



Local institutions and the Functional Landscape Approach in the Kafue flats

Summary of key findings

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Research Context

The overall objective of the assignment was to undertake post-intervention research that explores different experiences of FLA interventions within different communities, with a particular focus on the project's institutional capacity building for wetland management through Village Natural Resources Management Committees (VNRMCs) or other structures that have been presented as a means of developing sustainable livelihoods, local environmental enhancements, and social-ecological resilience. This research was undertaken in 6 wards out of the 12 where the FLA has been implemented within the PRESERVE Kafue Project area in Southern Province. These included: Itebe and Munenga in Mazabuka, Malundu and Keemba in Monze and Baambwe and Nakamboma in Namwala. These communities were selected for their potentially different social-ecological contexts (e.g. their proximity to wetlands and Game Management Areas, population, natural resource availability, access to markets) as well as their implementation experiences (e.g. performance of VNRMCs, links with other organisations) and their field accessibility. Qualitative and participatory field research was undertaken with community members during September and October 2021.

Key findings

Wetland benefits

- The table below shows the relative importance of wetlands in each of the six wards. Grazing and fishing are consistently ranked most important. Only in Baambwe and Itebe was gardening in wetlands cited. Elsewhere wetlands are used for collection of natural vegetation and other products.
- Grazing is undertaken on communal land and access is acquired through traditional rights. This is also the case for other activities. Wetland (flats) access is more difficult in Malundu, Keemba and Mungenga, due to the long distances from the villages to wetlands. In these areas few people have access to wetlands and those that do will use them for 'high value' activities such as animal grazing, fishing and hunting.
- Almost all wetland activities mentioned by the communities are undertaken during the dry season after flooding recedes. However, in a small number of areas fishing activities continue to be done even during the rainy season, despite it being illegal. Some wetlands become impassable by motorized transport making it difficult for Ministry of Fisheries and Livestock personnel to enforce the fishing ban during the close season.
- Most of the fishing activities takes place in Namwala and Itebe, in Mazabuka.

Ranked Importance	MONZE		NAMWALA		MAZABUKA	
	Malundu	Keemba	Baambwe	Nakamboma	Itebe	Munenga
1	Grazing	Grazing	Grazing	Grazing	Grazing	Grazing
2	Fishing	Fishing	Fishing	Fishing	Fishing	Fishing
3	Pole collection	Hunting	Domestic water	Hunting	Gardening	Pole collection
4	Grass collection	Pole collection	Gardening	Edible plant collection	Pole collection	Grass collection
5	Hunting	Grass collection	Pole collection	Pole collection	Dung collection	Edible plant collection
6			Grass collection	Sand collection	Grass collection	
7			Dung collection		Clay collection	
8			Clay collection			

Wetland users

- Wetland use is gendered.
- Men tend to be involved in herding cattle and fishing, game hunting and reed collection.
- Women make baskets from wetland materials, catch fish for home consumption, and collect drinking water, edible plants and clay (except in Nakamboma and Baambwe where men also collect edible plants).
- Both men and women cultivate crops and collect thatching grass.
- All wealth categories were found to be involved in wetland use, although richer farmers tend to use wetlands only for cattle grazing.

Changes in wetland use

- Respondents highlighted an increase in the demand for wetland grazing areas, driven by poor rainfall throughout the three districts that has degraded catchment grazing areas (especially in Monze). Boreholes and wells have dried up faster, which has led communities to dig shallow wells near or within wetlands.
- Pressure on wetlands has also reportedly been driven by an increase in human population, recent upland crop failures and declining yields, and an increase in poverty generally.
- For Namwala there has been a significant increase in cattle population in the area, particularly in Baambwe.

Challenges for wetland use

- Increasing dependency on wetlands for grazing has meant an increase in cattle theft and loss, which people are concerned about.
- Season flooding means cattle needs to shift to the uplands, which is seen as stressful to the animals.
- Farmers are concerned about disease transmission among animals.

