



## **An overview of the Mzingwane Catchment, Zimbabwe**

**a contribution to the WaterNet Challenge Program Project 17**

**“Integrated Water Resource Management for Improved Rural  
Livelihoods: Managing risk, mitigating drought and improving  
water productivity in the water scarce Limpopo Basin”**



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WaterNet is leading Project 17 under the Challenge Program on Water and Food, entitled "*Integrated Water Resource Management for Improved Rural Livelihoods*". The project is financed by the CGIAR through the CPW&F and by the partners in the project.

The partners in the project are:

**Project leader: WaterNet**

**International Research Institutes:**

- International Crop Research Institute for the Semi-Arid Tropics (ICRISAT)
- International Water Management Institute (IWMI)

**Universities:**

- UNESCO-IHE
- Universidade Eduardo Mondlane: Faculdade de Agronomia e Engenharia Florestal
- University of the Witwatersrand: School of Civil and Environmental Engineering
- University of Zimbabwe: Centre for Applied Social Sciences; Department of Civil Engineering; Department of Soil Science and Agricultural Engineering; Mineral Resources Centre

**National Water and Agricultural Authorities:**

- Administracao Regional de Aguas do Sul, Mozambique
- Department of Agricultural Research and Extension Services, Zimbabwe
- Instituto Nacional de Investigacao Agronomica, Mozambique
- Mzingwane Catchment Council, Zimbabwe
- Water Research Commission, South Africa

**Non-governmental Organisations:**

- World Vision Zimbabwe

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“Integrated Water Resource Management for Improved Rural Livelihoods: Managing risk, mitigating drought and improving water productivity in the water scarce Limpopo Basin”

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## Introduction

In the poverty stricken rural areas of water scarce semi-arid tropics, translating integrated water resource management from concept to action remains largely undone and a daunting challenge. New policies and structures, developed through water reforms since 1990, do not generally penetrate to the smallholder farmer. Smallholder farmers are generally part of structurally and/or politically marginalised districts, such as distant rural areas (Mozambique), former homelands (South Africa) and communal lands (Zimbabwe), with little voice in natural resource management (Love *et al.*, 2004). The global food challenge requires a focus on these smallholder farming communities living in water scarce and ecologically vulnerable landscapes (Falkenmark and Rockström, 2003), such as the Limpopo basin.

Water policy and institutions in the Limpopo Basin are mainly concerned with water for irrigation, cities, mines and industry. However, blue water resources for irrigation are over-committed in the basin, while the bulk of agricultural produce sustaining lives of resource-poor farmers originates from green water flows in rainfed agriculture.

Rainfed agriculture is risky, with recurrent droughts and dryspells. Smallholders have little access to blue water for irrigation. They cultivate on poor soils and unreliable rainfall is the main source of water (Twomlow and Bruneau, 2000). Crop yields are low and failures are frequent (Scoones, 1996), with one million people in the Limpopo basin depending on food aid in 2003. However, there is a large untapped yield potential even in the semi-arid rainfed areas, through improved soil and water management (Agarwal and Narain, 1997; Pretty and Hine, 2001; Zhu, 2003). Often, the problem is not physical scarcity of water, but rather the lack of integrated management approaches (linking crops, soil, water, climate), human capacities and weak institutional arrangements (WaterNet, 2003). Water productivity, yields and thereby livelihoods can be improved, through integrated soil and water management for dryspell and drought mitigation. Improvements can be achieved through agricultural interventions in dryland farming (Twomlow *et al.*, 1999) or through supplementary irrigation using rainwater harvesting (Gwenzi, 2004) or accessing alluvial aquifers (Dahlin and Owen, 1998; Owen, 1991). The challenge is to facilitate an adaptive process of participatory farm development, supported by institutions and an IWRM framework that incorporates all facets of managing green and blue water resources (Love *et al.*, 2004).

The new water governance in the Limpopo Basin countries enshrines principles of equity and user participation in decision-making. Catchment institutions provide a possibility for progressive and sustainable, stakeholder-based water management (Carmo Vaz and Van der Zaag, 2003; Manzungu and Mabiza, 2004; Savenije and van der Zaag, 2000; van der Zaag and Savenije, 2000). This could be a stakeholder based framework for IWRM, which addresses land/water/environment issues from a management, policy and institutional perspective, from the local to the basin scale (WaterNet, 2003).

