

Nile Basin Development Challenge Community Engagement Report: Diga



Diga woreda, West Wollega, Ethiopia
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Background Information

The Nile Basin Development Challenge (NBDC) is implemented by a consortium led by the International Livestock Research Institute and the International Water Management Institute. It is funded by the CGIAR Challenge Program on Water and Food. The NBDC aims to improve the resilience of rural livelihoods in the Ethiopian highlands through a landscape approach to rainwater management.

The NBDC comprised five linked projects examining: 1. Learning from the past; 2. Developing integrated rainwater management strategies, 3. Targeting and scaling out of rainwater management innovations, 4. Assessing and anticipating the consequences of innovation in rainwater management systems; and 5. Catalysing platforms for learning, communication and coordination across projects. The project undertook work in three study sites: Jeldu, Diga and Fogera woredas.

The group working on 'developing integrated rainwater management strategies' organised 'community engagement exercises' in each woreda to identify key NRM challenges with the aim of informing innovation platform action research.

The community engagement process was led by Beth Cullen (ILRI). Alemayehu Belay, Zelalem Lema and Aberra Adie played key roles in terms of logistics, facilitation, translation and note-taking. The following report documents the process and results.

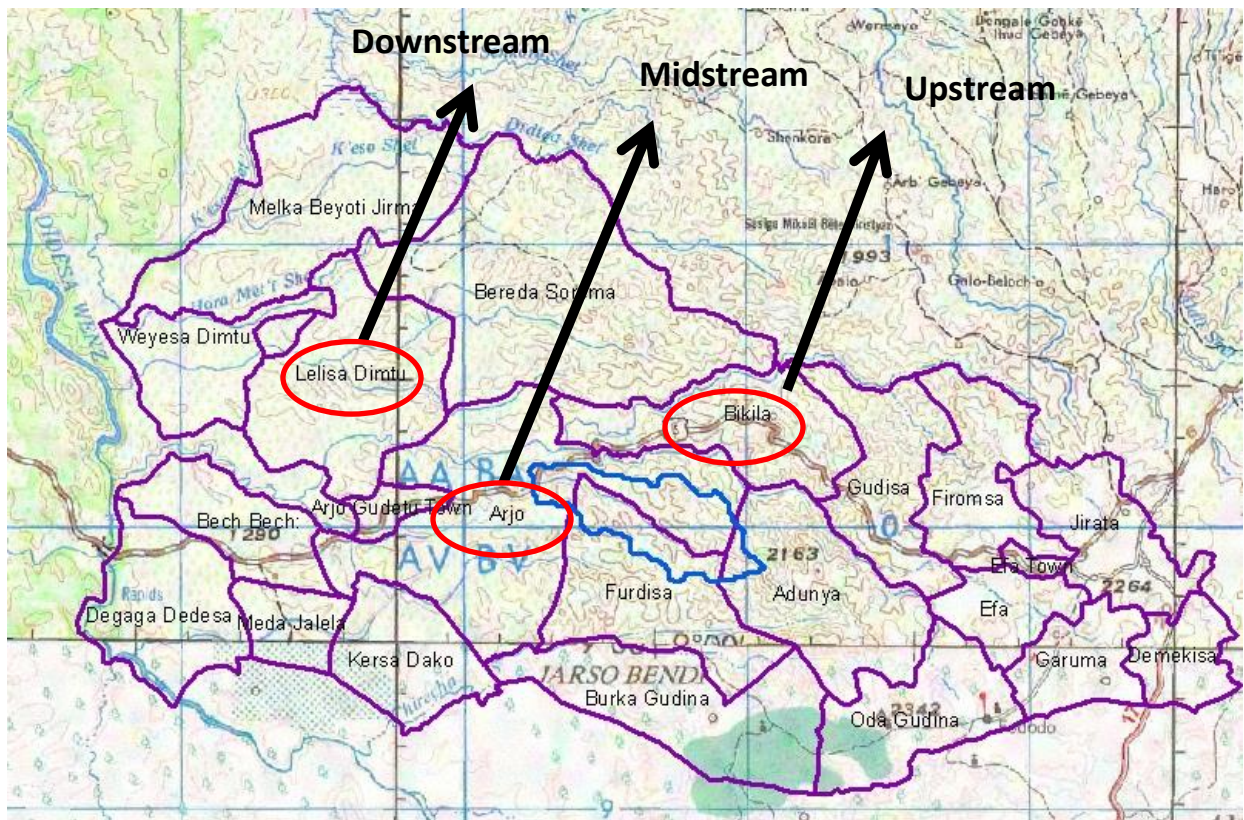
Rationale

A key issue in fostering change in rural systems is the power imbalance between farming communities and decision makers. Although it is increasingly acknowledged that approaches to NRM so far have been top down, there is still an issue of how to engage with local communities and bring them into the process. It is critical to address this because farmer participation is vital for the success of NRM and RWM activities.

