



Local-Level Integrated Water Resource Management in Malawi

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IWRM and Rural Livelihood Project in Dzimphutsi: Process Documentation

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The authors tried to reflect the process and impacts of the project as accurately as possible, but, obviously, they take full responsibility for any misquotation or incorrect interpretation.

LIST OF ABBREVIATIONS

Ha	Hectares
GVH	Group Village Headman
IWMI	International Water Management Institute
IWRM	Integrated Water Resources Management
MASAF	Malawi Social Action Fund
MoIWD	Ministry of Irrigation and Water Development
MDGs	Millennium Development Goals
PSC	Project Steering Committee
SADC	Southern African Development Community
TA	Traditional Authority
WUA	Water Users Association

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1. BACKGROUND: PIONEERING LOCAL-LEVEL IWRM

Since 2006, the SADC Regional Water Sector Programme, supported by Danida, has piloted Local-Level Integrated Water Resources Management (IWRM) through IWRM Demonstration Projects in five countries: Malawi, Mozambique, Namibia, Swaziland and Zambia. In each country, the Programme invited national organizations interested in piloting this approach to become the implementing agent. This report documents the process, impacts and lessons learnt of the project in Malawi, where the Ministry of Irrigation and Water Development guided an implementing agent, the firm CODA, in implementing the 'IWRM and Improved Livelihoods project in Dzimphutsi Area'.

The SADC/Danida Water Sector Support Programme aimed to demonstrate how principles of Integrated Water Resource Management (IWRM) can be put into practice in poor rural areas. The focus was on those principles that have received limited attention as yet: water resource management at the lowest appropriate levels, users' participation, and the inclusion of women. Through the piloting and 'learning-by-doing' in the five countries, the IWRM Demonstration projects gradually developed an innovative scalable approach to water services called local-level IWRM. Seven innovations are summarized in a 'Lessons Learnt' report¹.

In short, the starting point for local-level IWRM is the recognition that people have multiple domestic and productive water needs, certainly in rural areas where agriculture-based diversified livelihoods depend in many ways upon water. Better access to water brings health and alleviates women's and girls' burdens of water fetching and it improves production of crops, vegetables, animals and fisheries for food and income. Thus, water contributes directly and indirectly to all Millennium Development Goals. These needs are met by using and re-using water resources from multiple inter-related water sources, both naturally and from infrastructure. Synergies from combining multiple sources reduce infrastructure costs and strengthen coping strategies to mitigate human-made and climatic and environmental shocks. Local-level IWRM recognizes that communities have managed their multiple water sources for multiple uses in an integrated manner since time immemorial, often informally and orally.

Local-level IWRM is an intervention approach for using water for poverty alleviation and gender equity through participatory and demand-driven multiple-use water services (MUS). Through repeated cycles of time- and budget-bound 'projects', it capacitates communities to solicit support from external agencies and to co-design and implement water improvements according to their own evolving needs and priorities. This contributes to environmentally, financially, and institutionally sustainable water resource management. Each project or 'loop' at community-level follows the typical steps of any participatory intervention: understanding the community and building trustful relationships, planning and prioritizing activities, compiling detailed action plans, implementing, and continuously monitoring and evaluating process and livelihood impacts. Skipping one step may cause problems later, which still warrants going back and addressing that earlier step. Moreover, as external support is easily captured by the male elite, specific targeting approaches are needed to ensure that the marginalized are included from the onset.

¹ SADC/DANIDA Water Sector Support Programme. 2009. Innovations in Local-Level Integrated Water Resource Management. Lessons learnt from the Integrated Water Resource Management Demonstration Projects in Malawi, Mozambique, Swaziland and Zambia. 2009. Synthesized by Barbara van Koppen, Jonathan Chisaka, and Stalin Sibande Shaba. Pretoria: SADC/DANIDA Water Sector Support Programme, in collaboration with the International Water Management Institute.

Local-level IWRM, understood as integrated services delivery, seeks to overcome formal sectoral boundaries within the water sector, where professionals tend to focus on one single end-use: either domestic, or irrigation, or cattle watering etc. It creates a supporting environment, in which the range of governmental, non-governmental and private water and rural development support agencies collaborate, both horizontally and vertically, for one-window service delivery. Further, acknowledging that water is a catalyst for broader development in which water is often the limiting factor, local-level IWRM also forges integration of land tenure issues and other factors to render water use more beneficial. By holistically mobilizing support vertically and horizontally, intermediate-level agencies can respond more effectively to communities’ integrated needs, and national agencies can effectively support this intermediate-level response. Over-time, communities are sustainably empowered by strengthening their relationships with agencies. This is systematized around local planning processes. Therefore, local government and other authorities, in particular Traditional Authorities, who play such pivotal role in accountable planning and implementation of incremental improvements according to people’s own priorities, are the integrators of needs-based services.

The practical understanding of local-level IWRM as an iterative, step-wise intervention approach is summarized in figure 1. Annex 1 provides the detailed components of all seven steps. These steps are further elaborated in a separate document entitled ‘Guidelines for local-level IWRM. Based on experiences of IWRM Demonstration projects in Malawi, Mozambique, Namibia, Swaziland, and Zambia’². The target group of these guidelines are the local authority structures in charge of water projects in SADC and elsewhere.

Figure 1: Overview of responsibilities, phases and steps

Responsible Organization	Phases	Steps	Steps
Creating a supportive environment			Continuous ‘Step’ Seven: Do participatory monitoring and evaluation and impact assessment for follow-up
Local authorities and support agencies	Initial	Step One: Mobilize support	
		Step Two: Select communities	
Participatory planning, implementation and monitoring			
Communities facilitated by local structures and support agencies	Participatory planning	Step Three: Understand the community and build capacity	
		Step Four: Create a vision and select activities to fulfil it	
		Step Five: Compile action plans	
	Implementation	Step Six: Implement the action plans	

This report documents the process of operationalizing these steps by government agencies and private service providers for Dzimphutsi community in Malawi. Findings are based on IWMI’s continuous monitoring of the process from local to national level with regular field visits, from 2007 till December 2009. Further, during the last months of the project, an impact assessment household survey was undertaken among 30 households (23 beneficiaries and 7 non-beneficiaries; 17 women respondents and 13 men respondents) to assess impacts and

² SADC/Danida Regional Water Sector Programme. 2009. Guidelines for Local Level Integrated Water Resource Management. Pretoria: Southern African Development Community/Danish International Development Agency, in collaboration with the International Water Management Institute.

lessons learnt. These households were randomly chosen from clusters of beneficiaries and non-beneficiaries in proportion to the village population, so Dzimphutsi village (15), Mwazika village (7), Joseph village (7), and Zilipaine village (1). Five households had unmarried heads. Two households were polygamous. The average household size was six. October and November are also the driest period, which allowed studying water uses under that scarcity.

2. THE PROJECT FRAMEWORK

In 2005, the SADC/Danida Water Sector Support Program invited the Malawian government to design and implement a pilot project on local-level IWRM. The national Ministry of Irrigation and Water Development (MoIWD) responded to this invitation. A team of the Ministry of the Irrigation and Water Development, including the Principal Secretary, identified various sites, including the Dzimphutsi area, East Bank of the lower Shire Valley, near Chikwawa, Southern Malawi. It submitted a project proposal in May 2006 to pilot this new approach in Dzimphutsi constructing a village dam (weir) in the Nkudzi stream, which would protect against flooding and allow better water control during the dry season for irrigation and multiple other uses. Community organization in Dzimphutsi was good. This project was selected as the local-level IWRM Demonstration project.

The proposal of the MoIWD of May 2006 stipulated that MOIWD would be responsible for managing and supervising; for identifying an implementing agent; for chairing the Project Steering Committee; and last but not least, as a policy institution for guiding and determining other areas of replication of the project.

