

# **Cultivating livelihoods: an assessment of water allocation and management practices in small-scale irrigation schemes - case studies from the Mzingwane Catchment, Zimbabwe**

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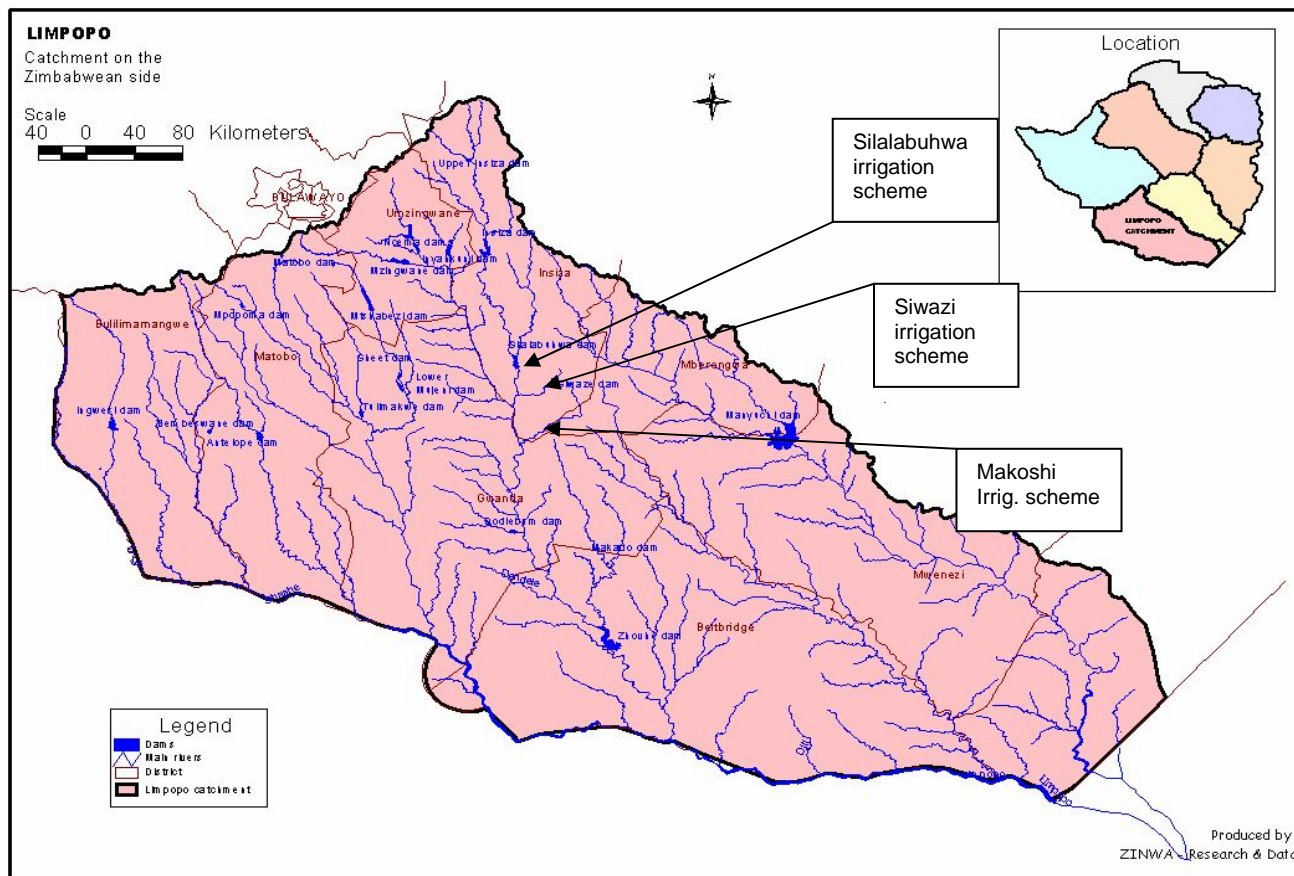
## **Introduction**

Good management of irrigation schemes is becoming increasingly recognized as an essential means to achieve successful irrigated agriculture the world over. It is recognized that poor performance is not only a consequence of technical performance in the design and operation of irrigation systems - although it is sometimes an important factor (Samakande *et al.*, 2004). Many of the problems are based on weaknesses in the organization and management of the scheme (Manzungu, 1999; Manzungu and van der Zaag, 1996; Senzanje *et al.*, 2003). This paper seeks to examine and evaluate the socio-cultural, institutional and political aspects of water allocation and management in three small-scale irrigation schemes in the Mzingwane Catchment, Limpopo Basin, Zimbabwe.

## **Study area**

This study focused on three irrigation schemes, Silalabuhwa, Makoshi and Siwazi but more in-depth study was done on Silalabuhwa. These irrigation schemes are all located in Insiza District in Mzingwane catchment (figure 1). A variety of crops are grown in the three schemes which include, maize, sugar beans, sweet potatoes, vegetables and winter wheat.

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**Figure 1.** Location of study sites in the Mzingwane Catchment (after ZINWA, 2003).