Experiences of VNRMCS in implementing the FLA

- 24 Village Natural Resources Management Committees (VNRMCS) have been trained by SHA and they promote activities aimed at enhancing sustainable utilisation of natural resources. VNRMCS members are volunteers who have an interest in natural resource management and conservation.
- There are two VNRMCS in each ward, each with between 10 and 12 members.
- VNRMCS actively participate in community sensitisation and awareness-raising meetings on the various elements of the FLA. These VNRMCS also work closely with the Ward Development Committees (WDCs) especially in Mazabuka and Namwala.
- VNRMCS share knowledge and information acquired through Lead Farmers who offer 'peer to peer' extension services to fellow farmers. For effective delivery of extension messages, beneficiaries are mobilised in interest groups based on different enterprises such as livestock rearing, vegetable production and field crop farming. This ability of the communities to share knowledge and organize themselves (hence indicating enhanced social capital) was more pronounced in Baambwe, Nakamboma, Itebe and Malundu.
- Lead farmers acquire their knowledge through SHA training and field visits. At the time of the study, 3125 beneficiaries had been trained and had subsequently modified their farming practices to include climate smart agriculture (CSA), crop rotation and crop diversification. It was also reported that nutrition levels have improved due to training in improved cooking methods.
- There was evidence that VNRMCS have played an active role in effectively reducing destructive livelihood practices while also enhancing food security and resilience.
- Farmers reported a reduction in tree felling in all wards with the exception of Munenga, where 'outsiders' from the Boma still indiscriminately cut trees for charcoal. Authority for them to cut trees is given by a few headmen who do not adhere to the VNRMCS bylaws. This charcoal is later sold in Lusaka and Mazabuka Boma.
- The research suggested those who have not benefitted directly from PRESERVE, or whom were not targeted for training, sensitization and empowerment activities, are those who continue to operate outside of the influence of the VNRMCS and exploit natural resources in traditional ways. The challenge, as always, is how to convey to those excluded that it is in their best long-term interest to adhere to

"When I was growing up in the 70s and early 80s we use to have a lot of rain in this area. Grass was all over here and we would take animals for grazing around streams nearby. These channels you are seeing used to have water flowing so we never used to take our animals very far. But now things have changed. Water is challenge... It changed around 1991; UNIP went with the rain!" (Malundu villager).

"We can't keep our animals nearby as you can see the area is dry. Even finding drinking water for humans is difficult. Most wells are dry, so animals cannot survive. So we are asking for boreholes to be sunk here to alleviate this challenge. This problem is not only here in Keemba but also in Malundu, Choongo and I can just say the entire district" (Keemba villager).

"Just look at that oxen drinking water at the hand pump, here we share drinking water with animals, and human population has increased so people travel long distances to fetch water" (Malundu villager).

"We are in Nakamboma but animals are in the plains [wetlands] with few herders so there is a lot of cattle rustling. Actually most cases at the magistrate court concerns theft of animals. Security is bad as few people are tending to a large population of animals" (Nakamboma villager).

"Additionally, those wetlands get flooded so we have to move animals upland, and just imagine the distance they cover. It's a tricky situation" (Nakamboma VNRMCS member).

"Our animals are very far and it's practically impossible to go there every day so we often receive cases of thefts and deaths due to diseases. As you know wild animals are not vaccinated so sometimes can transmit diseases" (Keemba VNRMCS member).

"SHA has empowered us with skills like in nutrition and conservation farming. So most of us have stopped doing those activities that were a danger to the wetlands and our livelihoods. We don't catch fish using illegal methods, cut trees indiscriminately for charcoal production or poaching. We are now able to feed our families throughout the year due to the improved farming methods" (Baambwe VNRMCS member).

"VNRMCS members provide messages on the conservation natural resources. They are doing a good job in reducing charcoal production. Here in Munenga, the community has accepted wholeheartedly these conservation messages. However, the main challenge is charcoal production by people who come from town. These are given permission by some headmen in Munenga" (Munenga Farmer).

