



Local-Level Integrated Water Resource Management in Swaziland

2009



Capacity Building for Lavumisa Irrigation Development Project: **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

ACA	Attitude, Competence, Application
CDP	Community Development Plan
DANIDA	Danish International Development Agency
E	Emalangeneni – Swazi currency; 1 E = 1 ZAR (South African Rand)
FINCORP	Swaziland Development Finance Corporation
IWMI	International Water Management Institute
IWRM	Integrated Water Resource Management
MFC	Maplotini Farmers' Cooperative
MNRE	Ministry of Natural Resources and Energy
MOA	Ministry of Agriculture
MOH	Ministry of Health
MOU	Memorandum of Understanding
MUS	Multiple-use water services
NAMBOARD	National Agricultural Marketing Board
PHAST	Participatory Health and Sanitation Transformation
SADC	Southern African Development Community
SSA	Swaziland Sugar Association
SWADE	Swaziland Water and Agricultural Development Enterprise
SWSC	Swaziland Water Services Corporation
TA	Traditional Authority

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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, namely 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 experiences in Swaziland, where the Swaziland Water and Agricultural Development Enterprise (SWADE) was the implementing agent of the project 'Capacity Building for the Lavumisa Irrigation Development Project'.

The SADC/DANIDA Regional Water Sector Programme aimed to demonstrate how principles of IWRM can be put into practice in poor rural areas. The focus was on integration where integration matters and 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 in the five countries, the IWRM Demonstration projects gradually developed an innovative generic understanding of local-level IWRM. Seven innovations are summarized in a 'Lessons Learnt' report¹.

In short, the starting point of 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. 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 outset.

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-

¹ SADC/DANIDA Water Sector Support Programme, in collaboration with the International Water Management Institute. 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.

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. Overtime, 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’. The target group of these guidelines are the local authority structures in charge of water projects in SADC and elsewhere. This report presents the way in which SWADE and the Maplotini community in Lavumisa, Swaziland, have taken these steps.

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	

2. THE PROJECT FRAMEWORK

2.1. SWADE

SWADE is a wholly owned Government company controlled and monitored as a Public Enterprise under the Ministry of Agriculture (before September 2008 it fell under the Ministry of Natural Resources and Energy). SWADE pursues its objectives through a systematic people empowerment process founded on a holistic development approach targeted at designated communities. Some of SWADE's main focus areas include: improving effective management of the biophysical environment; developing a supportive social and institutional environment; rendering farmer-owned irrigation schemes profitable; promoting a vibrant entrepreneurial environment and improving general health and nutrition in the communities. SWADE facilitates the use of water as a catalyst in the development of communities. It aims to 'develop people to take care of their own destiny' in the domains of water and agriculture.

SWADE developed its unique approach especially at the Komati Downstream Development Project (KDDP) and Lower Usuthu Smallholder Irrigation Project (LUSIP). Through participatory approaches that ensure that the voices of the disadvantaged are heard, SWADE creates strong project ownership and instills an entrepreneurial mindset amongst communities. SWADE provides training in irrigated crop production, livestock, infrastructure development, environmental management, health and sanitation and agribusiness development, using water as a catalyst. SWADE emphasizes the need for good and strong leadership among the elected leaders and the responsibility of the followers to follow their leaders and hold them accountable.

SWADE's approach encompasses 'Attitude Competence and Application (ACA) with three parts: Attitude (the importance of the right attitude development); Competence (the need for appropriate skills); and Application (the effective application of the skills). In this way, the community empowerment process culminates in the development of businesses that serve as a vehicle for wealth creation.

SWADE operates as one multi-skilled team addressing social issues, training, agriculture, engineering and environment, all with a strong training and capacity building component. The human development/social aspect of development is not compromised by the drive for 'visible' results. SWADE's focus is on horizontal and vertical integration of service delivery. It sees a project as a way to ensure synergy and complementarities among key support agencies in the project areas, in particular tiers of Government and parastatals, Traditional Authorities and possibly private sector actors.

2.2. The project proposal

In early 2006, the SADC/DANIDA Regional Water Sector Programme and SWADE agreed that SWADE would pilot in applying local-level IWRM with the Maplotini Farmer Cooperative in Lavumisa, in the south-eastern corner of Swaziland, bordering South Africa, at 150 km distance from Mbabane. In this area with only 300mm of rainfall, economic development is entirely water-driven. Part of Swaziland territory was inundated by the backwaters of the Pongolapoort Dam in South Africa, which was constructed in 1980. In compensation for this, the South African Government agreed to build and fill a balancing dam by pumping-up water from South Africa. Through an Operational Agreement, the Government of South Africa allocated five cusecs (142 l/s). One cusec is used by the Swaziland Water Services Corporation to provide municipal water services to Lavumisa town. The other four cusecs were made available for economic development.

In 1999, the Government decided to develop irrigation for mono crop sugar cane cultivation by the Maplotini Farmers Association, a resettlement farm of the Ministry of Agriculture and Cooperatives adjacent to Lavumisa town. However, by 2005, the Maplotini farmers, by then a Cooperative, faced many problems in sugar cane cultivation and poverty was still widespread.

The Local-level IWRM project with the Maplotini Farmers' Cooperative was part and parcel of national Government's economic planning for this area. In 2005, the construction of a new holiday resort around the dam lake was initiated, the 'Jozini Big Six'. Further, feasibility studies were started for public and private irrigation expansion for another 5000 and 3000 ha in areas around Lavumisa. These plans are part of the Interim IncoMaputo agreement signed between Mozambique, South Africa and Swaziland in 2002 and its progress is regularly reported to the three countries' Tripartite Permanent Technical Committee (TPTC). Such expanding water allocation for a thirsty crop like sugar cane would require successful negotiations with South Africa to pump during longer hours from the plenty water resources in the Pongolapoortdam. As a stepping stone in these longer-term transboundary plans, the Local-level IWRM Project would 'kick-start the development of the Lavumisa area'. Issues of transboundary water management and efficiency of agricultural water use echoed concerns in the global IWRM debates of the time, which further justified this project for the donor as an IWRM Demonstration project.

The agreed project proposal of SWADE to the SADC/DANIDA Regional Water Sector Programme included a participatory needs identification process. However, the proposal also already focused on the formal sphere of transboundary and efficient water management for the single purpose of commercial sugar cane irrigation. It named the project as 'Capacity building for the Lavumisa Irrigation Development Project'. In particular, it specified the 72 members of the Cooperative at Maplotini as the entry point. Still, the multiple water needs of multiple users were recognized explicitly: the budget also included a potable water supply system. That was targeted at all residents of Maplotini area, so including an estimated 50 households that were not a Cooperative member.

For the funding, the Swazi Government committed to provide matching funds of an amount of E² 1.1 million (USD 170,000) especially for infrastructure development for domestic water supply, also meant for home gardens, and for sanitation. Farmers were expected to contribute through loans E 7,200,000 (USD 1,110,000) for in-field infrastructural development and working capital in a proposed expansion of sugarcane on 100 ha. The SADC Regional Water Sector Programme allocated E 2,040,000 (USD 315,000) to SWADE for the period August 2006 – February 2008 (which was, ultimately, extended twice and then with a consolidation phase till November 2009). This amount was entirely allocated to SWADE's strengths of communities' capacity building and empowerment for sustainable entrepreneurship.

² The Swazi E (Emalangi) is equivalent to the South African Rand (ZAR).

3. THE INITIAL PHASE: CREATING A SUPPORTIVE ENVIRONMENT

Step One: Mobilize support

Step Two: Select communities

SWADE hit the ground running and kept running to create a sustainable, horizontally and vertically integrated supportive environment to mobilize and provide the holistic support required for local-level IWRM. First, once the Maplotini area was selected as a pilot area, SWADE composed its own project team on the ground, which encompassed social mobilization and technical skills required for water development and agriculture. In September 2006, a new office was opened in Lavumisa with a project manager and social facilitator. They were assisted, advised and backstopped as needed by senior SWADE specialists on social facilitation, agronomy, economy, environment, and engineering.