The aim of the participatory community engagement process was to enable NBDC innovation platform facilitators to interact closely with community members, build trust and rapport and gain a more detailed understanding of local issues and perspectives in addition to those identified by the NBDC baseline research (Ludi et al. 2013). Information about the major NRM constraints facing community members were fed back to innovation platform members and used to inform ongoing discussions.

Approach

Three kebeles were chosen to represent upstream, midstream and downstream locations in relation to the NBDC selected micro-watershed. These kebeles were Bikila, Arjo and Lelisa Dimtu respectively. Development Agents (Das) from the kebeles selected 16 participants: 8 female and 8 male of different ages and socio-economic status.



Fieldwork was conducted in November 2011, the work began in Arjo kebele on 25th, Bikila on 28th and Lelisa Dimtu on 29th November. The original plan was to start with an exercise to identify key resources and problems within the area, as perceived by community members, followed by a mapping exercise with male and female groups. After the mapping exercise we planned to conduct focus group discussions with male and female groups based on the following questions:

- What resources are abundant or scarce?
- How have these resources changed over time?
- What are the greatest problems affecting land and water resources?
- Who are mostly affected by these problems and why?
- What is currently being done to address these problems and by whom?
- What do you think could be done in the future to solve these problems?

The two groups were asked to identify the key problems and rank them in order of importance. The groups then fed back the outcomes of their discussions and collectively decided on the top issues, including information about causes, current practices and solutions. It was important for participants to talk about their ideas for solutions rather than just focusing on problems.

Our schedule did not go to plan as there were government meetings to inform community members of plans for the 'Sustainable Land Management' campaign. Community members had been selected by DAs to participate in both our exercises and the government meetings. Due to time limitations the mapping exercise was dropped from the work with Bikila and Lelisa Dimtu.

Bikila Kebele - Upstream

Most important resources:

Coffee was stated to be most important for income, followed by maize. Other resources highlighted were small amount of mangos (but recently issues of low productivity), livestock (cattle, sheep and goats), bee keeping, forests, land, banana, avocado, water (drinking, irrigation), sorghum, anchote (*coccinia abyssinica*), sesame, stone, wood.

Problems:

Among problems mentioned were crop disease (coffee, mango, pepper), worms, termites, baboons, monkeys, wild pigs, deforestation, population growth, livestock disease, soil erosion, lack of capacity for irrigation, decline of honey production, lack of drinking water, porcupines.

Changes over time:

Male participants reported that they have seen a decline in soil fertility which has led to a decline in production. In the past people could harvest enough to feed their families because the population of the area was lower and the land was fertile. Land has been used for a long time without proper management and farmers are now travelling long distances to lowland areas of the woreda to get additional land to increase production. They mentioned that soils are abundant around river banks as it collects there after flooding.

Changes in local weather patterns were reported; rainfall has declined and become erratic. Rains used to start in March and end in November, but over the past 3 years rains have not come on time. They now start in May and end in October leading to a decline in productivity. Springs and rivers are drying up during the dry season which leads to poor water quality for humans and livestock. In recent years they have experienced hail which destroys crops, and winds have become stronger than in the past. Female participants believe the area has become colder due to deforestation.

There have been dramatic changes in forest cover over the last two decades, before 1991 the area was heavily forested. Deforestation is attributed to settlers from other regions clearing forest for farm land and settlement. Both male and female participants reported new settlers coming to Bikila from other areas including Harar, Amahara and Tigray. This needs to be verified as they could be referring to woreda-wide migration patterns, rather than Bikila specifically. (It is also likely that local farmers from Bikila also move to the lowlands in search of more fertile farm land; this requires further investigation). Some believe that wild animals are coming into farmland because the forests are being cleared; they apparently didn't destroy crops to the same degree in the past. Now they come due to lack of habitat. Women also reported that many animals that were present in the past have now disappeared.

Participants felt it is better to maintain trees rather than cutting them; from experience they have found that if they cut one or two trees it affects the coffee crop. Female participants said that they prefer to protect trees due to the law and because of the benefits they gain from

them. If there are trees the climate and weather are good. They also stated that there are some trees which they do not touch due to cultural laws e.g. Waddessa (*Cordia africana*). However, it is likely that responses regarding forests were influenced by the presence of woreda staff.

Participants reported that the introduction of mangos has led to positive changes; almost every household now has Mango trees, but they are being affected by the current outbreak of an unspecified mango disease. Women reported a decline in honey production due to deforestation and use of pesticides on coffee trees.