Within the time period of 18 months, a 25 ha irrigation schemes was envisaged, which would get water from a new earthen dam. This structure was expected to also provide water in the Nkudzi River during the driest period (September-November). This would solve the problems of the livestock farmers, who now had to bring their animals downstream up to the Shire River, where crocodiles attacked the animals. The project would also 'provide domestic water supply to reduce the drudgery of water collection by women and also reduce incidences of diarrhea diseases that result from using unprotected water supplies'. Integration was foreseen through the 'design of water supply network for irrigation, domestic water, aquaculture, and animal watering'. Upstream land encroachment, deforestation and soil erosion warranted an integrated catchment approach, which could be achieved by collaborating with already ongoing afforestation projects. The project proposal explicitly envisaged integration among the service providers at intermediate and national level. The project 'would truly afford an opportunity for various institutions such as those responsible for Water affairs, Irrigation affairs, Fisheries affairs, Forestry affairs, Land resources affairs and community affairs to work together in a coordinated manner and integrated manner for economic efficiency environmental sustainability and social equity'.

Also, the proposed local-level IWRM project could be assisted by the government arm for such participatory approaches: the Malawi Social Action Fund (MASAF). Indeed, the step-wise approach of this Fund for rural self-help through the District Assembly is remarkably similar to the Guidelines for local-level IWRM (annex 1).

Therefore, even though that project ended in 2006, it is worthwhile to highlight its approach here.

- starting (and continuing) with capacity building of communities on proposal and budget formulation, accountancy, bank account opening, and monitoring (with procedures up to the Corruption Bureau);
- including community contributions in proposals;
- desk top screening of submitted proposals by local government; followed by
- checking applicant communities through field visits by the local government;
- realistic costing of the proposal on the basis of Bills of Quantities of the District Assembly;
- submitting to the donor (Worldbank), who then

- disbursed a cheque directly to communities' own bank accounts, with clear conditions whether certain tasks should be outsourced to a consultant, which then would follow normal tender procedures at local level, or, if above a certain threshold, at national level.

This was the project framework within which the 'IWRM and Rural Livelihoods Improvement Project in Dzimphutsi area' was to be implemented.

3. THE INITIAL PHASE: CREATING A SUPPORTIVE ENVIRONMENT

Step One: Mobilize support

Step Two: Select communities

As the community had already been selected, and even the main technology of a multi-purpose dam and irrigation scheme had already been identified, the initial phase entailed the mobilization of support. That is the creation of a supportive environment of delivery structures for further planning, implementation and scaling-up of the project. For this, the Ministry obtained the mandate to identify an implementing agent. In June 2006 a tendering procedure was initiated according to the national procurement requirements. Five bidders participated. In April 2007, the assignment was awarded to CODA, a regional firm for agriculture, civil engineering and rural development (procurement reference number IPC/021/009/006). CODA immediately placed a project manager and a community mobilizer in Chikwawa, who were to be backstopped by national-level colleagues (after the construction works, CODA staff operated from the capital). The SADC/Danida Water Sector Support Program financed CODA directly, while the national Ministry of Irrigation and Water Development took the responsibility of technical and general supervision.

Vertical integration was structured through a Project Steering Committee. This policy committee was to 'guide the execution of the project'. Members of this committee included: officials from ministries of Irrigation and Water Development, Agriculture, Forestry; District Assembly Planning Division; CODA; SADC/Danida Water Sector Support Program and Co-opted members. In the course of the project Senior Group Village Headman Joseph and the IWMI monitoring researcher became such co-opted members. The MOIWD chaired the committee. The Project Steering Committee met regularly during the course of the project.

Horizontal integration at District level was envisaged through a Project Technical Committee. This committee would 'review all technical aspects of the project including the designs, work plans and budgets before onward submission to the Steering Committee. Proposed membership included technical personnel from Water, Agriculture, Forestry, District Assembly and Local Project Committee representatives'. There were no administrative funds set aside for this role, though. As elaborated below, this committee remained inactive until the consolidation phase, so the interactions with the District Assembly were primarily through the Project Steering Committee. Lastly, in order to support already on-going monitoring, the International Water Management Institute recruited the Monitoring and Evaluation Officer of the District as national monitoring researcher. His interactions at all levels strengthened horizontal and vertical integration in support structures and communication with the Dzimphutsi community.

At community level, the receivers of this horizontally and vertically supportive environment were envisaged to be represented through Local Committees, 'responsible for day-to-day execution of the project', and one main committee designated as the Local Project Committee.

4. SELECTING PROJECT ACTIVITIES FOR THE PRELIMINARY DESIGN REPORT

Step Three: Understand the community and build capacity

Step Four: Create a vision and select activities to fulfill it

When the local CODA staff first contacted Dzimphutsi community, they enthusiastically set out to further elaborate the already defined activities into action plans and to identify other activities according to the promises made in the tender proposal. CODA mainly interacted with the communities' traditional leadership and some initiators of development activities. This is Senior Group Village Headman (GVH) Joseph, who oversees Dzimphutsi and 15 surrounding villages, and is under Traditional Chief Maseya. CODA also closely interacted with the Dzimphutsi Village Headman and his subjects, in particular the (future) chairman of the irrigation committee. CODA's built its understanding of the community in the course of these interactions. A base line survey carried out then indicated 97 households for Dzimphutsi; no other villages were mentioned.

The proposed irrigation development appeared to build on earlier attempts with river diversion irrigation. In 2003, the chairman of the irrigation committee and some other men had taken the initiative to dig a canal from the Nkudzi River. The canal went up to the road, where it was difficult to cross, but well visible. That served the underlying intention, which was to draw the attention of the well-wishers to Dzimphutsi community's initiative, commitment and willingness to work for their development. In Chikwawa district, with hardships of frequent flooding, many NGOs and government aid projects operate. World Vision's Food for Assets project responded and some efforts were undertaken to dig a new river diversion canal and irrigate a portion of land downstream of the road, Mtendere scheme. The water diversion from the Nkudzi River was not successful, though. A total of 56 farmers had participated in this yet-to-be-realized scheme. They came from Dzimphutsi and various surrounding villages under GVH Joseph, including Mwazika, Joseph and Zilipaine. However, they did not particularly represent the poor or women, as admitted by the leaders. (No written list was available up till the irrigation committee kept records in May 2009).

A second initiative also built on an earlier project; this concerned fish ponds along the river, a few hundred meters upstream of the irrigation scheme. It had also been initiated by community members who started digging ponds on their own, both communal and individual, to show that they were hard-working and committed. In 2004 – 2005, the same World Vision Food for Assets project supported the digging of more communal ponds. People from Dzimphutsi, Samu, Joseph, Zilipaine and James participated. However, according to community members, the NGO funds were limited for the entire construction and water provision from the Nkudzi River hardly succeeded.

The envisaged dam was expected to protect against floods and provide water to the both the irrigation scheme and the rehabilitated and new fish ponds. In addition to these two activities, CODA local staff compiled a much longer list of potential activities that were included in the subsequent versions of the inception report. Thus, in its draft inception report of May 2007, CODA proposed to include all 16 villages of GVH Joseph, and suggested

improved goat rearing, bee cultivation, Moringa tree promotion, over 100 fish ponds, re-forestation, boreholes, rehabilitations of piped water supplies, and protected wells to 1162 households. At this stage, the budget for civil works was still set as 'between USD95,000 and 150,000', so expressing more needs might have been thought to lead to higher allocations.