This report is a summary of initial findings from reconnaissance and planning trips carried out in the Mzingwane Catchment, Zimbabwe, during the 2003-2004 field season, prior to formal inception of the WaterNet Challenge Program Project.

The full study area is the Mzingwane Catchment (water management area in Zimbabwe), comprising the hydrological catchments of the major northern (left bank) tributaries to the Limpopo, from the Shashe to the Mwenezi inclusive. The study areas for fine scale modelling are two quaternary catchments, one in the Filabusi area and one in the Mtetengwe area. See Fig. 1.

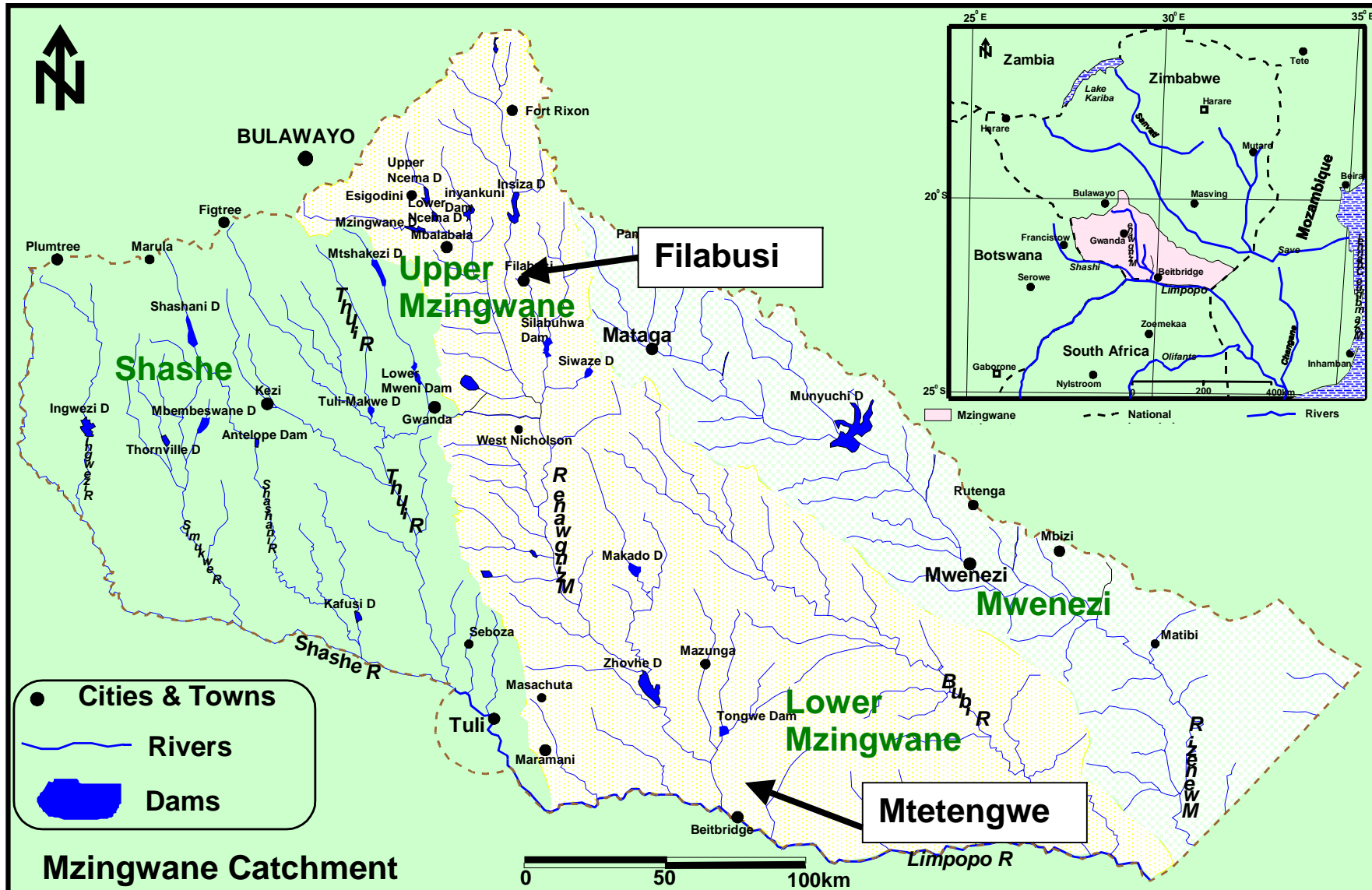


Fig. 1. Mzingwane Catchment, Zimbabwe, showing main rivers, dams and towns. The detailed study areas are indicated, Inset shows the location of Mzingwane within Zimbabwe. Base map after ZINWA (2003).