Another change mentioned was the availability of human resources. It is common for families to consist of 10 to 12 members but out of these not more than 3 are working on the land. The other family members are dependent, particularly students. Many of the students do not manage to gain entrance to University so they become dependent on the family. Their knowledge and skill in farming activities is reduced due to the time they spend in school so they are unable to support the family through farming.

Greatest problems:

| | Men | Women | Joint |
|---|--------------|-------------------|----------------|
| 1 | Termites | Monkeys | Monkeys |
| 2 | Irrigation | Termites | Termites |
| 3 | Soil Erosion | Coffee disease | Irrigation |
| 4 | Baboons | Livestock disease | Coffee disease |

1. Monkeys/Baboons

Participants noted that the problems they identified are generally recent in nature. In Bikila Monkeys and baboons destroy crops and take young livestock. Women report that monkeys are a problem during the day and wild pigs at night. Community members organize themselves according to neighborhood groups which take turns to protect crops. There are also similar arrangements for taking care of livestock. Men cannot kill monkeys because of current laws which prohibit hunting. Hunting wild animals was once an important part of the local culture and was probably a way of controlling animal numbers. Participants mentioned the tradition of 'Gafarsa', meaning Buffalo in Afaan Oromo, and 'Facha' which refers to trophies obtained from hunting which are publically displayed to show a man's status as a hero in the community). Women felt strongly that men should be allowed to kill wildlife as they are not frightened of women or children, however, they are unable to do so due to current laws and they lack alternative solutions.



Facha trophies displayed in area neighbouring Diga

2. Termites

Termites are also a major problem in Bikila and cause significant damage (See photographs below). Some community members associate the presence of termites with the forest. However, laws are there to protect the trees and wild animals; the woreda tells people not to cut the forest or kill the wild animals or they will be punished. Others stated that termites have always been present in the area but recently they have increased in number. DAs are apparently distributing chemicals to control termites and they traditionally flood the mounds to kill them, however these practices are not proving effective.

Women complained that men are not working hard enough to control them so numbers are increasing; there is a perception that men were stronger in the past. Women refer to the laziness and lack of effort of men who are currently not capable of finding the queen (locally referred to as king) because they are not digging deep enough.



Termite activity and destruction of newly built health station in Bikila

Community members use the bark of a tree, locally called 'Sootaloo' (possibly *Milletia ferruginea* or Birbira in Amharic, used in some places for fishing), to smoke termite mounds. The tree is still present in the area but the practice is reportedly no longer as effective as it was in the past.

Women believe that when there were more trees the termites were less. They also reported that if there is too much manure present in corrals the termites come and remove it, and destroy corral. Chemicals are being used as a solution by DAs but this is a very recent effort and so far it does not seem to be addressing the problem. There are conflicting reports from community members and local government staff, which may be due to the fact that community members are not aware of the piloted activities undertaken by government staff.

3. Irrigation

Irrigation was an important issue for male participants. They believe there is a lot of potential to expand irrigation activities as there are many rivers and springs in Bikila but most farmers do not have the capital to invest in irrigation equipment. Very few farmers (around 5 households) are using motor pumps for irrigation; those who have pumps rely on arrangements with other farmers by renting their farm land, and by sharing the fuel costs and benefits. Traditional irrigation by gravity is not used because the landscape is not suitable. Women do not focus much on irrigation because they say it is something they cannot do alone; they rely on men.

4. Coffee disease

Participants talked about 'Kolera', a name used locally to refer to coffee berry disease, which started appearing in Bikila around 6 years ago but has worsened in recent years. People also use the name 'kolera' for a range of other crop diseases, and they are not sure whether the same disease is affecting different crops, or what is causing the disease. Community members feel they have insufficient support from experts, but woreda experts are aware of coffee berry disease being a problem in the area. Mango disease occurred in the past year and coffee disease appeared around 6 years ago. Coffee disease makes the berries very dark and according to participants there is another disease which affects the roots. Participants reported that precise timing of weeding and harvesting activities makes a difference to their ability to control coffee disease, if they do not do these activities on time then the disease worsens. They also reported that they only enter the area where coffee is cultivated when the crop is ripe. There are no local solutions to 'kolera'; it is a recent problem which requires expert help.

5. Other issues

Erosion is another major problem; participants reported high rates of soil erosion which lead to difficulties in crop production. Women reported that when the road was constructed by Chinese workers a large area was left exposed causing large scale erosion that killed a number of cattle. There are ongoing erosion problems where soil has been removed and water still floods the land. Both male and female participants felt that the problem of erosion is decreasing due to training from the government. They are constructing cut off-drains out of stone and wood, planting trees on flood ways and building terraces in places. They also

traditionally practice farrowing/countour ploughing (traditionally called Ya'aa). However, community members feel that many of these practices are unsustainable because the land upstream is not well managed. They report that floods often destroy many of their NRM strategies. In addition, some women believe that trees do not help to control erosion; this was particularly from women who reported problems of erosion under their mango trees. There was awareness among participants that erosion is worse in some places than others and varies according to season, some felt that planting trees during the dry season would help to prevent erosion during the wet season.