Second, for horizontal hands-on coordination and sustainably strengthening of communities' relationships with the range of support agencies, an operational technical committee was set up right at the start. It consisted of all relevant Government departments, Cooperative representatives and SWADE. In 2008, a representative of the non-members of the Cooperative joined, as indicated in table 1. This technical committee is expected to continue after project closure for integrated support provision.

Table 1: Composition of Project Technical Committee at hand-over in 2009

Stakeholder	Responsibility
Ministry of Agriculture (MOA) - Cooperative Department	Business Systems and accounting
MOA – Agriculture	Cooperative Agronomic Technical Assistance ³
Swaziland Development Finance Corporation (FINCORP)	Financing the Cooperative. Sugarcane Business
MOA - Land Use Planning	Land Tenure
Ministry of Natural Resources and Energy - Rural Water Supply Branch	Potable Water Supply
Ministry of Health	Sanitation
Maplotini Cooperative	Sugarcane business
Representative non-members	Communal garden and nursery
SWADE	Cooperative Business, community-wide development, mobilization of community

³ Unfortunately, the local Extension Worker of the Ministry of Agriculture passed away in 2009.

Third, SWADE ensured **vertical integration** to obtain the national-level support for the services delivered. SWADE itself is a national agency with head office in Mbabane, where it maintains regular contacts with all senior national-level stakeholders, mirroring the composition of the local-level technical committee. Moreover, a **National Project Steering Committee**, in which representatives of the SADC Regional Water Sector Programme and the Maplotini Farmer Cooperative, also participated, added to these existing relationships. It met twice a year, starting on 22 September 2006 with: the Ministry of Agriculture and Cooperatives, Ministry of Natural Resources and Energy, the Swaziland Development Finance Corporation (FINCORP), the Rural Water Supply Branch, Ministry of Health and Social Welfare, Swaziland Water Services Corporation (SWSC), the Swaziland Sugar Association, the National Agricultural Marketing Board (NAMBOARD) and other financial institutions, and at local level the local Member of Parliament, Lavumisa Town Board, and the Traditional Authority.

Unlike countries with an elected local government at the lowest level alongside Traditional Authorities, Swaziland's lowest formal authorities are the Traditional Authorities. The lowest tier Government is at Regional level; they were involved from project commencement. In this economic development oriented project, with a farm cooperative on land owned by MOA as entry point, the initial role of the Traditional Authority was weak but strengthened over-time.



4. THE VISIONING PROCESS WITH THE COOPERATIVE

Step Three: Understand the community and build capacity

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

4.1. The process with the Cooperative members

The project was officially launched on 22 Aug 2006 in Lavumisa, in presence of all relevant support agencies. According to the proposal's emphasis on formal sugar cane irrigation by the Cooperative, SWADE invited only the 72 members of the Cooperative in the scoping and planning activities of the first months. Initially, three quarters of Cooperative members participated in the events organized by SWADE, but this steadily declined until 2008.

Shortly after the launch, an excursion was organized to allow the Maplotini Cooperative to interact with farmers in similar situations. This was anticipated to help broaden their horizons and adapt lessons to their particular circumstances. For implementing the step of 'understanding the community and building their capacity' and the subsequent step of creating a vision and selecting activities to fulfill them', SWADE applied its own tested approach. Social facilitation for transformation and self-reflection used, among other, the 'mirror exercise'. Taking a look at themselves in a mirror, many reported back that they saw ugly states, hunger, disillusionment and lost hope.

Taking one's destiny in own hands, social transformation, and leadership underpinned the two visioning workshops early October. Building on earlier interventions facilitated by the Ministry of Agriculture, problems were identified and analyzed. A sore issue emerged: very high debts with FINCORP for which the participating former leaders were not able to offer an adequate explanation even during the workshop.

SWADE presented possible pay-back scenarios with higher yields and incomes. This and other problems and needs were transparently identified in mixed-gender sub-groups. In the plenary report-back, the facilitator helped categorizing into social and business problems. After this, an elected small group finalized the ranking and prioritization of the identified problems by pair-wise ranking. The result is summarized in annex 2. On this basis, SWADE and the workshop participants transparently agreed which issues would fall outside this time-bound project and how these could be addressed alternatively, or at longer-term. The prioritized issues were taken forward to the next step: the participatory compilation of detailed action plans. These plans were to be submitted to the donor as part of the inception report.

This skillful social facilitation established trust while the Cooperative's self-diagnosis provided in-depth information to the facilitators about the issues at stake. This understanding was triangulated by a base-line

survey. Below, we sketch the general background of the Maplotini Farmers Cooperative as the context for the priority problems and broad project activities identified.

However, another important issue emerged in these early scoping and planning steps: the existence of a large number of informal non-Cooperative members with even less access to land and water for livelihoods. In spite of the aim of the overall project to be inclusive in local-level IWRM, these poorest of the poor risked to benefit only from the potable water scheme and sanitation, but not from the productive activities of the Cooperative. Unlike the many situations in which such findings are ignored and hidden under the flag of 'the' community, SWADE fully recognized these intra-community differences and engaged to retrofit, as discussed in later sections.

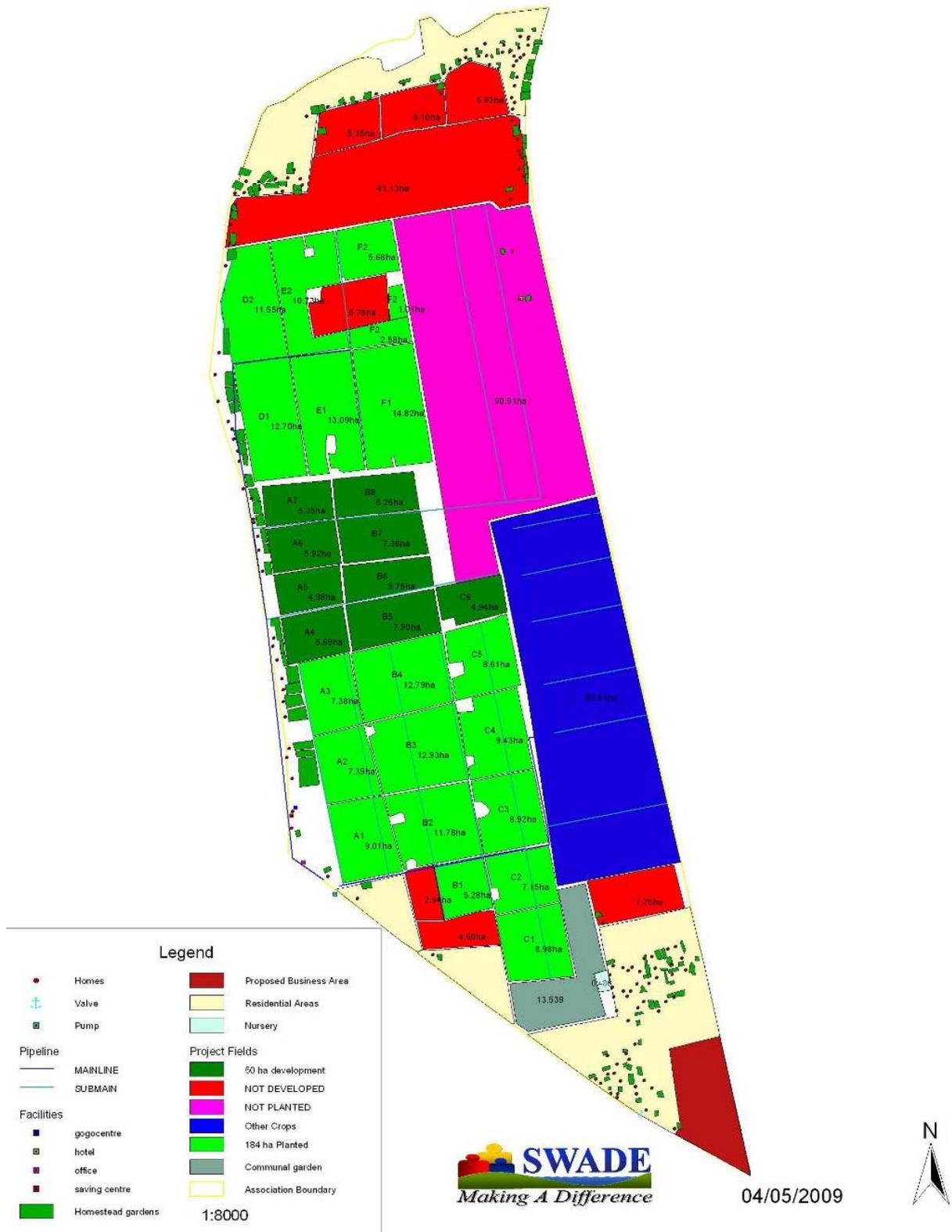
4.1.1. Background of the Maplotini Farmer Cooperative and rationale of identified project activities⁴