## Previous Work in the Mzingwane Catchments

In a classic study on the Limpopo Basin hydrology, Görgens and Boroto (1997) noted a number of short-comings in flow gauging of the river and its tributaries in the basin states, including Zimbabwe. Data availability on partitioning between the tributaries of the Limpopo - such as the Mzingwane, Mwenezi and Thuli - and riverbed alluvial aquifers is particularly limited. Based on existing data, it is estimated that around a quarter of the run-off of the Limpopo Basin is generated in the Mzingwane:

**Table 1. Subcatchments of the Mzingwane and their contribution to the Limpopo Basin (after Görgens and Boroto, 1997)**

Tributary	Catchment area (km <sup>2</sup> )	Unit runoff (mm)	Unit runoff (%)
Shashe	18991	24.33	12.3%
Mzingwane	15695	22.30	9.3%
Mwenezi	14759	17.34	6.8%
Bubi	8140	6.51	
Marico	13208	3.77	1.4%
<b>TOTAL</b>		<b>74.25</b>	<b>29.7%</b>

The alluvial aquifers of the Mzingwane Catchments are the most extensive of any tributaries in the Limpopo Basin (Görgens and Boroto, 1997).

Nyabeze (2004a, 2004b) has developed a 1 : 250,000 scale GIS based water resources model of the Mzingwane Catchments.

Ashton *et al.* (2001) reviewed the general characteristics of subcatchments in the Limpopo Basin, and the likely impact of mining on surface water. Although there are no published case studies on the impact of mining on water quality in Mzingwane, studies done on similar mines in the Mazowe Catchment, north-western Zimbabwe, indicate major problems with acid mine drainage and metal pollution, although these tend to be confined to the vicinity of the mine (Lupankwa *et al.*, 2004; Mabvria-Meck *et al.*, 2004; Ravengai *et al.*, 2004a, 2004b, in press).

Gold panning is also a major problem, causing siltation of rivers and mercury pollution (Shoko and Love, in press).

## Overview and Catchment Characteristics

### *Biophysical Character*

Generally rainfall decreases from the North to the South. Areas in the northern parts of the Shashe and the whole of Upper Mzingwane receive rainfall ranging from 450 mm to 650 mm per annum. These fall in natural region IV. The rest of the areas fall into region V, with a total annual rainfall of less than 450 mm, even getting to as low as 200 mm per annum in areas around Beitbridge, Chiredzi etc (Nare, 2004).

The Mzingwane Catchment generates around a quarter of the run-off in the Limpopo Basin (Görgens and Boroto, 1997). Most of this run-off is generated from the Shashe and Upper Mzingwane.

The mean annual run ranges from 600 mm in Shashe and Upper Mzingwane to less than 400 mm in Mwenezi sub-catchment (Ashton *et al.*, 2001; Nare, 2004).

Most of the catchment is underlain by the Zimbabwe Craton: greenstone belts and granitic terrain. The south is underlain by Limpopo Belt gneisses, and the south-west and far south-east by Karoo basalts, intrusives and sediments (Ashton *et al.*, 2001).

Soils in the catchment can be divided into four groups:

- Moderately shallow, coarse grained kaolinitic sands, derived from the granites and Limpopo gneisses;
- Very shallow to moderately shallow clays and loams, formed from the greenstone belts; and
- Very shallow sands, derived from the basalts (DRSS, 1979).

The catchment shows a strong division in agro-ecological and socio-economic structure:

1. The north-west, Insiza and Mzingwane Districts and the northern parts of Mangwe, Gwanda and Matobo Districts, have higher rainfall, better soils, more commercial agriculture, higher population density and higher household incomes.
2. The south and south-east, Mberengwa, Mwenezi and Beitbridge Districts and the southern parts of Mangwe, Gwanda and Matobo Districts, have lower rainfall, poor soils, more communal lands and ranchlands, lower population density and lower household incomes.

There has been widespread introduction of low cost drip irrigation kits in the communal lands (Maisiri, 2004; Chigerwe *et al.*, 2004). The use of these kits by small-scale farmers without external support and their impacts on yields per water usage are yet to be fully assessed.

