Water and Livelihoods: The Case of Tsovani Irrigation Scheme in Sangwe, Southeastern Zimbabwe

Solomon Mombeshora

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Sustainable Livelihoods in Southern Africa: Institutions, Governance and Policy Processes

Through work in southern Africa this research programme has explored the challenges of institutional, organisational and policy reform around land, water and wild resources. The case study sites have been in Zambezia Province, Mozambique, the Eastern Cape Wild Coast in South Africa and the lowveld area of southeastern Zimbabwe. Three broad themes have been explored:

- How do poor people gain access to and control over land, water and wild resources and through what institutional mechanisms?
- How do emerging institutional arrangements in the context of decentralisation affect poor people's access to land, water and wild resources? What institutional overlaps, complementarities and conflicts enable or limit access? What new governance arrangements are required to encourage a livelihoods approach?
- How do the livelihood concerns and contexts of poor people get represented in policy processes concerning land, water and wild resources in local, national and international arenas? What are the challenges for participation in the policy process?

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Summary

In 1996, the parastatal authority ARDA handed over the Tsovani irrigation scheme to 'community' management. This paper examines how this has worked and for whom. Following an overview of irrigation management policy shifts over time in Zimbabwe, the paper turns to an examination of the scheme. The paper identifies three different groups of irrigators. Only the relatively well off, with access to alternative cash incomes and good social and political networks are able to become commercial irrigators, as the infrastructure - and particularly pump fuel - costs are prohibitively high and rising. The others are able to either do small amounts of irrigation or use their plots for dryland agriculture. In 2000 a group of war veterans 'invaded' the scheme, claiming plots on underutilised areas. These however have not been used for irrigation since, as the land claimants had insufficient resources to pay for the water. The paper concludes with a discussion of appropriate irrigation policies, and the dilemmas faced in turning a dryland farming area to productive, irrigated agriculture.

Introduction*

Irrigation water is a key asset in drylands and it has vast potential for improving the livelihoods of rural farmers. This paper presents a case study of Tsovani irrigation scheme in Sangwe communal area in Chiredzi District. It looks at the transfer of a state asset to the community irrigation management committee. The Tsovani case provides evidence of unequal access to water, incomes, and social and political networks. The paper therefore argues that differential access to water and other household assets by plot holders in the scheme is contributing to the emergence of three main social groups – 'gold-class', middle and poor irrigators. The paper analyses the networks used by these three groups in accessing water, as well as wider economic and political institutions, and how this reinforces social differentiation in Tsovani. These processes run against the idea that the transfer of a state asset such as the Tsovani irrigation scheme benefits all the people concerned. The paper concludes with a discussion of policy dilemmas faced in turning a dryland farming area to productive, irrigated agriculture.

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Background

Tsovani Irrigation Scheme in Sangwe Communal Area is located in the northeastern corner of Chiredzi District in Masvingo Province. It is about 52 kilometres (km) from Chiredzi town. The scheme is on the west bank of Save River and is about 5 km upstream of the Jack Quinton Bridge. Save River forms the boundary between Chiredzi District on the western side and Chipinge District on the eastern side. Access to the irrigation scheme is by a narrow gravel road off the tarmac road linking Chiredzi and Chipinge towns (see Map 1, next page)

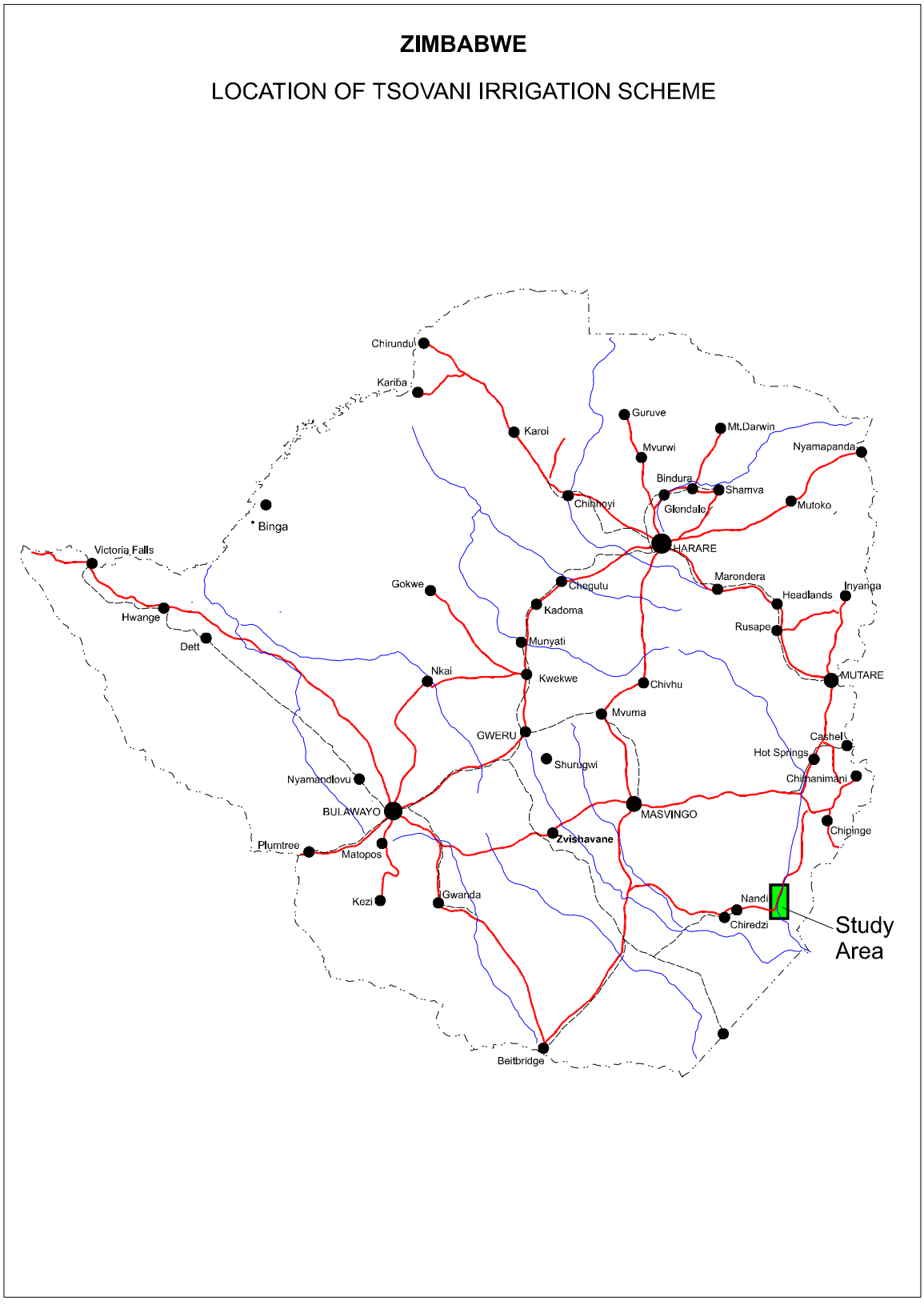
Tsovani Irrigation Scheme is in Natural Region V of the southeast lowveld. The lowveld is less than 900 metres above sea level and is characterised by erratic rainfall patterns that are usually below 650 millimetres per annum. Government and local people saw the provision of irrigation as a way of improving livelihoods from growing wheat, cotton, and other crops. However, the transfer and operation of the scheme seem to benefit some irrigators more than others.

In 1982/83, government ordered Chief Tsovani and some of his people living in the area demarcated for the irrigation project to move to the newly established Chizvirizvi resettlement area. Village 8 in Chizvirizvi was set aside for Chief Tsovani and his people. The resettlement area is about 20 km from Tsovani Irrigation Scheme and borders on Sangwe Communal Land (see Map 2, p. 4). In all, three villages had to move. Some of the villagers refused to move to Chizvirizvi and were resettled in neighbouring villages. Other villagers who worked for a core-estate at ARDA Chisumbanje were allocated irrigation plots in the new irrigation scheme.

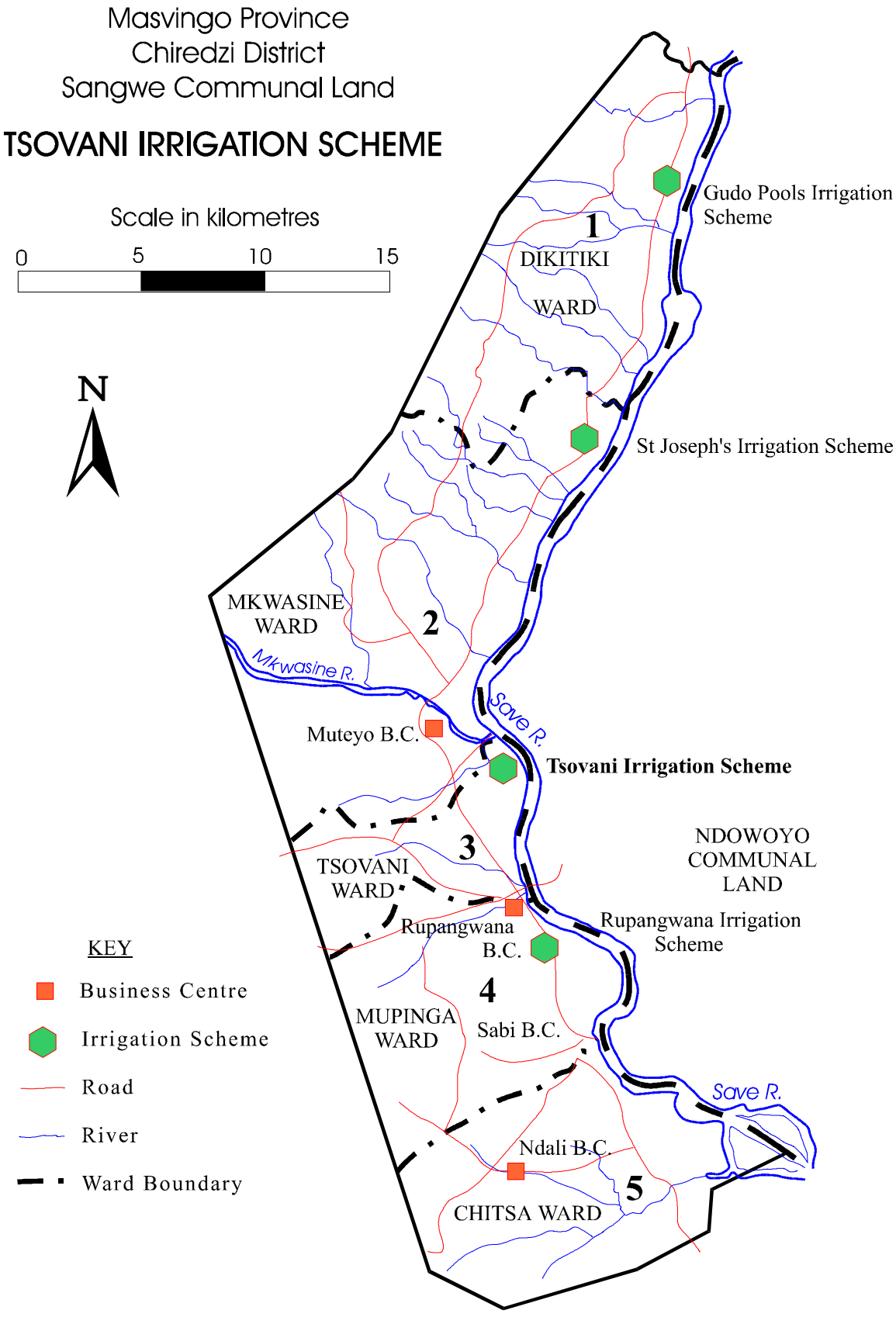
Tsovani Irrigation scheme became operational in 1984. It was established as a settler outgrower scheme by a core-estate management team of a parastatal – Agricultural Rural Development Authority (ARDA) – at Chisumbanje. ARDA Chisumbanje is across the eastern side of Save River. ARDA has other settler schemes in the Save Valley. Tsovani scheme had 358 hectares of flood-irrigated land. It has two compound areas where farmers stay but there is no provision for gardening (see Map 3, page 5). Farmers have to leave a portion of their irrigable land for growing vegetables, tomatoes, beans, carrots, etc. Usually there are about 4-10 lines per farmer for gardening and the water is drawn from the canals in the scheme.

Water is pumped into the storage dams. At the time of fieldwork, two dams were functioning. This is because the scheme is trying to reduce electricity costs payable to the Zimbabwe Electricity Supply Authority (ZESA). Water is drawn from Save by the riverside engine and pumped into the first dam. From there another engine pumps the water to the second storage dam that is upfield (see Map 3). From that dam, water is released into canals, with fields that are close to the storage dam receiving water first.

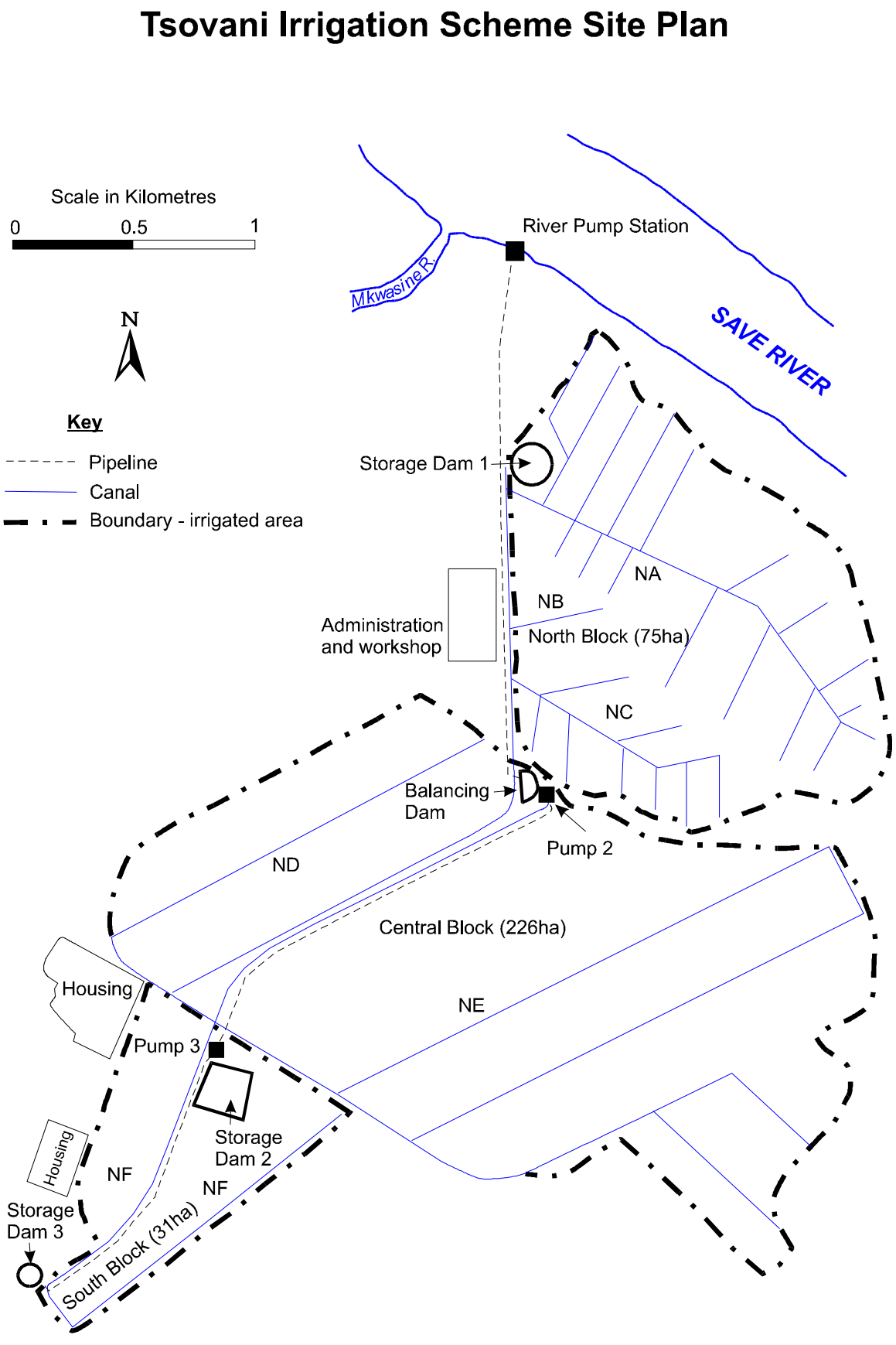
Map 1: Location of Tsovani Irrigation Scheme in Zimbabwe



Map 2: Sangwe Communal Land Wards



Map 3: Tsovani Irrigation Scheme



At inception, potential irrigators were selected from Sangwe communal land and neighbouring districts. They submitted application forms to the Ministry of Agriculture through the Chiredzi District Administrator's office. The applicants were called for interviews at the District Administrator's office. Among other things, the interviews ascertained the applicants' history, criminal record if any, assets, household composition and size, farming status, knowledge of crops and chemicals, and whether they were willing to leave their original homes and settle in the irrigation scheme.

Smallholder irrigation policies and institutions: a review

The establishment of the Tsovani irrigation scheme can best be understood within the context of the evolution of smallholder irrigation during and after the colonial period. This section reviews the key policies, their impacts and the institutions involved in promoting smallholder irrigation in the communal areas of Zimbabwe.

Table 1: Policies and institutions during the colonial period

Period	Policy and Impact	Institutions Involved
1912 -27	***Policy*** • Incorporation of white settler irrigation methods into indigenous agriculture.[1] ***Impact*** • Missionaries encouraged peasant farmers in Manicaland Province to dig irrigation furrows and provided wheat seed and sweet potato vines. • Peasants averted famine in 1912. • Peasants retained control over the construction and maintenance of their schemes.	Mutambara Mission, Manicaland Province
1928-32	***Policy*** • Aiding existing projects where local farmers had a significant measure of control. • Farmers developed small irrigation plots of 1-hectare or less but continued to practice rain fed farming. Government did not interfere with the farmers use of irrigated land. • The main justification for this was government's aid for famine relief • The Land Apportionment Act (1930) was passed which divided the country into white and black areas. ***Impact*** • The Land Apportionment Act's (1930) full impact was yet to be felt.	Section of Native Agriculture, Ministry of African Affairs, Parliament of Southern Rhodesia

[1] The Manyika people are said to have practised furrow, 'informal' irrigation or *dambo* cultivation before the coming of Europeans (see Manzungu and van der Zaag 1996: 4). With the passing of the Water Act of 1927, they lost the right to abstract water from major rivers for purposes of irrigation.

1933-44	***Policy*** • Takeover of Mutambara and other irrigation schemes by government and introduction of restrictive regulations. Regulations included: i) charging of water rent of 5 shillings in 1932 and 10 shillings in 1942 ii) rain fed cultivation by irrigators was prohibited iii) government agriculturalists introduced compulsory crop rotations. • Government justified increased control using the narrative that they were committing more funds and resources into constructing irrigation schemes. ***Impact*** • Increased restrictive government measures and lack of consultation resulted in declining cooperation by local farmers.	Department of Native Agriculture established in 1944 in the Ministry of African Affairs
1945-63	***Policy*** • Land Apportionment Act of 1930 amended in 1950 to force black farmers to move from areas designated as 'white' to 'black reserves'. • New irrigation projects were conceived and established as a way of absorbing the displaced and expanding black population. • An Irrigation Policy Committee was set up in 1960 to examine the strategy of using irrigation as a means of settling black farmers. ***Impact*** • Popularity of irrigation farming fell and government found it difficult to get volunteers to farm in new schemes. • This resulted in under-utilization of irrigation schemes. • The Irrigation Policy Committee's deliberations resulted in the halting of the construction of new projects for the period 1960-68.	Internal Affairs Administration, Department of Native Agriculture, Ministry of African Affairs, Irrigation Policy Committee, Department of Native Agriculture
1964-68	***Policy*** • The UDI government, with its policy of 'separate development' for whites and blacks, set up a parastatal, the Tribal Trustlands Development Corporation (TILCOR) to design and develop growth points in communal areas based on irrigation. These would entail a heavily mechanised 'core estate' that would provide services to settlers. • The existence of a core estate and settlers would justify further investment into other commercial and industrial ventures. This would provide employment and stem urban drift. • The main objective continued to be to resettle black farmers thrown off land taken by whites. The other objectives were that irrigators were to repay maintenance and capital costs. • The Department of Conservation and Extension (CONEX) continued to provide extension and management to existing irrigation schemes. ***Impact*** • TILCOR had limited impact in communal areas because of authoritarian methods of policy implementation and a shoestring budget.	TILCOR, CONEX, Ministry of Agriculture
1969-80	***Policy*** • Focus on state security under UDI and the intensification of the liberation struggle led to the transfer of the management of irrigation schemes from the Ministry of Agriculture to that of Internal Affairs. • Extension continued to be provided by CONEX. • Transfer of irrigation schemes, in 1978, to the Department of Agricultural Development (DEVAG). ***Impact*** • Increased policing and law enforcement under the Ministry of Internal Affairs led to more resentment of government by local farmers.	District Commissioners, Ministry of Internal Affairs, CONEX, Ministry of Agriculture, DEVAG, Ministry of Lands, Resettlement and Natural Resources.

Sources: Rukuni (1984: 224-26; 1986: 2-4); Manzungu (1996: 5, 21); DERUDE (1983: 1-2).

The above review demonstrates changing policies and their implementation under varying institutional arrangements. Farmers initially enjoyed a measure of autonomy from government, but, as government invested more resources, its control over farmer-initiated irrigation schemes increased. Government required irrigators to give up dry land farming and concentrate on their irrigated plots; produce surplus food and cash crops for the market; practise prescribed crop rotations; and plant on specific dates and pay water rates (Manzungu and van der Zaag 1996: 5). As farmers lost their autonomy, alienation set in and this became a defining feature of relations between local farmers and government officials.

The constant relocation of institutions responsible for the management and provision of extension services between various ministries of government does not seem to have contributed to the efficient discharge of duties by the officials concerned (Rukuni 1986). Furthermore, the placement of managerial responsibilities over irrigation schemes in the hands of authoritarian District Administrators engendered resentment of government by irrigators. Writing in relation to Nyamaropa irrigation scheme in Manicaland Province, Magadlela (1999: 63) points out that managers of European descent and African demonstrators, who were coming and going, did teach local farmers how to farm, but some of the farmers said that their management was sometimes too harsh in the sense that one mistake, such as planting earlier or later than the set date, could cost someone his or her plot.

In terms of livelihoods, colonial policies seem to have initially been driven by the need to enhance food security and famine relief in the communal areas. However, as government implemented the discriminatory policy of land apportionment, another objective was added, namely that of absorbing people displaced by forced evictions. This made government controlled irrigation schemes less and less attractive to local farmers. Moreover, forced evictions created a seedbed for the emergence of African nationalism that culminated in the liberation struggle and independence in 1980.

Post-Independence Period

As the Table 2 below illustrates, smallholder irrigation in the post-Independence period has been characterised by change with continuity in the spheres of policy, institutions and their impacts on livelihoods.

The most significant change after independence was the establishment of irrigation management committees in smallholder irrigation schemes in communal areas. These are decentralised institutions of governance notionally dealing with water and cropping, but in practice they touch on a whole range of other issues such as land renting, dispute settlement, and the operation and maintenance of irrigation equipment.

The original Tsovani scheme provides an example of a state-centric public good approach to local development. The farmers were, at least at the beginning, treated as 'beneficiaries' and not 'owners' of the irrigation project. At inception, the Tsovani irrigation scheme was run by a state parastatal, ARDA, which later handed over the scheme to members of the scheme represented by their management committee.

The settlers were required to undergo a six-month training programme. They entered into a lease agreement with ARDA Chisumbanje. The lease listed conditions that the settlers had to meet, and the rights of ARDA. The leases were of indefinite duration, but could be terminated by ARDA if there was an infringement. There were no provisions for dispute resolution. The leases prohibited settlers from sub-letting their plots, engaging in any other occupation or employment during the currency of the lease, and using their plots as collateral for loans. However, the settlers were reported to enjoy secure land tenure (ARDA 1996). This was because the ARDA management applied the lease conditions with some measure of flexibility.

A section manager who reported to the Estate Manager at Chisumbanje ran the Tsovani scheme. He had a total labour force of 21 permanent workers and additional labour was recruited as casual workers for such operations as weeding and cotton picking (ARDA 1996: 5). The section manager and his team provided tillage, maintained canals, repaired water engines, farm machinery and equipment, administered the schemes finances and provided security from thieves. Crop raiding animals, such hippopotamuses, were shot dead before they could cause extensive damage to crops. The settler farmers only paid rental fees for plots and accommodation, and hiring rates for tillage.

Settlers were accommodated in standard two-room houses irrespective of family size. The houses are set on small stands in rows that offer little privacy to the settlers. The houses remain state property and settlers are not permitted to make any alterations or additions to them. Although there are a few irrigators who live on site in the scheme's compounds, many irrigators have retained their communal homes in Sangwe and use the scheme for farming purposes only. The better off farmers built their own houses at Tsovani growth point.

Five years after the implementation of the economic reform programme (ERP) in 1991, ARDA Chisumbanje pulled out of Tsovani irrigation scheme, and an irrigation management committee was formed to run the scheme. Among other things, the ERP prescribed that the state should reduce its presence in the management of the economy and focus on creating conditions that are conducive to 'free' enterprise. One significant result of this was the privatisation of state assets such as marketing boards. The Cotton Marketing Board, for example, became the Cotton

Table 2: Policies and institutions after independence

Period	Policy and Impact	Institutions Involved	Roles
1981- 85	***Policy***		
	• Rationalization of extension services and expansion to cater for more irrigators and dry land farmers	• Merger of CONEX and DEVAG in 1981 to form the Department of Agricultural, Technical and Extension Services (AGRITEX), Ministry of Agriculture	• Extension services
	• Establishment of a department responsible for maintaining existing and establishing new schemes.	• Department for Rural Development (DERUDE) Ministry of Lands, Resettlement and Rural Development and a host of other line ministries	• Management of existing and establishment of new schemes
	• Establishment of farmers' irrigation management committees (IMCs) countrywide. IMCs are responsible for discipline of irrigators, assisting irrigation officers to select new farmers, acting as liaison between farmers and government officials and mobilizing farmers in self-help projects.	• DERUDE, district councils and IMCs	
	• Availing of financial credit to smallholder irrigators and dry land communal farmers	• Agricultural Finance Corporation Provision of credit to smallholder irrigators and dry land communal farmers (AFC), now called Agribank, Ministry of Agriculture	
	• Rationalization of large-scale commercial white settler and out-grower irrigation	• ARDA, Ministry of Agriculture. Establishing large core estates (state farms) with smaller out-grower settler sections. The ARDA management team farms core estates.	
	Impact		
	• Merger of TILCOR with the Save Limpopo Authority to form the Agricultural and Rural Development Authority (ARDA).	• ARDA management teams. A section manager, who is a member of the ARDA management team, was responsible for managing smallholder settlers.	
	• A number of core estates in the Save Valley and in other parts of the country were established.		
	• This resulted in the establishment and commissioning of ARDA Tsovani Irrigation Scheme in 1984	• Section management team that belonged to ARDA Chisumbanje. The core estate, represented by a section management team, provided land preparation, water supplies, credit, extension and other services to the settlers	.

1986-90	***Policy*** • Reduction of irrigation subsidies by government • Greater farmer participation in the design, financing and management of schemes ***Impact*** • Consolidation of irrigation management committees • Debates on role of government in the economy took center stage and this touched on its subsidies to various sectors of the economy including the smallholder irrigation sector.	• Department of Water Development, Ministry of Rural Resources and Water Development • AGRITEX, Ministry of Agriculture & District Councils, Ministry of Local Government	• Recalculating subsidy rates for small-holder irrigation scheme
1991-2000	***Policy*** • Adoption of the Economic Structural Adjustment Programme (ESAP) and removal of subsidies on agricultural inputs including water. • Passing of the Water Act of 1998 • Reduction of the state's presence in ARDA's smallholder settler schemes. Withdrawal of ARDA's role as provider of land preparation, credit, management and extension services at Tsovani Irrigation Scheme. ***Impact*** • ESAP resulted in increases in prices of farm inputs, electricity charges for pumping water at irrigation schemes. • Setting up of the Irrigation management committee at Tsovani • Replacement of water rights with permits	• Ministry of Agriculture • Zimbabwe National Water Authority, Catchment Councils and sub-catchment councils. • ARDA and the establishment of an irrigation management committee at Tsovani Irrigation Scheme.	• Implementing agriculture-related ESAP provisions • Integrated management of water
2000-02	***Policy*** • Adoption and implementation of a fast track land resettlement policy which resulted in the subdivision of large-scale commercial farms. Issues of access to domestic and irrigation water not clearly spelt out in the policy. ***Impact*** • Land reform programme coincided with droughts resulting in increased livelihoods insecurity in Sangwe, as elsewhere in the country.	• Ministry of Agriculture, Lands and Rural Resettlement and the entire government bureaucracy.	

Sources: Rukuni (1986); Magadlela (1999); DERUDE (1983).

Company of Zimbabwe. In agriculture, the management of government-owned irrigation schemes such as that of Tsovani was transferred to committees set up for that purpose. This transfer was sometimes done in a hurry without considering the negative impacts of such transfers. These include, among others, limited capacity by local farmers to inherit expensive farming machinery like combine harvesters and the possible exclusion of poorer irrigating farmers from the newly created institutions – the irrigation management committees – by relatively wealthier and influential farmers. This is the theme to which the paper now turns.

The Tsovani irrigation management committee

This section presents the organisational structure and dynamics surrounding the irrigation management committee's role in mediating access to water. It focuses on the challenges that the committee has faced and the strategies it has used in facing these.

At the time of fieldwork, the IMC comprised seven members: six males and one female. Three of the seven members are some of the most successful and influential farmers in the irrigation scheme. The rest of the leadership is drawn from the middle group of farmers. Relatively poor irrigators participate in local management by electing leaders to the management committee and attending general meetings.

The Tsovani Irrigation Management Committee (IMC) gives expression to the inclusion of some irrigators in the management of the scheme. Although the committee does not have executive power (this remains the prerogative of the Ministry of Agriculture), it plays a crucial role in mediating access to irrigable land and water.

Withdrawal of ARDA Chisumbanje

Land allocation in Tsovani scheme changed slightly when ARDA Chisumbanje pulled out of the scheme in 1996. With the help of the Tsovani IMC, farmers were given additional one hectare plots to make them three hectares per farmer instead of the two hectares they were farming between 1984 and 1995. This was after the farmers lodged a complaint with ARDA that the two hectares per farmer were inadequate.

The transfer of the scheme to the Tsovani IMC generated new challenges. When ARDA Chisumbanje pulled out, the management committee faced problems of maintaining the equipment it took over from the core estate. Irrigators' contributions could not meet the costs of repair. Tractors, combine harvesters, ridgers, and other equipment left by ARDA started to deteriorate. Some parts were stolen and this resulted in tractors having frequent breakdowns that the committee could not cope with. Many irrigators had not bothered to buy tractors, ploughs, and cattle because they thought that ARDA Chisumbanje would continue to provide these. It was then that the most successful farmers, who include

some of the committee members, bought tractors individually. These tractors are hired out for a fee to irrigators and other farmers in Sangwe communal area.

Changes in membership

Nonetheless, a significant number of irrigators started reducing their presence in the scheme. They became dormant members who rented out their plots to other irrigators. The sudden rise in the cost of electricity put the poor irrigator farmers on the margins. For example, at the time of fieldwork, there were 83 registered irrigators but only 53 farmers were actually irrigating in the scheme. This problem resulted in many farmers renting out land that is nearer to the storage dam in the northern part of the scheme. The soils in that part of the scheme are more fertile as compared to the southern portion.

There were other reasons for the decline in membership. Some farmers continued to have two homes – one in the scheme and another in the communal area. Some of these farmers found it difficult to manage two homes at the same time and decided to concentrate on communal agriculture. However, they rented out their plots. Other households face severe labour bottlenecks. Most farmers use household labour but when children become adults, they migrate to urban centres. Other children marry and settle elsewhere. Parents in the scheme find it difficult to replace this labour and therefore reduce the sizes of plots they cultivate in the scheme. These elderly people do not take an active part in the management of the scheme. There were a few cases of farmers who squandered their income drinking beer. They therefore would fail to find money to buy inputs and would let their plots lie fallow. Other reasons for the decline in membership arose from natural causes. During the period 1984-2002, about 17 plot holders passed away.

The committee realised that many people were 'leaving' the scheme and that this would put a heavy burden on the few remaining members. The management committee resolved to allow plot holders to rent out land to other irrigators and to outsiders who were able to pay pool money for each hectare cultivated. The money helped the committee to meet its electricity bills and to repair water engines. During 2001/02, irrigators rented scheme land to an Agribank official, the wife of the district agricultural extension officer, and eleven teachers from neighbouring schools. Each of these individuals was renting an average of three hectares.

During the year 2001, some war veterans occupied a fallow portion of the scheme that ARDA Chisumbanje left when it withdrew in 1996. They attempted to gain access to water without paying pool money. The management committee insisted that it could not register the war veterans because it did not know whether the Ministry of Lands, Agriculture and Rural Resettlement sanctioned their actions. War veterans who failed to pay pool money rented out their plots at the rate

of 3,000 Zimbabwean dollars (Z$) per hectare per year. The farmers who rented these plots did not clear their fields of crop residues and canals were reported to be in a poor state of repair. During the 2001/02 season, there were 13 war veterans who had paid pool money and cultivated an average of 3.8 hectares of cotton per person. In all they cultivated 50 of the 203 hectares under command. The conflicts between the management and the war veterans culminated in the ouster of the existing management committee.

During the period June-July 2002, war veterans reorganised the management of the scheme by taking over key positions in the IMC. Irrigators are now required to cultivate three hectares only. The extent to which this 'equalisation' measure will succeed remains to be seen.

Inheritance

The committee has also been flexible over the inheritance of plots in the scheme by heirs of deceased plot holders. It leaves decisions over inheritance to the families of the deceased. As pointed out above, the scheme has in recent years lost 17 original plot holders. Surviving spouses inherited 7 of these whose sons inherited 6 of these. Two of these plots were lying idle because the families of the deceased had not resolved the inheritance issue. There was also a case of a younger male sibling who inherited his brother's plot. In another instance there was an unresolved and ongoing wrangle between mother and son over the inheritance of a three-hectare plot.

Electricity bills

The management committee occasionally disconnects electricity when they suspected that electricity bills are going beyond expected targets. They then convene meetings informing farmers to make contributions to pay for the excess. According to the chairman of the management committee, Clever Masekesa,

> *the best time to force people to pay up their subscriptions is when crops are almost ripe but also showing signs of wilting. That is when members pay up without any problems. Another tactic is to disconnect water at that time and this forces farmers to pay.*

Contributions also depend on the size of the plots cultivated field and normally these contributions are charged per hectare. Those with many hectares also pay more. Electricity contributions have on average increased sharply in recent years. As the figures below show, standard contributions towards electricity have increased sharply in real terms.

Table 3: Electricity costs

Year	Contribution per hectare
1990/91*	Z$38.59
1993/94*	Z$60.61
2001/02**	Z$5,800.00[3]

Sources: *ARDA (1996: 24); **Field Notes, February 2002.

The sharp increase in electricity charges is largely a result of the inflationary pressures in the country and the Zimbabwe Electricity Supply Authority has increased its tariffs to keep up with these pressures. Tariff rises have an immediate impact on irrigators and make irrigation an unaffordable livelihood option for the poor in the Tsovani scheme.

Conflicts and conflict management

Conflicts sometimes arise over access to water. Access to water is dependent on payment of pool money and the guiding principle is that if a farmer does not pay he consequently does not have access to water. However, those who fail to pay pool money sometimes damage canals so that water can flow directly into their fields. In other instances they irrigate their fields at night using water left over in canals during the day. The management committee strongly discourages such practices but does not have the power to deny the offenders the right to continue cultivating their fields. The offenders are pressured into repairing the damaged canals.

Some irrigators draw more water than others from the canals by using more siphons than is permitted. Each canal has the capacity of 40 siphons. Each farmer should have 8 siphons to use to draw water from the canal. Someone can decide to have more than 8 siphons and this means that other irrigators might end up having to use less water to irrigate their crops. This causes resentment and the management committee keeps a check on this practice by physically surveying irrigators' water use.

Maintenance

Earth canals need constant maintenance and repairs. If this is not done, water is lost through seepage and it takes time to reach irrigators downstream. In addition, portions of the canals that lie along fields that are not in use still have to be maintained. The management committee applied a measure of pragmatism when dealing with such problems. The committee encouraged downstream irrigators affected by such problems to try and keep the canals in a good state of repair. Self-interest in such cases motivates irrigators to repair canals. This enables them to continue to have reasonable access to water.

[3] The exchange rate in 1991 was US$1.00 = Z$5.00. The rate depreciated to US$1.00 = Z$ 9,80 in 1996. The current official rate of exchange is US$1.00 = Z$55.00, but with a strong parallel market.

Domestic versus irrigation water

The management committee together with most farmers resolved that priority would be given to paying for power for pumping irrigation water from Save river rather than the pumping of drinking water from the scheme's two boreholes. Irrigators who are resident on the scheme have to look elsewhere for drinking water. However, some draw water from canals and Save River for domestic purposes. Others fetch water from distant communal boreholes in neighbouring villages.

Relations with wider political and market institutions

The irrigation management committee's flexibility is also reflected in its relations with wider political and economic institutions. Politically, the chairman of the committee manages the interface between the scheme and ward as well as Chiredzi district officials. Some of the councillors are themselves members of the irrigation scheme. A notable case is that of the councillor for Ward 5 whose wife has a plot in the scheme. The chairman also works closely with AGRITEX officials at the district level.[4] The wife of the district AGRITEX officer rents a three-hectare plot in the Tsovani scheme.

Economically, the scheme's relationship with market institutions has interesting permutations to it. Whilst irrigators would like to secure credit for buying farm inputs, the rates of interest charged by financial institutions such as Agribank are prohibitively high. Irrigation committee members raised concern about this issue and hoped that the reduction in interest on loans would go a long way to help farmers capitalise their operations and apply the required farm inputs in their enterprises. Whereas the period 1984-1990 was characterised by the presence of government marketing institutions such as the Grain Marketing Board, Cotton Marketing Board and ARDA Chisumbanje, the period 1991-2002 has seen the increasing presence of privately owned companies that transact with farmers at the scheme. These new market players are mostly involved in the purchase of cotton produce from irrigators and other dry land farmers in Sangwe. Such companies include Cottpro, Cargill, Tarafern, and Cottco. The Grain Marketing Board continues to buy wheat from irrigators; it also buys maize from them and other communal farmers. These private companies have depots in Chiredzi and neighbouring Chipinge district where irrigators in Tsovani scheme can sell their produce.

The operation of these companies in the area signals the incorporation of irrigation farming into broader circuits of capitalist production and the market. The irrigation management committee members, along with other irrigators, are themselves active participants in the process. However, the relations of local irrigators with market institutions have sometimes been problematic.

[4] AGRITEX is now known as Agricultural Extension (AREX).

The high interest rates charged on loans contribute to defaulting. This has resulted in farmers evading the cotton companies. Farmers with loans may even lie by understating their cotton yields. During the harvesting period some farmers hide away from creditors. The other problem is that some farmers spend their money lavishly on beer and forget to pay back debts. During the next season the farmers would be in trouble. They end up with more debts. This has resulted in many farmers being blacklisted by the companies. Others have had their property repossessed or auctioned by creditors and this negatively affects their livelihood options.

Differential access to water and other resources

The irrigators in Tsovani scheme have differential access to key assets such as water, political influence, and money. In practice, these factors are closely intertwined, reinforce each other, and are contributing to the emergence of three groups of farmers: 4 successful 'gold-class' irrigators (7% of the 58 irrigators interviewed), and 24 (41%) middle and 30 (52%) poor irrigators.[5] The irrigators are distinguished on the basis of a wide range of factors: degrees of capitalisation; land use and work ethic; yields, income and access to credit; access to labour; and politico-economic influence.

Capitalisation

The four gold-class irrigators (7% of the 58 irrigators) have the most capitalised farming operations in Tsovani. They own tractors, tractor-trailers, ridgers, discs, and have ox-drawn ploughs. In addition, they have tractor drawn mist-blow sprayers (see Table 4 below). They ordinarily have more hand hoes, wheelbarrows and knapsacks for spraying cotton. In addition to ploughing, gold-class farmers use their tractors to transport inputs from shops to their plots and to take bales of cotton to the market. They also hire out their tractors to middle and poor farmers. Middle irrigators have ox-drawn ploughs, scotch carts, knapsacks. They face transport problems and rely on hiring the tractors of gold-class farmers. The farm equipment of poor irrigators ranges from hand hoes, wheelbarrows and knapsacks. They are dependent on the gold and middle-class irrigators for tilling their plots within the irrigation scheme (see Table 4 below).

Land use

The most successful irrigators farm between 10 and 15 hectares. They mainly grow cotton and maize. They prefer growing cotton because it yields the highest income. Maize is grown because it helps these farmers to have staple food and some of the maize is used to pay in kind hired

[5] Financial institutions in the country categorise account holders on the basis of income earned. Agribank introduced the term 'gold class' to depict account holders who attain a certain threshold of earnings and savings. The term 'gold class' includes but is not necessarily restricted to these farmers. It includes other well-to-do account holders.

labourers. Gold-class farmers consider it a disgrace for a farmer to have to buy grain for family consumption. Officially, each irrigator is supposed to farm three-hectare plots in Tsovani, but in practice gold-class farmers cultivate larger pieces of land than this. They rent land from other plot owners who are not able to make full use of their land. Because they are land hungry farmers, they do not rent out any of their land. Gold-class farmers also have a strong work ethic. They attribute their success to hard work and sheer determination and farming is their main source of livelihood.

The areas farmed by middle irrigators in Tsovani ranged from six to nine hectares. They grow cotton, maize, wheat, and vegetables. Most farmers in this group practise dryland or rain-fed agriculture in their communal areas of origin.

Poor irrigators in Tsovani scheme cultivate between one and three hectares of land. They face a variety of constraints that limit the size of land they farm. They also grow maize and cotton and other subsistence-oriented crops on their plots. Some of them practise rain-fed agriculture in the irrigation scheme because they cannot afford to pay electricity charges.

Yields, income, and creditworthiness

Gold-class farmers harvest between 70 and 100 bales of cotton. As a result, they enjoy higher incomes that range between Z$400,000 and Z$750,000 per year. They are creditworthy farmers who are able to access loans from the Cotton Company of Zimbabwe (Cottco). They have growers' accounts with the company that allow them to secure inputs such as seeds and chemicals on credit. Moreover, they can access these loans as individuals and not as groups.

Middle-group irrigators harvest between 10 and 69 bales of cotton. Their incomes ranged from Z$100,000 to Z$399,000 per year. They can only borrow money from Agribank as groups and not as individuals. These groups are often debt ridden. They fail to repay loans from Cottco and Agribank. It is therefore difficult for them to access loans from these financial institutions. They face financial constraints that make it difficult to increase their production and break into the gold class category.

Poor irrigators harvest 1 to 9 bales of cotton and earn between Z$8,000 and Z$99,000 per year.[4] Some of these poor irrigators are war veterans and former employees of ARDA who were retrenched during the 1990s. Other poor farmers in Tsovani are widows who lost their husbands in the late 1980s. Some of their children died of AIDS and they are taking care of AIDS orphans and grandchildren. They ordinarily do not qualify for loans from financial institutions and rely on borrowing money from

[4] The Poverty Datum Line is about Z$108,000.00 per year. The PDL has increased sharply due to rising inflation levels in the country. The rate of inflation is currently over 150% per year.

other farmers in order to buy inputs. They mostly earn additional money by selling their labour to middle- and gold-class irrigators. Some women brew beer for sale, others make clay pots for the local market.

Access to labour

The most successful irrigators draw their labour from poor irrigators and villagers from the surrounding communal area. They pay these labourers in kind using grain and 'free' tillage of fields using tractors. Maize is usually used as a form of payment during critical periods in the farming season, such as during weeding and picking cotton. In much the same way as gold-class irrigators, some middle farmers also hire labour from poor farmers. However, this group mostly relies on household labor their farming operations. They also hire school pupils to pick cotton. Poor farmers depend on their own labour for farming and supplement their meagre incomes by working for others. Most of them spend wintertime looking after the wheat fields of middle irrigators, chasing away quelea birds, often working from four o'clock in the morning to seven o'clock at night. They sometimes also do part-time work in the communal areas and in commercial farms and plantations in Chiredzi. They also help to mould bricks in the communal area.

Politico-economic influence

Gold-class irrigators use their influence to gain both access to water and wider politico-economic institutions. They often rent plots from other farmers that are close to the upper storage dam and this gives them first access to water. Another critical factor is that gold-class irrigators wield a lot of influence in the irrigation management committee.

The gold-class irrigators significantly influence the decisions taken by the management committee. Three of the four gold-class farmers are in the elected management committee. They often discuss informally crucial issues and make decisions that they then impose on the rest of the management committee. Other irrigators see them as running the scheme to suit their interests.

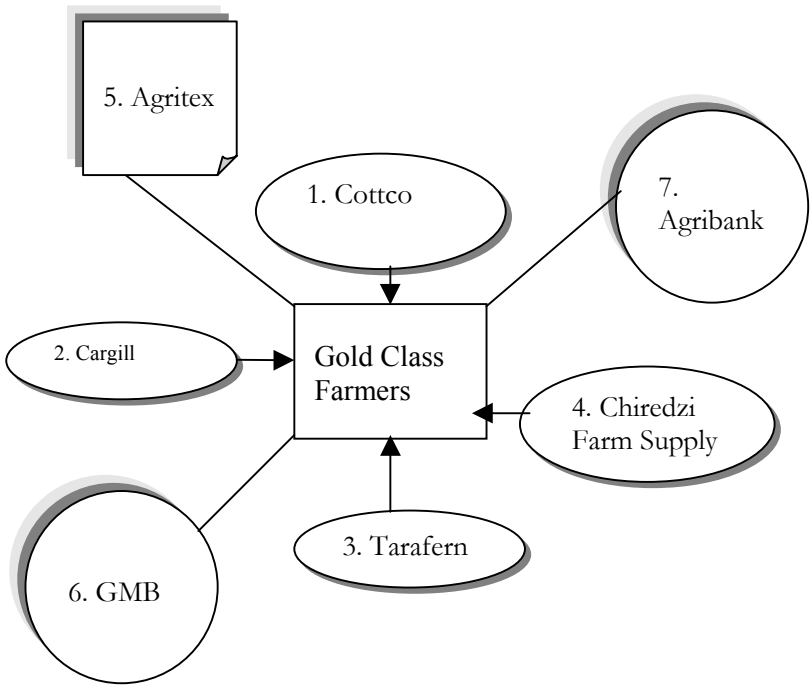
They determine when to collect and pay 'pool' money that is used to pay power bills to the Zimbabwe Electricity Supply Authority (ZESA) and have the water engines switched on. As we have seen above, they farm between 10 and 15 hectares. Most of this land is rented from other plot holders, but these gold-class farmers pay pool money to the coffers of the scheme for the rented land. This greatly helps to beef up the resources of the irrigation scheme and enables it to meet ever-increasing electricity bills. If a gold-class farmer has 15 hectares of land under irrigation, this means that the farmer has to pay pool money for the 3-hectare plots of five irrigating households. The contributions of the other irrigators are usually not enough to meet the water bills, therefore gold-class farmers have a considerable say over decisions about the timing of payment to the power utility. Other farmers wait until the gold-class irrigators have made their financial contributions to the common fund.

Gold-class farmers take a keen interest in making sure that water runs in the canals and into their fields. There are instances when some of the gold-class irrigators close the canals with sand bags so that pools of water are created in the canals and this enables their siphons to draw much more water. In sum, this group of farmers utilises a lot of water in the scheme.

As already pointed out, gold-class farmers gain first access to water because they often use their financial power to rent plots that are near the upper storage dam. The engineman shuts down his engines at about two o'clock in the afternoon. The farmers in these up fields would have finished irrigating their plots. Downwards, farmers have to wait until water is not flowing in the canals and that means they work longer hours than those nearer the storage dams. Gold-class irrigators are able to work shorter hours because water is released early in the morning and by midday they have finished irrigating their plots. The farmers at the lower end of the scheme receive water last and this is often a source of bitter complaints by those affected. These farmers work longer hours because they receive water later during the day.