The history of the Maplotini Farmers Cooperative dates back to 1964, when the Ministry of Agriculture and Cooperatives established the Mkhulamini Fattening Ranch and re-allocated the 72 original inhabitants to the area just north of Lavumisa town. Each of the 56 male-headed and 16 female-headed households got a 'plot' of 8 hectares of land, hence the area name of 'Maplotini'. The farmers formed an association by then. On this farm land owned by the Ministry of Agriculture, they practiced rain fed maize subsistence farming and cotton cultivation for cash and some livestock. Their residences were scattered.

When the Ministry of Agriculture and Cooperatives decided to support the cultivation of irrigated sugarcane in the Maplotini farm, piped water was used that flows from the balancing dam to a sump which has one off take for Lavumisa municipal water provision and one for the Maplotini farm. A total area of about 400 ha for drip irrigation was developed in two phases. In 1999 -2000 MOA developed 260 ha with drip irrigation, out of which 184 ha for sugarcane. The remainder 80 ha was suitable for other crops, like vegetables and maize. It was leased-out to a private maize producer up till 2004 (it is reported that the private producer disappeared without explanation, leaving a trail of debts, which were incorporated into the sugar cane business). In 2004 – 2005 irrigation main lines, but no on-farm drip irrigation as yet, were developed for an additional 140 ha sugarcane (see map 1).

⁴ Source: various SWADE documentations and Sikhosana, Nelisiwe, Rachel Masuku, and Sdumo Masango. 2007. The socio-economic status of Maplotini community'. Unpublished report January 2007. SWADE

MAPLOTINI FIELD LAYOUT MAP



Irrigation is either by gravity or by pumping. Lower-lying southern-eastern lands near the Mahalibhomeni neighborhood are gravity-fed. Yet, some parts that are suitable for vegetables and maize remained unused. The remainder higher-lying portions northwards require electric pumping. This is partially used for sugarcane, partially fallow. Sand filtration at the off-take from the sump removes particles that would otherwise clog the drip emitters.

Thus, the first project activity was to assist the Cooperative in the on-farm development of an additional **100 ha sugar cane and 41 ha diversified crops** – depending on loan availability collectively. This activity was already suggested in the ‘Capacity Building of the Lavumisa Irrigation Development project’ proposal and was endorsed during the visioning process. Moreover, the fallow 80 ha irrigable land was to be put in use again. With the introduction of collective sugar cane on Cooperative members’ former plots, they had lost the opportunity to farm on their own. Hence, the second component of the project was to divide these 80 ha into **one hectare plots** for individual Cooperative members for high-value vegetables or maize. It was also realized that increased homestead cultivation would serve the same purpose.

With the arrival of collective sugar cane irrigation blocks, people had to leave their scattered dwellings and move to the four residential zones (Mahalibhomeni, Mbangweni, Maplotini & Tshatshalatsha) at the fringes in order to free up good soils for the sugarcane cultivation and to enable the regular burning of the old cane. Initially, some subsidy for cement for such relocation was available. Most farmers shifted – but a couple of them were still staying behind. **Finalizing their re-location** to the residential zones was a third activity identified for the Local-level IWRM project.

No further activities were foreseen for the remaining 400 ha land with partial or full irrigation infrastructure or for the 100 ha in the blocks that are still totally undeveloped. Further north, there are 570 ha of grazing area which is hardly used, but not addressed for this project. Other poverty problems were also raised, but not chosen as activities for this project. For example, electricity development was needed beyond the one connection for the electric pumps at the road adjacent to Lavumisa town that there is now. There are no schools, clinics, or social services as yet. High HIV/AIDS prevalence warrants burial schemes. Unemployment rates are as high as 45 percent for men and 53 percent for women. This would be addressed indirectly through wage employment increase in sugar cane production for one third of the population for whom this is the main source of employment. Communities’ needs are also addressed by few NGOs active in the area, e.g., World Vision and the Lutheran Development Services for credit and banking, which constructed a community building.

A major issue that came out of the visioning process was that ever since the start, profits from these irrigation investments had been very disappointing, creating a heavy debt burden for the Cooperative. The total construction costs of irrigation infrastructure for the 400 ha were USD 1 million (about USD 2500/ha). The pumps and main irrigation lines were government grants, but farmers had to take a loan for the on-farm development. They took a loan of E 2.5 million for the first 184 ha with FINCORP. However, by 2006, the debt had risen to E 5 229 289.00 (USD 747,000). Seasonal loans, which can amount to E 1 million, are also required for seeds, fertilizers, and herbicides, but these loan amounts are immediately subtracted from the income for FINCORP before the sugar mill pays the Cooperative.

At least four factors contributed to these debts. First, the quality of the design and installation by consultants hired by the Ministry of Agriculture and Cooperatives had not been optimal. Second, partly as a result of that and partly as a result of weak farm management, the yields of sugar cane were low at 80 T/ha (with 100 T/ha as a standard) ever since the early 2000s. Therefore, the Ministry of Agriculture and Cooperatives had advised the

farmers to employ an externally recruited farm manager and to form a Cooperative. The association appointed a retired skilled farm manager. It became a Cooperative in 2005. The Cooperative decided that its own members could not be employed as wage laborers on the scheme, because they were expected to give the farm manager a hard time and to want high wages. The farm manager works with some 25 wage laborers, 2 irrigators, and 2 people managing the pump house.

Third, up till 2006, the cooperative members had opted to receive annual dividends of about E 10,000 per member from the sugar cane income. The repayment arrangements of the on-farm capital loans allowed this: the Cooperative can either use all net income for loan repayment, or use part of the net income for dividends to be shared as income among members, and delay the loan repayment period. The latter implies rapidly accumulating interests, though.

Fourth, the internal management of the cooperative was fraught with non-accounting practices. Various earlier committees had been forced out, without proper financial reports. Allegations and deep mistrust on financial issues prevailed. Members did not know how much they owed and why the Cooperative failed to repay. This lack of clarity was characterized by the Auditing Section of the Ministry of Agriculture and Cooperative in its report for the year 2006 – a study requested by SWADE: ‘We were unable to get all the necessary information to certify ourselves on the authenticity of all transactions in the Cooperative Society, especially the acquisition of all fixed assets and loan’s agreement between the society and the financier. Even explanations by board members which we had to rely on differ between each one of them’ (MOAC 2007).

Thus, the fourth activity of the ‘Capacity building of the Lavumisa Irrigation Development project’ became agronomic and engineering **advice on farm management and capacity building for improved functioning and financial management** of the Cooperative, in order to decrease the debts.

Last but not least, in the visioning workshops members clearly articulated the desire of the cooperative to get **more secure land rights** as a 99-year lease from Government. The land is formally owned by the Ministry of Agriculture. At that stage, there was no clear registration, land tenure map or succession plan of Cooperative membership as yet.

This state of ill-being was compounded by lack of access to safe water. As this also affected other residents of Maplotini area, the detailed action plans that were compiled and implemented are discussed in section five. Section four focuses on these five related activities exclusively by and for the Cooperative members. For them, SWADE’s social facilitator concluded after the visioning process, among others, that they:

- ‘Have been subject to ill-informed decisions on their farm development. This seems to be the root of the mistrust, amongst themselves and external people or organizations. A few painful truths will have to be unearthed, in particular regarding the finance management, which seems to be a closely guarded secret by a few, to help the farm development have a fledging chance at success’.
- ‘The farmers are extremely vulnerable, especially to exploitation, but also to the elements. Their situation is the true face of abject poverty. The chance to be able to have access to a home garden or one hectare plot would go a long way in empowering them at individual level’ (Hlophe 2006).

