

RESEARCH REPORT

Small-scale Irrigation Development for Sustainable Rural Development: A Case Study of the Tyhefu Irrigation Scheme

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Introduction

It is especially in the rural areas of South Africa that people live in a vicious cycle of poverty that perpetuates underdevelopment. The country's President, Thabo Mbeki, has observed in this connection that 'the rural areas of our country represent the worst concentrations of poverty. No progress can be made towards a life of human dignity for our people as a whole unless we ensure the development of these areas' (Pycroft, 2002: 15). Clearly, there is a need to fast track the development of the rural areas. The government faces a massive backlog in promoting and stimulating sustainable rural livelihoods created first by apartheid and second by the lack of a clear rural development policy.¹ This is further compounded by the conspicuous absence of a rural voice.

With approximately sixty percent of the total population of the Eastern Cape Province living in the rural areas of the former Transkei and Ciskei, improving agricultural productivity, especially small-scale farming, is a crucial but not a sufficient condition for the eradication of poverty. There is however widespread scepticism regarding the potential of small-scale farming to generate sustainable rural livelihoods. Currently, the small-scale farming sector continues to battle with the seemingly insurmountable task of moving from its subsistence status to market-oriented production. It is well-known that the agricultural sector in the former 'homelands' performed dismally compared with the white commercial agricultural sector. Whether agricultural productivity can be improved remains controversial.

This study was conducted against the background of current attempts to rehabilitate and revive the defunct Tyhefu irrigation scheme, based on irrigation management transfer policy (IMT).² The Tyhefu irrigation scheme was one of several irrigation schemes established in the former Ciskei, (now Eastern Cape) between 1976 and 1985. The main question this paper seeks to examine is the extent to which a rehabilitated and revived Tyhefu irrigation

scheme can generate sustainable rural livelihoods. Based on research over two years, (2000-2001), the main constraints and challenges facing the farmers were examined.

The findings of this study suggest that irrigation management transfer is a complex and delicate process. In this new set of arrangements, beneficiaries face formidable challenges in terms of capacity (human and financial) if small-scale irrigation farming is to become a viable sector. No doubt, the viability and sustainability of the Tyhefu irrigation scheme demands a comprehensive package of interventions that address various issues of markets and marketing, capital investment and access to finance, technology, education and training, support and extension services. This raises concern about the possibility for independent agricultural production as well as sustainable rural livelihoods.

Agriculture under Apartheid

A major feature of the agricultural sector in South Africa has been its dual structure. This dualism, with significant differences in costs, infrastructure and level of production, is well documented (Vink and Kirsten, 2000; Lipton, 1977; Niewoudt and Groenewald, 2003; Schrire, 1992; World Bank, 1994). The dual structure is starkly reflected in the fact that approximately 60,000 commercial farmers occupy almost eighty-seven percent of the total agricultural land and produce more than ninety-five percent of marketed output, whereas small-scale farmers³ in the former homelands occupy thirteen percent of agricultural land and contribute only five percent to output (Niewoudt and Groenewald, 2003:3). The consequences of discriminatory rural development policies and the legislative construction of a dualistic agricultural system in South Africa have been to concentrate poverty within the rural areas, particularly the former homelands (Pycroft, 2003:106).

Historically, agricultural development has been viewed in terms of the efficient, capital intensive, largely white-owned, technologically advanced, large-scale commercial sector. Consequently, the government prioritised this kind of agriculture as a key sector that would stimulate economic development. Conversely, small-scale agriculture has been characterised as a traditional, backward, unproductive and inefficient subsistence sector and generally associated with the homelands. Kassier and Groenewald (1992:347) describe the commercial farming sector as reminiscent of the farming sectors in the developed world, producing surpluses and using considerable amounts of purchased inputs. In contrast, the subsistence sector has many of the characteristics of subsistence farming as experienced elsewhere in sub-Saharan Africa.

Extension and support services have always emphasised the dichotomy between commercial and subsistence agriculture. As a result, major service institutions were biased in favour of white commercial agriculture. This bias

was made possible by a long history of direct state intervention in South African agriculture. Effectively, it meant the systematic dispossession of the crucial means of production that would offer some hope for the emergence of a black propertied class (Kimemia, 2000:33). The consequence has been the creation of several distortions, which not only ensured a highly skewed distribution of land ownership but also a differential access to resources. Where support services existed for the small-scale farmers the quality has always been inferior. The cumulative effect of these measures is a small-scale farming sector that has been restricted to low input levels. Consequently, small-scale farming has been unable to meet the needs of the rural population, who became net food importers from the white agricultural sector (World Bank, 1994:22). Vaughan (1992:421) argues that 'the historical undermining of smallholder production, which so substantially reduced the significance of the peasantry as a social and economic category, contributed to the widespread assumption that a smallholder class no longer exists as a significant locus of production in South Africa agriculture'.

