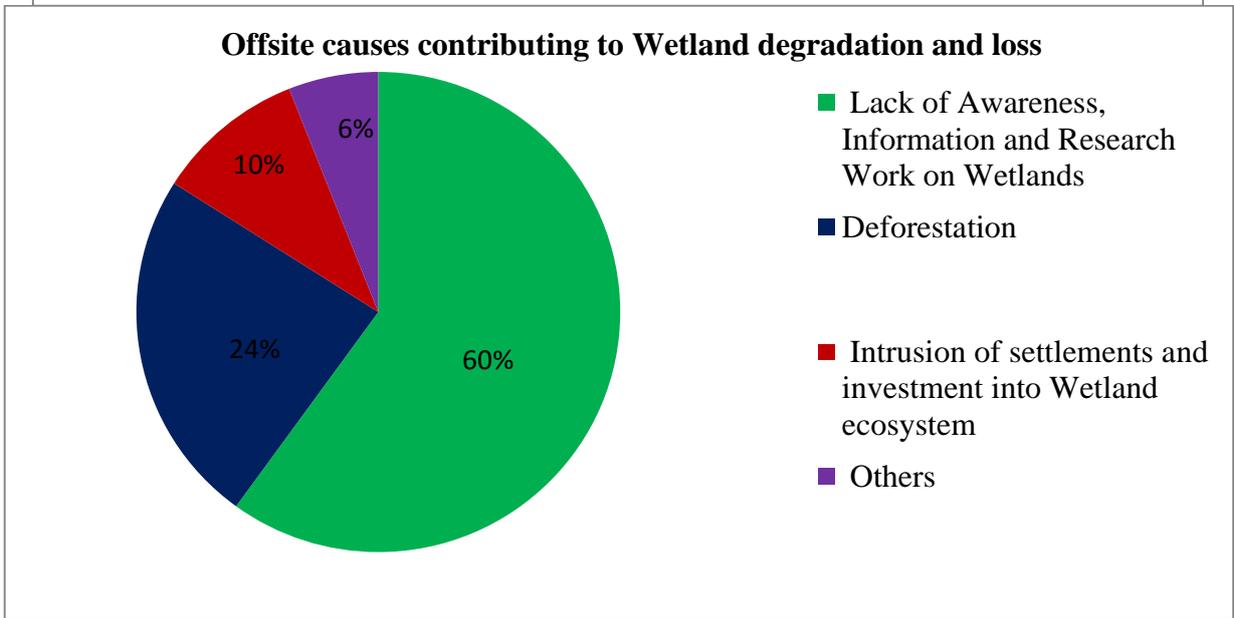
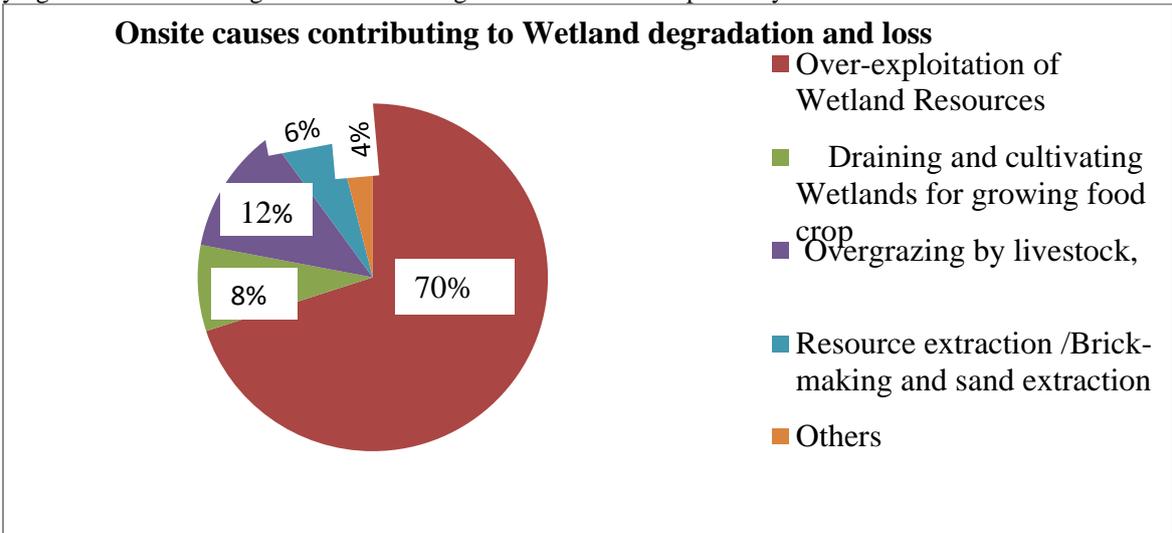
With respect to vegetation cover over time on the wetlands concerned, the survey indicated that the majority of households (77 %) said that the vegetation cover on the wetlands were decreasing while 9 % of the households felt that the vegetation cover was increasing but still another 14% would not detect any change on the wetlands.