A variety of livestock diseases were reported: these included trypanosomiasis (locally known as 'gandii'), a disease which causes cracking of cattle hooves (local name not recorded). Gandii has been a problem for a long time but according to respondents the symptoms are more problematic now than in the past; some were perhaps talking about other more recent diseases which have occurred in the last few years. There is reportedly no local treatment either conventional or traditional. There was previously a disease locally called Bishoftu (not sure of the scientific name) which has now disappeared, they used to treat this by branding animals. Low milk yields were also reported (1 litre per day) due to the use of unimproved breeds. Women also believe that tsetse flies sucking blood of cattle also has an effect on milk yield. Women also reported a weed called 'sidissa' which affects animals in the wet season (causes bloating).

Low productivity and lack of fertility of land was mentioned by both male and female participants. They use dung to increase fertility, and have been practicing composting for the past 3 years. Corralling is for the dominant means of maintaining soil fertility; corrals are kept on areas for different durations according to the season: 3-4 days during the wet season and 7-9 days during the dry season. The duration varies depending on the size of the corral and the number of animals. The main reason for changing the place more frequently during the wet season is to find drier places. Corralling has been practiced in the area for generations. Participants report that the practice has not changed since their fathers' time but it is now decreasing because of lack of labor due to more people going to school.

Arjo Kebele - Midstream

Most important resources:

The most important resources mentioned by respondents were water for crops and livestock, people, mango trees, bananas, sugar cane, coffee, maize, sesame, sorghum, millet (dagusa), 'goderee' (a root crop which grows near water), grassland, land, livestock (skins, milk, butter, meat, ploughing, income), honey, rain, forests (medicine, wood for fuel and construction, religion, food, income, good environment), wild animals for tourism. (These are not listed in order of importance)

Problems:

Among problems mentioned were lack of drinking water, deforestation, lack of fertile soil, red soils prone to erosion, termites, lack of land for some, lack of wood for fuel and construction, livestock disease, milk yields, honey production declining, problems with corralling, lack of support to farmers, not enough experts.

It was interesting to note that women identified bananas as a significant crop, but this was not highlighted by the men. It seems that people are starting to grow what they call 'Kenyan bananas' locally because they can get a good price for them at market (1 birr per banana). Participants also reported that they can harvest bananas in a shorter time period than mangos. It appears that the recent problems with mangos locally may be a factor in diversification.

Women in Arjo tended to focus a lot on crops in their mapping exercise and highlighted a number of issues that were missed by the men.

Changes over time:

Women and men noted that before 1982 the area was highly forested but more recently expansion of agricultural land has contributed to deforestation. People from Wollo reportedly settled in the Diga area in 1991 from Benishangul where they were originally settled after the famine. Wollo settlers cleared forested areas for farmland. Participants commented that at that time there were fewer mango plantations and forest fires were a major problem. Trees were also cleared to remove habitat for wild animals which damaged crops.

Male participants commented that there were less livestock in the past because of the forest density, but this has changed partly due to an increase in population and due to extension work and technology transfer. They also mentioned that coffee is new to their kebele; it started to be cultivated around 5 years ago.

Women reported that there were incentives to decrease forested areas due to the presence of tsetse fly which apparently are worse during the rainy season and when there are more forests. They also reported that they keep corrals for less time during the rainy season due to tsetse. (This is of relevance for any research into corralling but may just be based on local perceptions which are not necessarily representative)

Greatest problems:

| | Men | Women | Joint |
|---|-------------------|-----------------------------|-------|
| 1 | Soil Erosion | Termites | |
| 2 | Termites | Mango & other crop diseases | |
| 3 | Livestock Disease | Soil Erosion | |
| 4 | Water problems | Lack of drinking water | |

NB: The issues were not jointly ranked by male and female participants because of time constraints

1. Termites

Termites are a major problem in the area. They affect crops, forests and houses and have always been present but after deforestation the problem became worse. Women were adamant that termites are their main problem. Traditionally they controlled them by diverting water to flood the termite mounds; they also make fires and smoke the area infested with termites with wood from specific trees. They use chemicals if they have enough money but the chemicals are often not available locally and if they are distributed by the government they do not give enough.