VNRMC bylaws. It is, however, early days for the bylaws and perhaps once they are formally approved then things might change.

- Note that out of the total population, only 3600 people are direct beneficiaries of the project.

Bylaw development

- Various rules and regulations governing natural resource management have existed within communities prior to the PRESERVE FLA intervention, although the enforcement of these has been challenging since they originate in government policies (as opposed to being instituted at the community level).
- The VNRMCs developed bylaws in accordance with the aims of the FLA, and in collaboration with the Ward Development Committees and representatives from the Forestry Department, The District Council (Community Development Office) and the Department of Chiefs and Traditional Affairs. These build upon existing rules and regulations, and the results of participatory land use maps developed in 2020 by SHA.
- The bylaws have been aligned with existing policies (e.g. the Forest Act, the Wetlands Policy).
- There is some variation in bylaws from one community to the next, which appear indicative of adaptations to each different social-ecological context. A typical example of VNRMC bylaws is shown in Box 1.
- Bylaws are prohibitive and arguably authoritarian in tone. While this is unavoidable given the need for clarity, it should perhaps be kept in mind that the FLA itself supports sustainable use and management rather than an outright ban on specific resource use. Nonetheless, those farmers interviewed were supportive of them.
- While the penalties for non-compliance have been discussed and established within VNRMCs, there appears to be some inconsistency between and within wards in terms of how these have been communicated, how they are enforced, and the nature of the penalties themselves. Offenders are supposed to be referred to the chief or the chief's council who then passes judgement, but punishments appear to differ from one chiefdom to the other, and between one offender and another within the same chiefdom despite the same bylaw being broken.
- As yet, however, the bylaws have not been formalized within the wider community; currently people are being sensitized about the various rules and being 'discouraged' from engaging in activities that contravene them.
- Some members require resources to better communicate the bylaws.
- The research did not find evidence to suggest that there have been any major changes to the VNRMCs in terms of their membership, operations and bylaws to date. This is perhaps unsurprising given their relative infancy. The only changes observed relate to the election of additional members (Itebe and Munenga), and where the chairperson in Munenga relocated to Chongwe district. Given the slight social-ecological differences between districts and wards, it is likely that these VNRMCs and their bylaws adapt and evolve over time; this would be an indicator of 'healthy' institutional arrangements and hence it may be useful to think about how these changes could be monitored and recorded in the future.

"We as VNRMC members are finding it difficult to effectively disseminate sensitization messages. We do not have raincoats and gum boots making it difficult to reach people when it rains. We also need T-shirts and IDs for easy identification and bicycles. A bicycle was only given to the chairperson but what about other members" (Baambwe VNRMC member).

Enhancements to natural capital

- Whilst the impact of VNRMCs and bylaws on natural capital is very much a long-term monitoring project, farmers suggested a range of more immediate impacts:
 - Improved fish catches (and the reopening of fish camps in Mazabuka) were noted by farmers and attributed to improved water levels, although this is more likely a function of various upstream environmental and climatic events.
 - Cattle herders cited an improvement in grazing land in all the wetlands in Malundu, Baambwe and Itebe.
 - A reduction in the deforestation driven by charcoal production was reported, as was an overall decline in pole collection, grass cutting and gardening in wetlands. This change in behavior was attributed to the VNRMC bylaws as well as the success of new upland cultivation techniques (CSA) that take the pressure away from wetlands and forests. Moreover, with the improved incomes from agriculture, some farmers are able to afford iron roofs, hence reducing the reliance on wetland products for roofing material.

"In previous years, this area where we are standing would have been dry but not this year. This year is a different story and grass is still green" (Baambwe herder).