Finally, the households were interviewed whether they fear that wetlands in their surrounding may one day disappear or not. The overwhelming majority of the households (89 %) said that they would fear that the wetland would disappear one day in the future while the remaining percentages of households said that they would not fear.

About 92 of households had no education background. This low level educational background of households might aggravate the unwise use of the wetlands, and might also influence their understanding of the current status of the wetlands due to impacts as a result of human activities.

Respondents were asked about onsite, offsite and underlying causes contributing to the wetland degradation and loss. Accordingly large proportion of respondents replied that over-exploitation (70%) of the wetland resources, Lack of Awareness, Information and

Research Work on Wetlands(60%), Lack of appropriate government policy implementation in wetlands(35%) were onsite,offsite and underlying causes contributing to the wetland degradation and loss respectively.



Wetland Management and Conservation Issues

In this wetland, there is no any NGO engaged in the natural resource conservation and management activities. Yet, the governmental office responsible for these activities in place is the Gewane natural resources management Office. However, in this office the total trained manpower is only one, of which one expert is assigned for the whole environmental protection activities, entirely focusing only on the control of deforestation.

During this study, it was also understood that there were no any local mechanisms in place to conserve the natural resources in general and the wetlands in particular in the areas studied. This is an indication that conservation of natural resources has not been given due emphasis in this area. However, when the households were asked whom they think should be responsible for managing the wetlands, the highest percentage of households (64 %) rated the government as the most responsible body while 21 % of the households rated the local community, and 15% rated both the local community and the government together as the most responsible bodies.

IV. CONCLUSION AND RECOMMENDATION

A large Proportion of household (96%) were found to be dependent on Meteke Wetland. 90% respondents replied that their family members go to the wetlands every day for various reasons. Selling mattress and reed took the loin share sources of livelihood which was followed by collection of wood for household energy, house constriction and furniture making

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Majority (92%) of households had no educational background. This low level educational background of households might aggravate the unwise use of the wetlands, and might also influence their understanding of the current status of the wetlands due to impacts as a result of human activities. Awareness creation programmes should be prepared for people living around to ensure the sustainability of the wetlands for their economic and societal benefits, and to protect the environment as a whole by the concerned GOS and NGOs.

The amount of waste being dumped directly into the wetland by activities around the wetland is increasing. This is posing increasing threat even to that part of the wetland which has for long been protected, even during the rainy season, from the inflow of waste and effluent discharges.

The local fishermen recall that in the past, the wetland was relatively clear even during the rain season. At present, the wetland, appears to have high levels of silt and waste, most of which originates from activities in and around the town. Pollution of wetland, weather by Car washing or urban settlement has serious implications for the livelihood of the people of the region as a whole. 76 % of the households stated that the wetlands were shrinking in size. 8 % of the households stated that the wetlands were expanding while 6 % of the households evaluated the wetlands as being not detect any change and 10% of the households evaluated the wetlands as fluctuating.

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