4.2. Other water uses and users

The irrigation scheme has de facto become the most important water source for multiple uses, but extensive use of this water for drinking does not align with the policies and regulations for safe drinking water and

sanitation and also constrains irrigation uses impacting on sugar cane yield. Therefore, the proposal already identified the need for potable water provision and sanitation.

When the new irrigation scheme became a major new source of water, the designers provided 14 households of Cooperative members (but not for many later non-members) in the lower lying south-east corner, Mahalbhomeni, with yard taps directly connected to the gravity-fed water supplies. There, intensive homestead cultivation developed as a result of this plenty availability of free water. In Maplotini as a whole, 21 percent of all residents get water from piped supplies to their homesteads from the 'irrigation' scheme, where they can use it for drinking and other domestic uses, cattle watering and enterprises like brick-making, etc.

However, elsewhere, the scheme designers tended to prioritize a single use: sugar cane irrigation. Only two taps were constructed. The tap at the head-end provides water continuously, but the one at the far north tail-end depends on pumping hours. Nevertheless, those without access to the two taps access irrigation water by removing the drippers from the irrigation lines. As they are difficult to put back, spillage is widespread. Thus, mostly 'illegally', another 36 percent of all residents in Maplotini take water directly from the irrigation scheme for domestic uses, cattle watering, and, if homesteads are near, for homestead cultivation.



In the course of the time, four boreholes were dug under various Government and NGO programmes, but only one is working well. The other pumps are not easily accessible or have saline groundwater. Twenty seven percent of all households depend on these boreholes. Eleven percent takes water from rivers or dams. Few households buy water from neighbors or the Swaziland Water Services Corporation in Lavumisa.

As so many people depend on the irrigation lines for domestic water supplies, the farm manager realizes how the irrigation scheme is de facto a multiple-use water scheme and he is careful not to add fertigation chemicals to remove dirt in the drips or fertilizers. The project's envisaged **new potable water supply** would allow adding

those materials for higher productivity, besides promoting health and re-location to the area fringes. **Sanitation** improvement, which the Government typically promotes to accompany potable water supply, would ensure improved latrines for the 52 percent of Maplotini residents with ordinary latrines, and the 40 percent who relieve themselves in the bush.

Section six documents this process, which also includes the estimated 50 non-member households who were also to be consulted for the potable water scheme and sanitation.

4.3. The non-members

In the course of the planning phase with the Cooperative, SWADE and the donor became increasingly aware of the many non-members in the Maplotini area. The formal Cooperative appeared a biased entry point if the piloted local-level IWRM was to benefit especially the most marginalized with even much less access to water and land than the Cooperative members.

SWADE's base line survey found a total number of 106 homesteads and 114 households with a total population of 703. Later on, the total number of households even appeared 135. It was discovered that only a part of them are real newcomers, such as in-migrating spouses, or Lavumisa town inhabitants who crossed the road to live in Maplotini in order to avoid newly levied municipal taxes. Perhaps a fifth of the original Cooperative members moved to South Africa. Hence, the large proportion of these households is off spring of the original 72 households, but without formal succession arrangements.

Youth under 15 years represents 47 percent of the total population. As many as 111 children lost one parent; a staggering 106 lost both parents – often due to HIV/AIDS. The non-members lack any formal access to land and water, other than residential rights endorsed by the Traditional Authority. The chief (Qomintaba) lives in Lavumisa and has his Headman and Inner Council (Bandlanthane) in Maplotini area.

The project proposal had only envisaged the potable water supply and sanitation for them, but SWADE decided to do the first two steps with them more broadly to overcome their initial exclusion. So SWADE somehow needed to retrofit the same planning process with the non-members to better understand this group and build trustful relationships and to facilitate a process of envisioning new activities and compiling detailed action plans in parallel to proceeding with the more advanced steps with the Cooperative (detailing action plans and implementation). Section seven elaborates this 'project cycle' with these informal stakeholders expanding on the already planned process for the water supply and sanitation.

5. DETAILED ACTION PLANS AND IMPLEMENTATION OF COOPERATIVE ACTIVITIES

Step Five: Detailed action plans

Step Six: Implementing

5.1. New collective sugar cane development and diversification

When SWADE and the Cooperative started detailing the action plan for the on-farm development of an additional 100 ha for sugar cane, the Swaziland Sugar Association advised to first meet the Cooperative's existing sugar quotas to the sugar mill, which had never been met in the past because of low yields. Therefore, only 50 ha were further developed. In July 2007, FINCORP gave the Cooperative a loan of E 1784 195, with a 15.5% interest, for 8 years, for all development, so pipes, seeds, fertilizers, etc. The already installed irrigation equipment was rehabilitated using the same loan. SWADE assisted by advice on the engineering lay-out, planning scenarios and also with the planting for the additional 50 ha. In April 2008, the first sugar cane crop was planted.

Usually, first year yields are low, but by September 2009, the first parts harvested gave a promising 120tch with an average sucrose content of 13%. In order to enhance productivity further, it is envisaged to add fertigation chemicals to the irrigation scheme to dissolve dirt in the drippers and urea as fertilizer as soon as the potable water scheme is operational.

The envisaged diversification of 41 ha for other irrigated crops than sugar cane was halted. Organic cotton and banana were considered, but not taken forward because of the need to take further loans to rehabilitate the already installed irrigation scheme and the lack of established markets as sugar cane.

5.2. Management of the Cooperative

SWADE supported the Cooperative Management Committee in two main ways. First, by promoting an entrepreneurial mindset with minimal dependency, SWADE stimulated the repayment of the outstanding debts to FINCORP. SWADE strongly advised the Cooperative Management Committee not to take any income for dividends anymore in order to reduce the accumulation of interests. After a protracted negotiation between SWADE and the FINCORP, an agreement was reached not to pay out money for the school fees. To complete the negotiation process, SWADE asked the Cooperative to sign forms that they would not apply for loans anymore.

The second way in which SWADE supported the management of the Cooperative was by facilitating the working relationships within the Committee and between the Committee and the farm manager. Their capacity was built through leadership and financial management trainings and regular assistance. As mentioned above, MOAC was brought in to do an audit which confirmed the lack of transparency. The first Annual General Meeting was held in 2008 where, for the first time in eight years, two audited statements were presented to membership for their approval and election of a new management committee. The MOAC commissioner facilitated the election process. In this way, the book was closed on the past lack of transparency and mutual trust. The Management Committee and farm manager were also sensitized on the transparency and accountability relationships that should exist between the two.

As a result of these internal and external developments, yields increased and the repayment scenario looked significantly better by September 2009 than three years earlier. For the 50 ha loan of E 1.784 195, an amount of E 1.356 899 was still outstanding. The 184 ha loan of E 5.2 million in 2006 was still 5.063708 by early 2008. After the harvest in November 2008, it was E 3.7 m. In September 2009, only an amount of E 2,818.269 was still outstanding. If the good sugarcane prices payable to farmers continue, repayment of all loans can be expected within two years or so.

In sum, SWADE's technical capacity building and the creation of more clarity and confidence about respective roles within the Cooperative opened up a virtuous circle of mutual accountability and appreciation and significant yield and income increases, leading to a much better outlook for the Cooperative's future profits than even imagined at the start of the project.

5.3. Development of 1 ha plots

In support of the cultivation of 1 ha plots in the unused eastern 80 ha, SWADE started a demonstration plot. This gave some income which was used to create to new implementation structure for these individual plots: the Maplotini Investment (Pty) Ltd. Vandalism prohibited its continuation, unfortunately.