In order to forge relationships with the District Assembly, CODA presented its ideas to 56 stakeholders participating in the District Executive Committee (DEC) meeting in May 2007. The project was included in the District Development Plan. The participants of the meeting gave useful feedback, also looking at how to integrate this new plan with ongoing projects. They found it very ambitious and advised to reduce the scope of the project or the area or both, or to extend the deadline. Further, useful advices were given on contacts and other projects to link with, such as the EU-funded project 'Forestry management for improved Rural Livelihood' on catchment conservation which operated in the hills upstream. The Water for People project in Dzimphutsi, which provides water supply for domestic uses, would overlap with this project, so DEC advised to shift the Water for People project to other areas.

During a meeting in June 2007 on the draft inception report, SADC/Danida Water Sector Support Programme clarified that the activities promised in the winning bid were no a priori commitments: 'The Inception Report of May 2007 has a list of activities that correspond to the one in the IWRM project document. The project document should however be seen as a guideline and the implementing agent would have to consult the communities and explore their needs. It is important that the list is discussed and agreed with the communities and the communities understand implications and can take an informed decision'. (Basically, the donor emphasized a two-phased financing here: one for the planning phase and one for the implementation of the agreed and budgeted action plans. Projects in other countries also faced this, which led to the overall lesson learnt that participatory approaches like Local-Level IWRM explicitly require somewhat separate financing of planning and implementation).

For participatory planning, a visioning workshop was conducted on 11 and 12 July 2007. In support of this, the facilitator for participatory natural resource management from the Zambian local-level IWRM project was invited to lead the visioning workshop and build capacity. Eight women and seven men, including the leadership, participated, besides the District Commissioner and some of his staff, and CODA.

The visioning workshop allowed CODA to communicate and explain its plans and check how they aligned with communities' aspirations. The key problem identified was the expanding population and migration of people into the upstream hills, where they increasingly cultivated marginal lands, which led to soil erosion and silting up of the river beds of the Nkudzi. While the river was always flowing till the 1980s, the stream started reducing afterwards. The lower part of the catchment, before the Nkudzi drained into the perennial Shire River, had dried once some years ago during the critical driest months of September to November. This impeded many water uses by all surrounding villages for bathing in this hot area with temperatures of 40 degrees Celsius, washing cloths, livestock watering, and also tree nursery making.

The participants' main vision was to have reliable Nkudzi river flows. In the local vernacular, Chichewa, they gave their own interpretation of Integrated Water Resource Management as 'Kasungidwe ka madzi ndi zina zabwino zochokera ku madzi' meaning 'Way of conserving water and all benefits that can be derived from it'. Further, four priorities were identified: first, improved water resources availability through construction of water conservation structures/facilities; second, improved people's health through the provision of safe water for domestic uses as well as improved sanitation facilities; three, development of an irrigation scheme; and, four,

fish ponds rehabilitation and stocking. Participants also expressed their preference for using own local skilled labor and own contractors, such as the irrigation scheme chairman, instead of bringing foreign contractors.



5. DETAILED ACTION PLANS IN THE FINAL DESIGN REPORT

Step Five: Detailed action plans

On the basis of the visioning workshop and further field visits, CODA compiled a preliminary design report, which was discussed in a Project Steering Committee in November 2007. At that moment, the rainy season was beginning, which made it impossible to construct the dam, but work on the irrigation scheme and fishponds could be done. With the comments, CODA reworked the design report and completed it with a book of dam drawings in March 2008.

In this period, SADC/Danida Water Sector Support Programme and IWMI suggested to widen up the consultations beyond the leadership and to target the poor and women as beneficiaries. They also suggested capacity building. As mentioned, at the district level, a technical team was to be formed and the full assembly should be kept in the loop. As this project had been initiated through the Ministry of Irrigation and Water Development, the Project Steering Committee suggested that the Ministry of Irrigation and Water Development would chair the envisaged Technical Committee at district level. In the approved Final design report of March, the following detailed plans were envisaged.

5.1.1. Dam and conveyance structure

For water conservation, small dams or weirs in the Nkudzi River were foreseen. This was expected to store water from the rainy season for use in the wet season. The report first mentioned five simple weirs across the river. The five sites for these dams had been identified and discussed with the village leadership. However, in the course of May, the dam design was changed and the final number of dams was set at two. The total storage volume was calculated as $16,800\text{m}^3$, which was seen as sufficient to meet the total crop water requirements and conveyance losses of $15,000\text{m}^3$. There would not be a separate spill way, but excess water would simply overflow.

The rationale behind this unexpected decrease from 5 river weirs to 2 dams was not well communicated, so farmers started, inevitably, wondering whether money had been misappropriated.

Below the lowest and largest dam, two buried PVC pipes of 200 mm diameter were proposed. These would convey water directly from the dam, through a silt trap structure, to the fish ponds and irrigation scheme over a distance of 706 meters.

It is not very clear in the design reports what would happen with the downstream flow during the critical September-November months. The report reiterates the earlier suggestions by CODA and the community's vision that the storage dams would allow a steady river flow of $0.2\text{m}^3/\text{second}$ during these months. This flow would enable direct access to women and men for bathing and cloth washing and for animals, in the 'permanently flowing Nkudzi River'. It was also expected to recharge groundwater for boreholes. However, the technical design, which included an outlet or flush gate for all dams to flush silt and pebbles during the rainy season, suggested full closure. The report states that 'the gates are to remain closed soon after the rains to

store water to be used during critical months'. The latter intention would bar all downstream uses of Nkudzi river of the stored water.

5.1.2. Mtendere Irrigation scheme

A scheme for year-round cultivation was designed. The crop water requirements were estimated at 15,000m³, which could be provided by the five dams. For the land allocation process, CODA envisaged that 97 households of Dzimphutsi would get 0.1 ha each and that each household would randomly pick a number. Later interviews revealed that a number of 102 plots had been suggested by the community. Originally, they had thought of 56 new plot holders, but they proposed to almost double to 102 by halving the sizes of the plots. The leadership's reasons for this were that it did not want to be selfish and preferred better sharing of benefits also to avoid that people otherwise would start stealing.

The design report remained silent on any further land allocation issues (which encompassed five villages, as elaborated below). There was no mention of former land occupants and their compensation. There was no mention of any intra-household issues in this targeting procedure. So especially in male-headed households it remained unclear who 'the' household was: was this the male head? Or were plots to be allocated jointly to husbands and wives? Or was the customary matrilineal system to be followed in which land is most often in woman's names? At the same time, the report mentioned that among the predominant tribe of the Mang'anja in this area, the marriage pattern is matrilocal in the sense that the husband generally follows the wife in the new family's home. This is strongly related to a matrilineal inheritance of land in women's names. This land tenure system prevails in an estimated 65-75 percent of the cases. In the other cases, the man brings the wife to his home. Sometimes he pays lobola for that. It is noted that land titles in women's names can go hand-in-hand with men's decision-making powers in other spheres, e.g. as heads of the household or managers of the family farm. Although the design report showed its awareness about matrilineal land tenure, this failed to be translated into an allocation procedure that would respect, and not erode, this culture of women's empowerment.

CODA justified this neglect of land allocation procedures in later interviews, as 'preferring to leave such issues to the community'. In reality, this means leaving it to the leadership which the project urgently needed for the construction work. This forfeited any opportunity for the supporting agency to ensure that the poor and women benefit equally from the public funds.

5.1.3. Fish ponds

Seven fish ponds were to be rehabilitated and restocked, and training to be given. The report expected the target group to be primarily the elderly and children and the poorest of the poor, with a minimum of 40 percent women. Ponds require little extra labor and fish can be fed with farm and kitchen waste like maize bran. Again, the allocation procedure was simple arithmetic, without addressing issues of group formation: the village of Dzimphutsi of the supposed 97 households would be divided into seven groups of 14.

5.1.4. Domestic water uses and livestock

This component was quite reduced in the design report, compared to the original proposal, the visioning workshop and earlier inception reports. Instead of an integrated approach that looks at all water uses according to people's priorities, the emphasis moved to irrigation and fisheries from the central dams. For sanitation, only the construction of 37 latrines with concrete slabs for those households without such improved facilities was envisaged. Also, the borehole committees would be trained through district staff with existing training materials. The construction of a river washing point was also foreseen.