Gold-class farmers have greater access to wider institutions and this helps to reinforce their positions within the Tsovani irrigation scheme. These institutions include those in the public and private spheres. Public institutions include AREX, Agribank and the GMB and private institutions include Cottco, Cargill, Agricom, Chiredzi Farm Supplies, and Tarafern. Diagram 1 below summarises the networks that gold-class irrigators have with these wider politico-economic institutions.

Diagram 1: Networks of gold-class farmers



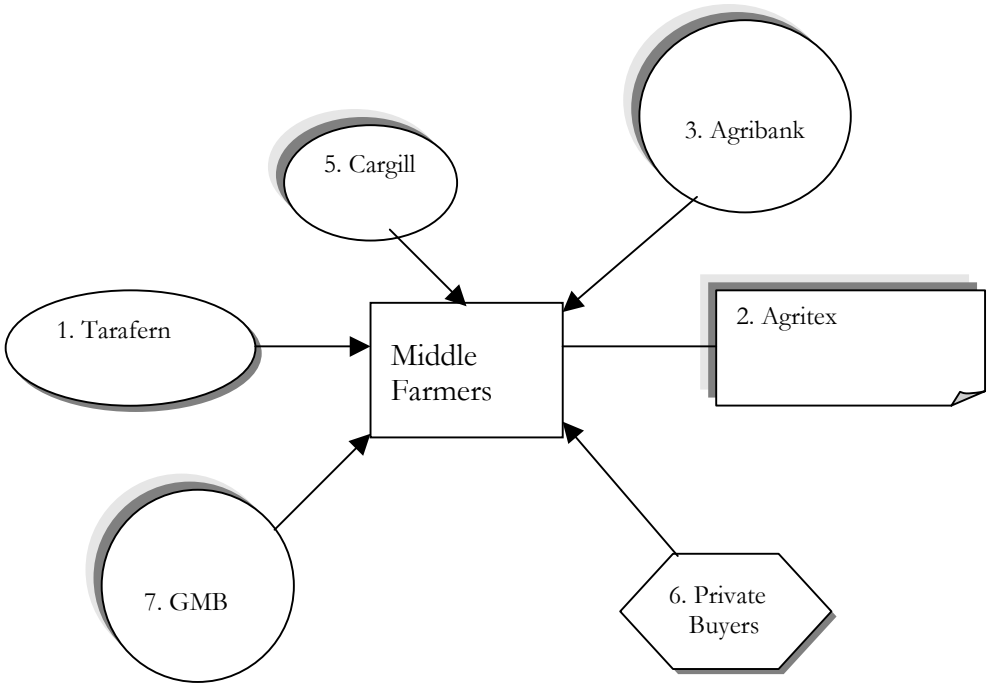
The Cotton Company of Zimbabwe (Cottco), formerly the Cotton Marketing Board, provides seeds and inputs on credit to qualified farmers. Farmers are required to sell their cotton and other produce to this company. The company in turn operates a stop-order system to recover its money. The gold-class farmers in Tsovani have ready access to these facilities. Cargill started operating in the area in 1998. Gold-class farmers sell some of their 'excess' cotton to this company but first preference is given to Cottco. Cargill does not provide credit to farmers but offers more competitive prices. Tarafern is a new company that buys cotton from farmers in Tsovani and Sangwe generally. Gold-class farmers have the option of selling their cotton to this company as well. These farmers buy some of their chemical and seed inputs from Chiredzi Farm Supplies in Chiredzi town.

The public institutions that gold-class farmers make use of are AGRITEX, the GMB, and Agribank. AGRITEX provides extension services to irrigators of all shades and to communal farmers but the gold-class irrigators make the most use of extension officials. These officials have a tendency of spending more time with farmers whom they regard as exemplary and progressive. Gold-class farmers sometimes sell their maize produce to the GMB. Finally, Agribank used to provide seasonal short-term loans to this group of irrigation farmers but the sudden increase in interest rates on loans has made this institution less attractive to them.

Middle-group irrigators are also members of the irrigation management committee, although their influence is less pronounced. In terms of alliances, some members of this group align themselves with the gold-class and others with the poor. This is dependent on the situation and issues at stake. For example, in matters of access to water, the middle group complains together with the poor that gold-class farmers use a lot of water and that they have privileged access to it. Middle-group farmers, however, align with the gold-class when attempting to access tractors for tillage and transport, and when making contributions to pool money that enables ZESA to switch on the electricity that powers water engines. These alliances are significant because their own contributions are not enough to meet the electricity bills. They have difficulty raising pool money, and their alliances with the gold-class are significant as a result of this feeling of relative deprivation. ZESA sometimes switches off power at times when farmers are in acute need of water for their crops. It is in times such as these that alliances with gold-class farmers are really crucial because they have an immediate impact on yields and livelihoods.

The vast majority of middle farmers are depended on the management committee for decisions concerning water allocation and payment of pool money. At some of the meetings we attended, middle-group irrigators accused management of neglecting their interest over water and they would accuse management of bias towards gold-class farmers.

Diagram 2: Institutions associated with middle-class group

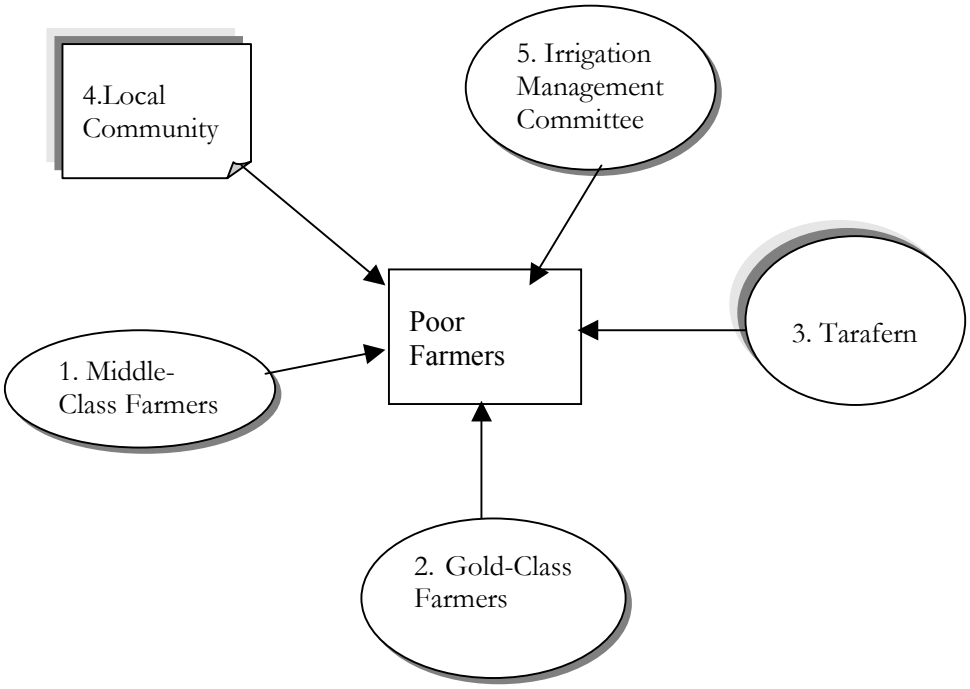


Middle-group farmers have relatively limited access to wider politico-economic institutions. Some cannot borrow money because of poor repayment records. They therefore utilise new cotton buying companies such as Tarafern, Cargill, and Agricom to sell their produce. These new companies do not provide loans and middle-group farmers find it difficult to raise money for farm inputs. This group of irrigators also sells wheat and maize to the GMB. AGRITEX officials give farming advice to this group of farmers, but the management committee also helps in this regard.

The association of poor irrigators to wider institutions is summarised in Diagram 3 (next page). Poor farmers have patron-client relations with the gold- and middle-groups of farmer. This helps them to gain access to tractors and oxen for tillage and transport services. Their relations with the management committee tend to be full of suspicion. They blame management for their plight, mainly because management insists that those who do not pay pool money cannot access water.

As a result of transport problems and the need for cash, poor irrigators sell their produce to middle-income and gold-class farmers. They occasionally sell cotton to Tarafern, which pays for the cotton there and then, although its prices tend to be lower than those of Cottco and Cargill.

Diagram 3: Institutions associated with poor farmers



Poor irrigators are mostly of Karanga and Ndebele origin and they live in the compounds in the irrigation scheme. They have fewer networks with locals and this makes it difficult for them to be assisted by locals. Furthermore, they have no communal land fields. Because they cannot afford to pay for electricity and water, they practise rain fed agriculture in the irrigation scheme.

The poor farmers therefore have very limited access to irrigation water. Some fail to maintain canals because of old age. They also face problems of accessing water for drinking. Some end up drinking water from canals. They occasionally break canals at night in order to divert water to their fields, especially when rains are late.

The following table presents individual case study evidence concerning some of the central features of these three groups of irrigators in Tsovani. It presents the household characteristics, living conditions, household assets, sources of income, and access to political office of a gold-class, middle, and poor farmer. These three irrigators – Habari, Ijumaa, and Rehema[6] – help to throw more light on the typical features analysed in the preceding sections.

[6] These are pseudonyms.

Table 4: Comparative cases of irrigators, 2000/01

	Gold-Class Irrigator *Habari*	**Middle Irrigator** *Ijumaa*	**Poor Irrigator** *Rehema*
Household's Social Characteristics	Habari, age 48, is Ndau and lives in Tsovani village in Ward 3. He is originally from neighbouring Chipinge district. He is married to one wife and has four daughters (age 6-18 years) and lives with two female nephews (16 and 20 years old). His wife and himself did four years of secondary education. Two of his daughters are in secondary school; one is in primary school and the youngest one has yet to start school.	Ijumaa, age 53, is Shangaan and lives in Masekesa village in Ward 3. He is married to two wives. He has three daughters (age 17-19 years) and four sons (age 2-13 years). His wife and himself have primary education. Two of his daughters are in secondary school and one has primary education. Two sons are in primary school and the other two are of pre-school age.	Rehema, age 62, lives in Compound 1 of the irrigation scheme. She is Ndebele and is a widow. She has four daughters, aged 16-28 years. Two of her daughters are divorcees. She lives with her three granddaughters (ages 3, 4 and 10 years). Her son died of AIDS in 2001. She did primary school and her eldest daughter is training as a teacher at Gwanda Zintec College in Matabeleland South Province. Her eldest grandchild is in primary school.
Living Conditions			
Sources of drinking water in summer and winter	The main source of drinking water is Save River. It takes members of his household 10 minutes to get to and from the river. Habari complained that the river is silted, water is in short supply during winter and that it has an awkward taste.	The main water source is a privately owned borehole at the homestead. It takes members of the household about 10 minutes to fetch the water. Ijumaa reported that the Environmental Health Technician commended the borehole as clean and very well maintained. He maintains it himself. He however pointed out that government should sink more boreholes for the area.	The main source of drinking water is a community borehole that is one kilometre away. The water was said to be salty. Rehema indicated that the borehole is very well maintained. It is fenced to protect it from animals. Like Ijumaa, she noted the need for more boreholes. She also pointed out that the government should subsidise electricity in the irrigation scheme so that irrigators who live on site can afford to pump domestic water from the scheme's derelict boreholes.
Main House	Habari has a four-bedroom house with a cement floor and brick under roof of corrugated iron sheets.	Ijumaa has a four-bedroom house with a cement floor and brick under an asbestos roof.	Rehema has a three-room house at the scheme's compound. It has a cement floor and brick under corrugated iron sheets.

Household Assets			
Landholding(s)			
i) Homestead plot	Habari's one-acre homestead plot is in communal land allocated to him by the village head.	Ijumaae has a three-acre plot allocated to him by the village head.	Rehema's homestead in the compound is less than one acre.
ii) Arable dryland blocks	He inherited six acres from his father in Tsovani village.	Ijumaa relies solely on irrigable land. He has no arable blocks of communal land in Sangwe.	She has no land in the communal area.
iii) Irrigated blocks	He cultivates three hectares.	He has three hectares of irrigable land in the scheme.	She has three hectares of irrigable land.
iv) Kitchen or market garden	Uses a few lines in the irrigable blocks to grow vegetables.	Cultivates vegetables on small portions of the irrigable blocks.	She grows vegetables on portions of the irrigable land.
Renting of Land			
i) To others	Habari did not rent out any land because the land that he has is inadequate.	Ijumaa said that the land that he has is not enough.	She did not rent out any land.
ii) From others	He rented three hectares of communal dry land from a neighbour. He paid cash for the rented land, i.e. Z$3,000.	He rented land from other plot holders in the irrigation scheme who were not able to use their land.	She cannot afford to rent land from others.
Farm Implements			
i) Ploughs	0	2	0
ii) Hoes	15	6	7
iii) Wheel barrows	2	2	2
iv) Knapsacks for spraying cotton	2	3	2
v) Scotch carts	0	1	0
Farm Machinery			
i) Tractor	1	0	0
ii) Rider	1	0	0
iii) Disc Plough	1	0	0

Source of Income			
Farm Income	Habari sold his cotton produce to Cotton Company of Zimbabwe (Cottco) and Tarafern. He received the following income: Cottco = Z$500,000 Tarafern = Z$250,000	Ijumaa sold cotton to Cargill and received Z$171,000.	Rehema sold her cotton produce to Cottco and received Z$32,000.
Other sources of income	His other sources of income include selling livestock; hiring out his tractor to transport bales of cotton for other farmers.	His household's other sources of income are selling livestock, ploughing other people's fields, brewing beer and remittances from his son who is in South Africa.	She earns additional income by doing part-time work for other irrigators such as weeding, harvesting etc. She occasionally brews beer and makes clay pots for sale.

These three cases illustrate that differential access to water and other household assets by plot holders in the Tsovani scheme is contributing to the emergence of rich, middle and poor irrigators. The case of Habari demonstrates that background factors such as his secondary education helped him to gain more access to key resources. These resources include land in and outside the scheme, and farming machinery and equipment. This differential access to resources also shapes the livelihood outcomes of the irrigators. Habari has diverse sources of income. In addition to farming, he also sold livestock, and hired out his tractor. Among the 58 irrigators interviewed, Habari reported the highest income from cotton sales. More money enables him to rent plots from other irrigators who are not able to make use of their land because they cannot pay pool money and buy the required farm inputs. He was clearly ahead of the pack in terms of household material assets, but the only noticeable constraint he mentioned was access to water for domestic use.

The case of Ijumaa seems to show the limitations imposed by marrying two wives and the focus on one source of livelihood, namely farming the three-hectare plot and rented land. Ijumaa is able to realise a significant income from his cotton produce that enables him to send his children to school. However, if his income is divided between his two wives, it seems to be closer to that of Rehema rather than that of Habari.

Social factors such as old age, widowhood, the divorce of her daughters and the death of her only son seem to be constraining Rehema in her irrigation farming in Tsovani. Rehema faces limitations in her attempts to diversify her livelihood sources because the activities she engages in do not attract much reward. In addition, she has the responsibility of looking

after her grandchildren and to help her daughter who is training as a teacher at Gwanda Zintec College.

In Tsovani irrigation scheme, access to water critically hinges on the ability of a potential farmer to pay a joining fee of Z$12,000. After this, farmers have to pay pool money that varies according to the levels of consumption of electricity at the scheme. It therefore seems that access to financial assets plays a key part in the scheme. Farmers who are able to raise pool money are at a distinct advantage. However, it is the strategies used by various farmers to productively combine key productive resources that seem to explain the emergence of the three types of farmers in Tsovani, namely gold-class, middle, and poor irrigators.

Conclusion

The Tsovani irrigation scheme appears to show potential for more economic autonomy and less reliance on the state. But in practice, the inheritance of such an asset by the community has proven to be a mixed blessing. High costs – notably of pump electricity and maintenance – have resulted in the poorer farmers failing to fully utilise their irrigable pieces of land. Poor irrigators have not been able to cope with increases in contributions to pool money required to pay electricity bills. In addition, they are not able to secure loans from financial institutions because they are considered as high risk. Even if they were able to secure loans, the interest rates on such loans remain prohibitive. In practice, therefore, very few farmers are able to benefit, resulting in unanticipated forms of social differentiation.

A recent attempt at redistributing irrigated land and water access by war veterans has resulted in shifts in political control in the scheme, but not necessarily economic benefits. New scheme members, without the necessary capital and assets, find themselves in the same position as existing poorer scheme members, unable to reap the benefits of irrigation infrastructure.

This suggests the need to rethink irrigation support in dryland areas, and the design of schemes that may benefit a wider range of especially marginalised people. With water as key an asset as land in the lowveld, the current redistribution policies of government need to take this into account.

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