Silalabuhwa irrigation scheme is one of the oldest schemes in Mzingwane, having been opened in 1967 with initial size of 360 ha. However the scheme expanded with time and has grown to about 440 ha with 843 plot holders. The plot sizes range from 0.1-1.0 ha. Water to the scheme is supplied from Silalabuhwa Dam, which has a capacity of  $23.454 \times 10^6 \text{ m}^3$ , via gravity flow through a canal. There are five night storage dams in the scheme that were constructed in 1966 with varying sizes depending on the section they serve. Dams 3 and 4 are bigger compared to the other three.

**Figure 2.** Silalabuhwa irrigation scheme.

Siwazi was designed and constructed by the Zimbabwe government extension department (AGRITEX, now AREX) and was completed in 1992. The scheme size is 20 ha with 50 plot holders each allocated 0.4 ha. It gets its water from Siwazi dam which has a net capacity of  $2.235 \times 10^6 \text{ m}^3$ . The water is gravity fed into asbestos pipe network to the scheme where it goes to the night storage dam. From the night storage dam it goes to the fields through concrete lined canals. A block system of irrigation is practiced where each farmer has a 0.133 ha in each of the three blocks. The method of water supply is flood irrigation.

**Figure 3.** Siwazi irrigation scheme.

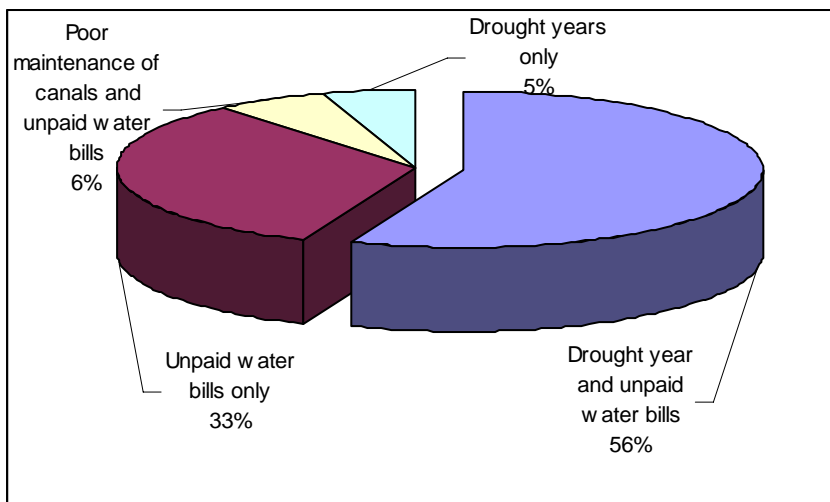
Makoshi irrigation scheme gets its water from Makoshi dam that was constructed in 1997 and work started on the scheme in 1998. It is 10 ha in area, with 25 plot holders. Each plot holder has a 0.4 ha. The scheme gets its water from Makoshi dam which has a net capacity of  $9.524 \times 10^6 \text{ m}^3$ . The water is gravity fed through PVC piping to the scheme. The farmers use drip kits for irrigation.

## Methods

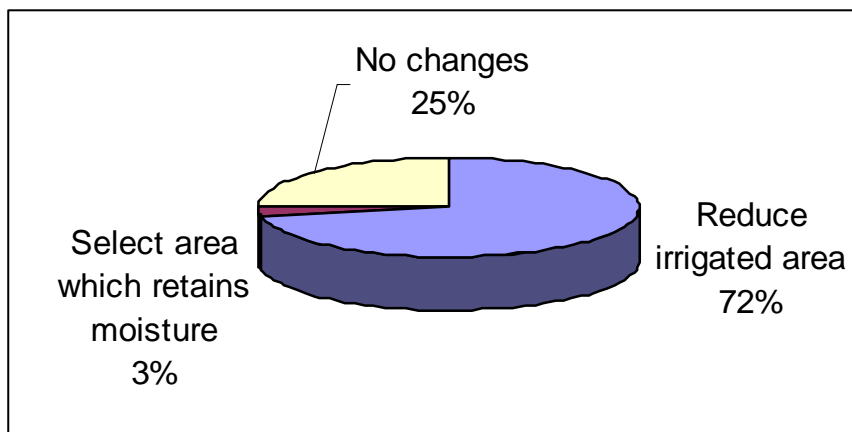
The methods used include documentary review, case study approach and comparative analysis. The methods used to collect the necessary data are key-informant interviews, semi-structured interviews, group discussions as well as administering a questionnaire to the farmers. Content analysis was used to analyse and quantify the results of the interviews. For quantitative data, excel was used to generate frequency tables. The sample plot holders were sampled from two sections/blocks of Silalabuhwa; Nonoka and Vuka as well Makoshi and Siwazi. Sample size of 120 was used, 100 in Silalabuhwa and 10 each in Makoshi and Siwazi.

## Results and Discussion

### Water Shortages



**Figure 4.** Causes of water shortages



**Figure 5.** Response to water shortages

*Silalabuhwa:* The greatest proportion (56%) of respondents attributed water shortages to drought year and unpaid water bills.

*Siwazi:* Even though Siwazi also pays for water there is no history of any water cuts at the scheme because of the stringent regulations in place that ensure that everyone pays water bills on time.

*Makoshi:* In Makoshi irrigation scheme, 90% of the respondents said they do experience water shortage as a result of blockage of pipes that causes low water pressure.

*Water Allocation*

The way water is allocated in Silalabuhwa is different compared to Makoshi and Siwazi. In Makoshi farmers are not involved in water allocation as the pipes are always laid down in the plots and it is the duty of the water distributor to open the gate valve at the dam and the valves at each plot. In Siwazi, the block system is used where by each farmer has a 0.133 ha in each block. Watering is by blocks and there is a water bailiff, a civil servant, who is responsible for allocating water to the blocks. Within the blocks, farmers give each other turns to irrigate. Whereas in Silalabuhwa and Siwazi farmers take as much water as they need for as long as they need it, in Makoshi a timed rotation is used.

In all the three schemes there were claims of unfair water allocation. Some farmers said sometimes they have problems in getting water especially when it is planting time when everyone needs water as water will be allocated on a ‘*you know who*’ and ‘*who you are*’ basis. They alluded this to favouritism, where the subcommittee looks at who you are in society as well as one’s political affiliation. They are only completely assured of water when it is harvesting time since competition for water then will be low.

**Table 1.** Reasons attributed to unfair water allocation and suggestions given to improve allocation

Reasons	Suggestions
<ul style="list-style-type: none"> <li>• No respect and lack of consideration for others among irrigators (A farmer can take as much time as he wants irrigating when there are more farmers waiting for the same water)</li> <li>• There is favouritism whereby they (subcommittee) looks at someone social and political standing as well as relationship to the Chairmen or other committee members</li> <li>• Water is not released on stipulated time i.e. 7a.m resulting in farmers not getting enough time to irrigate</li> <li>• The water is allocated as per requirement</li> </ul>	<ul style="list-style-type: none"> <li>• Water distributors should be paid so that they do their work well,</li> <li>• Time given to each irrigator should not be violated</li> <li>• Subcommittee should be changed regularly so that the disadvantaged do not suffer at the expense of the same committee</li> <li>• Water should be supplied at the stipulated time, early in the morning so that people have enough time to irrigate their fields</li> <li>• Stringent measures should be put in place so that those who are not supposed to irrigate on that particular day do not do so.</li> </ul>

<p>in terms of how many farmers are irrigating on that day, but some farmers do not register for water but they go ahead and irrigate.</p>	<ul style="list-style-type: none"> <li>Should have a meter at every night storage dam so that farmers in that particular section are accountable for losses, this also encourages them to maintain their canals. Farmers should be charged for the water they are using, not for losses</li> </ul>
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Farmers said they do not say anything in meetings and various reasons were given. Some of the critical, recurrent reasons given are;

- I am a widow: [people say that] I can not say anything of value and no-one will take me seriously
- I am shy because I am a woman, I can not speak in front of men
- I am too old (86 years) and tired
- The Chairman dictates and never listens to anyone

Results indicated that there are more males than females in the committees be it the IMC (Irrigation Management Committee) or sub-committees, even though the females make up the largest number of the plot holders in the scheme.

**Table 2.** Reasons cited for ineffectiveness of IMC and suggestions that increase effectiveness of IMC

Reasons	Suggestions
<ul style="list-style-type: none"> <li>• No coordination among committee members thus it is weak</li> <li>• No communication between farmers and committee</li> <li>• Dictatorship on part of the Chairman</li> <li>• Same Committee has been in control for a long period</li> <li>• No transparency</li> <li>• Misuse of water funds</li> <li>• They are more involved in politics that have nothing to do with the scheme operations</li> <li>• Favouritism</li> </ul>	<ul style="list-style-type: none"> <li>• Sub committee members should attend IMC meetings, currently they are not allowed to attend</li> <li>• There should be a constitution which governs conduct of the IMC and penalty for those who do not adhere to rules</li> <li>• Current committee should be removed from office as it has run out of ideas to make way for a new one</li> <li>• Constitution should state the terms of office of the IMC</li> <li>• IMC should be changed regularly and there should be an independent body to assess its performance</li> <li>• IMC should be trained in management aspects</li> </ul>

## Conclusions and Recommendations

The findings show that the institutional arrangement in the schemes determines the way water is allocated and they also affect water use and management. The results also show that the irrigators do not have the same access to water and do not speak with one voice as to how water should be managed as social status, gender, power, institutional dynamics and group interests appear to determine one's accessibility to water and its management. These findings suggest that for smallholder irrigation to achieve equity and efficiency in water allocation and management there should be integration of the technical, institutional dynamics, social and political factors from planning to implementation of projects.

## Recommendations

- Formulation of policy guidelines specific for each type of scheme to conform to the management in a given scheme depending on prevailing conditions and size of the scheme.
- The responsible authorities should take into account how they can exclude non-paying farmers when designing irrigation schemes.
- Big schemes (100ha or more) should be operated as subsidiary units to improve management.
- Strengthening irrigation scheme institutions such as the IMC, Section subcommittees, farmers and AREX supervisor and extension staff so that there is coordination that can improve overall management.
- User based allocation should be used in these schemes.

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