

SHARING THE WATER: INSTITUTIONAL AND ORGANISATIONAL ARRANGEMENTS AT DZINDI IRRIGATION SCHEME IN SOUTH AFRICA

S.S. Letsoalo and W. van Averbake¹

Correspondence author: S.S. Letsoalo, Centre for Organic and Smallholder Agriculture (COSA), Department of Agricultural Management, Tshwane University of Technology, Private Bag X680, Pretoria 0001

Keywords: Sharing water; Institutional/Organisational arrangements; Irrigations scheme.

ABSTRACT

The paper investigates institutions and organisations dealing with the sharing of water at Dzindi, a smallholder irrigation scheme in Limpopo Province where water supply is inadequate for full irrigation. Since its establishment, Dzindi has lived through several important political changes, which were accompanied by a gradual withdrawal of state authority. This has provided the community of plot holders at Dzindi with opportunities to internally modify the content and enforcement of existing water-sharing rules. The paper documents the institutional and organisational changes that have occurred in the sharing of water among farmers and explores related perceptions among the different actors.

1. INTRODUCTION

Institutions, meaning the rules and their enforcement arrangements (Swift and Hamilton, 2001:85; Hubbard, 1997:240 & Eicher, 1999:3), and organisations, referring to the structures people create to define, revise, and enforce rules (Gabriel, 1999:82), are two important factors in the management of shared resources, which in the past have often been ignored in smallholder irrigation (Bembridge, 1997:31). Historically, institutions and organisations governing African smallholder irrigation projects in South Africa were externally created and imposed, because

¹ Centre for Organic and Smallholder Agriculture (COSA): Department of Agricultural Management, Tshwane University of Technology, Private Bag X680, PRETORIA, 0001 SOUTH AFRICA, Tel. No. +27 12 318 5329, Fax No.+27 12 318 5869. E-mail: letsoaloss@tut.ac.za.

local pre-colonial communities did not practise irrigation (Bundy, 1988). The question arises to what extent farmers hang on to existing institutions and organisations when power over irrigation projects is transferred to them. It is this question that guided the present study, which was conducted at Dzindi Irrigation Scheme, hereafter referred to as Dzindi.

Dzindi is situated in the Venda region of Limpopo Province and was started in 1954. It occupies an irrigated area of 136 hectares, and consists of 106 plots of 1.28 hectares each. Most plots are sited on sloping land, and have been terraced. The water distribution system consists of a weir, which diverts part of the water flowing in Dzindi River into a concrete canal for distribution to the individual holdings. The water flows continuously through the canal, and all the water that is not used is returned to the river. Plot holders practise 'short furrow irrigation', a form of surface irrigation that is well suited to labour-intensive farming systems (De Lange, 1994:12).

The amount of water entering Dzindi is insufficient to allow for full irrigation (Cadet, Delcourt, Hoarau, Steinmetz, Ralivhesa, Letsoalo, & Van Averbake, 2003). From the start this necessitated arrangements to ensure sharing of water among farmers. The objectives of this paper were to document internal and external group dynamics influencing the behaviour of plot holders with regard to the sharing of water as indicated by changes in the historical and current institutional and organisational water-sharing arrangements, to determine the degree of compliance of participants with the water-sharing rules, and to explore related perceptions among the different actors.

2. METHODOLOGY

Information on the history of the water-sharing institutions and organisations was obtained in two ways. The first involved the construction of a time-line (Matata, Anandajayasekeram, Kiriro, Wandera & Dixon, 2001:82), in which a collective of 83 farmers engaged in the participatory reconstruction of the history of the scheme. The second involved individual interviews with five elderly members of the scheme, who were present when Dzindi was established. The current situation was documented using different sources of information. These included written records held by the Scheme Management Committee

(SMC), observations of what the various actors involved in the sharing of water did, and interviews with different actors. Among the people that were interviewed were 16 plot holders, three members of the SMC, the local agricultural extension officer, and the two water bailiffs.

Data collection strived towards capturing the full diversity of views and practices, and was sustained until all ambiguities had been clarified, and no additional information was forthcoming. Depending on circumstances, the interviews were recorded on audiotape, written down in shorthand, or put to memory, depending on the sensitivity of the occasion. In all cases, transcription occurred as soon as possible after the interview was held. Trained, Venda-speaking research assistants interpreted and translated the interviews from Venda to English.

3. RESULTS AND DISCUSSION

3.1 Historical institutional and organisational water-sharing arrangements

At establishment of Dzindi, the state, personified by a white extension officer, presented farmers with a set of rules pertaining to the drawing of water from the distribution system. The rules were communicated verbally to the farmers. Written records of rules and regulations on water sharing dating back to that time could not be found. There is doubt that such records were ever held at the Scheme, because farmers, who were part of the SMC at establishment, claim never to have seen a copy.