Box 1 - Example of Bylaws agreed by each VNRMC

Traditional Tenure of Forests

1. All forests in chiefdoms are managed by headmen on behalf of chiefs through VNRMCs at village level who shall be enforcing the bye laws.
2. Access to the forest is through headmen, who shall work in conjunction with the VNRMCs for assessment and resource utilization and record keeping.
3. No cutting of trees/collection of resources except with permission from headmen through VNRMCs.
4. Permission for charcoal production should be obtained from Forestry Department in consultation with chiefs, headmen and VNRMCs.
5. Natural Resources Management activities and sensitization to be done by VNRMCs.
6. Offenders to be adjudicated by headmen and the chief or Chief's Council.
7. The Chief's Council to come up with fees and punishments for would be offenders.

Fire Protection

1. No unnecessary burning in communities.
2. No burning of grazing areas or of thatching grass or in dambos or wetlands.
3. Burning period is from May to June, with permission from Forestry Department, Chief's Council, WDCs, CRB and VNRMCs.

Women's Rights

1. Women have equal rights to own, develop and utilize land.
2. Women have the right to make decisions on natural resources management and participate in decision making and to protect it.

Streams and Rivers

1. There shall be no cultivation near stream and river banks to reduce siltation
2. No one is allowed to block the stream or river. Every person should have access to the stream or river and also access by domestic animals.
3. No one should make bricks close to rivers or streams.
4. No cutting of trees near rivers or streams to reduce erosion and siltation.
5. No one is allowed to fish using illegal fishing gear like mosquito nets and traps or to use poison.

Dambos and Wetlands Management

1. No one should cultivate in dambos or wetlands so as to maintain percolation points and to help recharge wetlands.
2. No burning of dambos/wetlands as they serve as grazing areas and no burning of thatching grass.
3. No cutting of trees in wetlands to prevent soil erosion.
4. Fencing of dambos/wetlands is prohibited as these are communal lands,
5. No one should sell part or the entire wetlands. Anyone contravening this rule will be punished by the Chief or Chief's Council.
6. Brick making in wetlands is prohibited.

Fruit Tree Protection

1. No one should cut fruit trees as they provide fruits in their time for the community and are sold for income generation of households. Whoever does that contravenes this section and is liable to punishment by the Chief's Council.
2. Community members to plant indigenous fruit trees at their home steads.
3. Only ripe fruits should be plucked from trees and anyone contravening rule this will be punished by the Chief's Council.
4. Community members to participate in early burning exercise to enhance natural regeneration of trees and grass.
5. Everyone should protect forests for the benefit of the community.

Fish and Wildlife

1. Illegal fishing is prohibited
2. Use of illegal fishing gear is prohibited. Only nets of recommended mesh sizes must be used.
3. Everyone should adhere to the fishing ban (closed season) regulations.
4. No one should poison fish in streams and/or rivers
5. Poaching is prohibited
6. All community members to participate in the conservation and management of natural resources.

Shade Trees

1. No cutting of shade trees in the community as they serve as resting places for both humans and animals. Only debranching is allowed.
2. All community members should get involved in planting shade trees.

Integrated Wetland Management

1. Burning of wetlands is prohibited.
2. Grazing of cattle in wetlands should be monitored by the owner or any person assigned to herd them.
3. No area within wetlands should be fenced off. These are communal lands to be accessed by everyone.
4. No area in wetlands should be sold off to an individual or group of individuals or company.
5. No cultivation is allowed in wetlands.
6. Brick making is prohibited. Anyone contravening this rule will be punished by the Chief's Council.

“Sometimes VNRMCs committee members and lead farmers would select their relatives to benefit from empowerment programmes such as giving them chickens, goats, vegetable seeds and legume seeds. This discourages other members who do not have relatives in decision making positions” (Munenga Farmer).

“You know when this project started, we did not know about as headmen and the chief was also in the dark. We came to know about it when it had already started. But for any programme to succeed, the chief should be made aware first and he should be adequately sensitized so that he gives a go ahead for it to have his blessings. But this never happened initially and it hampered activity implementation at first” (Malundu Headman).

Other issues relating to the VNRMC functioning

- One issue highlighted, however, was that of nepotism among VNRMC members, which manifested in the alleged unequal allocation of resources and training. This has important implications for the sustainability of these institutions in the future; if the VNRMCs and bylaws are to be successful they require 'buy-in' from the whole community, as well as operating under principles of transparency and equity.
- Another issue cited was that of poor participation and collaboration between traditional leaders and SHA during the early stages of the programme (particularly in Baambwe, Malundu and Keemba Wards).
- VNRMCs work closely with the WDCs who in turn work with District Councils. Their work is thus reported, disseminated and adopted in other wards, and hence there is huge potential for the VNRMC and FLA 'model' to spread around the region (good innovations spread!). However, this will depend upon the effectiveness and enthusiasm of each WDC and councilor. We suggest that an enabling environment can be created by sensitizing councilors on the importance of FLA principles but also facilitating exchange visits by councilors and members of VNRMCs to other project sites.
- Training in nutrition has also led to improved nutrition at household level, thereby reducing opportunistic diseases and malnutrition. Provision of legume seeds (groundnuts, cowpeas and beans) and vitamin A bio-fortified orange-fleshed sweet potato vines have also added to improved food security and income levels. The additional income has made it possible for most families to send their children to school. Awareness on sustainable utilisation of natural resources has led to an appreciation of the environment resulting in reduced cutting of trees for charcoaling.

Differences between wards

- As highlighted above, there remain significant problems of deforestation and charcoal production in Munenga ward of Mazabuka, where headmen have allowed people from outside the immediate area (and the jurisdiction of the VNRMC) to produce charcoal for markets in Mazabuka and further afield in Lusaka. This is being driven by population growth and financial inducement.
- VNRMCs in areas nearer wetlands, such as Itebe and Bwaambwe, are very active in sensitizing members about fish conservation and the use of appropriate fishing methods as compared to other areas who are less reliant on fishing.
- In Monze, due to the area being very dry, VNRMCs members focus on messages that promote conservation of water more than in other areas. These messages include promotion of CSA and tree planting.
- The bylaws formulated by each VNRMC reflect these differences.

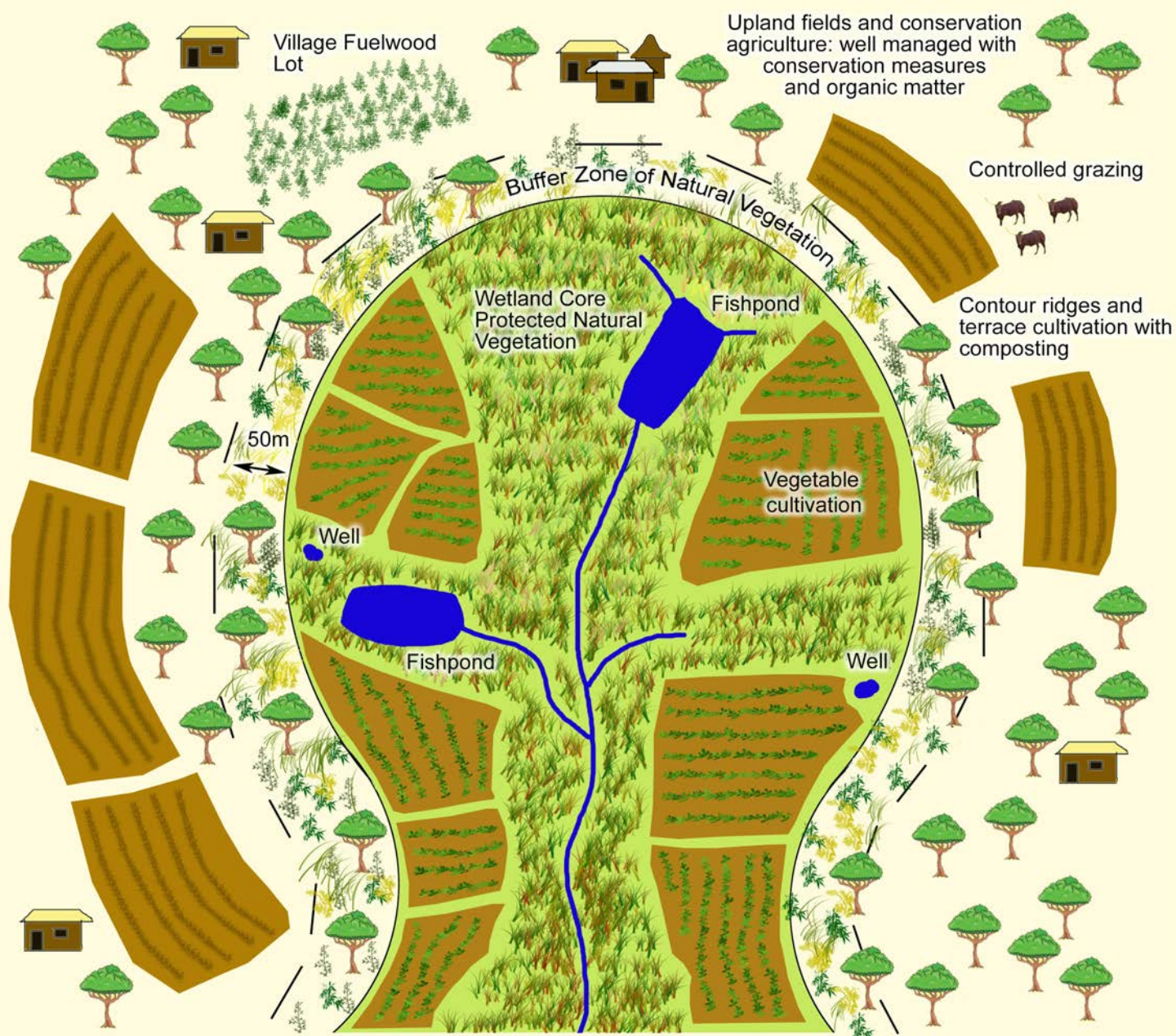
Wider impacts of the PRESERVE FLA?

- The FLA has reportedly led to improvements in food security, nutrition, income levels, enterprise development, access to clean water, sanitation, hygiene, gender issues, savings and ecosystem awareness and knowledge about CSA.
- Training in business skills and value chain analysis assisted Farmer Producer Groups (FPGs) to develop business strategies and plans to benefit from their farm enterprises. The sale of assorted vegetables, beans, groundnuts, cowpeas and orange-fleshed sweet potato vines has improved income levels for beneficiaries. Beneficiaries were also trained in savings, loans and business information, and subsequently many have been able to buy food, agricultural inputs, school requisites and clothes for themselves and their children.
- Some communities have developed 'village banking clubs' in which shares are issued to members according to their investment, and money is loaned with minimal interest.
- As mentioned above, there are some emerging issues with unequal access to resources; not everyone has received training or been given resources such as fruit trees, goats, chickens, groundnuts, cowpeas, beans and orange-fleshed sweet potato vines. However, the manner in which communities were engaged does seem to have involved extensive meetings, consultation, and an open and democratic process of community election of lead farmers and VNRMC representatives.
- Social-ecological resilience within communities appears to have been enhanced (e.g. via VNRMCs, social capital, livelihood diversification and CSA) and there is evidence of adaptive management, which will benefit the whole community (although those directly participating in the project will benefit more).

“I am a groundnut seed grower, this has enabled me to sell it at higher prices and given me higher returns. It is a really good empowerment for me... I now have enough money to buy school requisites and buy household necessities like sugar, cooking oil and baking powder. I have diversified into selling scones and fritters. Previously this time of the year we would have just been languishing without doing anything profitable” (Baambwe farmer).

“I had a very good harvest of sweet potatoes in June. After selling them I realized a lot of money which I never used to have even after producing maize for sell. I have found a lot benefits in cultivating them. I have even reserved some vines to plant in the next season. Additionally, they taught us other cooking methods like mixing sweet potatoes with fish to maximize nutritional benefits. This has greatly improved nutritional levels at home and my kids are looking healthy” (Itebe farmer).

Box 2 - The principles of the FLA.



FLA Technical measures

- Measures implemented depend on the unique socio-ecological characteristics of each site, and are developed in collaboration with local resource users.

In the Wetland

- Wetland zoning controls the expansion of cultivation and protects the centre of the wetland where natural vegetation helps stop erosion and gully formation. Natural vegetation also enhances biodiversity.
- Wells in the centre of the wetland are avoided since they can become focal points for gully formation.
- Ensuring the domestic water supply increases the value of wetlands.
- Watering cans or treadle pumps for water extraction need to be carefully monitored to ensure equitable access and avoid environmental degradation.
- Wetland cultivation should be restricted to small plots adapted to local conditions, and surrounded by natural vegetation buffer zones to reduce erosion.

In the Village

- Village Natural Resource Management Committees can be developed by communities to manage FLA interventions and resource use.
- Village savings and loans schemes can facilitate investment and improved marketing.

In the Catchment

- Afforestation improves rainfall infiltration which has positive effects on the wetland's water supply, and reduces runoff, erosion and sedimentation in wetlands.
- Contour ridges reduce runoff and encourage infiltration of rainfall.
- Organic composting improves crop yields and enhances water infiltration.
- Conservation agriculture techniques help improve water infiltration, soil structure and fertility.
- Agroforestry increases water infiltration, improves soil fertility and stability, and can provide marketable goods.
- Wetland edge buffer zones of natural vegetation prevent sediment and runoff reaching the wetlands.

Key take-home messages

- **24 VNRMCs have been trained by SHA, and promote activities aimed at enhancing sustainable utilisation of wetland and catchment natural resources.**
- **On-going sensitization activities within the community are effectively enhancing people's knowledge base on wetlands and their associated livelihood activities, and broader catchment natural resource management issues.**
- **VNRMCs are being used to communicate and disseminate information on a wide range of activities, including good nutrition and cookery lessons, sanitation and hygiene, savings and loans and business plan development.**
- **The process of VNRMC formation and the development of bylaws has facilitated the wider exchange of knowledge and ideas among communities, thereby enhancing social and natural capital.**
- **Bylaws show minor (but unique) adaptations to the community in which they have been developed.**
- **Most people are supportive and abide by the VNRMC bylaws, although in some areas there are issues with community members declining to follow them.** The reasons behind this are complex and require further research, but this situation is likely a function of: a) inclusivity and coverage issues during the project start-up phase, b) poor community understanding / sensitization to the potential benefits of participating in the FLA, and/or c) the promotion of a FLA message that prohibits wetland and catchment natural resource use, rather than encouraging sustainable utilisation.
- Hence, there is **need to explore and develop mechanisms through which the bylaws can achieve greater 'buy-in' from the wider community.** This could involve more inclusive 'sensitization' and education activities, and potentially some community-led modifications to the bylaws so they become more inclusive and attractive.
- Nonetheless, the embedding of bylaws within the VNRMCs and their endorsement by the chiefs suggest that these **institutional arrangements for sustainable management will likely be sustained after the cessation of the PRESERVE programme.**
- Collectively, these suggest the **significant enhancement of social capital and institutional arrangements for adaptive natural resource management.**
- Overall, the research findings suggest that the **institutional capacity building elements of PRESERVE have so far made a significant contribution to enhancing social-ecological resilience through the creation of functioning and adaptive VNRMCs and their respective bylaws.** Furthermore, these have complemented and helped co-ordinate other elements of the PRESERVE FLA, not least the introduction of climate-smart agriculture that has brought **gains in livelihood security that have offset the traditional demands for wetland and forest exploitation.**
- The **excellent network of institutional linkages** (both formal and informal) in which the VNRMCs operate provides huge potential for the PRESERVE experiences to be disseminated widely.