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Land, Farming and IWRM: A Case Study of the Middle Manyame Sub-Catchment

Takunda Hove

Ateg Resources Environmental Consultants, Harare, Zimbabwe; takunda.atteg@gmail.com

Bill Derman

Department of Environment and Development Studies (Noragric), Norwegian University of Life Sciences, Aas, Norway; bill.derman@nmbu.no

Emmanuel Manzungu

University of Zimbabwe, Department of Soil Science and Agricultural Engineering, Harare, Zimbabwe; emmanuelmanzungu@gmail.com

ABSTRACT: Zimbabwe's water reforms that were undertaken in the 1990s were meant to redress the colonially inherited inequalities to agricultural water, increase water security against frequent droughts, improve water management, and realise sustainable financing of the water sector. They were underpinned by the 1998 Water and Zimbabwe National Water Authority Acts, which were based on Integrated Water Resources Management (IWRM) principles. This article describes how IWRM has been implemented against a backdrop of an ever-evolving land reform programme and a struggling agriculture sector. We examine how water is accessed and used in and around three water sources in the Middle Manyame Sub-Catchment, one of the seven sub-catchments of the Manyame Catchment. The Sub-Catchment is of particular significance because there was significant agricultural production on white-owned large-scale farmers, which have now been extensively allocated to small black farmers. The study demonstrated that while the land reform has, in theory, broadened access to water, irrigation water usage has remained low because of a depressed agriculture sector, shortage and high costs of electricity, and lack of capital needed to restore damaged or stolen irrigation equipment. The findings indicate that the assumption of a self-financing water sector, based on a well-functioning agriculture sector, which is the largest water user, has not been realised, and this has negatively affected implementation of IWRM in the Middle Manyame area and in Zimbabwe in general.

KEYWORDS: Water reform, land reform, agriculture, IWRM, Zimbabwe

INTRODUCTION

Zimbabwe's water reforms were undertaken in the 1990s for internal and external reasons. Historically, Zimbabwe's developed water resources were mainly used by large-scale commercial farmers (overwhelmingly white) to irrigate a wide variety of crops at the expense of the majority black population (Manzungu and Derman, this Issue). This explains the intention by government to redress this skewed and unequal access to water (Manzungu, 2001). At the same time, the World Bank and other donors promoted a neoliberal agenda, which among other things tried to institutionalise the notion of water as an economic good (Derman and Manzungu, and Manzungu and Derman, this Issue). Thus the water reform process was at a crossroads – how to reallocate water to black farmers while maintaining water revenue from white farmers who were on the land. Another conundrum was how to factor in land reform into the water reform process. The Fast Track Land Reform ignored the new units

of water management – catchment and sub-catchment councils – which among other dimensions had responsibility for water allocation, monitoring water use, billing water and catchment protection (Derman and Manzungu, this Issue).

For this and other reasons (see Manzungu and Derman, this Issue) the promise of Integrated Water Resources Management (IWRM) water stalled. For example, concerning integrating land and water, there was a failure to build upon the Water Resources Management Strategy (WRMS) document that had proposed to link water and land (GoZ, 2000a). The document was meant to operationalise water reforms as captured in the Water Act (GoZ, 1998a) and the Zimbabwe National Water Authority (ZINWA) Act of 1998 (GoZ, 1998b). In this article, we focus on water access and water use by the new settlers who received land under the land reform programme and some white farmers who have remained. More specifically, we focus on whether the new settlers were able, not just to access water, but to use it for agricultural production. We also wanted to know if the past water revenues from agriculture would be maintained, because they were critical to self-financing water sector in accordance with the IWRM principles enunciated in the Water Act.

Most of the water used in Zimbabwe is surface water, of which 45% is stored in government dams and the remaining 55% in some 5,700 dams in former large-scale commercial farming areas, on mines and on plantation estates (GoZ, 2000a). Underground water, representing about 10% of the total water use in Zimbabwe, is tapped mainly through boreholes. Records show that there were over 24,300 boreholes in the country (GoZ, 2000a).¹ While the country has a total developed irrigated area of approximately 206,000 hectares (ha) and a potential irrigable area of 1,500,000 ha (Madiya and Zawe, 2013: 8),² the former figure has substantially decreased since 2000 because of aged and outmoded equipment, limited working capital, poor management, the collapse of social institutions and their poor placement (Anseeuw et al., 2012). Another reason has been the failure to irrigate because of the transition to fast track land reform. As Matondi (2012: 213) writes:

The wastage in terms of infrastructure was phenomenal. The irrigation systems were idle, either because the pumps or pipes had been stolen or damaged, or because the new settlers lacked the necessary skills to run them. Tractors and other farming equipment were appropriated from farms through illegal means and were literally driven into the ground due to lack of care and maintenance.

This explains why much of the water that remains in dams is unused. Agriculture, which had previously used over 80% of the water resources for irrigation is depressed. Our focus is the Middle Manyame Sub-Catchment (MMSC), one of the hubs of white large-scale commercial agriculture that witnessed two types of agricultural resettlement for black farmers: A1 village based farms and A2 commercial farms. A1 farms are organised into village-like farms with each member receiving 1-70 ha of land (depending on the agro-ecological region) divided into residential, farming land (arable) and grazing land.³ The purpose of A1 farms is to lift small farmers out of poverty and to decongest communal areas in contrast to the commercial orientation of the A2 model. A2 farms were supposed to be given to individuals who had resources and sought to become commercial farmers. They range in size from 2-1000 ha depending upon the agro-ecological region (see below for their characteristics). Our article examines how IWRM fared in the midst of agricultural and land reform. It provides evidence to

¹ The number of boreholes has dramatically increased with the collapse of the Harare (capital city of Zimbabwe) water supply system (Manzungu et al., 2016) and some farmers opting to use cheap groundwater (see below).

² Manzungu (2011: 16) citing FAO figures, estimates a lower figure. "On the basis of available water resources the irrigation potential of the country is estimated at 365,000 ha on the basis of the available internal renewable water resources and not on water from the Zambezi and Limpopo border rivers and such sources". It is fair to say that there is need for new research to revisit the irrigation potential of Zimbabwe.

³ Matondi (2012: 55) describes the A1 model as "comprising small, integrated communities using locally evolved norms and rules to manage resources and people".

highlight the inability of IWRM to accommodate changes in other sectors, particularly agriculture and energy. As argued by Mapedza et al., in the midst of a political, social and economic crisis IWRM has few prospects for success (Mapedza et al., 2016). By casting water reform as a technical process, and abandoning its political economy roots, the stage was set for a water reform, which achieved neither its neoliberal objectives nor the political economy of promoting a vibrant black agriculture.

The article is organised as follows: After a short discussion of methodology, we discuss Zimbabwe's land reform and a transformed agriculture in this sub-catchment. We then turn to the details of agriculture and water use in the Middle Manyame and how water users gain access to water. We note the central place that payment for water takes from the perspective of ZINWA, and the catchment and sub-catchment councils. The article concludes by examining how the Zimbabwean emphasis upon commercial water and user pays has limited IWRM and the use of water for development purposes.

For the field research portion of this study, we selected three dams, the Biri, Mazvikadei, and Kingston.⁴ These enabled us to study the different uses of water and the variation of water access and use within the sub-catchment. The study adopted a case study research design. We selected the Middle Manyame Sub-Catchment (MMSC) because it was one of the centres of large-scale white commercial agriculture, had an extensive irrigation sector and contributed a significant proportion of the nation's tobacco, wheat and maize production. In addition, we could build on earlier research on the formation of the catchment and sub-catchment councils (see Derman and Manzungu, this Issue). Lastly, it gave us the opportunity to study the water use and irrigation patterns on the resettlement farms. We interviewed people who were using or had used the waters in the past and the present water users.⁵ In addition to water users and farmers, we interviewed representatives from ZINWA, Manyame Catchment Council, Middle Manyame Sub-Catchment Council, Rural District Councillors, Ministry of Water, Environmental Management Agency, Parks and Wildlife Authority, Department of Agriculture and Rural Extension, Ministry of Lands and water users' associations.

LAND, WATER AND AGRICULTURE IN ZIMBABWE: A BRIEF HISTORICAL OVERVIEW

Zimbabwe's agrarian history has been characterised by the division of lands which saw the colonists claiming by 1970 45% of the land with approximately 40% in Native Reserves reserved for blacks (Palmer, 1977). At that time, there were approximately 5,310,000 blacks and 255,000 whites (Palmer, 1977). White or European lands, which became the large-scale farming sector after independence, occupied the more fertile lands and possessed the better water sources. Undoing this inequality in land and water has been a major goal of the Zimbabwe government since its independence in 1980. In addition, historically whites benefited from state support for agriculture, irrigation and water supply (Herbst, 1990). In the meanwhile, black Zimbabweans were forced into the more marginal lands (Palmer, 1977; Ranger, 1985; Manzungu and Machiridza, 2009). The Native Land Husbandry Act (1951) sought to make blacks resident in the Tribal Trust Lands and choose between subsistence agriculture and full-time urban or industrial employment. This had a net effect of undermining black agriculture. In addition, the Southern Rhodesian government⁶ of the day sought to reduce the number of cattle owned by blacks. This effort resulted in fierce resistance and ultimately the programme was abandoned but not before generating severe unrest (Duggan, 1980; Alexander, 2006).

To correct the historic land imbalances, the newly independent Government of Zimbabwe planned to redistribute 5 million ha of land located mainly in the less-favoured agro-ecological regions and which tended to be farms abandoned during the war of liberation (Kinsey, 2000) because of the willing

⁴ For a more detailed consideration of the methods see Hove, 2012.

⁵ We note that several A2 farmers coming from the security sector were not open to being interviewed.

⁶ Southern Rhodesia was the colonial name of present-day Zimbabwe.

seller/willing buyer basis. During the 1980s, the government resettled 56,000 households on 3,324,880 ha (Moyo, 1995: 121). There were a variety of models of land reform but the most common was Model A that gave a family 5 ha of land for cultivation, 10 ha of grazing land and 0.5 ha for their homes. The present A1 model is based upon this older form. In sum, the first phases of land reform did not involve the best lands or satisfy the larger need for land reform. Most white farmers and corporations' lands were left untouched.

During the 1990s, while water reform was initiated and implemented, the pressures for land reform were building. Despite the Land Acquisition Act of 1992, which ended the restrictions of the Lancaster House Constitution on acquiring land for resettlement, there was little movement until 1997 when the government announced it would acquire 1804 large-scale commercial farms (Moyo, 2000a: 73). This was followed by a major donor conference in 1998, which sought to provide a framework for land reform. The conference failed in its objectives and some 1471 farms were listed to be acquired by government for redistribution. This process of acquisition stalled in the courts as landowners objected to their farms being listed (Moyo, 2000b; UNDP, 2002; Alexander, 2006).

In 2000, the government embarked on the Fast Track Land Reform Programme (Matondi, 2012; Moyo, 2013; Moyo and Yeros, 2013), whose motives and results are subject to highly divergent opinions. Proponents of the programme saw it as part of a potential revolutionary strategy towards black economic emancipation. According to Moyo (2004) market-assisted land redistribution in the first two decades of independence had done little either to level out ownership disparities between the large-scale farming sectors and black farmers, or to restructure the rural landscape. However, opponents saw it as a strategy by an increasingly unpopular (ZANU PF) party to use the redistribution of land to retain power (Alden and Anseeuw, 2009; Compagnon, 2010; Maunganidze, 2015). They point to the launch of farm invasions right after the government suffered its first ever electoral defeat when the government-proposed draft constitution was rejected in the February 2000 referendum. With parliamentary elections looming, a national opposition party growing, the claim is that the government-sponsored the violent takeover of white farms spearheaded by war veterans to prevent farm workers from voting or assisting the opposition party, and to reward war veterans, party officials and government officials with land (Hellum and Derman, 2004; Kriger, 2003; Compagnon, 2010).

The Fast Track Land Reform Programme produced two types of resettlement farms as mentioned earlier, A1 and A2. The majority of the people resettled under A1 model scheme were communal residents, urban unemployed, followed by war veterans, military, and civil servants (James, 2015). By 2011, 145,775 people had benefitted from the land reform on about 5.8 million ha (Matondi, 2012). In general, as highlighted below, A1 farmers have struggled to balance cash crops (tobacco, vegetable gardens and contract farming) with food production (mainly maize). The challenges also arise from the fact that, because A1 farmers come from different areas, some communal and some urban, they have struggled to build new and viable institutions to manage water (and other resources) for productive and domestic purposes. This is an area that requires new research because the leadership of A1 villages has tended to fall on war veterans who led the Committees of seven but are now subject to local variations. A2 farmers, on the other hand, were expected to be commercial farmers with farms ranging from 2-2000 ha, depending on location and the agro-ecological region.

The A2 model is administered under the Agricultural Land Settlement Act (Chapter 20: 01). In the A2 model, altogether 16,386 beneficiaries had accessed approximately 2.9 million ha of land by 2009 (Matondi, 2012). In essence, these newly resettled farmers represented an emerging group of water users, but with little or no history of institutional access to water (Derman and Gonese, 2003; Hove, 2012). A few white commercial farms remained on the land, usually with their farms diminished in size but maintaining their irrigation systems and infrastructure. By 2009, the Government of Zimbabwe had acquired about 10.8 million ha of land for the entire resettlement programme out of a total of 12.3 million ha of commercial farmland (Ministry of Land Reform and Resettlement (MLRR) cited in Matondi, 2012)

While there is widespread agreement on Zimbabwe's need for land reform and for providing access to black Zimbabweans, there are disagreements as to how successful it has been and who has benefitted from it and its long-term implications. On one side of the debate is the view that many more (black) farmers participating have entered into the agriculture sector and have contributed to either an actual increase in agricultural production or else the potential to do so (see Scoones et al., 2010; Hanlon et al., 2013; Moyo, 2013). On the other side is the view that there remain significant challenges relating to secure land tenure and agricultural production (Marongwe, 2011; Zamchiya, 2011; Cliffe et al., 2011; Matondi, 2012) before the outcomes of the fast track will lead to a strong rural economy.

We will not enter into the debates in this paper. Suffice to say for the time being, food insecurity remains a part of the Zimbabwe landscape. While there was an increase in food security and maize production in 2013-2014, 2015-2016 was a poor year due to drought in some parts of the country.⁷ This has not been helped by a weak economy, the loss of jobs in the formal sector, and high unemployment. The International Monetary Fund notes that Zimbabwe's economy remains in a weak state, with an unsustainably high external debt, massive de-industrialisation, informalisation of the economy and high rates of unemployment. While Zimbabwe's Gross Domestic Product (GDP) grew at an average of 7.5% from 2009 to 2012 it is now slowing down rapidly. This economic slowdown is due to continued de-industrialisation, liquidity challenges (the lack of, and high cost of, capital, revenue underperformance and bank weaknesses), outdated technologies, structural bottlenecks that include power shortages and infrastructure deficits, corruption and a volatile and fragile global financial environment (African Development Bank, 2014). This is the backdrop against which agriculture has been practised in Zimbabwe since 2000.

Post-fast track agriculture in the Middle Manyame Sub-Catchment has seen the transformation of its agriculture from large scale to medium and small-scale farms. Most of the large-scale commercial farms, which dominated the landscape, are now locations of resettlement. Up until 2001-2002, the Middle Manyame area was the centre of winter wheat production, which depended upon a reliable supply of irrigation water. The situation has dramatically changed. For example, wheat production across the country has fallen from 250,000 tons in 1999-2000 to 30,000 tons in 2010 and has remained more or less at that level. (Anseeuw et al., 2012: 38).⁸ According to the Financial Gazette (24 July 2014) the 10,000 to 12,000 tonnes expected in 2014 were enough for one week's supply of flour for bread. This means Zimbabwe would have to import at least 440,000 tonnes to meet the shortfall in national demand, paying close to USD220 million for wheat imports at an import parity price of USD468 to USD500 per tonne.

THE MIDDLE MANYAME SUB-CATCHMENT: A DESCRIPTION

The Middle Manyame Sub-Catchment is one of the seven sub-catchments that make up Manyame Catchment (Figure 1). It covers a large part of Zvimba District and small parts of Makonde, Mazowe, and Chegutu districts (Latham, 2002a,b; Hove, 2012). There are four major rivers that drain the catchment, namely the Manyame, Mukwadzi, Muzare and Munene. The average annual rainfall for the sub-

⁷ The Famine Early Warning System (FEWS) has a series of reports on Zimbabwe. They say that Poor households relying on food purchases will continue to face livelihood protection deficits and food gaps even with ongoing safety-net programmes and a near-normal start to the 2016/17 cropping season. National cash shortages are expected to limit economic and livelihood activities, such as agricultural and nonagricultural labour, and self-employment. Worst-off areas may face Emergency (IPC Phase 4) outcomes during the peak of the lean season.

www.fews.net/sites/default/files/documents/reports/Aug%202016_FAOB.pdf (accessed on August 22, 2016)

⁸ We focus on wheat since it was a major user of irrigation water. Other grains while declining have been rebounding since 2009 relying mainly on the rain.

catchment is 802.3 mm while the mean annual runoff (MAR) is 123 mm. The percentage coefficient of variation is 110.

Our study focused on three different sites around three dams, Mazvikadei, Biri and Kingston. Construction of the Mazvikadei Dam located north of Banket town on the Mukwadzi River was funded by the Zimbabwean government. An Italian company undertook the construction. It was completed in 1985 to supply water for irrigation. Over time, it has become the site for luxury cottages and water-based recreation activities.

Biri Dam is located on the Manyame River about 120 km northwest of Harare, Zimbabwe's capital city and approximately 20 km from Chinhoyi Town. Its surface area is 2,300 ha and has a storage capacity of 345,000 mega litres (ML). Apart from being a source of irrigation water, the dam also supplies water to the City of Chinhoyi. It was built by a consortium of about 70 white and black large-scale commercial farmers, and the National Social Security Authority (NSSA) contributing 22.5%, which makes it the single largest shareholder. The ownership of the dam is contentious – the government through ZINWA is now the owner after the government nationalised all large dams in the aftermath of the Fast track land reform programme. NSSA⁹ and the other farmers who contributed financially, insist that they still have co-ownership, until they are bought out by ZINWA.

Kingston Dam was built by a white farmer (Mr. Robin Smith) in 1972, and he is the owner of the dam.¹⁰ Located on Pindipark farm near Chinhoyi, the dam was built at the confluence of the Chitawe and Msengi rivers. It has a capacity of 3600 ML of water, below ZINWA's cut-off point (5000 ML) for being designated a national dam. There are five farmers who use its water for irrigation; Mr. Smith and four resettled A2 farmers. Mr. Smith is a very experienced commercial farmer, who grows barley under contract from Delta Beverages for beer-making as well as tobacco, potatoes and soybean. He has been farming in this area since 1965 and had 250 ha of land under irrigation. After the land reform, he is now left with 91 ha. The other four A2 farmers have land ranging from 5 ha to 60 ha under irrigation, and grow soybean, wheat, maize, potatoes and tobacco. Wheat is now being grown on a lesser scale because of the delay by the state-owned Grain Marketing Board (GMB) to pay them and the high cost of electricity to irrigate, coupled with massive load-shedding¹¹ and billing.¹² In general, most farmers are shunning growing wheat due to these two reasons. The decline in wheat cultivation has had an impact on the revenue that accrues to the sub-catchment. According to an official from Middle Manyame Sub-Catchment, this has left it in a precarious financial position because of depressed revenue from water.

Tobacco is fast becoming the most important cash crop for A1 and A2 farmers because the price is not regulated as that of maize and wheat. It is sold either using the auction system whereby it is sold to a buyer who pays the best price or increasingly through a contract system where the costs of production are provided by a tobacco company and then deducted from the sale. The fortunes of soybean are also better – unlike maize and wheat there are many private players who compete for it.

Small gardens specialising in semi-commercial vegetable production are found usually close to water sources around the three sites. These gardens measure around 1000 m² and are irrigated using small diesel pumps or manually by buckets. The gardens are run on a family basis though around Biri Dam some gardens are run on a cooperative basis. Gardens are a way of supplementing A1 farmers' incomes especially during the dry season. Fishery owners, mainly at Mazvikadei, have also established gardens

⁹ As far as NSSA is concerned it can ill afford to lose the money that belong to pensioners.

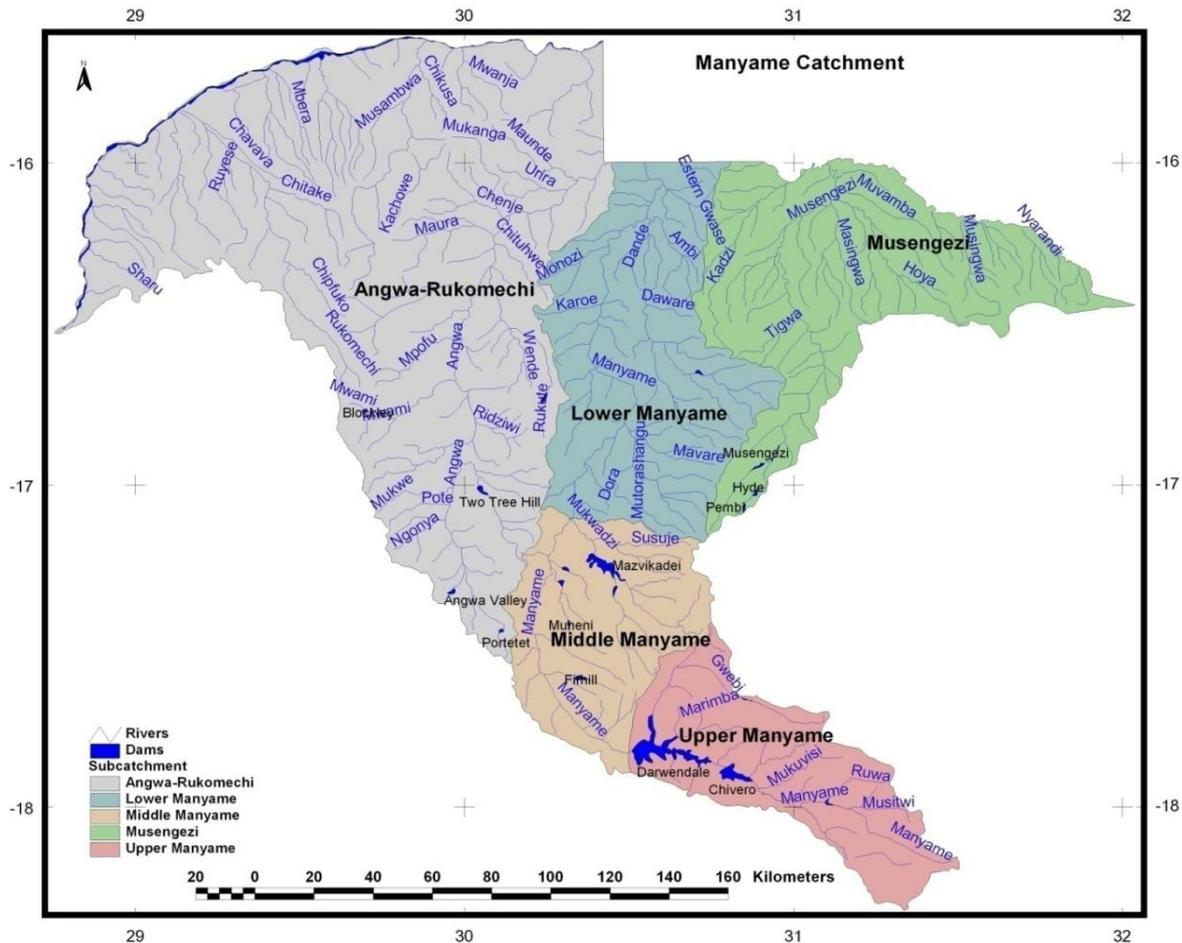
¹⁰ Mr. Smith is one of the few white commercial farmers who has managed to remain on land. He is the ZANU PF councillor for Zvimba Rural District Council Ward 31 and has held that position for 32 years.

¹¹ A major difficulty for farmers has been load-shedding by the national electricity company – ZESA (Zimbabwe Electrical Supply Authority) combined with high rates.

¹² For example, one A2 farmer was worried about the legitimacy of a US\$28,000 Zimbabwe Electricity Supply Authority (ZESA) electricity bill that he had just received given how often he did not have electricity.

as a way of supplementing their income, especially during winter when there is a decreased catch of fish. Crops grown in the gardens include vegetables like rape, covo and tomato. The produce is sold to the nearby communities, visitors who come to Mazvikadei Resort, as well as to Gold Dust Township, Chinhoyi and Banket towns.

Figure 1. Sub-catchments of Manyame Catchment.



WATER USE IN MIDDLE MANYAME

Irrigation water

The fast track land reform led to substantial changes in irrigation in the sub-catchment. A good case in point is the Ghost Acre Irrigation Consortium that, at one time, was the largest water user from Mazvikadei Dam. It comprised six farms that were linked through a single irrigation system. Water was pumped from Mazvikadei Dam into Ghost Acre Dam and then onto individual farm reservoirs (Zawe, 2006).¹³ Each farm had its own pumping station and had a consistent supply of electricity. The farmers shared the main pipelines, main pumping system and security of the irrigation equipment. Each farm

¹³ This account is based on Conrad Zawe’s PhD thesis. Zawe had also been an irrigation engineer in the Department of Irrigation and, currently, he is the Director of Irrigation Development Division in the Ministry of Agriculture, Mechanization and Irrigation Development. The division has been grossly underfunded.

was managed individually. The farms had varied cropping emphases such as wheat, maize seed, and soybean and, often, changed crops depending upon market conditions.

In the aftermath of the fast track land reform, these farms were designated as A2 farms. The new owners included a managing director of a local bank, an army major, a university associate professor (who had just become a judge), and the Zimbabwe Ambassador to the United Nations. Ghost Acres Farm moved from being one large farm to seven A2 farms. The new A2 farmers were not able to cooperate to undertake irrigation as has been the case before because they came to the farms at different times, and had different expectations, experiences and resources (Zawe, 2006). In the end, the old irrigation system was not utilised resulting in pipes being sold or unrepaired. The other problem, which was common to the A1 and A2 settlers, was that they became irrigation farmers overnight and in most cases they lacked the capacity to keep the irrigation systems functional (Zawe, 2006). There are also challenges regarding access to water. As can be seen from Table 1 the majority of farmers were not irrigating and as low as 8% irrigated from a dam because dam water is more expensive.

Table 1: Methods and proportion of A2 farmers accessing irrigation water.¹⁴

| Method of water access | Proportion of A2 farmers accessing water (%) |
|------------------------------------|--|
| Irrigating direct from a dam | 8 |
| Irrigating from a private borehole | 18 |
| Irrigating from a river | 31 |
| Not irrigating | 43 |

The remaining white commercial farmers showed resilience. About 62% of the remaining white commercial farmers were irrigating the land and had applied for permits (GoZ 2001). Their stay on farms is tenuous given the continued general hostility to 'white' farmers and thus complying with the law is essential for being permitted to remain on their farms.

A similar story of underutilising irrigation infrastructure was also unfolding in the A1 sub-sector. Tendai Murisa described another case involving A1 farmers settled on what had been the Dalkeith Farm. Here the 73 settlers received pipes and sprinklers from the government. According to Murisa (2011: 1115):

The Chidziva Farmers' Association was established to improve the farming capacities of the members and to contribute towards better lives through collectively seeking for farm inputs, markets and introducing other income generating projects. The initial focus of the association was on irrigated winter wheat, and specifically on securing inputs and coordinating both household and hired labour. The leadership of the group successfully requested assistance for farm implements from the Government of Zimbabwe after the co-existence deal with the former farm owner had collapsed. The government issued them with two brand new 125 horsepower water pumps and some of the pipes required for irrigation and the Government of Zimbabwe insisted that the group should produce wheat for resale to the Grain Marketing Board. However, by 2008 the group members were yet to use the new equipment due to the nonavailability of electricity.¹⁵ The reasons cited by A1 farmers are varied. One major reason was the shortage of capital to acquire, for example, water pumps. The lack of cooperation among A1 farmers worsened the situation as evidenced by their failure to pool resources to secure two water pumps needed after water pipes and sprinklers were provided by the government at Dalkeith farm. Instead of the pipes being used for the prime

¹⁴ Data from Middle Manyame Sub-catchment Council Records obtained by Takunda Hove.

¹⁵ Murisa recounts a second case study of an A1 farm which saw initial success of irrigated wheat and then its significant decline. The area under irrigated wheat production declined from 40 to just 3 ha (Murisa, 2011: 1161).

purpose of irrigation, some people were stealing and selling them. This prompted the Village Development Committee Chairperson to ask every farmer to come and collect their share of pipes and keep them for themselves because of the risk of keeping them in a central location.

According to the current chairperson of the MMSCC, Mrs. Biri, they have been centralised again and the villagers are now hopeful of receiving two pumps from the government in an effort to revitalise the irrigation sector.¹⁶ In general, we did not see the capacity in agricultural extension to advise A1 farmers on either the appropriate technology or appropriate group structures to do irrigation.

Overall, the decline in water usage in dams, because of lack of irrigation, has resulted in a situation where most dams within the Middle Manyame are almost full at the end of the dry season. Mazvikadei Dam, the largest in the sub-catchment, was almost 90% full in August 2016 despite the drought. This was not the case before fast track when most dams would be less than 50% full by October because of irrigation by commercial farmers. Thus, although the land reform broadened users' access to water through opening up water sources traditionally meant for white farmers, there has been no concomitant use of irrigation water.

Gardening

Irrigated gardens usually found close to the dams are irrigated by hand or by diesel pump. The gardens range in size from about an eighth of a hectare to one hectare. A1 farmers gain access to garden land in two ways: Firstly, for farmers living close to dams, they move closer to the dam and establish gardens claiming that it is their land. These actions can result in the garden owners being fined by the Environmental Management Agency (EMA) for cultivating within 30 m of a watercourse. Secondly, Village Development Committees also allocate land for gardens within their area of jurisdiction.¹⁷ The main crops grown are green mealies (maize), tomatoes, and vegetables (rape, covo, cabbages, onions, sweet potatoes and spinach). Where gardens are hand-irrigated, a large majority of the participants are women whereas in gardens irrigated by pumps, men tend to participate more (Hove, 2012). Women typically sell the produce to the local communities as well as in nearby towns, Banket and Chinhoyi.

In the Mazvikadei area, people involved in fishing tend to establish their homes near the dam¹⁸ and also utilise land adjacent to their homes as gardens. Fisherfolk do this to supplement their income, especially during winter when there is a decreased catch of fish. No one allocates them land for gardens; it seems like an unwritten rule that a fishery owner has the right to establish a garden adjacent to his fishery.

An employee of the MMSCC commented that the sub-catchment council does not charge for water used for irrigating land less than a hectare because this is considered primary water use. In principle, the use of a pump would trigger payment for water. However, in practice, farmers are not charged for using water in gardens. A local ZINWA employee when asked if a farmer using a pump was paying for water, the response was loosely translated "For that one, we all agreed to let him prosper first before we can start levying him".¹⁹

¹⁶ Interview at Chinhoyi, August 2013.

¹⁷ We did not establish the criterion used to allocate land.

¹⁸ In Zimbabwe, the dam refers to both the dam itself and the waters behind the dam. In wider usage one could say lake or the waters behind the dam.

¹⁹ Interview at Middle Manyame Sub-catchment Council official, Chinhoyi, 28 February 2013.

Domestic water

Access to water for domestic water varies across different groups. The white farm-owners supplied their farm workers with drinking and domestic water from boreholes.²⁰ With the farm occupations and transfer of ownership to A1 farmers, boreholes that relied on electricity for pumping broke down or the electricity was cut off because new farmers could not afford to pay. In addition, the government did not support the new farmers to maintain water infrastructure. Water shortages therefore currently affect the majority of the resettled farmers, particularly A1 farmers. Some farmers have been able to install manual pump technology to replace the electric pumps.

Mining

The Middle Manyame Sub-Catchment includes small-scale and large-scale mines. There are large-scale mines of chrome, gold, and dolomite as well as numerous small-scale mines that are dotted across the sub-catchment. Some A1 farmers are complaining that they are no longer able to use water from Mukwadzi River (which is downstream of Mazvikadei Dam) because of cyanide contamination from Ayrshire mine's leaking slimes dam.²¹ This complaint was supported by the Councillor of the area who called for the Environmental Management Agency (GoZ 2002) to levy stiffer penalties on mining companies that pollute the environment. Asked to respond to these allegations, an Ayrshire mine official disputed the A1 farmers' claims and said they should instead thank the mining company for making water available during periods of scarcity when Ayrshire asks ZINWA to open the valves of Mazvikadei Dam for the downstream commitments.

Some A2 farmers have raised concern over the encroachment of small-scale miners known as *Korokozas* on to their farms. These miners leave open pits, trenches and shafts, which are a danger to livestock. To add to that, many small-scale miners pan in the watercourses especially along the Chitawe River. This leads to increasing rates of siltation in dams downstream and potential pollution by mercury. Kingston Dam, for example, is located downstream of panning at the confluence of Chitawe and Msengi rivers.

OPERATIONALISING THE USER PAYS PRINCIPLE²²

While the water reform was intended to emphasise the various elements of IWRM such as monitoring water use in line with allocations, we found in 2012 and 2013 in interviews with ZINWA and with the Chairperson of the MMSC that the focus was largely on increasing the amount of revenues from the sale and on payment for water. In one typical interview we asked an A2 farmer the following:

Q. Are you aware of Middle Manyame Sub-Catchment Council?

A. Yes we are aware of it.

Q. What is its role in water management?

²⁰ A1 farmers forced the farm workers out of their homes and then occupied them. The farm workers are now doing piece jobs for the A1 farmers in return for clothes, milk, soap and any other commodity that the A1 farmers have. It is through the establishment of this working relationship that former farm workers may be allowed to obtain water from the few boreholes together with A1 farmers (Rutsate et al., 2015).

²¹ A slimes dam or slimes is for storing the materials left over after separating gold from the ore.

²² In the National Water Policy there can and should be flexibility. The policy states: "Water pricing: To achieve efficiency, water prices will be based on the user pays and polluter pays principles and be socially acceptable to different interest groups in the water sector. Subsidies will be targeted to users who are not in a position to pay the full cost of the service provider or where national interests would be compromised". (GoZ, 2013: 20). As of October 2016, there are no provisions for supplying water to users who cannot pay the full cost although the cost of water has been reduced (see Manzungu and Derman, this Issue).

- A. I am not sure but I only see them when they come to drop their invoices.
- Q. Are you ever consulted on issues relating to water management or have you ever been invited to participate in water resources management meetings?
- A. We have never been consulted. Like I said the only time we hear about them is when they drop off their invoices.

Thus irrigation has become important in the sub-catchment, not just because it stabilises and increases crop yields, but because it generates revenues for ZINWA and MMSCC.²³ Payment for water is based on either a permit to abstract river water or groundwater, which is issued by the Catchment Council, or an agreement between the farmer and ZINWA for accessing water stored in government dams. As reported by Manzungu and Derman (in this Issue) agreement water (water from government dams) is much more expensive (up to 10 times) than water abstracted from rivers or underground.

To simplify their revenue collection the MMSCC based payment for water on the size of the land under cultivation and the crops being grown.²⁴ For wheat it was estimated that it required 7.5 ML/ha until it reaches maturity. For other crops a value of 7 ML/ha was used. The sub-catchment makes a site visit to one's farm to determine the type of crop under cultivation as well as the size of the land in question, before they can bill for water.

As highlighted below, the user pays principle has not been accepted by many water users, particularly farmers nor did they know much about the functions of catchment and sub-catchment councils (Kujinga and Jonker, 2006; Mtisi, 2002, 2008, 2011). The resistance to pay in combination with a failure to pay has resulted in the incapacitation of water management institutions, i.e. catchment and sub-catchment councils, and ZINWA. But farmers were not the only problem. As of August 2016, ZINWA was owed USD133 million by local authorities, irrigating farmers and government. As a consequence, ZINWA has had great difficulty in meeting its payroll.²⁵ The remaining white commercial farmers were at the forefront recording a 62% payment rate followed by A2 farmers with 26%. There was nothing significant from A1 farmers. A caveat is however, needed. Many A1 farmers do not irrigate using permit or agreement water. Most families have resorted to gardens where water is not charged and in terms of legal categories it is regarded as 'primary water' (water for domestic use, see Derman and Manzungu, this Issue).

Across the board, the amount of legal water requested for irrigation is low. The former Chair and the current Chair of the MMSCC, the Catchment Manager of the Manyame and current farmers all assert that much less water is being requested and being used for irrigation than in the past. Unlike Mazvikadei and Biri Dams, the waters from Kingston Dam are, in percentage terms, more heavily used because the water is cheaper.

In general there is a growing trend of farmers 'running away from agreement water' and preferring to pay for actual water use (flow water) because of the desire to access cheaper water (see also Manzungu and Derman, in this Issue). In some cases this means playing the system. Most of the farmers, particularly around Biri Dam are drawing water from Manyame River as opposed to drawing directly from the dam. Further, most interviewed farmers favour water from their farm dams which are

²³ When we began our research, a nationally known accountant was chairperson of the sub-catchment. He also owned a farm in the sub-catchment. He was replaced by a woman who worked in the Department of Agriculture and who had also received a farm in the sub-catchment.

²⁴ The capacity for determining actual water used has been lost with no monitoring of borehole use for irrigation and for lack of measurement of water pumped onto a farm.

²⁵ Zinwa chief executive officer Jeffer Sakupwanya told the Parliamentary Portfolio Committee on Lands that the water utility was facing financial problems, with its 2000 workforce being owed a total of USD11 million in salary arrears which accrued over the past seven months. The biggest debtors are local authorities owing USD36 million, irrigators USD37 million, other small farmers owing USD5 million and the government owing the rest (Newsday June 22, 2016).

ungazetted hence only attract a water levy (US\$1.06/ML) and the sub-catchment rate (USD1/ML) annually. This is different from drawing water directly from the Biri Dam where a farmer will, in addition to the aforementioned charges, also incur agreement water charge of USD12.68 (plus VAT)/ML/year. The large town of Chinhoyi, including a district hospital and university, rely on water from the Manyame River. Rather than drawing its water from behind the dam, Chinhoyi Municipality obtains it from the river below. This way the town is charged for flow water as opposed to agreement water.²⁶ In order to make the waters available at the lower rates, ZINWA opens the dams' valves for Chinoyi.

The same applies for most A2 farmers and white commercial farmers who opt to draw water from Manyame River directly rather than from Biri Dam so as to be charged for flow water and not agreement water charge. In 2014 Chinhoyi Municipality's water abstraction per day was about 20 ML which translates to 600 ML of water per month and about 7200 ML per year. The Municipality is supposed to be paying for water at the municipal rate of USD11.71 per ML per year plus a water levy of USD1.06 per ML plus the sub-catchment rate of USD1 per ML. The total if this occurred would be USD111,790 per year. Instead, the Municipality is only paying the water levy (USD1.06 per ML) plus the sub-catchment rate (USD1 per ML) equalling USD2.06 per ML. This means that for the whole year, Chinhoyi Municipality is only paying USD2.06 multiplied by 7200 ML which equates to about USD14,832.

As the owner of Zimbabwe's dams larger than 5000 ML, ZINWA is mandated by law to inspect and maintain them. They are currently facing financial and human resource challenges to effectively exercise their mandate. In the MMSC we observed the deterioration of the Biri Dam as well the malfunctioning of one of the dam valves as a result of lack of maintenance. In a visit to the dam wall we found leaking valves, a leaking maintenance boat, the absence of a rope to climb to the water level of the control tower, lack of documentation of water quality and, in general, lack of support of the two ZINWA employees who are tasked with dam maintenance as well as with collecting levies on behalf of ZINWA.

The story is the same around the Mazvikadei Dam. Five of 18 farmers interviewed prefer to irrigate from their private boreholes as opposed to drawing more expensive water from the dam. In general, farmers do not pay for borehole water. The unregulated drilling and use of borehole water throughout Zimbabwe has undermined user pays and principle and the notion of the indivisibility of water.

Most farmers are aware there is legislation that compels them to pay for commercial use of water but above half (53%) of the A1 farmers interviewed are not prepared to pay for water even if they irrigate, contending that water is a free God-given resource and nobody should force people to pay. One farmer remarked "ZINWA has not put any cents on this dam, so why should it force people to pay".²⁷ But, some 20% of the A1 farmers professed ignorance about the Water Act and its provisions. They expressed surprise when informed that any commercial usage of water must be done through a water permit.

The unwillingness or inability to pay was also evident among A2 farmers. Some 57% of the 18 A2 farmers interviewed are irrigating. However, of them 74% are not keen on paying for water. While other A2 farmers are willing to pay, they cannot afford to because of the delay by Grain Marketing Board (GMB) to pay them for the produce delivered. This is further exacerbated by massive electricity load-shedding which has affected most farmers who rely on electric pump yields. Some farmers claim that electricity is now too expensive and hence it becomes uneconomic to irrigate. Some black commercial farmers who were part of the consortium of about 70 large-scale commercial farmers that built the Biri Dam, refuse to pay saying they built the Biri Dam and hence cannot pay for water from the

²⁶ Even so, Chinhoyi Municipality has difficulty in paying ZINWA.

²⁷ Interview conducted by Takunda Hove, July 17, 2012.

said dam. One black commercial farmer had this to say, "the government gave us permission to build this dam and we have got the papers to confirm that".²⁸

One of the reasons cited is the laxity in enforcement of the Water Act. Farmers will only pay when their lack of payment attracts the attention of ZINWA. The laxity of legal enforcement was confirmed by ZINWA who cited lack of resources to properly monitor water usage and curb illegal abstractions. Some A2 farmers said they cannot pay for water to irrigate yet the land they are irrigating was given to them by the government for free. These sentiments were also echoed by Derman and Manzungu (in this Issue) and Mtisi (2011) when they reported that farmers are refusing to pay for water arguing that they got land for free from the government. The same gesture should be extended to water access. In addition, most respondents claim that the most politically well-connected A2 farmers were not paying and ZINWA personnel were often reluctant to even enter their farms.²⁹

DISCUSSION AND CONCLUSIONS

This study sought to understand if and how IWRM has been sustained in the context of an ever-evolving land reform programme, a struggling agriculture sector and poorly resourced institutions. The situation that we found in 2013 is vastly different from what existed in 2000 (see Derman and Manzungu, this Issue). In 2000, irrigation water was scarce at the height of the dry season. Winter wheat and many other crops were irrigated through an array of large dams, small farm dams, and boreholes. Primarily large-scale white commercial farmers who had invested heavily in irrigation controlled the waters. Farmers were paying for water at a nationwide set price and paying a small levy for the operation of a River Board. While there were issues with electricity supply in the 1990s, farmers were, in general, able to rely on electricity for their irrigation pumps whose supply was far more regular in the 1990s than after 2000. Water revenue flowed into state coffers until fast track land reform forced large-scale farmers off their farms.

The water reform envisaged commercial farmers remaining on their farms. However with fast track the envisaged water revenues for the sale of agricultural water dried up, which severely hindered the operations of ZINWA, catchment and sub-catchment councils (2000b) despite attempts by ZINWA and councils to mobilise financial resources.

While land reform has broadened people's access to agricultural resources, which could not be achieved under the neoliberal water reform (see Manzungu and Derman, in this Issue) the transition to a viable agriculture sector is proving challenging. In place of relatively large commercial farms there are now new A1 villages and smaller but commercial A2 farms (Matondi, 2012; Moyo, 2013). Many A1 and A2 farmers lack irrigation infrastructure some of which was vandalised during the fast track land reform, some of which was sold and others with poor crop pricing. As a result, water revenues declined. Many new farmers have resisted paying for water for reasons including: they cannot afford to pay, they are ignorant of the law or refuse. Some farmers express the opinion that since they got land from the government for free the same gesture should hold for water. Our findings are corroborated by Mtisi (2011) who found that land reform gave birth to new water users which posed challenges of how the available water resources could meet both the social and economic objectives of the reforms. There are also issues related to the land reform – insecure tenure has led to some farmers doubting whether they would remain on farms against the backdrop of land being vested in the state. Government could arbitrarily cancel the offered letter or the 99-year lease which reduced some investments (Matondi and Dekker, 2011). To date, the 99-year leases have not been accepted by financial institutions as guarantee

²⁸ Interview, Urundi Farm, 24 October 2012.

²⁹ For security of respondents, it is not possible to name them.

of loans which has meant lack of funding for investments. Without loans it is difficult for farmers, even with the best of intentions, to maintain their infrastructure.

There are also cultural issues at play. The user pays principle of commercial water is in conflict with the customary notion that water is a God-given resource that is available for all. Establishing a user-pays principle has gone against notions of fairness (Derman and Hellum, 2007; Hellum and Derman, 2005; Chikozho and Latham, 2005). In customary law, a distinction is made between drinking water where there is usually a norm of sharing and water for irrigation.³⁰ Water for irrigation has had to be paid for since the 1990s and only rarely does it involve customary sharing arrangements. An exception has been hand-dug wells for gardens in communal areas. In general, many A1 farmers come from communal areas where water has always been managed by local institutions under the legal notion of primary water but under the belief that water comes from God and that hence it is for free (Derman and Hellum, 2003).

It is not enough to observe that the two reforms undertaken by the government with a view to address inequalities in access to both land and water resources were incompatible and compromised the goals of both reforms. We instead need to ask why was this obvious connection between land and water reforms missed? We suggest that the answer may lie in the politics of water and land reform. Within the Government of Zimbabwe there have been two major constraints to supporting IWRM: the first has to do with government resources to respond to farmers' needs and requirements of water; the second is the lack of communication and policy coherence between the ministries of water and agriculture. When ZINWA was created large numbers of the Department of Water's personnel moved to the new institution. However, because of the loss of revenues and lack of state support, ZINWA struggled to maintain essential services. The Ministry of Agriculture, on the other hand, was driven politically to focus on nationalising all private farms, resettling them and providing for resettled farmers and not communal areas ones. IWRM, no longer donor-supported, was not among the priorities at any level of government or in ZINWA except for one dimension – water as an economic good. However, the better resourced Ministry of Agriculture did not provide sufficient resources for the maintenance and support of existing irrigation systems.

This study has shown that while water reform has potential to enhance access for small- and large-scale farmers and enhance livelihoods, it is difficult to realise such benefits if the reforms are not carried out in recognition of the redistribution of land which coincided with water reforms. The rural landscape has been dramatically altered through fast track and land reform. Rather than having a few large-scale commercial farms in the MMSCC there are now hundreds of new farmers, and many new A2 farmers. The water management system was designed for large-scale, not smaller-scale and small-scale farmers and thus it requires significant new resources to alter previous irrigation systems. ZINWA and the catchment councils have been unsuccessful in convincing resettled farmers (Models A1 and A2) what services they will receive if they pay for water. Water users do not value the role of the catchments and sub-catchment councils who from the current perspective are rent-seeking organizations. The national government provides little support to ZINWA while owing it large amounts of money. Donors have re-entered as described by Manzungu and Derman, this Issue but with an emphasis upon urban water supply, infrastructure and sanitation increasing ZINWA's reliance upon 'selling' water. Most users at this point in time seek to pay as little as possible and preferably nothing. Only councils that have substantial amounts of permitted water will be able to sustain themselves.

In July 2016 the government has launched a new program called Command Agriculture. The USD500 million Command Agriculture Programme launched by Vice President Mnangagwa aims to have farmers produce two million tonnes of maize on 400, 000 ha of land. Government's decision to embark on the

³⁰ Rutsate et al. (2015) have found that this does not ordinarily extend to farm workers and former farm workers on resettled farms.

programme was necessitated by the rise in national food insecurity from about 12% in 2011 to 42% this year. Zimbabwe, like several other SADC countries, had to rely on imports to supplement its meagre grain harvest this season. The Zimbabwe Vulnerability Assessment Report said four million people need food aid this year because of an El-Niño-induced drought.³¹ This marks the importance of irrigation but how the water will be provided and who will pay for it remains unknown.

However, the program has been centrally decided in the absence of sufficient resources. It has bypassed catchment and sub-catchment councils. As emphasized by Manzungu and Derman's article, this Issue, we find little reason to be optimistic about a broad and holistic conception of IWRM in Zimbabwe. There is now a 15 year history of radical land reform's failure to create a holistic program. The water sector has become donor reliant and contemporary priorities have changed. Given the lack of economic support for the Ministry of Environment, Water and Climate, and the severe economic difficulties of ZINWA, water resources management has a low priority. It is hard to envision ZINWA or the Ministry re-investing in IWRM because it does not promise quick monetary returns from the sale of water. There was no strategy or policy guidance on how the transformation of agriculture in the Middle Manyame Sub-catchment would support IWRM to improve the efficiency, equity and environment. In the current economic and political climate of Zimbabwe the resumption of IWRM seems highly unlikely.

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³¹ www.thezimbabwedaily.com/top-stories/64179-500m-maize-scheme-on-cards.html (accessed September 1, 2016). It has also been reported in *The Herald*, the government's national newspaper in a series of articles. For example, www.herald.co.zw/command-agric-nets-300-000ha/ (accessed September 7, 2016).

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