The first water-sharing rule governed access to irrigation water. Dzindi was not designed to allow farmers to irrigate whenever and however much water they wanted. Instead, the design allowed for farmers to irrigate once a week over a period of half a day during daylight hours. Farmers were instructed to follow an irrigation timetable, which listed the 106 plot numbers and the time periods during which each plot holder could draw water to irrigate his or her plot. Farmers failing to make use of their allocation forsook irrigation for that particular week, or had to irrigate at night. Since water entered the distribution system around the clock, all who were prepared to work in the dark were free to use water as they wished.

The second rule controlled the flow of water in canals. At times, the flow reaching farmers' fields was insufficient to complete the irrigation of an entire plot. This applied particularly to conditions immediately after land preparation, when the infiltration rate of the soils peaks. Increasing the flow of water entering a distribution furrow can be achieved by obstructing the flow in the main canal just beyond the outlet to that furrow, for example by placing a large stone at the bottom of the canal. Obstructing the flow in this way raises the water level in the canal ahead of the obstruction, causing more water to enter the outlet. However, the rule stipulated that farmers were not allowed to manipulate the flow of water in the canals, because this reduced the amount of water being made available to farmers farther down the canal.

The third rule was aimed at keeping the water in the canals clean. It forbade farmers from washing their bodies or clothes in the canals, especially when that involved the use of soaps.

From the start, enforcing the water-sharing rules was left to farmers, who were assisted by two water-bailiffs. These were civil servants tasked with policing the use of water in the Scheme. They reported offenders to the SMC, the elected leadership of the plot holders organisation, not to the Extension Officer. When informed of an offence against the rules, the SMC imposed a monetary fine. The value of the fine for transgressing any of the three water-sharing rules was the same, namely 25 cents. This value remained unchanged until 1982. The money collected from fines remained available for use by the Dzindi farmer community. Its disbursement was controlled by the SMC, and it was primarily used to pay for maintenance of infrastructure at the scheme.

A farmer who was accused of an offence, but who failed to attend the appointed SMC hearing without an acceptable excuse, or who refused to pay the fine imposed on him or her, was invited twice more to a SMC meeting. In the absence of a suitable response, the accused was reported to the local headman, who, in turn, forwarded the matter to Chief Tshivhase, under whose jurisdiction the farmers of Dzindi fell. In all cases involving the breach of water-sharing rules brought before him the Chief enforced the decisions of SMC without any verification process. This indicates that the Chief accepted the legitimacy and powers of the SMC when it came to the sharing of water at Dzindi. Involvement of the Chief, however, caused the fine to be doubled. One half of the new

amount, equal to the original fine, was paid to the SMC, whilst the other half was paid over to the Chief as settlement of the case.

3.2 Current institutional and organisational water-sharing arrangements

During its fifty-year existence Dzindi, has been exposed to several important political changes. These include the transition from being a state-supervised project in a declared native area to being part of the nominally independent state of Venda in 1979 (Van Averbake, Letsoalo, Mohamed & Khosa, 2004:14-23), and the re-incorporation of Venda into South Africa in 1994, which brought with it a policy of irrigation management transfer (Perret, 2002). Yet, the institutions and organisations governing the sharing of water at Dzindi were never in any substantial way. All three rules that were introduced at establishment still apply. Enforcing the rules is still the task of two water-bailiffs and the SMC, and does not involve the Extension Officer. Even the role of Chief Tshivase has been retained.

As in the past, when it comes to offences involving the breaking of water-sharing rules, the Chief does not alter the decisions of the SMC, and when such cases do reach him, the fines are still doubled and distributed as before. Most farmers found guilty of offences against the water-sharing rules comply with the fines imposed by the SMC, and few have to be reported to the Chief. Farmers have long since realised that when it comes to sharing of water at Dzindi the Chief is little more than an extension of the SMC. Therefore, most prefer to accept SMC rulings. The SMC still receives, controls and disburses the money for fines.

3.3 Changes in institutional and organisational water-sharing arrangements

In 1982, the SMC decided to write down the water-sharing rules. This decision was made to provide transparency and consistency in application, and also to adapt the value of the penalties to the prevailing value of the Rand. In a mass meeting the rules were first recalled, then confirmed by all present, and finally written down. The mass meeting also decided on the new fines. The fine for obstructing a distribution canal was raised from 25 cents to R10 and that for obstructing the main canal from 25 cents to R25. According to the bailiffs and members of the

SMC, obstructing the flow in canals to raise the level of water is very common. One bailiff claimed that he observes at least one such offence every day of the week. However, the obstruction rule is no longer absolute. In at least one case a farmer has been granted permission to obstruct the distribution canal when it is his turn to irrigate. His field draws water directly from the main canal and at the inlet the water level in the canal is too low for water to enter his field.

The fine for washing body or clothes with soap in the canal was also increased to R25. This offence became a lot more common when parts of Dzindi that were not irrigable, were made available for settlement. Insufficient provision was made to supply the newcomers with water, causing them to rely heavily on the water in the canal for most purposes. Taking water from the canal is allowed, but some people do not bother scooping the water out of the canal to do their laundry. Instead they wash their clothes directly in the canal. The 1982 meeting of farmers did not reach an agreement on the value of the fine imposed on persons irrigating on days or times not allocated to them. The meeting awarded the SMC with discretionary powers to make a decision and insisted that SMC members should be punished more severely than ordinary farmers, because their behaviour was expected to be exemplary.

The records kept by the SMC indicate that the fines for irrigating on non-scheduled days range between R10 and R100. High fines usually applied to cases involving an SMC member. The highest fine on record, which amounted to R250, was imposed on an SMC member found guilty of irrigating on the wrong day. When water bailiffs observe an offence they no longer report it immediately to the SMC. Instead, they reprimand the offenders first, and only when offenders refuse to accept blame, fail to show remorse, or repeat the same offence in quick succession do the bailiffs bring the offenders before the SMC. Selected farmers have expanded their plots using land that was not scheduled for irrigation when the Scheme was established. Often this involved the irrigation of soils that are too shallow or land that is too steep. Usually, the SMC and the Extension Officer are aware of these extensions, and in some cases have approved them. The SMC's position is that the water-sharing rules stand. In other words, expanding one's plot does not give one the right to more water. It is up to the farmer concerned to decide on how to use the water available to him or her in the most efficient manner. Farmers are now allowed to exchange irrigation days or times. This has removed

some of the rigidity of the rule, but at times the relaxation is being abused. Reportedly, instances of farmers irrigating on a day not allocated to them without prior arrangement have increased in frequency.

3.4 Degree of compliance with water-sharing rules and related perceptions

Farmers commonly break the water-sharing rules at Dzindi, and the records of offences kept by the SMC show that some farmers break the rules more often than others. Van Averbake *et al.*, (2004:52-57) categorised farmers at Dzindi into three distinct groups. The first group was called "*vahilimi vhabinduli*", a Tshivenda term that refers to farmers who run their farming enterprises as a business and make profits from it. The second group was called "*vhalimi vha u difusha*". It consisted of plot holders who farmed primarily to feed their families. The third was called "*vhalimi vhatoli*". All plot holders in this group employed at least one full-time farm worker to farm on their behalf. Exactly half of the 62 offences brought before the SMC during the period 2000 to 2003 were committed by *vhalimi vhabinduli*, who, in 2002, constituted 29 % of the plot holders at Dzindi. Production of this particular group of farmers was characterised by a strong market-oriented focus. In 2002, 81 % of the value of their production was realised as sales, compared to a scheme average of 65 %. They were also more reliant on irrigated farming for income. On average, 54 % of their total household income in 2002 was derived from farming their plot, whilst the scheme average was only 31 %.

The relatively high frequency of breaking the water-sharing rules by members of this group is not surprising. Of all four-farmer groups they can least afford yield losses or failures due to water stress, and consequently they are prepared to pay the fines when caught. Interviews with four of the frequent offenders confirmed that this was indeed their stance on the matter. During face-to-face interviews a minority of farmers accused the SMC of inefficiency and favouritism for failing to deal appropriately with persistent offenders. They all referred to the case of a farmer who uses a pump to draw water from the canal to irrigate an expansion to his field. When he pumps, farmers lower down the canal no longer obtain enough water to irrigate their fields. The problem had been reported to the SMC but after more than a year the SMC had not yet made a ruling. When asked about it, SMC members indicated that discussions were ongoing, and that a ruling would be made soon. The

accused farmer justified his action by pointing out that the SMC had allocated land for expansion to him, and that this land was located above the canal, necessitating the use of a pump.

The majority of farmers that were consulted perceived the fines imposed on offenders as too low to act as an effective deterrent. SMC members and the extension officer also attributed the high frequency of transgressions to the fines not being sufficiently severe. A few farmers were of the opinion that fines imposed by the committee were at times inconsistent. However, the only case of apparent inconsistency that could be traced was that of a SMC member, who was caught twice irrigating his fields on wrong days. At first he was fined R250, the heaviest fine ever. When a few weeks later he was caught again committing the same offence, he was only fined R50, apparently because he showed remorse and begged for mercy.

4. IMPLICATIONS FOR SMALLHOLDER IRRIGATION POLICY AND EXTENSION

The findings of this case study show that imposition of institutional and organisational arrangements governing the sharing of water in African smallholder irrigation projects by an external authority is not inherently unsustainable. At Dzindi, a set of three simple water-sharing rules introduced by the state 50 years ago has survived, basically in unaltered form. Over time, farmers have acquired the necessary power and opportunity to change the arrangements, but so far they have not done so. This suggests that the original institutional and organisational arrangements have inherent strengths, which continue to appeal to participants.

One of the strengths is that the sharing rules are equitable. A second is that the rules make sense to participants. They have clear objectives, to which the farmer community subscribe. A third is that enforcement of the rules involves an organisational arrangement that does not threaten social coherence of the farming community at large. From the start, the task of policing the rules was given to water bailiffs, who are civil servants. Farmers consider them as outsiders, and therefore without obvious reason for partiality. Moreover, their cost is born by the state. Judgments of offenders, decisions on punishment, and use of income

derived from fines, are all left in the hands of the farmer community, represented by an elected Scheme Management Committee.

The SMC represents the moral authority of Dzindi, a position well suited to make judgement and impose penalties. Excluding the Extension Officer from the water-sharing institutions and organisations has avoided confusion about the function of that office at the Scheme. In other situations in the past, adding a policing role to the conventional advisory role of extension, for example in programmes of herd reduction and livestock dipping (Brown, 1969:85) compromised relationships between extension staff and their clients. The findings of this study indicate that in situations where water supply is limited, there are serious constraints to the commercialisation trajectory supported by the current government (Department of Agriculture, 2001:3).

At Dzindi, it was the group of market-oriented farmers who breached the water-sharing rules most often. Supporting commercialisation among irrigation farmers on projects such as Dzindi, without attending to limitations in the supply of water, is likely to lead to an increase in conflicts over water. When one of the resources is common property, such as water at Dzindi, commercialisation may lead to attempts by commercial producers to individualise the resource (Cousins, 1995:6). As a result conflicts among farmers may arise, and these may lead to irreparable schisms within the community concerned. Experience elsewhere has shown that social conflict may lead to the collapse of smallholder irrigation projects.

REFERENCES

BEMBRIDGE, T.J., 1997. Small-scale farmer irrigation in South Africa: implications for extension. *South African Journal of Agricultural Extension*, 26:71-81.

BROWN, D.L., 1969. *A study of animal and crop production systems and potential of the Bantu Ciskeian territories*. D.Sc. Agric thesis. Bloemfontein: University of the Orange Free State.

CADET, Y., DELCOURT, K., HOARAU, L., STEINMETZ, N., RALIVHESA, E. K., LETSOALO, S. S., & VAN AVERBEKE, W., 2003. Losses in the distribution system of Dzindi Irrigation Scheme. *Poster*

presented at 36th Annual Conference of South African Society for Agricultural Extension (SASAE). Klein Kariba, Bela-Bela.

COUSINS, B., 1995. *A role for common property institutions in land redistribution programmes in South Africa*. IIED Gatekeeper Series No. 53. London: IIED.

DE LANGE, M., 1994. *Small scale irrigation in South Africa*. WRC Report No.: 578/1/94. Pretoria: Water Research Commission

DEPARTMENT OF AGRICULTURE, 2001. *The strategic plan for South African Agriculture*. Pretoria: Directorate Agricultural Information Services.

EICHER, C.K., 1999. Institutions and the African farmer. *Third distinguished economist lecture presented at the International Maize and Wheat Improvement Centre (CIMMYT)*. Mexico City, January 15.

GABRIEL, Y., 1999. *Organizations in depth*. New Delhi: SAGE Publications India Pvt Ltd.

HUBBARD, M., 1997. The new institutional economics in agricultural development: insights and challenges. *Journal of Agricultural Economics*, 48(2):239-249.

MATATA, J.B., ANANDAJAYASEKERAM, P., KIRIRO, T.N., WANDERA, E.O & DIXON, J., 2001. *Farming systems approach to technology development and transfer: a source book*. Harare: FARMESA.

PERRET, S., 2002. Water policies and smallholding irrigation schemes in South Africa: a history and new institutional challenges. *Water Policy*, 4:283-300.

SWIFT, J. & HAMILTON, K., 2001. Household food and livelihood security. In Devereux, S. and Maxwell, S. (eds.). *Food security in Sub-Saharan Africa*. London: ITDG publishing:pp.:84-89.

VAN AVERBEKE, W., LETSOALO, S. S., MOHAMED, S. S. & KHOZA, T.B., 2004. *Analysis of the situation at Dzindi Irrigation Scheme*. WRC Report No. 3/K5/1464/4. Pretoria: Water Research Commission.