## **Management**

Under the Zimbabwe National Water Authority (ZINWA), the Mzingwane Catchment is managed by the Mzingwane Catchment Council (MCC). The MCC is composed of elected officials and serviced by ZINWA officials (who report to the ZINWA CEO in Harare):

- MCC Chairperson: Mr Kenneth Drummond (large scale commercial farmer / game rancher)
- MCC Vice-Chairperson: Mr Phanuel Ncube (agricultural services manager, Mwenezana Estate, Triangle Sugar Ltd)
- Mzingwane Catchment Manager: Mr Tommy Rosen
- Mzingwane Catchment Deputy Manager: Mr B Ncube

Involvement in catchment management is largely dominated by the powerful in society (commercial farms, plantations, mines, cities) and not communal farmers – who are yet to see water as an economic good. The only way in which they are involved is via Rural District Council (RDC) representation on the subcatchment councils (SCCs). The degree of involvement of many stakeholders is also a challenge that is partly due to scale of water consumption. For example, in the Mwenezi Subcatchment, Mwenezana Estate uses apparently more water than all other users combined (certainly more than all other recorded users).

In terms of local governance, most of the Mzingwane Catchment lies within Matabeleland South Province, under a Provincial Governor / Resident Minister in Gwanda, with service provision by a Provincial Administrator. Some parts of the Mwenezi Subcatchment fall into Midlands Province and Masvingo Province. Below the provinces are the districts, run by District Administrators (DAs) (officials who are part of the Ministry of Local Government and National Housing) and Rural District Councils (RDCs) (RDCs have elected councillors and chairpersons, and appointed CEOs). The local government and water management boundaries do not overlap.

Most governmental functions in Zimbabwe are carried out by national government departments, even at the local level in rural areas. Thus, for example, health officers at district level report to a provincial health officer who reports to the permanent secretary for health. All three officials

are part of the national Ministry of Health and Child Welfare, and not any district (local government) or provincial government department.

Water affairs are fragmented with some functions being taken by ZINWA (some by the catchment councils, some by the catchment managers and national office), some by the Department of Water Development or the District Development Fund (Ministry of Water Resources and Infrastructure Development), some by the Department of Irrigation, the Department of Agricultural Engineering, or the Department of Agricultural Research and Extension (Ministry of Agriculture and Rural Development) and some by RDCs. This fragmentation is most apparent in irrigation. Functions and duties of these departments and agencies tend to overlap, creating difficulties for water users, especially those at grassroots.

In practice, governance activities in rural areas tend to operate by consultation between the RDC, DAs and local officials of national government departments. This is not required by constitution or law, but tends to be the *modus operandi*. The key officials are the DA and the RDC CEO, since they manage district officials and liaise with and coordinate with district / local level officials of national government departments (ministries) and other national structures (eg ZINWA). It should be noted that there is a high turnover of governmental officials at all levels, due to generally uncompetitive salaries, and this makes it difficult to realize long-term planning, management and implementation of policies in the water sector.

## **Development**

A wide variety of NGOs are active in the Mzingwane Catchment, although they are organised by province and district – not catchment.

**Table 2.** NGOs active in the Mzingwane Catchment.

<b>Organisation</b>	<b>Activities</b>	<b>Districts and Subcatchments*</b>
ARDRA (SDA)	Irrigation	Gwanda, Matobo (ST,MZ)
Catholic Relief Services	Irrigation	Mangwe (ST)
Compassion Ministries	Irrigation	Beitbridge (MZ)
Dabane Trust	Irrigation (drip kits for 0.50-0.75 ha gardens), boreholes, dams, alluvial aquifer harvesting <sup>+</sup>	Gwanda, Matobo (ST,MZ)
Development Trust of Insiza	Irrigation, boreholes	Insiza (MZ)
Give A Dam	Water harvesting: dam construction, rehab, boreholes	Throughout
Hlekweni	Irrigation, organic fertilisers	Gwanda (ST,MZ)
ITDG	Irrigation	Gwanda (ST,MZ), Filabusi (MZ)
LEAD	Irrigation (especially drip)	Throughout
Lutheran World Services	Irrigation, boreholes	Gwanda, Beitbridge (ST,MZ) Mberengwa, Mwenezi (MW)
Mvuramanzi	Irrigation	Beitbridge (MZ)
Safire	Irrigation	Gwanda (ST,MZ)
SDARMP	Water management, crop and livestock productivity, community empowerment	Gwanda, Beitbridge (ST,MZ) Mberengwa (MW)
World Vision Zimbabwe	Wide variety in agriculture: water harvesting and infrastructure, irrigation, seed, farmer training. Want to get into water resource management.	Deepest penetration: Filabusi (MZ) Less: Beitbridge (MZ), Mangwe (ST) 2004: Gwanda (MZ,ST), Matobo (ST), Mwenezi (MW)