Small-scale farming has a long history in South Africa and has been promoted in various guises since the Tomlinson Commission's report in 1955. The Tomlinson Commission promoted the concept of small-scale farming as a means of alleviating poverty and promoting economic development. The Commission believed that small-scale farming in 'traditional black areas' had the potential to produce a surplus of agricultural commodities (1955:117). The concept of 'economic unit' farm size was central. Tomlinson envisioned the emergence of a middle class farmer group with the capacity to produce a liveable income through full-time farming. The viability of this strategy required the provision of supporting infrastructure in terms of farm inputs, transport and agricultural extension, in addition to the planning of the farm areas into economic units. The government rejected these recommendations, with the result that viable small-scale farming never became a reality.

Generally, the results of small-farmer development programmes have been disappointing. Van Rooyen and Nene (1996:329) sum up small-scale farmer development as follows: 'experience with small farmer strategies highlights several problems, of which insufficient participation, lack of ownership, ad hoc participant selection, lack of property rights to farm land and deficient support services play a significant role in failing to establish a small farmer category in the country'. The shortcomings in the promotion of small-scale farming suggest that 'the concept was never introduced under fully supportive conditions' similar to existing for large-scale farming (van Rooyen and Nene, 1996: 327).

The current climate is hostile to the development of small-scale farmers, despite various legislative and policy changes since 1994. The prospects for revitalising agriculture in the former homelands and establishing a new class of emerging farmers are bleak. The dual nature of agriculture remains very much

intact. Even if widespread agrarian reform were to be achieved, the impact of such reforms would be limited by the lack of access to critical inputs such as credit, training, and extension services. Until such time as a supportive environment is provided, the potential of small-scale farming cannot properly be judged.

Irrigation Development in the Homelands

A review of the literature on irrigation development on the African continent provided useful insights for this study. The lessons from irrigation development in sub-Saharan Africa indicate that the continent is littered with examples of derelict and costly failures. The broader African experience is not unique, but shares many similarities with the South African situation. For example, many irrigation projects have suffered from a combination of technical, institutional and organisational constraints. Generally, irrigation scheme management and consultants were primarily oriented to dealing with the technical or agronomic, and not the human, challenges associated with irrigation development. Farmers in all cases were situated at the bottom of the production chain. Farmers worked in a tightly controlled environment which emphasised compliance with all the irrigation management directives. In an environment in which the centralisation of all functions was so salient, farmers were restricted in the extent to which they could affect and influence irrigation scheme management. Clearly, farmers worked in an organisational context not suited to their needs. The reductionist approach adopted by the planners meant that sound working relationships between the farmers and irrigation scheme management could not be realised. Almost without exception the case studies reviewed indicate that the industrious type of farmer was never developed as was envisioned in the planning documents. Nor were rural livelihoods improved in a sustainable manner. It is not surprising, therefore, that the top-down or centrally planned approach in the implementation of many irrigation schemes proved unsustainable.

Irrigation development (including betterment planning and farmer support programmes) is one of at least three approaches to agricultural development in the homelands. Generally, none of these approaches brought any lasting benefit to the local population. Instead the reserves continued to slide into ever-increasing poverty and widespread environmental degradation. The irrigation schemes were seen as government's response to low agricultural productivity and 'the absence of commercial agriculture in the homelands to what was attributed to the perceived lack of entrepreneurial and managerial ability among black farmers'. Such schemes seemingly offered 'a deceptively simple solution to the problem' (Brand et al, 1992: 356; Cloete, 1987: 546-547). This notion, combined with the philosophy of optimal resource use, was taken to dictate that outside management should be introduced to develop

agriculture (Brand et al, 1992:356). Consequently, large-scale centrally managed estate or project farming in both irrigated or dryland production became the main focus in the former homelands.

Irrigation and Agricultural Policy in Post-Apartheid South Africa

The poor track record of many irrigation schemes, despite huge investments, in the former homelands prompted the government to reconsider its active and direct role in small-scale irrigation farming. This resulted in the closure of many irrigation schemes including the Tyhefu irrigation scheme. Prior to 1994, government in the former homelands was responsible for the operation, maintenance and finance of irrigation schemes. In addition to rampant corruption, irrigation scheme managers found that their entire budgets were consumed in running and maintaining the economically non-viable irrigation schemes.

The new policy framework, known as the irrigation management transfer (IMT), is premised on the transfer of ownership, authority and responsibility with regard to small-scale irrigation schemes from government to the farmers. In other words, the intention was that the irrigation schemes were to be totally owned, managed and maintained by participant farmers, in the form of Water User Associations (WUAs).⁴ The primary purpose of WUAs is to provide for the effective representation of small-scale irrigation farmers on the irrigation schemes at a local level as well as managing water on behalf of their members. Furthermore, IMT requires that costs be recovered from the beneficiaries of the schemes.

The process was envisioned as fully participatory. As such, irrigation management transfer required the maximum involvement of all stakeholders in every aspect of project development. The key role players are the farmers, their committees, extension officers, consultants, relevant government departments, local government, and non-governmental organisations. This approach differs radically from the way in which the irrigation schemes were planned and operated in the past.

The introduction of IMT is no small undertaking for the beneficiaries considering the top-down nature of development in South Africa during apartheid. The latter resulted in many communities lacking the necessary skills and resources with which to meet the new demands. Access to markets as well as the generally poor infrastructure in rural areas, add to some of the critical challenges facing the small-scale irrigators. These challenges hinge on the question of the viability and sustainability of the irrigation schemes.

IMT is justified on several grounds. First, there is the issue of disparities in the degree of support provided to state and private irrigation schemes. Second, the government found the financial burden of maintaining and operating unproductive irrigation schemes, through the provision of annual subsidies, impos-

sible to justify and sustain. Consequently, following budgetary re-prioritisation after 1994, financial support for the management, operation and maintenance of many irrigation schemes in the former homelands was withdrawn, resulting in the collapse of many of them. Last and most important, external pressures on the government have dictated the path which the government should take with regard to service delivery. Specifically, the South African government's macro-economic strategy, *GEAR, in line with the World Trade Organisation rules*, calls for deregulation and reduction of support (in terms of providing subsidies) for the agricultural sector. Internationally, there is a pervasive policy consensus in favour of reducing state control and management of irrigation schemes based on the argument that state managed enterprises are costly, over-subsidised, inefficient, and tend to deepen state financial crises. Transferring state responsibility to farmers, according to proponents, relieves the state of financially burdensome obligations, while at the same time enhancing farmer involvement. As such, irrigated agriculture is deemed to be a lower order user of scarce resources and therefore must be seen to be moving towards self-sustainability (Maritz, n.d.: 3).

To facilitate the process, the government has undertaken to upgrade the infrastructure of existing irrigation schemes at public expense as a once-off subsidy before the transfer of ownership to the farmers, or to their institutional entity. There is no intention to develop new irrigation schemes. Also, the requirement is that each irrigation scheme be examined individually to determine its financial and economic viability. This requirement is based on the fact that commercial banks and other lending institutions will only finance profitable projects.

Irrigation management transfer in South Africa is still in its infancy. As such it is not possible to give a comprehensive evaluation of the process. As a growing area of research, there is still a paucity of data on many aspects of IMT. While there is a growing body of literature on operational and financial performance, 'less evidence is available on effects of management transfer on maintenance and economic performance of irrigated agriculture' (Vermillion, 1997: v). At the same time comparative country studies are few, while comparisons between IMT and non-IMT cases are rare. Considering that governments initiated IMT to reduce the costs of operation and maintenance, it is surprising that a limited number of studies have been done on the impact of IMT on government. Equally, the absence of a standardised analytical paradigm to date makes it difficult to arrive at general conclusions or policy implications.

Even though research studies internationally present a mixed picture, overall, the results of the impact of IMT are generally positive. The focus of many studies is on short-term and immediate results. A general concern is whether these gains can be sustained over the long-term. Reported positive results include reduction of costs for both farmers and government; enhanced financial self-reliance; expansion of service areas; reduction in the amount of

water delivered per hectare; and increases in cropping intensity and yields (Vermillion, 1997:29). For example, a study of IMT at the Dawheya Irrigation scheme in Ghana (Sam-Amoah and Gowing, 2001) has shown relatively high yields sustained despite the fact that both cropping intensity and cultivated area decreased. A decrease in production and running costs and an increase in average net income and high financial self-sufficiency ratios have been reported. This has led to the conclusion that IMT has resulted in better performance. On the negative side studies have focussed on increased costs for farmers, poor financial viability and deterioration of irrigation infrastructure.

The Tyhefu Irrigation Scheme

Project History

The Tyhefu irrigation scheme can be found on the eastern bank of the lower Fish River approximately 30 km west of Peddie in the Eastern Cape. It consists of five settlements – Ndlambe (160 hectares), Pikoli (120 hectares), Ndwayana (55 hectares), Kalikeni (151 hectares), and Glenmore (93 hectares) along a stretch of approximately 25 km of the river. Of these five settlements Ndlambe is the focus of the study. Approximately 1000 hectares of potentially irrigable land is undeveloped. This area will be extended once the scheme becomes functional. At the time of the closure of the Tyhefu irrigation scheme the total irrigated area was 694 hectares.

The Tyhefu area has historically been described as ‘one of the most eroded and impoverished areas of the Ciskei. Some of the drier parts are virtually beyond rehabilitation. The area is densely populated and is so drought-prone that the people are unable to subsist from the land: a truly depressed area’ (Ciskei Department of Agriculture and Forestry Annual Report, 1984/85) Furthermore, Loxton, Venn and Associates⁵ (1977) identified problems of advanced erosion, veld degradation and limited agricultural potential. They found the area moderately suited to extensive and semi-intensive livestock production rather than cultivation. Where farming was taking place, the land was not utilised to its optimal capacity. Despite the fact that in some areas of the Eastern Cape there is overcrowding, much of the land remains unutilised. Agricultural productivity in the Tyhefu area is further limited by the agro-ecology of the region. This includes poor soils, low and irregular rainfall, water quality problem, high evaporation rates, seasonal extremes of temperature and a poor resource base. Other constraints to successful farming for the majority of the rural population include limited access to credit and finance, poor (or non-existent) support and extension services, and poor infrastructure.

Preliminary investigations into the feasibility of irrigation development in the Tyhefu area date back to the 1930s. The abandonment of the idea at the time was attributed to water quality problems. Only in 1977 was implementation of the Tyhefu irrigation scheme undertaken as a pilot project. The scheme was a

state-driven, top-down initiative. This study argues that the justifications for the Tyhefu irrigation scheme were conflated, with the result that the ambition to sustain political control of the Tyhefu area far outweighed considerations regarding the financial viability and sustainability of the proposed project. Given the repressive political climate of the time in South Africa, the planners' proposals were a mechanism for the realisation of the socio-political and economic agendas of the apartheid state and of the Ciskei government. The planning and implementation of the Tyhefu irrigation scheme were thus affected by broader Ciskeian political interests. Various competing and conflicting interests sought a stake in the proposed irrigation development, thereby dividing and alienating the rural population. On the one hand, there was the need on the part of the apartheid authorities and the subordinate Ciskei government to assert authority in the Tyhefu area through the installation of chiefly authority. At the village level, a complex web of relationships and interactions existed: the role of the village elite, the Tribal Authority, the Tyhefu irrigation scheme management and the farmers.

Given the above, strict centralised managerial control and decision-making over the activities of the farmers, capital intensive and sophisticated agricultural techniques, and the production of high value crops, were the main requirements for success at the Tyhefu irrigation scheme. This approach did not allow for farmer participation in the initial planning process, design and implementation phases. Farmer participation would have run counter to the principles of exclusion and the narrowing of political space on which the South African state was firmly grounded. According to Van Averbeke et al. (1998: 4-5) during the late 1980s the growing awareness among the irrigation scheme workers of their rights, and the demand for higher wages, led to a general decline of most of the irrigation schemes in the Eastern Cape as well as the erosion of the authority of irrigation scheme management.

Management style was autocratic and top-down. The effect of this approach was the non-accountability of management, feelings of incompetence among the farmers, and inadequate training and development of local institutions (Bembridge, 2000). According to Backenberg et al. (1996: 61) on most schemes the relationship between farmers and project management was that of customer and supplier. Farmers had no sense of ownership. This was not conducive for effective interaction and cooperation with irrigation scheme management. Thus, the farmers were limited in the degree to which they could affect and influence management. As a commercial enterprise, the Tyhefu irrigation scheme managers interpreted their role as one of ensuring efficient production through the provision of various inputs and marketing of the crop.

The economic viability of the Tyhefu irrigation scheme was in doubt from the start. As a result, it was running at a large operational loss (circa R1 million) prior to management withdrawal in 1995 (Bembridge, 2000: 37). Whilst the Tyhefu scheme was able to maintain sustained production through the annual

subsidies received from the state, it was a financial failure. The study by Hill (1984) on the 'Economic Viability Studies on Three Irrigation Schemes in Ciskei' provided a detailed analysis of the economic performance of the Tyhefu Irrigation Scheme. Hill (1984: 2) concluded that all the existing schemes were sunken costs. He made several observations regarding the Tyhefu scheme. He (Hill, 1984:1) noted that already by 1984 the Tyhefu Irrigation scheme had not produced a positive cash flow, even in the operational sense. The poor economic performance of the scheme can be attributed to a number of factors: corruption, lack of participation by farmers, poor management, centralised control and decision making, water quality, labour intensity, the use of electricity as a source of power, and fixed market prices for crops.

Besides the perceived short-term benefits of improved food security and access to employment, all respondents are unanimous that the scheme's impact on the village and region as a whole has been limited. The respondents point to the lack of development of the area. Available evidence on many irrigation schemes suggests that 'the distribution of benefits was limited in relation to total need and to aggregate resources available for development. Although higher levels of resource use, production and wage employment were achieved through modern farming enterprises... little was done to promote a class of self-employed farmers or to improve farming conditions for small holders outside these schemes... The projects... often incurred losses, and rarely involved spill-overs or linkages with the surrounding communities' (Vink and Kirsten, 2000: 20). Bromberger and Antonie (1993: 23) referred to the irrigation schemes as 'islands of prosperity amidst an ocean of poverty'. At the same time many of the farmers incurred a heavy debt burden.

At the time of the closure of the Tyhefu irrigation scheme, none of the management functions had been transferred to the farmers. This proved counter-productive since the ultimate aim of reviving the irrigation schemes is the transfer of all responsibilities to the farmers. With no managerial and other skills critical for the viability and sustainability of the irrigation schemes, capacity-building is essential. At present the Tyhefu scheme is technically insolvent or defunct. The land has been lying fallow since 1997.

Attempts at Reviving and Rehabilitating the Tyhefu Irrigation Scheme

In 1998 the community of Ndlambe wrote a letter to the Minister of Water Affairs and Forestry requesting the urgent revival of the Tyhefu irrigation scheme. The Minister's (1998) response is contained in the following statement: 'It is clear from the information supplied to me... that a number of issues regarding irrigation need to be addressed, apart from the question of adequate water supply. These include the restoration of effective management, the development of the further irrigation potential originally planned... I have accordingly requested that the whole question of development, adequate water

supply, water tariffs, sustainability and management of irrigation be investigated...’ Basically, this statement sums up the major challenges facing the farmers of the Tyhefu irrigation scheme.

The Departments of Agriculture and Land Affairs (DALA) and the Department of Water Affairs and Forestry (DWAFF) have subsequently taken the decision jointly to rehabilitate and transfer the irrigation schemes to the farmers, the beneficiaries. The Minister of Water Affairs and Forestry appointed a Task Team in 1997 to advise DWAFF and DALA on all water-related aspects of the schemes. With regard to the Tyhefu scheme this step involved the proposed extension of the water pipeline. In addition the Task Team was to make recommendations about which government departments or structures were to be responsible for what functions. The report, entitled ‘Report on Investigations into ways of Rehabilitating the Water Supply Aspects of Certain Irrigation Schemes in the Former Transkei and Ciskei’, was presented in August 1997. DWAFF was assigned the task of taking over all the bulk water supply management responsibilities, the rehabilitation of bulk water infrastructure where necessary, and the creation and capacity-building of Water User Associations (WUA). The responsibilities of the Provincial Departments of Agriculture and Land Affairs (PDALA) related to on-farm activities. In the Report it was indicated that rehabilitation of TIS would be implemented in three phases at an estimated cost of R75 million. It was envisaged that the process would start in September 1997 and be completed in March 1999. Since then the proposed schedule and costs have had to be revised. The main obstacle has been cited as the availability of funds.

The Departments of Water Affairs and Forestry and Agriculture and Land Affairs commissioned LawGibb (technical consultants) in June 1999 to conduct feasibility studies. The main objective was to determine whether the construction of a bulk pipeline from the Lower Fish River Government Water Scheme, with all associated works, to supply irrigation water to the rest of the Tyhefu irrigation scheme would be viable (LawGibb, 1999). Furthermore, the Minister of DWAFF requested that the restoration of the pump systems be looked at as a matter of priority, so that farmers could resume farming. Subsequently, in August 1999, Argus Gibb undertook visual inspections to assess the condition of the entire infrastructure. They found that since the closure of the irrigation scheme in September 1997, the infrastructure had deteriorated considerably. This deterioration included pump installations which required major refurbishment due to a combination of theft, vandalism and poor maintenance. Physical rehabilitation for Phase One started in 2002, with the whole operation expected to be completed in 2004.

A Project Steering Committee (PSC) was formed at the beginning of the rehabilitation process. The PSC was intended to be a temporary structure which would be disbanded once the Tyhefu irrigation scheme became operational. Its main task was to oversee the whole rehabilitation process as well as work

hand-in-hand with all the stakeholders. The Water Users' Association (WUA)⁶ was established in terms of the Water Act No. 36 of 1998.

The main critical issues not yet resolved relate to the crops that will be planted, issues of marketing, user charges, and access to finance. Several crops have been suggested including sugar beet, jojoba beans, citrus, wheat and various vegetables. At the moment, all the stakeholders are reviewing a proposal from a Johannesburg-based Israeli company interested in contract farming for high value crops.

There are many details and agreements to be entered into by the community. In many ways these activities seem to be beyond the comprehension and scope of the community and their elected representatives. The institutional structures need to be fully conversant with the conditions and terms of the contracts into which they might enter. Considering that the potential business partners are sophisticated (and will protect their own interests at all costs with competencies not immediately available to the community), there is a need to capacitate the PDALA, NGOs as well as other people working in the area so that they can render effective professional advice to the community. If need be outside expertise should be sought. The eagerness on the part of the community to see the project running, as well as poor institutional support for the elected structures and insufficient training, are areas that need to be addressed urgently.

The process of rehabilitating and reviving the Tyhefu irrigation scheme has proven lengthy, delicate and uncertain. This is a source of concern for the community. Their argument revolves around widespread poverty, unemployment in the area and an appeal for government assistance.

Methodology

Fieldwork was conducted intermittently over a period of two years (2000 and 2001). A critical part of the orientation and planning phase was a review of the literature and consulting with officials or experts on various aspects of the research. The literature review entailed the perusal of a wide range of documents (commissions, research and consultants' reports, South African government policies and legislation, and journal articles and books. Locating primary documents pertaining to the planning and operation of the Tyhefu Irrigation Scheme has been difficult. The same goes for accessing reliable statistical information. Literature on Third World irrigation schemes, particularly those in Africa, proved an important source of information.

A reconnaissance survey was carried out in June 2000. This involved consultation with local leadership structures and some community members where the scope and objectives of the research were outlined and discussed. The researcher attended various community and committee meetings when invited, playing, in most instances, the role of an observer rather than a direct participant, except where an opinion or direct advice was solicited. These

meetings provided the opportunity for informal discussions with the various stakeholders during the initial stages and throughout the research period. Most importantly, these meetings led to a better understanding of the complexities involved in the upgrading and rehabilitation of the Tyhefu Irrigation scheme, enabled the accumulation of additional data and provided the basis for the drafting of the questionnaire.

The target population for the study was all the former farmers at the Tyhefu Irrigation Scheme. Also, all six members of the Board of Directors, Project Steering Committee and Water Users' Association of the Ndlambe section of the irrigation scheme formed part of the target population. No sampling frame existed for this study, since no reliable list of former farmers existed. Using estimates of between 300 and 350 farmers in the Ndlambe section, it was decided to interview ten percent of the target population.

The survey research approach was adopted in order to obtain the required information. Two types of semi-structured questionnaires were compiled based on the literature review and preliminary informal interviews with various stakeholders, namely (a) for the ex-farmers of the Tyhefu irrigation scheme (b) a questionnaire for members of the Board of Directors,⁷ Project Steering Committee⁸ and Water Users' Association⁹ of the Tyhefu Irrigation Scheme, hereafter referred to as institutional structures. The questionnaire for the former farmers consists of two sections. Section A dealt with demographic as well as socio-economic factors (age, educational level, sources of income and labour, income derived from farming, farming experience, contribution of Tyhefu Irrigation Scheme to rural livelihoods and scheme impact). Section B focussed on farmers' perception of constraints, challenges and the process of reviving the irrigation scheme. The questionnaire for the institutional structures focussed on the constraints, challenges and the rehabilitation process.

A Socio-Economic Profile of the Farmers at the Tyhefu Irrigation Scheme

The age distribution of the majority of the respondents (62 percent) ranges between 31 and 50 years. A study by Kepe (1992:61) on the various irrigation schemes in the Ciskei (Tyhefu, Zanyokwe, Shiloh and Keiskammahoek) found that people with interest in continuing farming were farmers between the ages of 46 and 55 years. Thirty-eight percent of the respondents were in the category of what can be regarded as older farmers. According to respondents the youth have not shown any real interest in farming. Reasons given for such interest vary, and include statements that they are interested in other activities such as wage employment and sport. As one respondent argued: 'Our children have not seen any real benefits from farming, hence the lack of interest. They've seen us struggling with the management of the scheme before and thus prefer either working in the urban areas or starting their own businesses. The majority of the

youth are job seekers in the urban areas. Perhaps with poor job prospects everywhere, the rehabilitation of the scheme might prove a major incentive for the youth. A majority of them have registered as potential farmers. It's a wait and see approach if they will actually get involved'. Catling and Saaiman (1996: 174) suggest that 'many young people associate working on the land with the negative experiences of the past and a stigma is attached to agriculture. In order to improve agriculture and to encourage new livelihoods in the rural areas, more must be done to promote agriculture amongst the youth'.

Overall, the standard of education is very low. More than half of the respondents have not reached standard five. According to educationalists, people with less than four years education are unlikely to have attained any degree of functional literacy (Koshy in Bembridge, 2000: 51). This observation holds true for the respondents of this study who expressed concern about their lack of essential skills such as management, marketing, financial management, record keeping, and the application of new agricultural techniques. Their perception is that illiteracy is a major hindrance to successful commercial farming. Various studies have reported similar low levels of formal education in the former homelands (Steyn, 1988; Williams and Rose, 1989; Kepe, 1992 and Bembridge, 2000). Illiteracy and the age of the farmers has been linked to the reluctance or lack of response of farmers in adopting new technologies, innovations, and they have a negative effect on agricultural productivity and the provision of extension services (Van Averbeke et al., 1998; Bembridge, 1985).

The findings indicate that the majority of respondents are not dependent on one source of income but on a combination of various means. State transfers in the form of pensions and disability grants constitute the main source of gross cash income for sixty three percent of the respondents' households. Other studies have confirmed the importance and value of state transfers to household income (Monde-Gweleta et al., 1997; Ainslie and Ntshona, 1997; Van Averbeke et al., 1998).

It is quite evident the respondents are struggling to make ends meet with the meagre financial resources at their disposal and the limited employment opportunities available. The effects of deprivation and poverty are cushioned, albeit on a limited basis, by kinship and reciprocity.

Since the closure of the Tyhefu irrigation scheme there had been no income derived from farming. During fieldwork it became clear that the amount of income derived from farming varied considerably between the commercial farmers and small plot-holders. According to the respondents, income ranged from as little as R300 per season for the small plot-holders to R10,000 for the commercial farmers. No records were provided to confirm these figures. Dissatisfaction among the farmers is quite evident, especially the ex-commercial farmers, about the income to be derived from farming.

It is clear from the research findings that agriculture contributed to the livelihoods of the farmers in a modest way. This is particularly so if one considers the

unpredictable nature of the income derived from farming by all the farmers at the Tyhefu irrigation scheme. This supports the conclusion of the research by Monde-Gweleta et al., (1997) that in both dryland and irrigated environments in the Peddie district, agriculture does contribute to the income of many households, but rarely constitutes a livelihood in its own right.

Research Findings

This section examines the perceptions of constraints, challenges and the process of reviving the Tyhefu irrigation scheme. Respondents were asked about the factors that affected the degree to which they could farm successfully, based on their experiences as former farmers at the now defunct irrigation scheme. Eighteen items were used to measure the perceived main constraints and challenges. These can broadly be divided into the following categories:

- Quality and nature of support and extension services;
- Skills and training needs: agricultural training, information and research;
- Input and product markets; and
- Physical factors influencing irrigated crop production: climatic conditions, soil and water quality and availability, pests and diseases, tenure security and farm size.

Primary constraints and challenges identified by the respondents for the future in a rehabilitated Tyhefu irrigation scheme are finance and credit, markets and marketing, institutional support, training, and support and extension services. Respondents were unanimous that these have the potential to undermine the viability and sustainability of the scheme.

Support and Extension Services

The quality and nature of support and extension services was described by eighty percent of the respondents as very good during the early years of the irrigation scheme. However, all respondents were quick to point out that the service deteriorated considerably during the 1980s until the scheme's closure in 1997. Respondents are critical of the type and nature of the service rendered. The service is described as having been top-down and authoritarian. In spite of the presence of extension staff on the irrigation scheme premises, farmers indicated a limited rate of contact. Extension officers were described as working more in their offices and rarely doing any on-site visits. As one respondent noted, 'This made it difficult for us as farmers to get advice and establish good working relationships with the extension officers. In most cases the type of service was irrelevant to the real needs of the farmers'. Overall the respondents in the study rated the quality of service as poor, ineffective and misdirected. The result was that farmers relied more on their colleagues for advice and assistance.

Respondents had reservations regarding the knowledge and skills of extension officers. It is evident from the findings that the competence of extension officers is questioned. Hence, it is believed this limited their ability to provide sound advice to farmers on key production and irrigation practices. Well-trained competent extension officers resident on the irrigation scheme particularly during the first few years are critical to the success of the Tyhefu irrigation scheme. Specialised training of new and serving extension officers should receive priority. There is a strong argument for the overhaul and re-orientation of the extension service to address the needs of small-scale irrigation farmers. Working partnerships between farmers, institutional structures and extension officers need to be forged. This relationship should differ markedly from the one that existed before the collapse of the scheme, which was top-down, technocratic and authoritarian. Extension service needs to strive through training towards encouraging greater farmer independence and collaboration rather than the subordination of farmers.

Related to the above is the need to upgrade and reorient research to focus on the needs and problems of small-scale and emerging farmers. It is for this reason that all the respondents in this study regard agricultural training, information and research as prerequisites for successful small-scale irrigation farming. A major anomaly identified by the respondents is the inability of the farmers to access timely agricultural information and services. This includes information on new crop cultivars with high yield potential and market value, soils analysis, advice on fertilizers and pesticides, effective weed, pest and disease control, and farm management methods and techniques. Research evidence suggests that previous research effort has been devoted largely to commercial farming and that such research output is marginally relevant to the needs of small-scale farmers (Catling, 1996).

Skills and training needs

This study found that the poor educational level of the farmers is positively related to their level of functional literacy. Feelings of incompetence among the respondents are widespread. All the respondents realise that they need to acquire various skills through training for greater independence. Critical skills considered lacking are the drawing-up of business plans, formulation and reading of contracts, financial control and management, record keeping, computer literacy, adopting latest technology, project planning, management and evaluation, keeping minutes, communication, conflict resolution, marketing and management, operation and maintenance, and quality control. Research evidence (Cousins, Cousins and Theron, 1996: 185) on small-scale commercial farmers in the Western Cape suggests that business management skills, which include keeping proper farm accounts and records, are often limited. According to Rogerson (2000: 210) the lack of management or business skills serves to worsen all the other problems of rural producers, since

entrepreneurs lack the capacity to analyse situations and chart ways to minimise the adverse impact of constraints on their business. Thus, a high level of financial management will no doubt be one of the critical areas that need to be addressed.

None of the farmers have any formal agricultural training. Even though the majority of the farmers are confident about their agricultural knowledge and farming skills (as a result of their previous involvement in irrigation and subsistence farming, sometimes as farm labourers in the commercial farm sector), they need training in new production, irrigation techniques and practices. This is particularly important given the fact that the rehabilitation and revival of the Tyhefu irrigation scheme is premised on market-oriented farming. The skills they possess can largely be regarded as general farming skills such as weeding, fencing, and driving. Specialised farming skills cannot be said to exist on a wide scale. Innovative practical training suited to the needs of the farmers is critical.

Markets and Marketing

Marketing of produce for the majority of the farmers, particularly the food plot-holders, was a serious problem. It is clear from the findings that marketing was generally not well-organised, and was poorly developed based on the availability of buyers. There was stiff competition among the farmers whilst at the same time they restricted their activities to narrow localised markets. In most cases this problem resulted in reduced profit levels. For the commercial farmers, low monetary returns when using the scheme's marketing services were a source of tension between them and irrigation scheme management.

In the past, the level of rural infrastructure and the fact that Tyhefu irrigation scheme is located far away from main markets made it difficult, if not impossible, to exploit favourable market opportunities. Backeberg et al. (1996: 52) observe that 'an unfavourable economic location renders the profitable production of many products impossible. It also reduces the ability to produce many fruits profitably'. Overall, farmers at the Tyhefu irrigation scheme require both improved access and improvements in marketing of their produce. Also, one of the challenges is the development of a marketing system that will serve as a mechanism through which farmers can channel their produce. