Community Wetland Management in the Kafa Biosphere Reserve

A manual for communities, practicioners and administrations

Imprint

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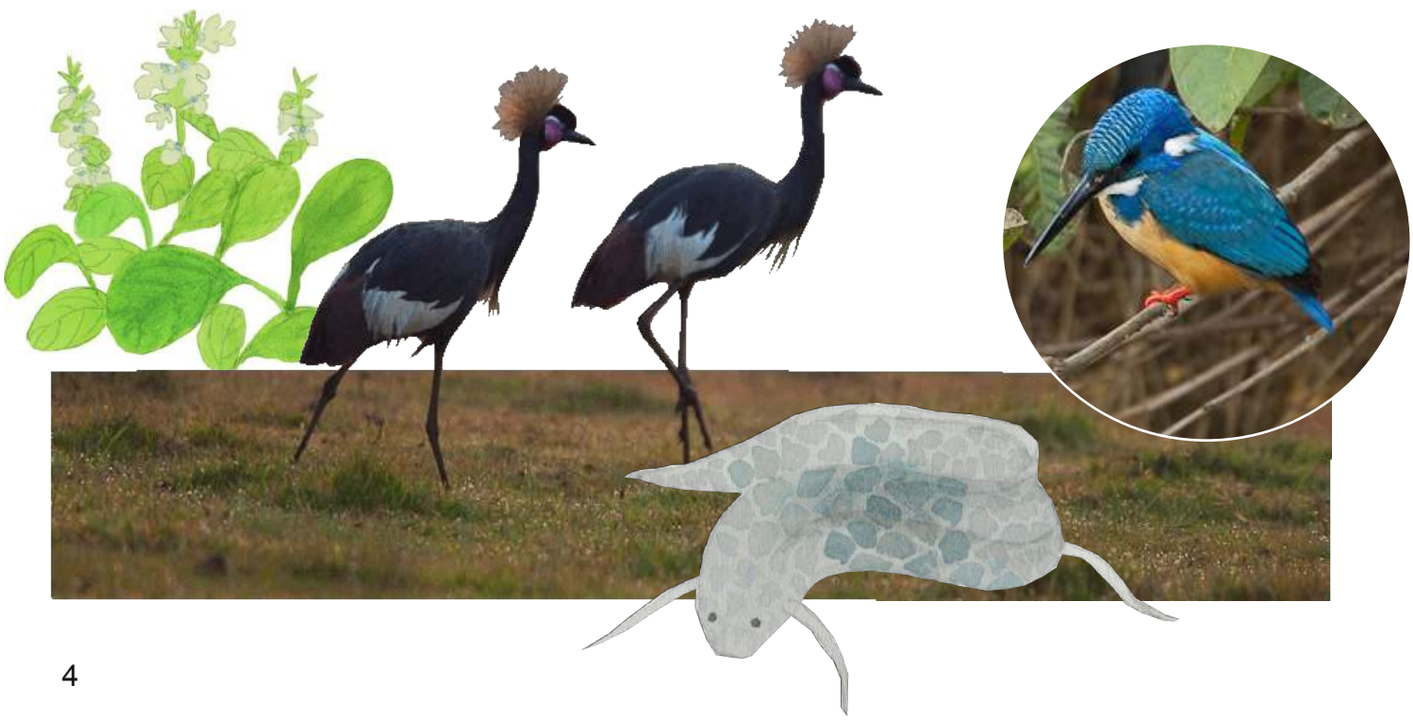
1 Introduction

1.1 What is the aim of the manual and how should you use it?

This manual is prepared for rural communities, field workers and practitioners in the Kafa Biosphere Reserve to support the integrated management of wetlands and watersheds. The integrated management combines the conservation of plants and animals and sustainable use.
Rural communities live together with their surrounding environment in the wetlands and depend on the resources for food, fodder, buidling material and to mitigate climate change. The interaction of the rural communities with the nature creates benefits but also might be a threat to an intact environment, for example because of overuse. Understanding and knowledge of how to use wetlands and watersheds without harming the environment is very important for preserving the resources for now and the future.