<b>Organisation</b>	<b>Activities</b>	<b>Districts and Subcatchments*</b>
Zimbabwe Project Trust	Irrigation	Insiza (MZ)

\*Subcatchments: ST=Shashe/Thuli; MZ=Mzingwane; MW=Mwenezi

+ Referred to widely by the confusing term "sand abstraction"

### ***Data Availability***

Water data (quantity, some quality) are available from ZINWA for the Mzingwane main stem and, to a lesser, extent, for the Thuli, Mwenezi and Bubyeye main stems. . Similarly, the water infrastructure in Mzingwane is more developed than in the other subcatchments. The causes for this imbalance in developments in the different subcatchments are still being studied, and will form part of subsequent reports.

Furthermore, little work has been done to date comparing water demand/usage and water management systems under different land tenure systems: communal, A1 resettlement, A2 resettlement and large scale commercial farming.

## Shashe-Thuli Subcatchment (Water Management Area)

### **Catchment Characteristics**

Most of the subcatchment is underlain by the Zimbabwe Craton: Gwanda Greenstone Belt, Lower Gwanda Greenstone Belt, Mphoengs Greenstone Belt and granitic terrain. The south is underlain by Limpopo Belt gneisses, and the far south (Thuli Village area) by Karoo basalts (Ashton *et al.*, 2001).

Soils in the subcatchment can be divided into four groups:

- Moderately shallow, coarse grained kaolinitic sands, derived from the granites;
- Very shallow to moderately shallow sandy loams, formed from gneisses;
- Very shallow to moderately shallow clays, formed from the Greenstone Belts; and
- Very shallow sands, derived from the basalts (DRSS, 1979).

From Kezi northwards, the subcatchment is in Natural Region IV, with low (under 650 mm) and unreliable rainfall, and poor soils. South of Kezi is in Region V, with poor soils, rainfall under 600 mm and in places under 450 mm (Ashton *et al.*, 2001).

North of Kezi, land use is commercial farming, private and resettlement land, mainly livestock rearing with some drought resistant crops. The south is Communal Lands, and agriculture limited mainly to livestock, especially goats (Ashton *et al.*, 2001).

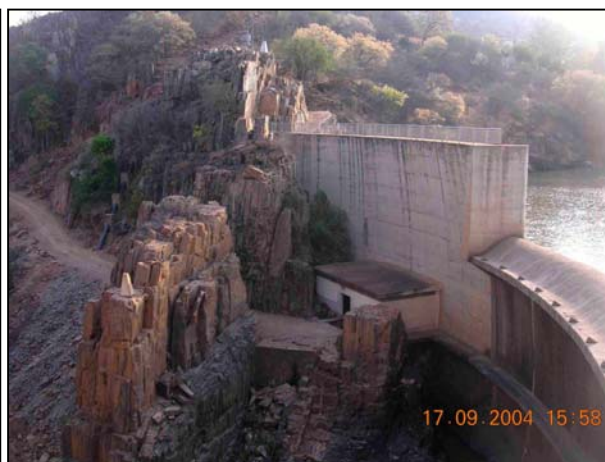
The main settlements are Plumtree town, Kezi and Maphisa Villages.

### **Management**

Under ZINWA, the subcatchment is managed by the Shashe-Thuli Subcatchment Council, which is chaired by Eng. Caxton Mangisi of Blanket Mine. Structures remain poorly developed. The subcatchment falls within the local government districts of Mangwe, Matobo and Gwanda. The National Parks and Wildlife Management Authority is responsible for Matobo National Park, Thuli Safari Area and Tshabalala Sanctuary.



**Fig. 2.** Thuli River at Freda Mine.



**Fig. 3.** Thuli-Makwe Dam.

### ***Development***

There are large irrigation schemes at Thuli-Makwe, Shashe and Ngwezi managed by a farmer committee, with support from AREX. Irrigation schemes have been developed by Dabani Trust (a local NGO) at Tshelanyemba and Sitezi, and by ARDRA at Natiza, Manama, Mtshabezi and Nkaze. There is much use (and further potential) for rock-rainwater harvesting in the uppermost Thuli, Mtshabezi and Mzingwane rivers. In the uppermost Mzingwane, a farmer in the Diana's Pool area won a prize for his system.