2. Soil Erosion

Men mentioned that the fertility of the soil has decreased due to the farming practices of their fathers' generation. They mentioned that they started ploughing the land in 1967 (fairly recently so they may have been incomers to the area? This needs to be checked.) Men believe that the top soil is being eroded due to the expansion of farmland which has exposed soil to erosion; they complained that there is no soil research being done in the area to advise people what they should plant to prevent soil erosion. Soil erosion is particularly problematic during the rainy season. Women mentioned that traditionally they practice contour ploughing because the local soil is vulnerable to erosion, which indicates local knowledge about how to control erosion. Some are also planting bunds with vetiver grass but this was recently introduced so this has not brought any visible changes so far. Terracing was mentioned as a potential solution but this may partly be as a result of extension work. Male participants mentioned that the DAs struggle to cope with addressing widespread issues such as soil erosion because Arjo is a large kebele so it is difficult for them to work with all households.

3. Mango Disease

'Kolera' which affects mangos and coffee was a problem mentioned by women but they do not know of any solution. This was not mentioned by men during the FGD but women felt it was a priority issue and ranked it second after termites.

4. Problems with water

Women mentioned that although there is plenty of water for livestock and crops there are problems with access to drinking water. Men also mentioned that there is insufficient access to clean water for the community. During the dry season there is a lack of water but during the summer it is abundant. Men also mentioned that out of the 1137 households in the kebele, 60 are using irrigation but the landscape in the area is problematic for irrigation practices. 6 households own motor pumps for irrigation. They also commented that households in the upstream areas of the kebele do not allow people downstream to use their irrigation channels, they do not want the channels to cross their farmland.

5. Other issues

Deforestation is contributing to lack of wood for fuel and construction. People have to buy eucalyptus from the government. There is also a decline in honey production due to forest decline. Honey was highlighted by women as important in the mapping exercise. Deforestation in highland areas is also causing soil erosion problems.

A variety of livestock diseases were mentioned by both male and female participants: *gandii* (tsetse), *warana* (possibly refers to tsetse or another biting fly, *warana* and *qarxasa* used interchangeably in some places), *qarxasa* (now on the decline), *bishoftu* (no scientific name found), *abba gorba* (possibly Black Leg, causes swelling of legs and body in cattle), *boshu fatu* (occurs during the dry season, no scientific name found), *abba sanga* (usually refers to Anthrax, occurs during rainy season and cold weather). New livestock diseases are also emerging. Men mentioned that there are problems due to the poor water quality for livestock watering and lack of grass. Women participants stated that they cannot corral cattle for long periods of time in the same place due to tsetse which is worse during the rainy period. This is why they reduce the length of time of corrals during the wet season. This contributes to problems of soil fertility. (This was refuted by other participants so may not be a widespread belief).

Irrigation was reported as a problem due to a lack of coordination which leads to upstream/downstream conflicts (people try and use water from irrigation channels constructed on neighbors' land). At the moment people are using traditional irrigation systems to divert small amounts of water but they want to increase the irrigation which is likely to lead to further conflict if this is not well organized.

Lelisa Dimtu Kebele - Downstream

Most important resources:

The most important resources cited by respondents were mangos, rivers, banana, land, corn, sorghum, millet, livestock, sand, coffee, chickens, sugar cane, water for irrigation

Problems:

Various problems were also identified including pests (monkeys, birds), termites, erratic rainfall, inability to purchase fertilizer, climate change, crop diseases (mango, banana, coffee), deforestation, not enough land for some, invasive weed (locally called biyya basii but so far no scientific name available), soil erosion, livestock diseases, lack of access to improved dairy cattle, shortage of animal fodder, human diseases (malaria, typhoid), lack of capacity to develop irrigation, access to drinking water, soil fertility. (Not listed in order of importance)

Changes over time:

There have been significant changes in land use patterns in Lelisa Dimtu. Participants reported that a missionary, known as Mr Laars, came in 1963 (possibly through Mekane Yesus). He introduced a school, a clinic, store houses and a grinding mill to the area and was apparently responsible for introducing mangos. He brought mango seedlings from Ilubabor zone, and focused on teaching women how to cultivate them; they were paid to do this. Before mangos were introduced, Lelisa Dimtu was covered by forest and grassland; people used to come from neighboring areas to hunt wild animals (elephant, buffalo etc). These forested areas were cleared for the mango plantations. He also tried to introduce agricultural production near the river. The presence of missionaries in Lelisa Dimtu led to in-migration from neighboring areas, like Diga and Gimbi which led to population increase.