For the rehabilitation of the two existing damaged boreholes, it was already said upfront that this would only be done 'where possible', meaning that 'this may be done or not depending on the assessment results and the rehabilitation costs'. No mention was made of two other taps in Dzimphutsi and surroundings. These were part of a large-scale area-wide piped gravity water supply, fed by intakes several kilometers outside Dzimphutsi, so out of any villagers' control. The water quality was good. This system had collapsed because intakes were swept away by floods. The National Water Development Programme had promised that this system would be rehabilitated – but this did not happen up till the project closure. There was no mention at all anymore of livestock water needs.

5.1.5. Community contribution

With regard to the community contribution, the contributions by the beneficiaries of the new fish ponds and irrigation scheme lost their voluntary nature in the design report compared to the original proposal. In the latter, the rationale for voluntary work was 'work for assets', while being trained in the construction of the assets which would be useful for operation and maintenance. However, the design report reminds how 'hunger' emerged as a major weakness in Dzimphutsi community during the visioning workshop. It proposed that every 10 days of paid work is complemented by 5 days of voluntary labor as community contributions. Moreover, unskilled labor would receive the national standard amount of MK200 per day (about USD1.40). The earlier promises to contribute through brick making were rejected, because the soils in Dzimphutsi would not be appropriate.

5.1.6. Budget

In the budget, 11 days of capacity building to 12 groups were budgeted for USD12,000, which is 9 percent of the total budget. The civil works budget is USD122,500, out of which USD8,485 is allocated for semi-skilled work and USD14,855 for unskilled work. The unit costs for constructing 1 ha irrigated area and almost one fishpond are high at USD12,250.



6. IMPLEMENTATION

Step Six: Implement the action plans

6.1. Dam and other construction works

Once the design for two dams was agreed upon, construction works took off. Throughout the civil works implementation, the Ministry of Irrigation and Water Development monitored the quality of works. Romana Consulting Engineer was appointed as field inspector. Works progressed with some delay. Costs for construction materials such as cement went up considerably, but speedy purchase of remainder material required more project funds. This required rapid approval of a duty tax waiver by the Malawi Revenue Authority. However, this waiver was repeatedly delayed.



For the massive construction works for the two dams, conveyance structure, irrigation scheme, and fish ponds senior VHM Joseph, Dzimphutsi Village Headman and irrigation committee chair were encouraged to act as foreman, overseeing all works. For the various rounds of recruitments about 20 skilled workers, including brick layers and carpenters, were recruited. Some 20 semi-skilled (male) helpers made mortar, collected stones, and passed to brick layers. A total of 105 households from five villages benefited from casual labour (Dzimphutsi, Joseph, Mwazika, Zilipaine and James). Everybody interested could do this work; recruitment was rotational by village. Only one member per household could participate. Mostly women gathered sand and stones and drew water. Men did unskilled jobs like bush clearing and excavation of irrigation canals and pipe line trenches. More lucratively, especially men crushed stones for the dam, and sold those to the project.

The remuneration became an issue. For some time, irrigation beneficiaries worked for 15 days and contributed 5 days of each successive works, from a 'work for assets' philosophy. However, by mid 2008, it had become clear that the labor on offer was less than what was needed for construction of all works. In these circumstances, the project beneficiaries negotiated a better pay. Instead of working for 15 days, and only be paid for 10 days, as initially agreed with CODA, all days were paid 'to encourage full community participation'. This speeded up implementation.

Wage work was also open for non-beneficiaries of the irrigation scheme and fish ponds. For them it was the main benefit of the project. Unskilled construction work self-selected the poorer segments. Unskilled labor was mainly provided by the poorest, although elderly often felt too weak. Obviously, for them there was no reason to 'work for assets'.

By mid-September most of the dam and some first maize fields were ready, as witnessed during a massive field visit by the Minister and Principal Secretary of the Ministry of Irrigation and Water Development, Members of Parliament of Malawi and other countries and international representatives of the local-level IWRM projects in the five pilot countries. The Members of Parliament and other politicians were keen to speak at this occasion underlining how these interventions reflected governments' successful service delivery to their constituencies.

However, even before work was finalized, sustainability issues emerged. The river flow in the rainy season 2008-9 had slightly changed its route and eroded the river borders near to the new fish ponds. Also, the earthen dikes supporting the lined irrigation canals had appeared too loose and eroded. River training and backfilling were therefore proposed for the s-called 'consolidation phase', which lasted to November 2009. During this phase, remuneration for construction works emerged again as an issue.

The contents of the pilot projects in all five countries were discussed during a workshop in March 2009 in Swaziland organized by the SADC/Danida Water Sector Support Programme. The aim of the consolidation phase was to ensure sustainability of the project realizations after phasing out, both among the beneficiary communities and the local-level supportive environment, in particular through Local Government. Sustainability implied, above all, that communities would take charge of their assets on a voluntary basis wherever possible.

For the IWRM and Rural Livelihoods Improvement in Dzimphutsi area project, the workshop was unique in bringing a representative of Dzimphutsi community, the Chikwawa District Commissioner, the District Irrigation Officer, the representative of the national Ministry of Irrigation and Water Development, CODA and the IWMI monitoring researcher around the table to jointly design the activities for the remaining period, with a funding of USD 35-45,000. The nature of the activities was broadly agreed upon. Among other activities, civil works were decided upon for backfilling of the irrigation canals and river training at the site where the river risked eroding further into the area of the fishponds. Capacity building was also foreseen. With the stronger focus on the community and the district officials, they expected that the intended support to communities would go via local government, also with regard to funding streams.

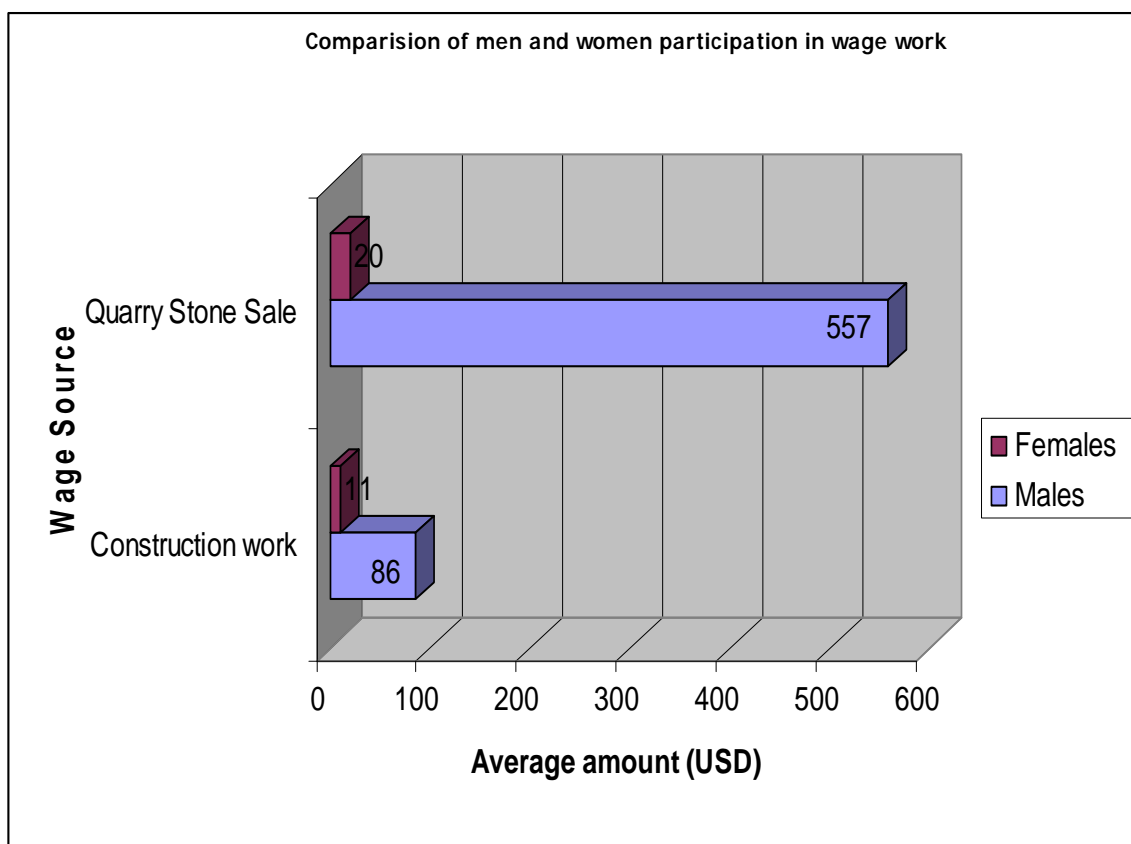
On 6 August 2009, well before the ending of the consolidation phase, the Commissioning Ceremony was organized in the presence of the Principal Secretary of the Ministry of Irrigation and Water Development and other high level officials. At this ceremony, the new schemes were formally handed-over to the communities' committees, overseen by GVH Joseph.