## **Mzingwane Subcatchment (Water Management Area)**

### ***Catchment Characteristics***

The northern half of the subcatchment is underlain by the Zimbabwe Craton: Bulawayo Greenstone Belt, Gwanda Greenstone Belt, Filabusi Greenstone Belt and granitic terrain. The southern half is underlain by Limpopo Belt gneisses, except for the area around Mazunga, which is underlain by Karoo basalts (Ashton *et al.*, 2001).

Soils in the subcatchment can be divided into four groups:

- Moderately shallow, coarse grained kaolinitic sands, derived from the granites;
- Very shallow to moderately shallow sandy loams, formed from gneisses;
- Very shallow to moderately shallow clays, formed from the Greenstone Belts; and
- Very shallow sands, derived from the basalts (DRSS, 1979).

From Gwanda northwards, the subcatchment is in Natural Region IV, with low (under 650 mm) and unreliable rainfall, and poor soils. South of Gwanda is in Region V, with poor soils, rainfall under 600 mm and in places under 450 mm (Ashton *et al.*, 2001).

North of Kezi, land use is commercial farming, private and resettlement land, mainly livestock rearing with some drought resistant crops. The south is Communal Lands, and agriculture limited mainly to livestock, especially goats. The main settlements are Gwanda Town and Esibomvu, Esigodini, West Nicholson and Colleen Bawn Villages (Ashton *et al.*, 2001).

North of Gwanda, land use comprises commercial farming, private and resettlement land. In the area around West Nicholson, wildlife farming and horticulture are practiced. Wildlife farming is carried usually in conjunction with the tourism industry. Commercial agriculture in tobacco, maize, wheat, and livestock is also carried out in the different parts of the catchment. The south is Communal Lands, and subsistent agriculture takes place with vegetables and maize cultivated during the wet months, in addition with livestock farming that predominantly consists of goats. The main settlements are Gwanda Town and Esibomvu, Esigodini, West Nicholson and Colleen Bawn Villages (Ashton *et al.*, 2001).

The City of Bulawayo draws much of its water supply from the Esigodini area dams: Insiza, Inyankuni, Mzingwane and Ncema. Commercial agriculture is a major water user, especially north of Gwanda (Ashton *et al.*, 2001).

### ***Management***

Under ZINWA, the catchment is divided into two subcatchments. The Upper Mzingwane Subcatchment Council is chaired by Clr. Landsdowne of the Bulawayo City Council. Structures are well developed, though there are often controversies on water allocations and pricing. The Lower Mzingwane Subcatchment Council is chaired by Mr. Robby Park of Bishopstone Estate and structures remain poorly developed.



**Fig. 4.** Mzingwane River at J.Z. Moyo School. The subcatchment falls within the local government districts of Insiza, Mzingwane, Gwanda and Beitbridge. The National Parks and Wildlife Management Authority is responsible for Mzingwane and Cunningham Recreational Parks, developed around Mzingwane and Lower Insiza (Mayfair) Dams respectively.



**Fig. 5.** Mzingwane River at West Nicholson.

### **Development**

There is a large irrigation scheme at Silalabuhwa (Silalachane) managed by a farmer committee, with support from AREX. This scheme is the oldest in Zimbabwe. There is extensive private irrigation from Zhova Dam and the downstream alluvial aquifers. Irrigation schemes have been developed by government at Siwaze, Dabani Trust at Dambashoko and Nkazesi, by ARDRA at Mtshabezi, LDS at Shavisvi and Chimtete GTZ at Magoche and World Vision at Zhulube, Malole, Sidzibe and a future site at Mbembesi. AREX manages a series of irrigation schemes along the Limpopo River.



**Fig. 6.** Silalabuhwa Irrigation Scheme



**Fig. 7.** Abstraction of alluvial groundwater, J.Z. Moyo School.

Farmer training is conducted by AREX and World Vision, on topics such as soil/water conservation, cropping, tillage. Tillage services are available for vulnerable households (e.g. poor, child-headed) from World Vision and Bishopstone Estate.

At Munyengezi in Mtetengwe Communal Lands, a communal farmer (single household) has developed 3 Ha of maize, vegetables and orchard using water from an alluvial aquifer.

## Mwenezi Subcatchment (Water Management Area)

### Catchment Characteristics

The northwest is underlain by the Zimbabwe Craton: granites and the Filabusi, Belingwe and Mweza Greenstone Belts. The Great Dyke passes through the northwest of the subcatchment. The central area is underlain by Limpopo Belt gneisses. The southeast is underlain by Karoo basalts and rhyolites, post Karoo granites in the Mateke Hills and post Karoo sediments in the east (Ashton *et al.*, 2001).

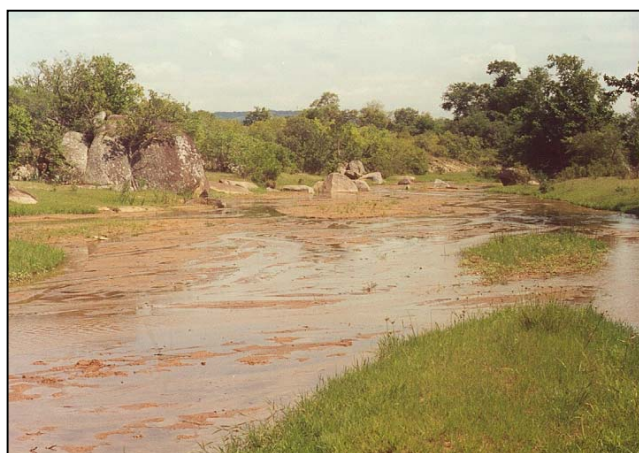
Soils in the subcatchment can be divided into six groups:

- Moderately shallow, coarse grained kaolinitic sands, derived from the Zimbabwe Craton granites;
- Very shallow to moderately shallow sandy loams, formed from gneisses and post Karoo sediments;
- Shallow to moderately shallow clays, with toxic levels of Ni and/or Cr in some areas, formed from the Filabusi and Belingwe Greenstone Belts;
- Very shallow sands formed from the Mateke Hills granites and the Mweza Greenstone Belt;
- Moderately deep to very shallow sands, derived from the basalts; and
- Deep sands, formed from post Karoo sediments in the Guluene-Chefu area (DRSS, 1979).

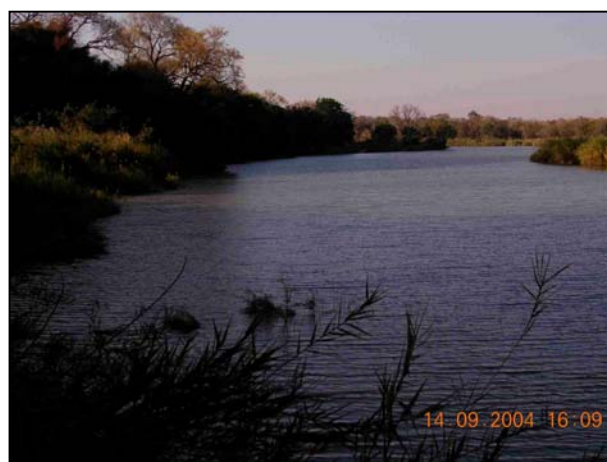
Northwest of Manyuchi Dam is in Natural Region IV, with low (under 650 mm) and unreliable rainfall, and poor soils. The remainder of the subcatchment is in Region V, with poor soils rainfall under 600 mm and in places under 450 mm (Ashton *et al.*, 2001).

Land use is mixed commercial farming, private and resettlement land and Communal Lands, with the area east of the Mwenezi River in the south forming part of Gonarezhou National Park. Agriculture is mainly livestock rearing with some cash and fodder crops, principally in the northwest. The main settlements are Mwenezi, Rutenga and Mataga Villages (Ashton *et al.*, 2001).

Agriculture is a major water user, including water withdrawals from Manyuchi Dam. Permanent pools on the Mwenezi River are the main source of water for game animals in western Gonarezhou National Park during the dry season, and are used as game viewing sites by tourists (Ashton *et al.*, 2001).



**Fig. 8.** Mwenezi River at Chegato.



**Fig. 9.** Mwenezi River at Mwenezana.

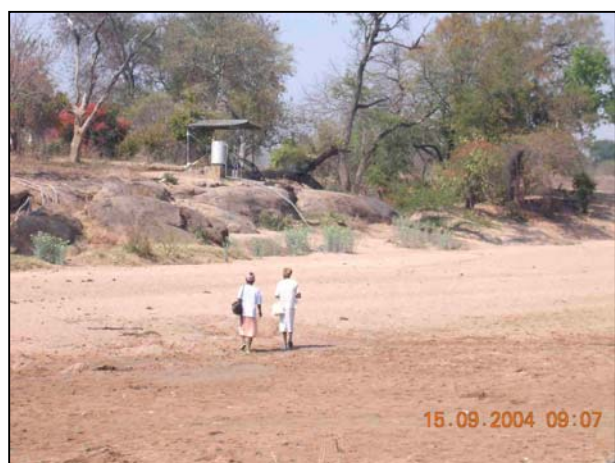
## **Management**

Under ZINWA, the subcatchment is managed by the Mwenezi Subcatchment Council, which is chaired by Mr. Phaniel Ncube of Mwenezana Estate, Triangle Sugar Ltd. Structures remain poorly developed. The subcatchment falls within the local government districts of Insiza, Mberengwa, Mwenezi and Chiredzi. The National Parks and Wildlife Management Authority is responsible for Gonarezhou National Park and Malipati Safari Area, both of which form part of Limpopo Transfrontier Park.

## **Development**

There is a large private irrigation scheme at Mwenezana (Triangle Sugar Ltd). Mwenezana uses water from Manyuchi Dam and collects the water by instream flow and a diversion at Rinette Weir. Small irrigation schemes have been developed by government at Biri and Mondi-Mataga, and by LDS at Chegato, Dunda, Machembaera and Remekedzo.

Farmer training is conducted by AREX and Mwenezana Estate, on topics such as planning, safety, health and environment, seed and seedling distribution (grass and tree) irrigation development. This assists in long term siltation management and improving the livelihoods of neighbouring communities. The estate wishes to develop an irrigation scheme for the informally resettled A2 farmers immediately downstream. There is good potential for rock-rainwater harvesting in the Sarahuru area, east of Manyuchi Dam.



**Fig. 10.** Abstracting alluvial groundwater, Maranda. **Fig. 11.** Irrigating sugar at Mwenezana.

## **Concluding Remarks**

WaterNet's project within the Challenge Program on Water and Food shall develop an adaptive process of participatory farm development, supported by institutions and an IWRM framework that incorporates all facets of managing green and blue water resources (Love *et al.*, 2004). A number of issues make the choice of Mzingwane Catchment a pertinent study site for the project:

Firstly, the Mzingwane Catchment, especially the southern and south-eastern districts, contains large areas of agriculturally marginal land. More than half the catchment is on poor soils and with low rainfall. Despite the availability of water in a number of rivers and dams, the catchment suffers water stress due to low and heterogeneous rainfall. It is precisely such areas where agricultural and land/water management interventions are most needed.

Secondly, the bulk of the population of the catchment is resource-poor smallholder farmers. Especially in the communal lands, these farmers live at the margins of economically sustainable agriculture. This is particularly the case in the southern and south-eastern districts of Mberengwa, Mwenezi and Beitbridge and the southern parts of Mangwe, Gwanda and Matobo Districts. Nevertheless, a number of projects and studies carried out in the catchment indicate clearly that there is a yield gap, and smallholder agriculture can be upgraded to provide a more sustainable livelihood for the communities.

Thirdly, interventions in institutional development are also required - and indeed demanded by the responsible authorities. Stakeholder participation in water management structures could be much better developed, and participation by smallholder farmers is limited.

Finally, since the Mzingwane Catchment contributes between a quarter and a third of the run-off of the Limpopo Basin, any hydrological interventions in the catchment have important downstream implications.



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## Glossary of Acronyms

AREX	Agricultural Research and Extension service, Ministry of Agriculture and Rural Development, Zimbabwe
CGIAR	Consultative Group on International Agricultural Research
DA	District Administrator
MCC	Mzingwane Catchment Council
NGO	Non-governmental organisation
RDC	Rural District Council (principal local government structure), Zimbabwe
SCC	Subcatchment Council (subdivision of a catchment council)
WMA	Water Management Area
ZINWA	Zimbabwe National Water Authority (state water management authority)

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2. Short report on five masters projects from the Mzingwane Catchment, Zimbabwe, a contribution to the WaterNet Challenge Program Project 17 "Integrated Water Resource Management for Improved Rural Livelihoods: managing risk, mitigating drought and improving water productivity in the water scarce Limpopo Basin". February 2005.