Participants reported that land was fertile in the past and they could produce enough food, but fertility has declined. Participants believe this is partly due to the presence of a state farm which was established under the Derg regime. Everything that had been introduced by the missionary was then taken over by the regime. Under the Derg, fertilizer was supplied by the government and irrigation was used. During this time people from Wollo were also moved to Lelisa Dimtu which increased the population of the kebele and resulted in clearing of forested areas for new settlements. Before the settlers came there was a protected forest which bordered Lelisa Dimtu and Bareda Sorama but it was destroyed by the establishment of 30 new households in 1992 E.C.

After the collapse of the Derg the land and mango trees were distributed to individual households by the current government, but individual households can no longer afford to buy fertilizer. This meant that farmers had to increase their landholdings to increase production which led to further deforestation. Settlers from Wollo and other areas have also brought relatives and other people to the area which has led to further population growth and pressure on natural resources.

Participants referred to climate change and springs and rivers drying up during the dry season. They say soil moisture was good in the past but farming is becoming difficult because the land has become drier. The livestock population has increased but some believe the productivity is declining due to problems with access to feed and water. Male participants reported that there is only one area of communal grazing land in Lelisa Dimtu which is not well protected due to the increase in livestock numbers.

Greatest problems:

| | Men | Women | Joint |
|---|---------------|----------------|----------------|
| 1 | Soil Erosion | Termites | Termites |
| 2 | Mango Disease | Drinking Water | Mango Disease |
| 3 | Water | Soil Erosion | Drinking Water |
| 4 | Termites | Mango Disease | Soil Erosion |

1. Termites

Termites have always been present in the area but it is only fairly recently that they have become a major problem, they attack a range of crops as well as grass when there are no crops in the fields. Women from Lelisa Dimtu said that chemicals were used in the past to control termites; both Mr Laars and the Aid commission (Derg) used to use chemicals to treat the termites but since the new government this method of control stopped which has made the problem worse. There used to be a chemical storehouse for pesticides at Lelisa Dimtu but it has been removed. According to female participants, mango seedlings brought by Laars were also treated with a ‘medicine’ to keep away termites, but they didn’t use any chemical treatments on the mango trees. There also used to be work groups (Debbo) and campaigns to remove queens using both chemicals and flooding. These groups were organized by people experiencing problems with termites on their land, but this practice has reduced because the termites are adapting and getting used to the different control methods. People now feel that the problem is beyond their capacity so they no longer arrange Debbo groups (requires resources). They also reported that after destroying the mound they used to put salt in the hole which was effective but now the termites have adapted to that also.

Community members have a detailed understanding of termites and their behavior, but it is hard to know how much of this is local knowledge and how much is informed by extension work. Participants reported that termites build mounds and the ‘king’ (queen) lives inside a ‘house’ which is waterproof, very strong and difficult to break. They can tell the age of the ‘king’ by its layers, they can live up to 8 years and they suspect that when one dies it is immediately replaced by another. They say termites communicate with each other, act on orders and work together to attack crops and houses (houses only last up to 3 years or so). They are perceived to be ‘enemies of the people’. Women spoke about a local honey produced in the ground which they rely on as a medicine which is now rare because of termite activity. One woman reported 12 areas around her house and land that were severely affected by termites which meant she

could not produce anything. DAs used chemicals after which she managed to produce a small amount, but after some time the termites came back. Now there are no chemicals available. She suggested that the government could use chemical distribution as an incentive for other work. Women also mentioned other pests, such as worms which affect tomatoes and onions after the seedling phase and an ant (locally called 'miti') which affects potato.

2. Mango Disease

Mango disease has appeared during the past 2 years (see photos above). Last year the yield declined but this year they are not expecting any fruit as there have been no flowers; previously production was constant. Lelisa Dimtu is known for mango production and people depend heavily on mangos for household income. Participants estimate that one household may have more than 30 mango trees and from one tree they can earn an average of 200 to 300 birr. Mangos are particularly useful for covering school fees. Community members have no idea of the cause of the disease. Men reported that initially they tried to use traditional knowledge to control the disease; they smoked affected trees and cut them down but the disease still spread to the other trees. The problem is now beyond their control. There has been no help so far from the government and they are not sure how aware they are of the situation.



Symptoms of mango disease on trees in Lelisa Dimtu kebele

They are struggling to grow new fruit trees (both mango and oranges) due to problems with termites which destroy the young seedlings. All the fruit trees they have are now old, which may be a cause of the disease. Banana and coffee have both been recently introduced to the kebele but both are being affected by disease which has resulted in declining productivity.