Then, beginning September, when the CODA civil engineer wanted to start the civil works in Dzimphutsi which were now supposed to be fully based on voluntary contributions, the community asked pertinent questions on both the allocation of the budget and the funding streams to CODA instead of local government and themselves. It took the CODA engineer 11 days of intensive negotiations with all stakeholders at community, district, and national level to find an acceptable solution within the short period left before the end of the project in November 2009: CODA would pay a token MK100 per day for each person providing community support.

The lesson learnt is that agreement at the planning phase about the nature and level of communities' contributions in construction should be accompanied by measures to abide to this within reason, e.g. through agreements signed by all parties. More harmonization across projects in a district could catalyze such agreements and avoid very high compensation by the one project, which cannot be sustained after the project, or offered in a different project. For the level of remuneration there are various considerations. When one misses his or her daily income because of work for the project, remuneration seems justified certainly for those who do not gain from the project otherwise. Wage work targeted to them may well be their only benefit. Also, better payment accelerates implementation.

A second lesson concerns wage differences. Interviews with 7 men and 5 women revealed significant differences in wages. The strenuous task of stone quarrying was mainly done by men, who earned an average total of USD557. The few women doing the same only gained USD20. Women dominated in unskilled work, earning an average total of just one eighth of that amount, USD86 (See figure 3).

Figure 3: Comparison of men and women participation in wage work



6.2. Mtendere irrigation scheme

6.2.1. Irrigation plot allocation

Unlike the assumption of CODA that all inhabitants of Dzimphutsi, estimated at 97 households, would randomly select one plot, interviews with VHM Joseph and the irrigation committee chair and members highlighted the following land allocation process. First, the total number of inhabitants for the five villages concerned by this project (Dzimphutsi, Joseph, Mwazika, Zilipaine and James) appeared 672 (309 males, 363 females) (Chiefs' Village Registers, 2009). Dzimphutsi counts 295 inhabitants (see annex 2).

A total of 102 farmers, 59 men and 43 women, obtained a plot. The average plot size is 0.1 Ha. The village headman and Irrigation Scheme Chairman have 0.2 ha. So even though the number of plots was twice the original 56 plots, less than one out of each six households could benefit. The perspectives on the plot allocation process differed among the beneficiaries and non-beneficiaries. Table 1 gives the basis on which 23 interviewed plot holders got their plot.



Table 1: Criteria for acquiring irrigation plot (n=23)

Criteria used to acquire an irrigation plot	Number of respondents	
	men	women
Former Plot owner and relatives	6	5
Labour contributors to irrigation scheme bush clearing /Committed members/able to pay subscription fees	3	4
First come First Serve	2	1
Inherited from parents	1	0
Don't know	0	1
Total	12	11

Further interviews revealed the background of these criteria. The plot allocation procedure was fully managed by the male-dominated irrigation committee, in which GVH Joseph played an important role. Before the development of the Mtendere irrigation scheme, there were 31 plot holders in that area, with land mostly in women's names in this matrilineal society. They belonged to all five villages. Some poor farmers were involved in rudimentary residual moisture cultivation, which is highly vulnerable to water shortages during critical months of October to November. One such farmer mentioned a harvest of only 50 kgs of maize.

These existing plot holders got the priority for the newly developed plots, and were also allowed to invite their families and clans to obtain a newly developed irrigated plot of 0.1 ha. However, there were also cases of women former plot holders who were evicted. One interviewee heading a household with a sick husband told that she had a plot in this area before the scheme came, but she found herself evicted after the allocation. Another woman, from Joseph village, reported how she had a plot before, but was asked to share with a relative. However, their sister who is sick failed to pay subscription fees of MK 500 was, so both were evicted and their land was reallocated to another person.

The second group of candidates could only subscribe for one of the 102 plots once when the former plot holders had been satisfied - a priority that some of these other candidates felt as being unfair. The criteria for the second group was that they should have been keenly interested in the project from the beginning onwards. So people who had come to some meetings, but then left again, were not entitled to get a plot. Candidate plot holders had to subscribe and pay MK 500 (USD 3.6) subscription fees for the maintenance fund. This amount was too high for some, as reported by a poor elderly widow, who had wanted access but could not afford the subscription fees.

The rule in the constitution is that defaulters receive penalties like fine of MK50 (USD 0.4), or are denied access to irrigation water and not allowed to grow in the next season if they fail to meet a grace period to pay. Indeed, such case was found.

Another condition for plot titleholders was that they used the plot productively. If not, the irrigation committee had the power to withdraw that plot. This differs from rainfed agriculture, where tenure security is basically life-long.

The respondents who failed to obtain a plot underlined that land acquisition in this irrigation scheme was mainly through the irrigation committee so slightly different from customary rain fed system where land acquisition is either through local leaders and inheritance. Those who had applied said that they were later told that land was limited and therefore advised to wait for extension. Other non-beneficiaries interviewed said that they had not been informed at all about the possibility to obtain a plot. One of the interviewees acquired land through renting at MK 1000 (USD 7) per growing season. Renting out was reported for four other cases as well.

It is expected that those who had rented their plot out for an amount of KW500 or MK1000 may well decide to cultivate themselves next season seeing the benefits of irrigation.

Even though the percentage of women seems high (43 percent) women lost out in comparison to matrilineal rain fed land tenure. Most interviewees said that married men tended to register in their name especially when the husband is interested in irrigation scheme. Women's inferior land tenure status was legitimized as a cultural phenomenon, comparable to the tendency to adopt a man's surname as 'Mrs' when a woman gets married. So the gender equitable culture (!) of matrilineal land titling was replaced by patriarchal cultures that legitimized women's marginalization in land tenure. CODA endorsed the male-dominated leadership of the irrigation committee – whom CODA strongly needed to mobilize and supervise the construction work. The District Assembly also left the land allocation issues in the hands of the traditional authorities and farmer committees.

Nevertheless, most women interviewed still felt they had been empowered in terms of sustained food availability. The first year, everybody in the scheme grew maize for household food security. One of them underlined: 'when women produce food, all family members benefit because we have a family face'. The future will learn how the gendered organization of farming and income allocation evolve with the free crop choice including production for the market, as started in October 2009.

In sum, the plot allocation procedure widened the gender gap, which could have been avoided if the supporting agencies had engaged more pro-actively. The irrigation scheme also widened the gap between beneficiaries and non-beneficiaries – which is unavoidable even if the resource is shared by double the original beneficiaries. New plots will only become available if the scheme will be extended to 15 ha. The farmers think that there is sufficient water for such expansion.