This manual gives information on wetlands in the Kafa Biosphere Reserve and explains why they need to be protected. The manual explains different actions and how they affect wetlands. For each action, sustainable interventions are shown that help to protect the wetland or watershed and at the same time secure the livelihoods of the rural communities.



2 Wetlands in the Kafa Biosphere Reserve

2.1 What are wetlands and watersheds?

Wetlands are areas where the soil is soaked with water for most time of the year. So wetlands in Kafa Biosphere Reserve are rivers and lakes, flood plains, swamps and marshes, forest wetlands and peatlands. All these different types of wetlands have special animals and plants that are adapted to the water. For example, the Wattled Crane needs the wetlands in Kafa Biosphere Reserve to rest, breed and feed.

Box 1

What are the services and functions of wetlands?

All the different wetland types and areas areas have many different functions and services for the rural communities around them:

2.2 Why do we need healthy wetlands?

Only healthy wetlands are able to provide the functions and services that are important for the rural communities that live close to the wetlands. Wetlands will only serve as flood protection when the soils are intact and can take up a lot of water and the plants are able to act as barrier for floods. Also, the marshes and flood plains will only provide nutritious fodder for the animals like goats and cattle, when they are intact and can remain in their natural state. Degraded wetlands are not able to sustainably provide all the different functions and services and therefore are a problem for many rural communities. For example, degraded wetlands do not store enough water throughout dry periods.

Picture 1: Intact wetland with typical plants.

Picture 2: Degraded wetland with shrub vegetation.

Box 2

How to protect the biodiversity of wetlands?

Through knowledge and committment – public awareness of the need for protection is very important at the community and the decision making level alike. You can use public places, churches and schools to inform the people. You can also use methods like media, brochures, posters and websites.

Through preventing the introduction of invasive species – education and knowledge about the negative impacts of non-native species is necessary. Species like Water Hyacinth or the Giant Sensitive Tree invade the wetlands and are a threat to the natural biodiversity, for example because they grow faster and compete with other plants for water and nutrients. Regular supervision of the wetland and its catchment for new plants is very important!

Through protection of the wetland soils – the soil is saturated with water and species are adapted to the high water content of the soils. The natural plants and animals can only live in intact wetlands. If the soils are degraded, invasive species or species which grow very fast will dominate the wetland.

Often, these plants have a lower nutritional value (important for the use as fodder), and can not be used as herbs or medicine.

3 Which activities affect wetlands?

So wetlands are important for your community in many ways and through the use of wetlands you and your community are able to generate income and provide food security. However, some of the uses will have negative effects on the health of the wetland. In the following, the harmful practices and their consequences are describes. To avoid the negative consequences for wetlands, the options for improvement and according benefits for you and your community are highlighted.

3.1 Food production

The cultivation of wetlands is generally harmful for the natural processes of the wetland. In order to make the land suitable for agriculture, people drain wetlands, set fire, open ways or destroy/chase wildlife.

 By disturbing the natural water cycle of wetlands and draining the soils, huge amounts of greenhouse gases are released that contribute to climate change worldwide. The harm that is done to the environment outweighs the benefits of a constant use of wetlands as agricultural land. Agriculture on wetlands reduces the humus content of the soil so it gets less fertile every year, reduces the water content and wetland biodiversity.

 Help farmers to estimate the costs of their impact on wetlands: what amount of energy/labor is necessary to cultivate the wetland area? What negative effects does this have on the plants, water content and biodiversity of the wetland in general? This way, it gets clear that the costs of cultivating wetlands are much higher than the benefits over time. Often, the time and resources that farmers need to drain the land is not calculated, neither the long-term problems that arise due to the degraded ecosystem structure.

 When cultivation for food security is unavoidable, the farmer should agree to only use the land seasonally and not more than once a year.

Pictures 3 and 4: Living fences as demarcation for grazing plots.

- Divide the wetland into various sections
- Identify water points and routes, key habitats, cultural areas and areas for grass cutting for livestock, construction and ceremonies, and other critical areas: these areas should not be cultivated for their multiple benefits!
- After this demarcation of the wetland into different zones, allocate areas for cultivation (not more than 10-25% of the whole wetland area) and make sure that the area allocated for cultivation will not cause serious damage to the rest of the ecosystem.

Alternative options:
Creation of alternative livelihood options through:

- Diversification of crops, use of more productive technologies and more productive and resistant varieties on fields outside of the wetland.
- Finding other means of income generation, for example the production of honey, agroforestry, handicrafts, or alike.

It is important to target a reduction of the dependency on the wetlands, otherwise the use of the wetlands will continue for the communities daily survival.

3.2 Fishery

Wetlands with adequate water supply from annual rainfall are good sources of fish. Riverine wetlands like the wetland of Gewata are also ideal places for fishery. People in Gewata wetland areas harvest fish through traditional methods from Gojeb River. Wetlands like Alemgono and other wetlands in Kafa receive rainfall adequate for fish ponds and are potential fishery sites.

Fishery needs to be sustainable so that there will be enough fish to reproduce and fishing is possible in the future as well. The methods should not harm the environment.

 In Gewata wetland, farmers burn the wetland vegetation when crossing to Gojeb River for seasonal fishing. This reduces the risk of wildlife attacks and opens a passage. But fire on wetlands is a great risk for the animals and plants that live in wetlands.

 Train fishers on environmental management to enhance the awareness about harmful practices.
 Establish a permanent route/passage for fishers so there is no need to burn the wetland for passage.

The tradition of fishing can be strengthened through:

- Organizing association of fishers.
- Train members on modern fishery and support them with fishing materials and technology.
- Create linkage with markets in nearby towns like Bonga, Mizan and Jima.
- Sensitize local communities on nutritional values of fish, methods of preparation for varieties of food from fish and promote fish culture in the area, if possible.

Alternative options:

Fish pond farming: Integration of fish farming in agricultural/livestock production
Manure from livestock or chicken/poultry can be used as feed for fishes in fish farming ponds. The establishment of fish ponds should be done with fishery experts from the local agriculture office. The fish species for farming need to be carefully selected by experts. The species should be native, ecologically compatible and marketable.

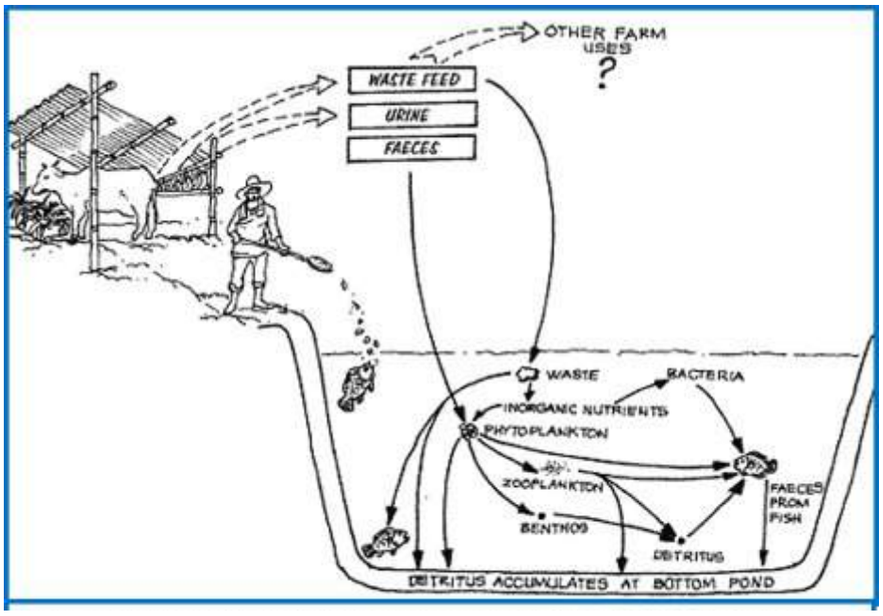


Illustration 1: How animal wastes work in fish pond farming (by Ashagrie G. & Abebe G., 2009).

Picture 5: Healthy wetlands are saturated with water.

3.3 Grazing

Wetlands in Kafa Biosphere Reserve are mainly used for grazing of livestock. Because of the amount of animals, there is a hight pressure on the wetlands like Alemgono. Free and unrestricted grazing with many animals is commonly practised in Kafa wetlands, but destroys the natural plant community. In the long term, only plants with a lower nutritional value will grow on the wetlands. These are able to survive the feed pressure from the livestock and the disturbance from the animals' hooves.

 The free movement of animals in the wetlands is damaging the vegetation and soil.

 When grazing of animals can't be avoided, the movement of animals should be restricted to demarcated zones. This form of rotational grazing ensures that the carrying capacity of the grazing area can support the limited number of livestock for a given period of time.

The benefits of rotational grazing are:

- Protected habitats for wildlife, birds and plants in the closed plots.
- Regeneration of plant species, increases quality of fodder; regeneration includes medicinal plants that are beneficial for farmers' health.
- Economic importance: besides the protection of ecosystem services and functions from an ecological point, rotational grazing improves farmers' income since enough feed is provided throughout the year by the intact wetland. Fodder is also available in the dry season, e.g. through a combination with the cut and carry method.

Box 3

How to set up a rotational grazing system?

Step 1 – build community consensus: all beneficiaries come together, discuss and agree on using their available wetland pastures through rotation grazing for mutual benefit. The wetland area should be divided into different areas, e.g. areas for cut and carry, rotational grazing, farming, the core area with strict protection. The communities of Doma and Alemgono have agreed on action plans for the community wetland management and integrated rotational grazing into the action plans and bylaws.

Step 2 – Record the actual number and type of livestock: count and categorize the livestock from all affected communities. Order them according to their age groups and species, allocate grazing space for each of the defined groups. For example, in the Kafa Biosphere Reserve, people have the tradition that calves graze separated from older animals and shoats browse in bushes and borders. In the wetlands around the Gojeb River source, people use live fences to divide the pastures and fence their animals.

Step 3 – Assess the carrying capacity of the wetland area: The carrying capacity is a measure for how many animals can get adequate feed from a plot of

wetland per unit time. Exclude the defined core areas of the wetland from the available area for grazing. Divide the rest of the wetland area into plots of a size that can sustain the feed of the communities livestock for a defined period, for example 15 days.
Some plots will only be accessible in certain seasons, e.g. because they might be too wet when flooded.

Step 4 – Protect the closed plots from livestock: the livestock should be kept on the designated plot for the defined time and not feed on other plots. This way the regeneration of the closed plots can be guaranteed. The plots can be protected through fences or assigned herders that control the range of the livestock. By enforcing bylaws and applying educative penalties on the owners of intruding livestock, incentives can be given to prevent the intrusion of livestock into closed plots.

Step 5 – Rotate livestock: After the agreed period of time (e.g. 15 days), livestock needs to be moved to the next plot. The grass on the former grazing plot can recover until the plot is opened again. The feeding plots will have a higher amount of young and nutritious grass. Why are wetlands important?

Alternative options:

To avoid wetland soil degradation through livestock, you could use the "cut and carry" method.

Degraded soil through the hooves of the animals

Cut and dried grass as fodder for animals

3.4 Harvesting plant material

Various plants that grow in wetlands can be used by local communities:

Grass as fodder for animals, palm leaves as building material, flowers and herbs as medicine, roots, sedges, tubers and many more.

 The use of wetland plants might negatively effect the plant communities that naturally grow in the wetland area. For example by harvesting flowering plants, the plant may not reproduce sufficiently for sustaining future harvest.

 Wetland plants might be harvested on a sustainable basis. Knowledge about which parts of the plants and the amounts that can be harvested is necessary.

 The method of grass “cut and carry” as fodder for livestock: community members cut the grass in a defined area and feed it to their livestock.

This way, the livestock itself does not access the wetland.

Additional benefits in the efficiency of fodder can be obtained by making hay:

- Hay is dried grass or green material that is used as fodder. Through drying, it can be stored in a dry place and fed to the livestock when other types of feed are scarce, for example during the dry season.
- Grass should be cut before the flowering stage to obtain the highest feed value. After cutting, it should be dried in the sun and turned frequently until it is evenly dry.
- The nutritional value of hay can be increased by treating it with a urea-water solution. This also helps to ensure that there is enough food during the dry months.

Picture 6: Livestock benefits from wetlands, for example because wetlands provide good quality fodder.

Box 4

How to treat straw with urea

Hay has a low nutritional value for livestock. The quality can be improved by treating it with a urea-water solution.

- Prepare a trench and line it with plastic or banana leaves on the sides.
- Chopp the straw into smaller pieces for better infiltration of the urea-water solution.
- Mix 1 kg urea (46%) with 10 litres of water per 16-20 kg of straw, sprinkle the solution on the chopped straw.
- Fill the trench with the moistened straw and cover it immediately with plastic or enset/banana leaves. Put soil on the cover so there is no air contact with the moistened straw. This reduces also the evaporation of water and nitrogen.
- After 3 weeks you can open the trench from one end. There is a strong smell.
- Take out the amount you want to feed and keep it outside until the next day before feeding it. You can slowly reduce the time between taking it out and feeding it, because the animals will get used to the smell.

3.5 Drainage

The soils of wetlands are normally very rich in humus and store a great amount of greenhouse gases like carbon dioxide. Because wetlands are saturated with water, there is only very little oxygen in their soils. This lack of oxygen leads to the formation of peat: dead bodies of organisms like plants do not entirely decompose in wetlands. The accumulation of this material is a reason for the high humus content of the wetlands and the resulting high fertility of the soils. Further, the undecomposed organic material helps to absorb, store and retain water in wetlands, therefore is important for flood mitigation and provides water for animals, plants and surrounding communities during the dry season.

 Digging channels into the wetland will dry out the wetland soil. This way, the fertility of the soil will decrease. When the wetland becomes dry, the special plants and animals will not be present any more. The wetland will not provide enough water for the communities and animals during the dry season, and on the other hand will not be able to buffer excess water during a flood, because the soil can not store and retain enough water.

 Terracing of the steep area surrounding the wetland to prevent soil erosion. You can grow multipurpose plants like Vetiver grass, legumes or nitrogen fixing forage plants like Sesbania sesban. These plants fertilize the soil and provide additional feed for the livestock, pollen for honey bees and prevent soil erosion.

- Vetiver grass helps to retain the soil and water in its roots. The grass can be used for thatching houses, crafts, has oily roots with industrial value, and young shoots can serve as animal feed. The tillers of the grass can be sold, because there is an increasing demand for road side and gully rehabilitation.

Box 5

Rehabilitation measures for degraded wetlands

Nurseries and reforestation – prevent further deforestation through aforestation measures with plants like Sesbania, Vetiver, fruit trees or multipurpose plants that for example have a high value for honey bees. These trees and plants can be planted around the wetland, but only in a distance of minimum 25 metres. Trees planted into the wetland will absorb the water and lead to the drying of wetlands. Trees that need a high amount of water, like Eucalyptus, should not be planted into the wetland or the catchment area at all.

Area closure – degraded areas can be restored through area closure. It is important to indicate for all users that the area is out of use and is not allowed to enter until it regained the natural condition that supports use. The protection of the closed area should be agreed upon jointly by the beneficiaries. Also, control and sanctioning mechanisms need to be in place.

Climate smart agriculture through agroforestry or alike – Agroforestry, organic farming, intercropping, composting, green manure are all measures for farmers and community members to produce food for secured livelihoods but also is a measure against the effects of climate change.

Protect water sources from pollution!

4 Participatory management of wetlands in Kafa Biosphere Reserve

Increasing the knowledge of the various beneficiary actors is key to the sustainable use and management of wetlands. With the participation of local resource users in the management process, the responsibilities can be shared and the sustainable development is actively promoted.

For setting up a participatory management system, the following steps should be taken:

1 – Identify the stakeholders and their interests: Identify the various groups of beneficiaries or stakeholders who have direct influence on a given wetland. The interest of these stakeholders should be identified. Who needs what from the wetland? How much power or influence has the stakeholder in the management of the wetland?

2 – Get information about the resources and the specific management problems: The stakeholders should participate in mapping all the resources they get from the wetland, and identify major management problems as well as the perceived causes.

3 – Set shared visions, goals and objectives: To reduce the problems and improve the situation, the stakeholders should develop a clear and shared vision, shared goals and objectives in a participatory manner.

4 – Identify the areas of intervention and necessary actions: The beneficiaries should identify major problems of their wetland and root causes. They analyze the problems and root causes in detail and identify interventions that will help reverse the problematic situation and improve the ecosystem integrity, functions and services of the wetland. Be aware that the intervention in one place may not be equally relevant in another wetland area. Therefore, select area specific interventions that address the problem and benefit people.

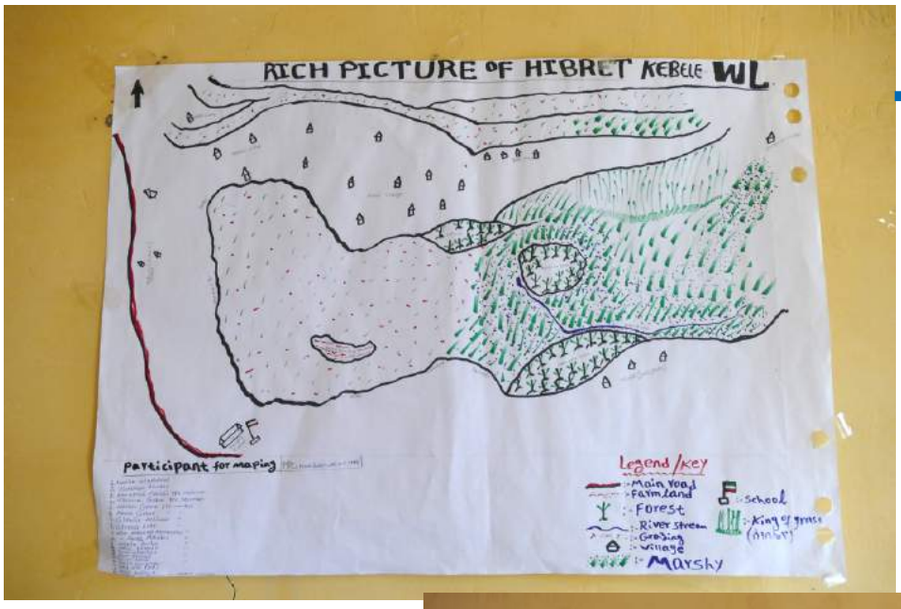
5 – Set up the community agreements as a management plan: A management plan is an organized document of agreement between the stakeholders to sustainably manage and use the wetland. Major components of a management plan are: background information about the wetland (resources, problems, opportunities, and stakeholders), visions and long-term goals, management objectives, prioritized interventions, implementation strategy, benefit sharing mechanisms, governance and conflict resolution structure, and the time frame for revision and a monitoring system. Wetland management should be led by a management plan which is developed through community participation and accepted by all stakeholders.

6 – Secure the legal backing of the management plan from the local administration: An ecosystem management plan operates in the jurisdiction of a certain government administrative unit and on the land under the control of the Woreda administration or municipality. Thus the local government should be informed about the management plan throughout its process. In addition, secured governmental support and permit for community ownership of the wetland needs to be ensured. Therefore, the management plan should

be prepared by the community in agreement with the local government. In addition, securing governmental support is important to legally protect the management plan from non-compliance. Some stakeholders might violate the rules of management or benefit sharing. Official endorsement of management plans by the government gives strength to its implementation and sustainability.

7 – Implement the identified actions and interventions: Interventions in the wetland should contribute to the improvement of the wetland, and interventions in the wetland area should be an incentive for sustainable use of the wetland's resources. Conservation of wetland resources and sustainable use should be balanced.

8 – Monitor and evaluate the effects of the interventions for the improvement of the decision-making: Periodic monitoring, evaluation and decision making based on lessons learned is important to continually improve management for sustainable benefits.



Current situation

Visionary situation

4.1 Capacity building

- Identify community watershed management traditions, knowledge and its relation to wetland management through community discussions.
- Involve community elders, because they have a lot of knowledge.
- Elders should teach youngsters by comparing changes in the watershed, wetland areas, resource conditions and general situation and trends.
- From the beginning of the process, people in the wetland area need to participate in the planning and implementation of the management plan.

This way, a sense of responsibility for the sustainable development and a sense of stewardship is created that help to provide incentives for compliance with the defined regulations.

4.2 Networking

Throughout the whole process, all different actors and stakeholders should exchange and discuss frequently. Besides, the communities should exchange information and knowledge with others, like communities who already successfully established a participatory wetland management scheme. Also the local government, development organizations and the NABU will help in the process so to facilitate the interventions to:

- Enhance best traditional wetland management practices.
- Introduce new wetland management approaches.
- Familiarize the stakeholders with new approaches through practical trainings and awareness creation processes, in harmony with traditional knowledge and norms. This helps to enhance acceptance and improve sustainability.

Understanding the gender dimension of wetlands is crucial for wetland management.

Women are at the heart of traditional life, they are keen and knowledgeable. For instance, women in Gewata wetland have artistically expressed the benefit of wetlands to their life and their family. They said "wetlands are our beauty salon and life of our children because we get milk for our babies and butter (traditional lotion) for our beauty care from cows that fed on wetland grass and water". In some areas women collect herbs as medicine for their cows and children, ornamental flowers, sedges, water and many other wetland products. On the other hand men of Gewata wetland area expressed wetlands as their tractors and bus. They said that "the survival of their oxen and horses is dependent on wetland products (grass and water)". Thus, wetland management issues should be decided with active participation and consultation of both women and men.

4.3 Implementing the measures

The measures need to be implemented with the agreement of the community and according to the management plan.

4.4 Benefit sharing

The costs of the interventions should be shared in the communities, e.g. through contributing labour, material or knowledge. Besides, also the benefits of the participatory management need to be shared fair among the members of the communities. In order to establish an equitable benefit sharing system for the respective wetland, these steps should be considered:

1. The resources derived from the wetland need to be identified.
2. Identify the resource users and interest groups. Now bring together the identified resources and the interest groups and find a balance between the available resources and their users.
3. Discuss about mechanisms of how the benefits could be shared among each of the interest groups.
4. Set up control mechanisms for the agreed system. This way, non-compliant behavior can be detected and sanctioned. For conflict resolution, the help of community leaders or the support from the government might be necessary.
5. The lessons learned and success stories from the communities should be exchanged with others who want to start a similar management scheme.

Impressions of stakeholder participation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