3. Access to drinking water

Access to drinking water varies across the woreda. Some have access to a source of drinking water which was established by Laars in Lelisa Dimtu; others have always struggled to get access to drinking water. Apparently there are only 3 springs in the kebele which are suitable

for drinking water. The majority of households use unprotected water sources and are exposed to waterborne diseases. Community members have also been told by missionaries that certain local water sources are dangerous and have parasites (including leeches) so people are afraid to drink. Children and women are most affected by poor water quality. Recently the water point established by Laars has dried up due to deforestation which took place 3-4 years ago by land holders (after the land was redistributed by the current government). Farmland has expanded and affected the water sources. Now people are forced to drink impure water from the river. They are competing with people from the 'Wollo area' for drinking water. This refers to an area which has been settled by people from Wollo who have access to drinking water but they restrict other people from using it.

4. Soil Erosion

Soil erosion is a major source of concern among both male and female participants. The rate of erosion is high; soil comes from the uplands to the lowlands and covers their land. The soil is sandy and destroys their crops. This is particularly problematic after the rains when they see large amounts of soil being washed into the river. Wind erosion is also a problem; it leads to destruction of crops and removes large amounts of soil leaving only stones making it difficult to grow crops. Erosion is apparently a common problem across the kebele. During the Derg regime tractors were used to control soil erosion (people did not mention how the tractors were used specifically) but now nothing is being done and it has become a serious problem. They prepare cut-off drains and check dams but they are destroyed. They also control as much as they can but their efforts are often in vain which leaves people feeling frustrated. They have also tried to plant grasses and trees in strips in their fields to protect the soil but they are destroyed by termites so no-one is doing this.

5. Other issues

Climate change was mentioned by participants as a problem. They reported shortage of rainfall and changes in temperature which they believe contribute to livestock and human disease, including increased rates of malaria. They also attributed the emergence of a new weed (locally called 'Biya Basi') which affects crop production to climatic changes.

Male participants mentioned problems accessing water for livestock and irrigation. There are no households in Lelisa Dimtu practicing modern irrigation, and approximately 10 households using traditional irrigation (these tend to be those with land near the river). There is lack of capital for motor pumps and no assistance for communities to utilize nearby rivers for irrigation.

General Observations

The process of reaching consensus during the joint ranking exercise was interesting to observe and the arguments that were made gave further insights into the problems faced by community members. For example, in Lelisa Dimtu men argued that mango disease was the most serious problem they face. However, women argued that mangos are harvested only once a year but the crops that people depend on throughout the year are destroyed by termites. They also pointed out that mango disease is recent so they do not have any idea of how it will affect the yields this year but the problem with termites has existed for longer and affects more people. This may reflect different priorities among men and women.

Female groups presented strong arguments for their ranking decisions and there was a high degree of consensus on the main issues. Female participants focused mainly on community-wide problems rather than individual agendas, which men had more of a tendency to do. For example, one of the male participants from Arjo kebele, a model farmer, prioritized irrigation as an issue because he wanted assistance to solve conflict with a neighbor over access to irrigation. Men in Bikila kebele queried why the groups were split by gender; some felt that women were not sufficiently knowledgeable about NRM issues. However, in all three kebeles, when issues were fed back and collectively ranked men tended to agree with women's ranking of issues.

In the mapping exercise men started with boundaries and physical structures whereas women focused more on homesteads and crops. As we only did mapping with one kebele this may not have happened in other places. It is also possible that the facilitators influenced the way the maps were drawn. It would be interesting to focus on mapping exercises with groups from different kebeles as a way of raising awareness of upstream/downstream issues. Maps could also be used as a way of aiding coordination across kebeles and communication between various stakeholders.

Priority issues that were identified tended to be tangible issues which immediately affect livelihoods and which require external help. The additional issues they mentioned which were not ranked as priority issues appear to be underlying drivers which are possibly linked to the issues they mention. See tables below. It would be useful to look at the issues prioritized by community members from a landscape view point. Most of the problems they prioritized were recent in nature and possibly a result of wider ecosystem imbalances. For example, the mango disease could potentially be a result of growing mangos in a monoculture, and an inability to plant new trees due to termites. Termite infestation could be a result of deforestation to make way for farmland; and monkeys/baboons attacking crops is likely to be partly due to expansion of farmland, loss of habitat and the fact that local hunting traditions have been banned. There is a need to take a systems approach to these issues: simply focusing on termite eradication will not address the underlying causes; similarly with mango disease, spraying will not necessarily solve the problem. These issues need further analysis to ensure that the right measures are taken so that the problems are not exacerbated.