Starting cultivation at a significant scale required operational funding for inputs: seeds, fertilizers, herbicides, private plowing services, etc. This was not foreseen in the project budget. As FINCORP is primarily interested in sugar cane, and not vegetables, SWADE mediated in identifying another loan scheme: Inhlanyelo micro credit fund for vegetables. 25 Cooperative members out of the 72, who together cultivated 13 ha, took credit of some E 4,000-10,000 per household. Arrears in loan repayment occurred, also because some preferred reinvesting the income in inputs for the next season, rather than repaying the loan. By September 2009 the debt amounted to some E 50, 000 – E 60,000 out of a total loan sum of E 130,000. No new loans are given, neither to members of the Cooperative nor to members of the communal garden below. Nevertheless, the area cultivated keeps expanding. By 2009, over 40 ha were cultivated with maize, beans, potatoes, beetroot, cabbages, carrots, butternut and green onions.

Good market channels were a pull factor. SWADE consolidated contacts between Investment and NAMBoard, and butternut and green onions and other vegetables could be readily sold. Other markets are with Game shops, or in nearby Matata Shopping Complex and in neighboring South Africa. However, public bus transport of larger quantities of produce to these markets has become problematic.

A cold room had been identified as a need in the visioning process, and was included in the project budget. However, other priorities interfered in the end, so SWADE advised the Cooperative to contact other potential sources, such as the Rural Development Fund.

A limiting factor for more farmers to join and for higher yields was the technical irrigation system. Only a part of the 80 ha appeared to be irrigable and cultivators decided to share plots on the better parts. Irrigation lines with drippers were lacking. The Cooperative gave those to the farmers on the condition that they would be repaid within three years. Portions of this area suffer from the seepage of water and fertilizers from the upstream sugar cane irrigation, which leads to water logging and soil salinity. Rehabilitation is needed.

For addressing the other needs that had emerged from the planning process, the relocation and insecure land rights vis-à-vis MOA, SWADE took a holistic and integrated approach, which also encompassed the non-members, as further explained under that section seven.



6. DETAILED ACTION PLANS AND IMPLEMENTATION OF THE POTABLE WATER SCHEME AND SANITATION FOR ALL

Step Five: Detailed action plans

Step Six: Implementing

6.1. Potable water supply for all residents

The Cooperative members had endorsed potable water supply and sanitation as an activity to benefit everybody during the visioning process. The elaboration of its detailed action plan warranted an inclusive approach to reach both members and non-members.

To start, SWADE facilitated the establishment of a new integrated **organizational structure** for consultation about the design, implementation of construction and sustainable operation and maintenance of the new scheme. For this, SWADE approached the Traditional Authority Inner Council (Bandlancane). Already in November 2006, the Traditional Authority oversaw elections of a water committee, but this had many vacancies which were only filled by 2008. This gradual approach fits the pace of traditional procedures, in which the headman (Induna) of Maplotini area is the first to contact. As a local leader embedded in nested governance layers rather than a development agent, messages go up to superiors and are extensively debated when going down again. Moreover, meetings are rare and they concern many points that may well get a priority over a water scheme project. Leaders would also like to ensure their share in the benefits. In other words, these procedures are slower than responses by a well-focused business-oriented enterprise like the Cooperative. Nevertheless, for any sustainability of community-wide initiatives like a centralized potable scheme, involvement and the support of the TA are an absolutely necessary condition.

SWADE trained the Inner Council of the traditional leadership in August 2007 on leadership issues. The design of the potable scheme and its siting inevitably raised questions about the relocation of the remaining houses in the scheme to the fringes, and even raised worries about again shifting of houses and residential areas. SWADE encouraged participants to get deeper in these issues, which evoked how pressing and sensitive land issues were. As a workshop participant commented: 'The land scenario is like filling up a one liter bottle with five liters'. As everybody had at least some land around homesteads, participants strongly favored water supply services to homesteads for gardening and cultivation, preferably as household connections.

The compilation of the detailed action plan for the **technical design** also took long. The committed Government budget for infrastructure was E 1.1 million. The consultant's technical assessment report and cost estimate of December 2006 suggested improvements for the various components of the irrigation scheme and a potable water scheme. For the later, two options were given: either connecting to the treatment works of Lavumisa

SWSC's town water supplies or extending the irrigation scheme with six points of chlorination to render water suitable for drinking. The latter option was estimated at E 380.000. Such multiple-use design of the irrigation scheme as a whole would allow important economies of scale. For the first option, SWSC itself could manage as a company. The second option would require community management.

In a community meeting with 128 participants, 70 percent preferred supply through a private company, and not community management, because of past abuse of member fees in the heterogeneous community of Maplotini. So in October 2007 it was decided to go ahead with SWSC. However, the cost estimate of SWCS for an urban-like scheme with household connections was as high as E 1.8 million. This was claimed to be needed to meet the high standards of urban water supplies in line with SWCS's reputation. Moreover, the Maplotini community would be relatively small for obtaining economies of scale. The price of water was expected to be over E50 per month – and was ultimately set at E80 for a supply of 500 litres per household per day, including maintenance.



SWADE's engineers then negotiated and designed a scheme of E 960,000 of acceptable standards to SWSC, in which the community would be responsible for maintenance with technical support by the Rural Water Supply Branch. Taking the example from Ethekwini Municipality (Durban and rural surroundings) in South Africa, this design has 1 m³ plastic storage tanks in each household. However, unlike the continuous gravity pressure in Ethekwini which allows refilling the tank as needed (for payment according to meters connected to the tanks), the tanks in Maplotini will be filled each two days to save on pumping costs. The E54 for water supply was a special rate, and should be paid in advance. Non-payers can technically be disconnected. The balance of E80 is for maintenance.

In March 2008, Government paid the committed funds so that construction could start. As also foreseen in the detailed action plan, leaders in each of the four zones ensured the mobilization of paid labor for digging the

trenches for the pipes and oversaw the work. A total of 135 households got connected and obtained a tank. The zone leaders of the water committee also collected 3 months advance payment of E240 plus E100 connection fees from virtually every household. In one zone, for example, 90 percent had paid by September 2009. This amount was put on the newly opened bank account, which was SWSC's condition for opening the water supply and start delivering water. The Memorandum of Understanding between the water committee, Cooperative, and SWSC, with SWADE as witness, in which also the special rate for the Maplotini residents is stipulated, was signed in September 2009. The Water Committee, trained by SWADE, initiated negotiations to apply for regional development funds under the rural electrification program as well.

By then, the predictions about the scheme functioning and resulting livelihood impacts varied. Unlike the initial strong emphasis on water supplies for multiple uses, in particular for homestead cultivation, some turned the argument around now that the scheme with purified water only had become so expensive. They warned against the 'temptation' for using expensive purified water for purposes that do not require such high quality. Others did not see a problem; they calculated how they can make more money from gardening even with this expensive water.

A concern is that asking payment for water could imply that many people would continue what they had done for decades, while still 'feeling strong': taking water from the irrigation lines. Moreover, NGOs kept installing boreholes, as three new ones in 2007, as a cheap and safe alternative. Yet, when many opt for non-use of the installed tanks, the viability of the scheme as a whole becomes less. Another concern is that households' water needs vary by household size. With multiple uses for e.g., gardening, differences in uses between users would become even stronger. Yet, the design is that they get the same volumes and have to pay the same price. Equal water provision may work for homogenous urban households, but this may be less the case in peri-urban and rural settings where water dependent livelihoods are highly diverse. Lastly, there is the concern for the few really poor households that simply cannot pay. An option may be that the Cooperative can create a social fund for such cases.

6.2. Sanitation

According to the national policy, the construction of a potable water scheme has to be accompanied by sanitation measures. A Participatory Hygiene and Sanitation Transformation (PHAST) workshop has to precede construction of improved toilets. In October 2007, such training workshop was held in Maplotini for 59 participants, both Cooperative members and non-members.

By then, SWADE was increasingly facing postponements and dwindling numbers of participants, usually between 18 and 38, in its capacity building meetings and trainings since the first meetings. People complained of hunger and that they had similar trainings in the past, e.g. from MOAC, without much results. It became clear: capacity building alone, as assigned to SWADE in the project proposal, was not enough.

In this light, the enthusiasm that the PHAST training sparked was even more remarkable. Residents of 135 households in Maplotini started digging pits, often through mutual help arrangements. With resources from SWADE, the Ministry of Health, UNICEF, and some money from the SADC Regional Water Sector Programme budget, plastic toilet seats and ring fences were given to all households who then constructed their improved toilet by early 2008. For the bricks, SWADE invited youth from Maplotini to set up a brick making enterprise. A small group of youth responded and created 'Khethabahle' brick-making enterprise. Initially, SWADE helped in providing sand, cement and other inputs and purchased the large bulk of bricks made for the toilets.

On top of the obvious livelihood benefits of improved hygiene and dignity and the economic empowerment of the youth group, the toilet construction had also an important positive influence on the project process. It was the first tangible benefit that all people in Maplotini saw from the 'Capacity building of the Lavumisa Irrigation Development project'. Moreover, this success was the result of constructive cooperation among everybody, which reaffirmed social ties in this heterogeneous and problem-stricken community. This, at its turn, enhanced SWADE's visibility and credibility in supporting and mediating the external support of the Ministry of Health. These first tangible benefits for both the people and the project process appeared of even greater help in SWADE's efforts to address the most contentious issue: land, as discussed next.



7. PLANNING AND IMPLEMENTATION WITH THE NON-MEMBERS

Step Three: Understand the community and build capacity

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

7.1. The land issues in Maplotini

As mentioned, SWADE became gradually aware that the non-members had not really been considered in the proposal formulation as target group in their own rights, other than stating that ‘everybody’ should benefit – but suggesting to take the Cooperative as entry point. The potable water scheme and toilet construction had brought everybody on board. Moreover, SWADE pro-actively reached out to the non-members, who had been ‘sitting and looking’ at SWADE’s initial interactions with the Cooperative, till SWADE contacted them, to know their broader aspirations and build relationships as well. These steps by SWADE pointed to the major problem: lack of access to land and water for beneficial use. This opened up the sensitive issue of land and water tenure in Maplotini.

The situation is complex because of the technical dimensions of water infrastructure. Siting of new water infrastructure directly affects land use, as for the still unfinished process of re-location of farms within the sugarcane fields. It also determines to a large extent who the beneficiaries will be and the siting of potable water tanks and toilets confirms land claims. The situation is especially complex because of the drastic demographic growth in the Maplotini area.

Cooperative members have weak collective use rights to a partly irrigable and partly undeveloped farm owned by the MOAC. However, with the 1 ha plots, it becomes possible again to obtain individual rights to land and, most preciously in this dry area: water. Their strong wish is a 99-year lease from MOAC.

However, vis-à-vis non-members, ‘Cooperative membership’ are a divide across siblings and kin or in-laws of different generations, besides a smaller portion of in-migrants. Succession of membership is fully informal. Yet, ‘members’ can and do claim a monopoly claim to land and water vis-a-vis non-members, trying to instill that they are the ‘owners of water and land’. The Traditional Authority, who considers all residents as its subjects, keeps exerting its customary claims to the land and even to some extent to the water, claiming that they facilitated the Government’s initial investments in the first place. Many residents accept Traditional Authorities claims as legitimate, especially those who have no other ground for claiming rights, obviously. In this legal void of contested normative frameworks, there are no precedents or rules whatsoever to settle these problems of crowding, neither formally nor informally. The Cooperative members have most to lose. Thus, the issue of irrigated land crosses households, extended families, neighbours and generations within the Maplotini community and within support agencies across Swaziland.

SWADE took these land tenure complexities on board, with a clear choice to ensure that everybody would benefit from the project, even if somewhat overlooked at the start. The first draft inception report of March 2007 on the basis of the visioning process with the Cooperative included the issue of re-location. SWADE senior management intervened at that moment, realizing the much wider implications and also seeing the potential scope for much more fundamental and far-reaching solutions. In the final inception report of June 2007, a more encompassing approach was proposed. This included a land use plan as part of an overarching Community Development Plan for all residents, with short- and long-term activities. This plan would be informed by national talks between SWADE and the Land Use Planning Section of the Ministry of Agriculture. During the subsequent talks it became clear that a 99-year lease and a meaningful and inclusive Community Development Plan would be a long-term affair, far beyond the time frame of this project. The Nduna of Lavumisa, who joined the national-level talks, commented how he appreciated SWADE and 'how much he had underestimated SWADE's capacity, but after the meeting he had developed trust for SWADE'.

SWADE then focused the complex issue on what initially looked like a quite feasible, concrete and time-bound proposal that would be acceptable to all parties involved: a communal garden of maximum 10 ha for non-members and a vegetable nursery for both Cooperative members with 1 ha plots and the communal garden cultivators. The costs for the communal garden would be a mere 5 percent of total project funds of the Capacity Building of the Lavumisa Irrigation Development Project. Much developed and irrigable land was idle anyhow, so access to such portions was expected to be feasible. Moreover, the proposal for the communal garden and nursery was made in the same spirit as the toilet construction: people need tangible benefits beyond capacity building alone. In early 2008, this re-focus of the project, with the required shift in budget allocation and explicit inclusion of activities for the non-members in the budget, was discussed with the SADC/Danida Water Support Programme and approved.



By August 2008, the DANIDA project manager joined the talks at high national levels between SWADE and MOAC, emphasizing that this IWRM Demonstration project seeks to ensure that everyone has equitable access

to project benefits and that all inhabitants have some form of land to improve their livelihood. Hence, DANIDA recommended that an agreement should be reached on 'an allocation of land for the communal vegetable garden. Further, the original settlers and their descendants should be confident in terms of their rights to the use of the land, within the limits and requirements of Swazi legal system'.

This meeting, plus SWADE's real threat to the Cooperative to close the Lavumisa office altogether, plus the much easier acceptance of the proposal by most less-vocal members, led to the final allocation of land. Ten hectares of gravity-fed unused irrigable land were allocated to the non-members for a communal garden (and potentially more to orphans through the Traditional Authority). This was in the south-eastern corner, near the residential zone of Mahalbhomeni. Half a hectare was allocated for a nursery. For the nursery committee, three members came from the 1 ha Investment group, three from the communal garden and one member from the Coop. They produce and sell various seedlings, and the demand is much higher than their current capacity.

The land for the nursery and communal garden is leased from the Cooperative for 5 years, renewable, through a Memorandum of Understanding by the Cooperative, the garden and nursery committees, and the Ministry of Agriculture, now fully aligned with SWADE. By September 2009, it only still had to be signed.

7.2. The communal garden

Step Five: Compile detailed action plans

Step Six: Implement the action plans

Once the land was made available, the detailing of the action plans and implementation went smoothly. In September a Garden Committee was elected for the communal garden group, which called itself 'Zondamavila'. This is exclusively composed of non-Cooperative members. For the technical design and construction of the communal garden, SWADE financed and members constructed the fence against roaming cattle, and in cutting the poles. SWADE engineers designed and constructed a simple row of taps, to which farmers could connect their hoses. By May 2009, the garden was put into use.

Plots are all 500m². The demand for plots was very high. Out of the 63 non-members households, 85 joined, even those at a one hour walking distance in the far north residential zone. It was decided to give everybody one plot, but for a second plot, one would have to show that it was used appropriately. If land remains idle, the committee takes away and gives to somebody else. Even some relatives of Cooperative members applied. Explaining the conditions of an E100 joining fee, the garden committee asked the Cooperative to submit a list with children wanting a plot. Those who want, have to come to the committee's meeting, when they will be shown their plot. By September, two children of Cooperative members had expressed interest.