6.2.2. Irrigated agriculture

During the first season of scheme-wide cultivation by mid 2009, everybody had to grow maize to allow for a uniform cropping and irrigation pattern. Other crops that had already been planted were even removed. The irrigators benefited from the state subsidies for fertilizer, but only for the first application of fertilizer. The logistics for fertilizer provision the second application could not be finalized in time this time. For the summer season, rice and sweet potato are planned.

One plot of 0.1 ha gave some 7 - 9 bags of maize, so about 350-420 kg, which could feed a household of six members during 3 months. By the end of 3 months, the first rainfed crop could almost be harvested.

Water distribution was organized by rotation. Each of the six blocks got water during two days. Block operators oversee this rotation. Two block operators also manage the dam valves, which they open and close, in principle at 6 am and 6 pm respectively. They were trained in doing this. Sixteen irrigators interviewed expressed that they experience some challenges in irrigation system namely; conflicts in water resource use, lack of farm

inputs, inadequate operation and maintenance skills, inadequate skills in scheme management, and low water supply capacity especially during critical months of October to November.

District officials and CODA provided some capacity building to the irrigation committee members, especially on agronomic issues, water management, and general leadership issues. Training in marketing, a topic of keen interest to farmers, is foreseen. The committee keeps records since May 2009. It has opened an account with the NBS Bank. The Department of Irrigation has issued them a general receipt book that helps them to account for the receipts. As advised by CODA, a Water User Association with byelaws and a written Constitution is being constituted. This will also allow applying for a water permit.

The irrigation committee considers applying for a land lease, to protect its now valuable land against encroachment by agribusiness like Illovo, or possibly even Traditional Authorities making deals with external buyers. A case in which Illovo sugar agribusiness along the Shire river claimed that grandparents had surrendered land, while the grand children were not even aware, had shown the relative weakness of informal land tenure vis-à-vis outsiders.

6.3. Fish ponds

For long, there was hardly any group formation to manage the fish ponds. The number of ponds itself kept varying, and it was unclear whether existing ponds (with owners from various villages under the World Vision project) would be rehabilitated or new ponds constructed. In the end, there were six new ponds, but, as mentioned, one was damaged by the floods. Their average size is 29 by 15 meters.

By October 2009, the leadership had a written membership list of 28 women and 7 men. Even though the formal criterion was to include 'all those interested' in Dzimphutsi and surrounding villages, all beneficiaries belonged to households already benefiting from an irrigation plot. It is not clear how and whether owners from the World Vision project were involved. It is also unclear why membership was not opened up to non-irrigation beneficiaries. Anyhow, interest seemed low, certainly among men.

The ponds were stocked in March 2009; however, fingerlings were only sufficient for two ponds, but spread over all five ponds. Some ducks were put as well, also to reduce malaria mosquito breeding. Some members bring their maize bran and other household waste to the fish ponds. Technical training on the basics of fish breeding was given by the district fisheries officers, at the request of CODA, to a newly formed ten-member committee. However, as for irrigation, no training was given to non-committee members. Although the first harvest should have taken place around October, this was done in November. The harvest was minimal. There were no nets, which cost over USD500, so the committee had to borrow from the fisheries department. Also, the plastic sheets in the ponds started leaking.

6.4. Community institution building

Parallel to the implementation of the civil works, CODA revamped the existing water point and health committee and initiated an irrigation and fish pond committee. By August 2008, the following committees, with gender composition, were reported.

Table 2: Gender composition of committees

	irrigation	Dam/fishpond*	Water point	health	Total	Leading positions**
Male	7	5	5	5	22	11
female	3	5	4	5	17	1
total	10	10	9	10	39	12

* In the report of August 2009, this committee has split in a dam conservation committee and a fish pond committee.

** Leading positions are chair, secretary, and treasurer.

Source: Appendix 14 of Third Construction report

While 43 percent women's representation reflects considerable gender equality, there is only one woman in a leading position (chair, secretary and treasurer) out of the 12 leadership positions. She is treasurer of the water point committee. Women's proportion in the most important committee, the irrigation committee, is 30 percent.

Also, the leadership is more concentrated than it may seem. A closer look at the composition of committees shows that the 39 positions are, in fact, filled by only 28 persons. Five persons serve on two committees, and three persons serve on three committees.

As mentioned, only committee members received technical training, and also leadership training. According to the respondents, training remains needed on operation and maintenance, scheme management, optimal water resource use and control, agronomy and agribusiness marketing. However, interviewed non-members regretted their exclusion from training opportunities.

Asking about the strengths of the irrigation committee, respondents were unanimous that the committee is organized, dedicated, tolerant, and able to resolve conflicts. On the other hand, some respondents mentioned weaknesses included the inability to share plots equally, absenteeism during visitors meetings, and failure to implement agreed actions. There were no complaints about the accountability.

6.5. Domestic, livestock and other water uses

While the design report paid less attention to other water uses than the original proposal, this marginalization exacerbated even further during the implementation phase. The sanitation component was limited to the construction of one toilet near the irrigation scheme for workers and farmers. Also, people received a one-day training on sanitation. However, the cement for the slabs was not delivered, and the design of the slab in the demonstration latrine was too expensive for villagers to construct on their own. Nothing was done to construct the washing point or rehabilitate the borehole.

What is more, the emphasis on the irrigation scheme and, to a lesser extent, the fish ponds by CODA and the irrigation committee led to the practice to close off the dam gate of the lowest dam and to channel any stored water through the two buried pipes to the fish pond and irrigation scheme. With the drying up of the riverbed downstream of the dam, any water uses there became impossible. People from the village of Dzimphutsi immediately downstream of the dam had now to walk further up to access the stream and two dam reservoirs.

This negatively affected women's labor burdens, quantities of water for domestic uses for household hygiene and all people's opportunities for bathing – an important practice in this very hot area. In response to the more difficult access to bathing places, men have started to make bathrooms in the houses. While this gives privacy, also to women, it aggravates women's task of water fetching. These other uses around the dam appeared risky. Sadly, in September 2009, a man trying to swim in the dam drowned.

Cattle also moved up, wandering among the people, but it also started roaming for water at boreholes, in the irrigation scheme and the fish ponds. In response to this, bye-laws have been introduced which oblige the cattle owner to pay about MK 050 (USD 0.4) as maintenance fee.

In the irrigation scheme, people now had to watch. Rules were also being set – but are often difficult to enforce. People and cattle from the further downstream village of Joseph, where there is only one borehole for 148 people, were now forced to go to the Shire River. Thus, the threat of crocodile attacks that the project originally had envisaged to prevent was even aggravated. The vision of a reliably flowing Nkudzi River for all became part of the people and their water uses only. Significantly, plot beneficiaries interviewed tended to agree with the new priority for the irrigation scheme, even if this was at the expense of their own other water uses. The non-beneficiaries complained, though, because the project deteriorated their access to water.

During interviews with the leadership, a possible solution came up: an open canal from the dam to the irrigation scheme instead of buried pipes. Such open canals were common in the nearby Nkhate Scheme and elsewhere as well. V-shaped intakes in streams feed water into these open canals which enables the direct water uses that took place in the downstream river bed before the project. That would also have allowed constructing the envisaged washing point, while well protected cattle watering points could have been added. Moreover, an open canal is easier to maintain and repair. Also, the extension to 15 ha would have been easier, as the diameter of the current pipe was considered to be very small.

The leadership also suggested designs in which domestic uses could have been integrated from the outset. For example, a piped system from especially the highest dam to the residential areas with some treatment works could have been included in the distribution networks. The leadership found that design option more important than the fish ponds. This would have allowed the households to have water for domestic water uses, gardening, and own individually-managed fish ponds. These and other design options were not discussed with the community, who were basically confronted with decisions already made. In this way, further opportunities for piloting Integrated Water Resource Management as the Ministry's original proposal in 2006 suggested, were missed.

6.6. Collaboration with district government

The most important goal of the Consolidation Phase was to ensure that the community and local structures would take ownership of the current and future realizations in Dzimphutsi and would be further capacitated to use sustainably. As mentioned, after the international workshop in Swaziland in March 2009 to define the consolidation phase in each of the IWRM Demonstration projects, the community members wondered about their share in the decision-making and funding of the activities. The same held for the District Commissioner and his staff. They doubted whether the consolidation phase with its top-down funding arrangements could enhance ownership of the project by the District Assembly. Several issues emerged that needed to be clarified. The district received a budget for 90 days of USD20 per diems, which is 4 percent of the total budget for the Consolidation Phase. Perhaps even more important was that the District Commissioner and his technical staff wanted not just to be called-in by CODA for one or two days ad-hoc trainings on topics set by CODA, but to

really participate. With progressing decentralization, their mandate is to define, allocate and support or implement development projects and they have the legal and budgetary competency for that in the national system.

Local government can realize this mandate well. They live in the area and know the people. They have the critical contacts with the Traditional Authorities which are essential for any development, as the Dzimphutsi case clearly illustrates. They can make things work and prevent and solve inevitable conflicts. Although staff turnover can be high (and almost all staff at the start of the project was replaced within the two years of the project), local government is permanent as an institution. They can coordinate and integrate with the multitude of small initiatives for more effective and longer-term solutions.

They are often more cost-effective. On the ground, representing a diverse range of technical skills, and close to communities, their salaries, transport and operation costs are much lower than national or international experts. Lack of capacity is sometimes cited as a disadvantage, but for their factual implementation, many projects already strongly rely on ad-hoc solicited cooperation of district technicians, as the IWRM project also demonstrates. Moreover, new projects could be used to further build such local capacity. Further, local government can harmonize rates and other costs. They issue bills of quantity (see annex 3) that can be used as reference throughout the district.

Without genuine ownership by local government and communities, core sustainability issues, such as payment for communities' contributions or sitting allowances, cannot be addressed effectively. Yet, local government is expected to solve problems created by poorly designed and implemented projects in which they had no stake in the first place. During the Consolidation Phase, the DC highlighted the undesirability of such fire-fighting role with especially the Ministry and CODA.

The DC visited Dzimphutsi on 31 September to assure the community of the Assembly's commitment to include these realizations in the local government development plans. He also encouraged them to take responsibility of the realizations.

7. LIVELIHOOD IMPACT ASSESSMENT

The livelihood impacts are summarized in the matrix below.

Baseline - before project				Livelihood impacts – after project		
Water Sources	Technologies	Uses and Users	Management	Technologies	Uses and Users	Management
Surface stream: Nkudzi river Upstream of site of new dam outlet	none - direct use	<ul style="list-style-type: none"> washing, bathing livestock watering 		2 dams for year-round water storage, but siltation problems	<ul style="list-style-type: none"> washing, bathing livestock watering 	dam operators operate dam to store water in dry season, and divert to pipes
Downstream of site of new dam outlet		<ul style="list-style-type: none"> washing, bathing livestock watering 	<ul style="list-style-type: none"> agreed sites for bathing and washing livestock roaming 	trickles from silt dispenser out flows and gate valve; remainder river bed downstream of dries up in dry season	none	dam operators close off dam water to downstream river bed in dry season
	<ul style="list-style-type: none"> incomplete diversion canal failed diversion by World Vision to a 56-plot scheme residual moisture cultivation in scheme site 	None		pipes to a new 10 ha irrigation scheme	<ul style="list-style-type: none"> 43 women and 59 men on 0.1 ha plots for 3 crops First , yielding 300 kg maize roaming livestock watering 	<ul style="list-style-type: none"> Irrigation committee, 7 men, 3 women Rules for livestock watching
	Failed effort to dig fish ponds because of river erosion	None		Pipes to 6 fish ponds; one eroded, but rehabilitated through river training	Group of 28 women and 7 men (overlaps with irrigated plot holders); very limited harvest	Fish pond committee 5 men, 5 women
river elsewhere	Broken piped diversion system with 2 stand pipes	none	Water point committee idle	rehabilitation underway	none	National Water Development Program
Groundwater	Two boreholes; one unfenced and broken slab	domestic uses by 284 women/girls from Dzimphutsi and Mwazika	Old water point committee	No rehabilitation	domestic uses, water fetching for bathing, increased livestock roaming	Water point committee
Sanitation				One demonstration improved latrine	Irrigation farmers	27 committee members trained in sanitation

8. LESSONS LEARNT

Continuous ‘Step’ Seven: Do participatory monitoring and evaluation, and livelihood impact assessment for follow-up

This section presents the lessons learnt.

- Local-level IWRM in the Dzimphutsi area improved many dimensions of wellbeing, including health, better sanitation, crops and fish for food and income, capacity building for water management, empowerment by learning-by-doing and strengthened relationships with District Assembly and national and international support agencies. Although the community was willing to share benefits by increasing the number of plots, the former land owners and especially men who were most actively engaged in the project, benefited most. Women’s land tenure weakened. Also, all fish pond beneficiaries already had a plot as well. Non-beneficiaries of irrigation plots and fish ponds, who also lost their direct access to the Nkudzi River downstream of the dam, complained about the project.
- When communal infrastructure is built, all water uses and users need to be considered holistically. Otherwise, professional biases or preferences of a particular group or service providers risk marginalizing other uses. In this case, the strong focus on irrigation was accompanied by a neglect of especially domestic uses.
- If all uses and users are considered, important economies of scale can be achieved. However, in this case the opportunity of a distribution network for ample household water supplies for multiple uses remained untapped. This would also have enhanced communities’ control over their domestic water supplies, instead of relying on a broken, centralized system controlled elsewhere.
- By ‘hardwiring’ priority setting of water allocation (through buried pipes to fish ponds and the irrigation scheme), it becomes even more difficult to follow people’s priorities. An open conveyance canal from the dam to the irrigation scheme would have met many more water needs, if proper washing points and cattle entry points would have been added.
- Communities need and can co-design infrastructure and hold technical support agencies accountable. Communities know their water needs and water resources best. They also have many ideas on infrastructure from own or others’ experience, but may need to be capacitated on more complex infrastructure options. The likely impact of infrastructure designs needs to be understood and communicated clearly, indicating site and period of water availability. Insight in construction, operation and maintenance costs and budgeting is an essential part of this. Bills of Quantities need to be disseminated and used widely (see example in annex 2). This not only avoids raising wrong expectations, but allows communities to propose better solutions. Moreover, by leaving the choice between, in this case, paid construction work or metallic sluice gates, with the community, they get an incentive to reduce costs where possible and to provide more own labor or cash contributions.

- Targeting procedures are only realistic if they specify member selection procedures and criteria and the fate of earlier users/ occupants; and if they address inclusion of female-headed households and women with own or joint land titles.
- It is difficult to retro-fit a bottom-up approach through communities and local government if a project is defined and funded at national levels.
- Participation by local government needs to be budgeted for.
- In Malawi local government is a well equipped institution for scaling-up local-level IWRM because it has most capacity to create and sustain community ownership and to minimize costs. While local government already directly implements certain tasks, e.g., capacity building, technical training, and operation and maintenance support, technical support providers are tendered for specialized technical jobs such as borehole drilling or irrigation scheme construction. By tendering through local government or even communities, accountability to communities and local government is strong.

Other IWRM Demonstration projects reports

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ANNEX 1: PROJECT STEPS IN LOCAL LEVEL IWRM

Step One: Mobilize support

Strengthen existing development plans.
 Compile integrated support.
 Define targeting procedures.
 Establish horizontal, integrated service delivery structures.
 Ensure vertical national support.

Step Two: Select communities

Develop selection criteria within time and funding frames.
 Communicate widely and test for compliance.
 Select.

Step Three: Understand the community and build capacity

Build trusting relationships and communicate the project concept.
 Do contextual profiling.
 Train the community and select community mobilizers.

Step Four: Create a vision and select activities to fulfil it

Do participatory situational diagnosis and problem analysis.
 Create a vision of new ways to manage water.
 Rank opportunities and needs.
 Select activities for implementation.

Step Five: Compile detailed action plans

Create and train community structures.
 Specify actions, roles and budgets.
 Sign off.

Step Six: Implement the action plans

Construct communal infrastructure and develop the capacity to operate and maintain it.
 Create management structures and develop their capacity.
 Implement the accompanying interventions and develop the capacity to maintain them.
 Ensure sustainability when exiting.
 Operate and maintain infrastructure and continue capacity development.

Continuous 'Step' Seven: Do participatory monitoring and evaluation, and livelihood impact assessment for follow-up

Monitor planning, implementation and use.
 Monitor the impacts on livelihoods.
 Identify follow-up plans for community-based water resource management.

ANNEX 2. DEMOGRAPHICS OF DZIMPHUTSI VILLAGE AND SURROUNDINGS

Table 1: Population before and after project

Village	Years					
	2007			2009		
	Males	Females	Total	Males	Females	Total
Dzimphutsi / James *	161	123	284	50 men 80 boys	68 women 97 girls ,	295
Zilipaine	68	90	158	75	99	174
Mwazika	66	51	117	66	56	122
Joseph	31	43	74	38	43	81
Total	326	306	632	309	363	672

**The population for James is embedded in Dzimphutsi. Initially they were the same village and have just disbanded. The demarcation is not yet clear (Village Headman James, interviews November 2009)*

ANNEX 3: BILLS OF QUANTITY EXAMPLE

Gravity Fed Piped Water

March 2004

BILL OF QUANTITIES AND MATERIAL SCHEDULE

SCHEDULE NO. I

Item	Description	Qty	Unit	Rate (MK)	Total (MK)	
					MASAF Contribution	Community Contribution
A	WORKING TOOLS					
1	Hoe complete with handle	45.00	no.		0.00	0.00
2	Shovel	20.00	no.		0.00	0.00
3	Phanga knife	10.00	no.		0.00	0.00
4	Picks complete with handle	20.00	no.		0.00	0.00
5	8mm nylon rope	2.00	roll		0.00	0.00
6	6mm nylon rope	2.00	roll		0.00	0.00
7	Baw Saw 36" Lasher	3.00	no.		0.00	0.00
8	Baw Saw Blades 36" Lasher	6.00	no.		0.00	0.00
	Total to Summary				0.00	0.00
B	INTAKE WIER TO SEDIMENTATION TANK					
	Pipes and Fittings				0.00	0.00
1	4" Galvanize pipe	21.00	6m		0.00	0.00
2	4" Gate Valve	3.00	no.		0.00	0.00
3	4" Automatic Single Air Valve	4.00	no.		0.00	0.00
4	3" Galvanized pipe	11.00	6m		0.00	0.00
5	3" None Return Valve	1.00	no.		0.00	0.00
6	3" Gate Valve	4.00	no.		0.00	0.00
7	3" Galvanized sucking pipe	2.00	1m		0.00	0.00
8	3" Automatic Single Air Valves	4.00	no.		0.00	0.00
9	2" Gate Valve	2.00	no.		0.00	0.00
10	1" Gate Valve	1.00	no.		0.00	0.00
11	1" Gate Valves for Air Valves	24.00	no.		0.00	0.00
12	110mm PVC pipe - Class 10	301.00	6m		0.00	0.00
13	90mm Ditto	334.00	6m		0.00	0.00

Item	Description	Qty	Unit	Rate (MK)	Total (MK)	
					MASAF Contribution	Community Contribution
14	110x32x110mm Tee Piece	20.00	no.		0.00	0.00
15	110x63x110mm Tee Piece	1.00	no.		0.00	0.00
16	110mm F/M Adaptor	20.00	no.		0.00	0.00
17	90x32x90mm Tee Piece	3.00	no.		0.00	0.00
18	90x63x90mm Tee Piece	1.00	no.		0.00	0.00
19	90mm F/M Adaptor	14.00	no.		0.00	0.00
20	63mm F/M Adaptor	4.00	no.		0.00	0.00
21	32mm F/M Adaptor	28.00	no.		0.00	0.00
	Civil Works - Finishing the Intake Weir					
	<u>All building works to be 1:4 mix, concrete works to be 1:2:4 and screed to be 1:3 mix with wood trowel finish</u>					
3	Cement	2.00	50kg		0.00	0.00
4	Sand	0.25	m ³		0.00	0.00
5	Boulder stones	0.30	m ³		0.00	0.00
	Earthworks					
6	Trench excavations	750.00	m		0.00	0.00
7	Trench backfilling	750.00	m		0.00	0.00
	Total to Summary				0.00	0.00
C	SUPPLY PIPES FROM SEDIMENTATION TANK					
	Pipes and Fittings				0.00	0.00
1	2" Non-Return Valve	1.00	no.		0.00	0.00
2	2" Galvanize pipe	15.00	6m		0.00	0.00
3	2" Sockets	15.00	no.		0.00	0.00
4	2" Gate Valve	3.00	no.		0.00	0.00
5	2" Bend	1.00	no.		0.00	0.00
6	1/2" Galvanize pipe	30.00	no.		0.00	0.00
7	1/2" Sockets	55.00	no.		0.00	0.00
8	1/2" Gate Valve	50.00	no.		0.00	0.00
9	1/2" Nipple	50.00	no.		0.00	0.00
10	1/2" Taps	25.00	no.		0.00	0.00

Item	Description	Qty	Unit	Rate (MK)	Total (MK)	
					MASAF Contribution	Community Contribution
11	1/2" Elbow	50.00	no.		0.00	0.00
12	90mm Tee Piece	1.00	no.		0.00	0.00
13	Ditto 75mm	1.00	no.		0.00	0.00
14	Ditto 63mm	2.00	no.		0.00	0.00
15	Ditto 50mm	3.00	no.		0.00	0.00
16	Ditto 40mm	4.00	no.		0.00	0.00
17	Ditto 32mm	18.00	no.		0.00	0.00
18	90x75mm Reducers	1.00	no.		0.00	0.00
19	Ditto 75x63mm	2.00	no.		0.00	0.00
20	Ditto 63x50mm	3.00	no.		0.00	0.00
21	Ditto 50x40mm	5.00	no.		0.00	0.00
22	Ditto 40x32mm	5.00	no.		0.00	0.00
23	Ditto 32x20mm	5.00	no.		0.00	0.00
24	75mm PVC pipe	800.00	6m		0.00	0.00
25	Ditto 63mm	750.00	6m		0.00	0.00
26	Ditto 50mm	900.00	6m		0.00	0.00
27	Ditto 40mm	850.00	6m		0.00	0.00
28	Ditto 32mm	2,000.00	6m		0.00	0.00
29	Ditto 25mm	2,050.00	6m		0.00	0.00
30	Ditto 20mm	3,000.00	6m		0.00	0.00
31	63mm F/M Adaptor	6.00	no.		0.00	0.00
32	Ditto 20mm	30.00	no.		0.00	0.00
33	Automatic Single Air Valves	4.00	no.		0.00	0.00
	Earthworks					
33	Trench excavations	12,000.00	m		0.00	0.00
34	Trench backfilling	12,000.00	m		0.00	0.00
				Total to Summary	0.00	0.00