Upstream/downstream factors emerged: soil erosion, deforestation, irrigation and water problems. It will be useful to look at how these issues could be tackled through better planning and coordination. Community members recognize a need for collective action because many of the problems they are facing are beyond their capacity and require large scale action. However, community participation at both planning and implementation stages will be essential. In this respect community issues were correlated with issues raised by IP members at the platform meeting: lack of coordination, lack of expertise, and participation.

| | Bikila | Arjo | Lelisa Dimtu |
|-----------------|-------------------|----------------------|-------------------|
| Priority Issues | 1. Monkeys | 1. Termites | 1. Termites |
| | 2. Termites | 2. Soil Erosion | 2. Mango disease |
| | 3. Irrigation | 3. Mango Disease | 3. Water problems |
| | 4. Coffee disease | 4. Livestock disease | 4. Soil Erosion |

| | | | |
|-------------------|-------------------|---------------------|-------------------|
| Additional Issues | Deforestation | Irrigation | Irrigation |
| | Livestock Disease | Pests: mice & worms | Deforestation |
| | Soil Erosion | Soil Fertility | Climate Change |
| | Climate Change | Deforestation | New weeds |
| | Soil Fertility | Population Growth | Livestock disease |

Community concerns could potentially be used as entry points to tackle broader underlying NRM issues. People were generally quite positive that the problem of soil erosion could be tackled and mentioned that there has been a lot of training recently on this issue but it has not had time to take effect yet. However, expression of these views may have been influenced by the presence of DAs and woreda staff. It is also clear that there is a need for better coordination across the landscape. Community members report that the NRM structures are not effective. The N2 hydrological and modeling work could potentially provide information that could make these efforts more effective. Research being done by students on the local soils could also be useful; it seems that the decline in fertility and erosion issues mentioned by community members are also partly due to local soils (nitisol) which are acidic and vulnerable to erosion.

In-migration to the area was identified as a key driver of change. We visited the local market in Arjo and there are people from all over Ethiopia living in the area. Some seem to still be migrating to the area as we met people who could not speak the local language which suggests that they are more recent settlers. There does not seem to be any control over migration to the area and there is evidence to suggest that access to land is becoming a concern. During all the focus group discussions new settlers were blamed for deforestation. This could be due to a number of factors: need for farmland, lack of a sense of ownership/belonging to the place, lack of land or income. It is, however, also likely that some deforestation is also practiced by those who have been settled in the place for a long time. Charcoal production is practiced in the area, mainly by poorer people who do not have an alternative source of income. The government is apparently proposing irrigation as a way of providing alternative livelihood strategies in an effort to stop charcoal production but this will take some time to take effect.

It seems that deforestation is a major problem in the area that intersects with other issues mentioned by community members. Local government is concerned by the problem of deforestation and community members are highly aware that they will be punished if they are caught cutting trees from the forest. They have developed covert methods for gradual deforestation by cutting the bark from the base of trees in the shape of a cross in order to make it look like a spiritual practice. As a result trees dry out and die, and can then be cut for firewood. Using these methods people expand farmland into the forest. This is reportedly not just being done by new settlers but also by local people whose farmland has become less productive; they know that land in the forest is more fertile. It would be useful to combine oral accounts of deforestation with secondary sources such as historical accounts and aerial/historical photographs to get more of an accurate idea of how forest cover has changed over time.

Next steps

- Issues need to be approached from a landscape view with different stakeholders using participatory mapping/modeling/planning techniques that can help to facilitate dialogue between various stakeholders, build capacity and address planning, implementation and institutional constraints.
- Communities and IP members alike are keen to see action. Look at ways of engaging with potential partners (GIZ-SLM, ORDA, FARM-Africa, Hundee, Melca-Ethiopia) who have expertise and resources to tackle issues raised by community members. These issues could be used as entry points to tackle broader NRM issues, which will be critical for gaining community confidence.
- Potential role for research: integrating hydro & modeling work with livelihoods information, IP activities and participatory approaches could be a way of linking the different project components, but ways of doing this need to be developed. Crop disease, invasive weeds, termites, livestock: possible action research topics or topics for interns to gain more detailed information.
- During the next IP meeting the issue of site selection needs to be discussed. This will require careful consideration, for example how many kebeles will the IPs be focusing on and which ones? What activities will the IP's be implementing/piloting and how? What scale should they be working on? Who should be involved from the community etc.
- Tigray watershed approach presents potential opportunities. Local government is in need of research inputs, as well as technical & institutional assistance. There is a potential role for the NBDC project to support this process, for example through research data as well as training and capacity building in participatory planning approaches. This could potentially lead to a combination of the model watershed approach that was originally proposed and the use of innovation platforms.

Further reading

Ludi, E. et al. (2013) *Rhetoric and realities: a diagnosis of rainwater management development processes in the Blue Nile Basin of Ethiopia*. Colombo, Sri Lanka: CGIAR Challenge Program on Water and Food (CPWF). 58p. (CPWF Research for Development (R4D) Series 5).

http://cgspace.cgiar.org/bitstream/handle/10568/27603/cpwf_r4d5.pdf?sequence=1