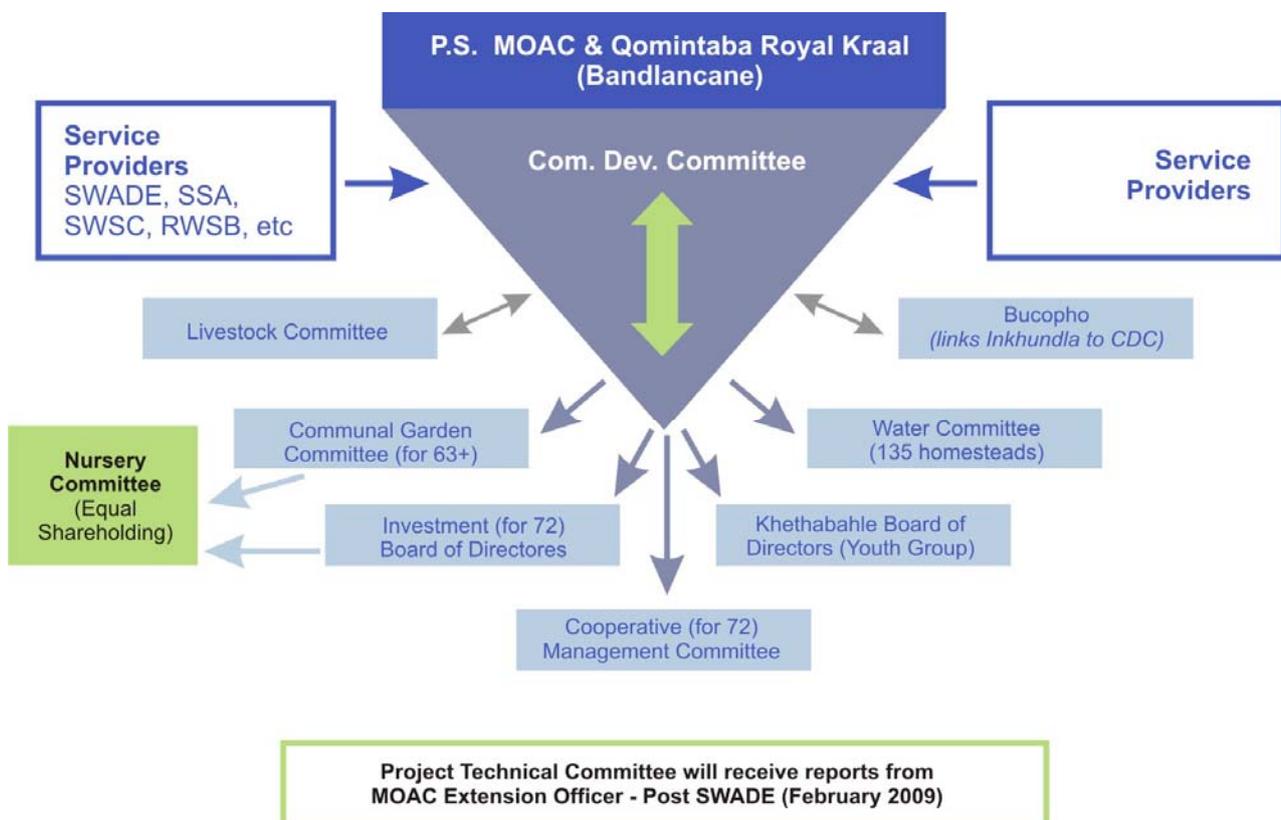
Although no gardener got loans to buy a hose, seeds, and inputs, within four months the communal garden had turned into the most intensively cultivated spot with, undoubtedly, the highest land and water productivity of entire Maplotini. Vegetables were consumed or easily sold to local and more distant markets and NAMBoard. As the gardeners commented: 'SWADE has heard our prayers'.



8. CONSOLIDATION AND EXITING

With the many new water users groups and committees, a key challenge for continued livelihood benefits is institutional robustness and sustainability of each new or revitalized committee. Also, there needs to be coordination between the Cooperative and all new institutions, and the two recognized main poles of power, the highest-level MOAC and the Royal Kraal. Other NGOs working in Maplotini also need to be integrated. Such integrated Maplotini-wide institution is the only legitimate body to further work on a Community Development Plan. A task force for the latter was appointed.

Figure 3: Proposed institutional structure Maplotini



Moreover, all structures should be able to communicate with all relevant service providers. The Technical Committee of this project's service providers, which, since the communal garden also included a representative of the non-members, is expected to continue after project closure.

Already in 2008, SWADE started to conceive and promote such new form of institutional coordination in Maplotini, as depicted in figure 3. The consolidation phase of the Local-level IWRM project pays much attention to the finalization of mutual Memorandums of Understanding and capacity building of committee members. Formats for mutual information and discussions have been compiled. In this way Maplotini community is empowered internally, but also externally to call upon a mobilized supportive environment. With the many relationships with service providers up to the national levels constructively strengthened in a mutual interest, prospects for long-term sustainability are optimal.

9. MONITORING, IMPACT ASSESSMENT AND LESSONS LEARNT

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

9.1. Livelihood impacts

The broad range of tangible direct and indirect livelihood benefits is given in table 2.

Table 2: Overview of newly created water uses with beneficiary users, livelihood benefits and other impacts

Water Source:	New /Rehab Technologies	Uses, Users, and Incremental Benefits	Management
Dam water Irrigation scheme (Partially gravity and partially pumped)	a. Existing and rehabilitated : 184 ha sugar cane	a. Higher yields and debt repayment by 72 Cooperative members	a, b. Debt repayment; transparent accountancy, new committee elected and trained; improved working relationships, self confidence and accountability
	b. New on-farm development: 50 ha sugar cane	b. New debt repayment by 72 Cooperative members a,b. Wage employment	
	c. Renewed use and rehabilitation: 80 ha for 1 ha plots	c. New diversified individual food and income for 36 Cooperative members; trained in agriculture	c. New Investment company of Cooperative members established and trained, loan taking but indebted, and marketing channels
	d. Newly developed: 10 ha communal garden	d. New access to land, water, food and income for 63 Non-members; feeling more respected; trained in agriculture	d. New Zamavela committee of non-members established and trained for management of communal garden
	e. Newly developed: 0.5 ha collective nursery	e. sale of seedlings	e. nursery committee with mixed membership
Offtake and treatment SWSC	<ul style="list-style-type: none"> New: potable water system New: improved latrines 	<ul style="list-style-type: none"> All 135 households access to potable water and latrines for health and dignity and women’s reduced labor; trained in hygiene Sale of bricks Paid construction work 	<ul style="list-style-type: none"> New Water Committee and water minders elected and trained; new initiative to apply for electricity for Maplotini. New Khethabahle brick making enterprise established and trained

Water Source:	New /Rehab Technologies	Uses, Users, and Incremental Benefits	Management
Other impacts	<ul style="list-style-type: none"> • More equity in access to land and water • More mutual trust and sense of community, understanding of roles and responsibilities, and conflict resolution • Realization that ‘you can still bend an “old log”’ • Application for rural electrification • More appreciation of development issues • Improved decision-making in the businesses • Internal coordination, including Traditional Authority • Start integrated Community Development Plan, including land lease arrangements • Strengthened relationships with external agencies through Technical Committee: MOA, FINCORP, NAMBoard, SWCS, RWSB, Lavumisa Town • Better coordination and ‘speaking with one voice’ between MOA, FINCORT and SWADE 		

9.2. Lessons learnt

The experiences, problems and solutions in the ‘Capacity building of the Lavumisa Irrigation Development project’ generated important new insights in (a) the benefits of local-level IWRM and its advantages over conventional single-use approaches, and (b) how local-level IWRM can be implemented.

Benefits of local-level IWRM

This local-level IWRM project showed how water creates **multi-faceted livelihood improvements**. Increasing the pie of available water resources for all, especially the marginalized, removes an often limiting factor for simultaneous improvement of health, food, income, and women’s reduced burdens. The communal garden showed that even without other support, water provision for micro- and small-scale enterprises was the **trigger** for development. The **water and land productivity** of these small plots beats formal, larger-scale systems and tangibly contribute to poverty alleviation at the same time.

These multiple benefits can be derived from multiple-use infrastructure design that looks in an integrated manner at infrastructure, livelihood benefits and capacity building. Surface water schemes like the one in Maplotini offer economies of scale. There can also be trade-offs, though. In this case, fertigation and fertilizer dissolution in drip irrigation systems would jeopardize water quality for drinking. However, providing high quantities of purified water for uses that do not require such quality is unnecessarily expensive. Combinations of multiple sources, e.g. through individual groundwater abstraction, or point-of-use treatment for the 3-5 liters per person per day for drinking and cooking may reduce potential trade-offs.

The experiences in Maplotini also underline the need to integrate **water and land tenure and siting issues**. This is especially critical for cropping. Land without irrigation water is less productive, if productive at all. For inclusive intervention, existing land distribution inequities need to be considered from the outset. Otherwise, irrigation development easily favors the relatively land-rich over the land-poor. Purposive selection of poor

people's land for irrigation improvement, e.g., on homesteads or negotiation of land re-allocation ensures their inclusion. Sector- or crop-based project goals tend to hide such implicit choices for a particular target group, which often a priori exclude the land-poor and women. As a result, water flows to the wealthy. Similarly, water efficiency in formal sugar cane farming and transboundary issues, which were associated with IWRM, were not even an issue on the ground in the present project. Yet, these goals led SWADE to take the Cooperative as entry point instead of all Maplotini residents.

The realization that an integrated approach to water, infrastructure, and land is key in inclusive local-level IWRM, is not to deny how **other support** can considerably further improve livelihood benefits. This was the case for hygiene training. A lack of integration of other interventions can even be a more limiting factor than water per se. The 1 ha plots in Maplotini had access to water, but lacked loan provision for inputs and marketing.

Above all, the integrated consideration of water and land in local-level IWRM underlines that communities bring a long history. Long-standing controversies and contests about the critical natural resources in any rural community are just to be expected. As the poorest and women's claims to natural resources are usually governed by informal arrangements, total reliance on formal institutions and rules tend to strengthen the claims of those closest to those formal institutions, so the (male) village elite. It is true that the land and water issues in Maplotini were complex, but other communities may well be as complex or even more complex. This underlines the importance of the lessons learnt in this project on how to deal with these complex situations in doing local-level IWRM.

How to do local-level IWRM?

It is considerably easier to address the complexities of equitable land and water tenure if this is fully understood and acted upon before project activities are identified and budgets allocated. This can be concluded from the efforts and conflicts it took to retrofit a more equitable approach after the biased start. SWADE and the SADC/Danida Regional Water Sector Programme made many more efforts to retrofit than other agencies and donors, who sometimes even fail to notice such implicit exclusion and elite capture under the mystifying notion of 'the' community. SWADE quickly recognized that its focus on the Cooperative as entry point had been limited, because its approach is to systematically assess genuine needs of everybody. SWADE fully understood the importance of 'informal' Traditional Authorities and the sensitivities of land issues. It acted immediately to change. Similarly, the donor fully contributed through a flexible adaptation of initial budgets and it joined SWADE in national-level conflict resolution efforts. Yet, it remained true that SWADE and the Cooperative members had agreed on activities with related budget allocations through the visioning process. By later recalling those plans and trying to include new target groups like the non-members in the communal garden, the new beneficiaries unwillingly became competitors for land and water, and project resources that had in a sense already been promised to the Cooperative members. Jealousies on this are understandable.

Negotiating equitable sharing of benefits is much easier if supporting agencies put equitable sharing as a win-win condition for anyone to benefit anything, from local to highest national levels. The communal garden and nursery could have been part of an overall agreement in which the Cooperative was only going to benefit if it accepted leasing some unused land. Such approach would have required sufficient understanding of local complexities and trustful relationships with all parties (step three) before envisioning activities and agreeing on priorities and budgets in an inclusive forum (step four).

A second lesson is how critical it is to create a supportive environment by integrating the range of support agencies **horizontally**. Only through the technical committee, catalyzed by SWADE, was it possible that the different agencies provided the right support at the right time. Moreover, the technical committee has become the body that the newly created and revitalized community institutions and the evolving representative coordinating structure can address in an integrated manner. This is in addition to the strengthened relationships with individual support agents.

Third, **vertical** integration is perhaps even more important for this supportive environment. This was clearest for SWADE's intervention for the land issues, but also for a consistent loan repayment policy. Moreover, it is at this highest level that support agencies like SWADE can considerably widen the scope of solutions to offer to communities. SWADE mobilized this power of integration.

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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: OUTCOMES OF THE VISIONING PROCESS WITH THE COOPERATIVE

A. BUSINESS NEEDS RANKED IN THE ORDER OF IMPORTANCE

#	Need	Description
1	Capacity Building	Past failures have been caused by limited knowledge. To better embrace development there is a need to be trained on business management, conflict management, leadership and modern agricultural practices. In 2005 farmers were trained on these topics and are currently not seeking a repetition but want hands-on application and mentorship. Therefore, the focus will not be on meetings and workshops but demonstrations, field tours and hands on mentoring. Meetings and workshops tend to be attended by a very small fraction.
2	Finance for individual plots	80 hectares of the farm has been subdivided into 1 ha plots to be allocated to members of the co-operative. The farmers need financing to rehabilitate the irrigation system and to buy farming inputs.
3	Sugarcane expansion	In addition to the existing 184 ha of sugarcane there is an additional 141 hectares with infrastructure plus an additional 100 hectares without infrastructure that need to be developed. The increased land under sugar cane will enable the cooperative better service their loan with FINCORP so that farmers will start receiving dividends earlier than it would have been if the area is not increased. Due to the limited amount of water only 100 hectares of sugarcane can be planted.
4	Loan repayment	The farm is currently facing a ZAR 4.6 million debt which cannot be paid if the status quo is maintained. There is a need for a turn around strategy that will be directed to cutting costs and increasing productivity.
5	Increased Water Allocation (<i>Efficient use of available water</i>)	Currently Maplotini Farmers Cooperative has an allocation equivalent to 284 hectares of sugarcane. Any additional land that will be cultivated will require that there be a storage infrastructure, which the project cannot finance at the moment. The project will therefore focus on ways of increasing water use efficiency using the available infrastructure. This will include utilizing the winter period for vegetables when the demand for water on sugarcane drops to as low as 30% compared to summer.
6	Farmers Owned transport	One of the critical components in sugarcane farming is transporting the sugarcane to the processing plant. This operation amounts to almost 50% of operating costs. Availability of loan financing and viability of the business will inform the final decision on this matter.
7	Vegetable Pack house	It was agreed that this was an important component since Maplotini will have to diversify into vegetables both at an association level and at individual farmer level. This will have to be worked hand in hand with the National Agricultural Marketing Board.
8	Other Businesses	There is a need to explore other business ventures which include; farm inputs, livestock, grocery shops, brick laying, tent renting and catering services and public transport.

B. SOCIAL NEEDS RANKED IN THE ORDER OF IMPORTANCE

#	Need	Description
1	Lease Agreement	The Maplotini community is made of people who were resettled from Mkhulamini Fattening Ranch in 1964. Since their resettlement they do not have proper documentation giving them authority to occupy the land. This document will also be used by individual farmers when applying for loans to financial institutions.
2	Burial Scheme	The need of a burial scheme was ranked high; this is an indication that the death rate is very high in the area. This is also linked to the exposure to modern funerals. If someone is buried without a proper coffin it is viewed as a shame.
3	Potable water and sanitation	The Maplotini community uses irrigation water for domestic purposes. This water is not safe, hence the need for clean water and sanitation. Some homesteads get water from a hand pumped borehole.
4	Increase land allocation for members children	Resettlement took place in 1964 and families have expanded hence the need for more land.
5	Re-location	Relocation within the farm is an exercise that was started when the farm started producing sugarcane. Farmers are supposed to relocate themselves to designated residential areas within the farm. This is to give way to the sugarcane irrigation project and also to make it easier for homesteads to have access to services like potable water and electricity.
6	Health Services	The area is affected by a high rate of sickness and therefore would like to have a clinic within the Maplotini area. There are also challenges in paying for medical services and thus a medical aid scheme was also identified as a need.
7	Grazing Lands	There are 568 hectares allocated for grazing but unfortunately it has been overgrown by thorn bushes and needs reclamation.
8	Community Services	Community services including a pre-school, community hall, electricity and entertainment club.
9	Ins and Outs	Some community members were left out in the sugarcane farming business during its formation because their land was less than 8 hectares and those who were not settled appropriately.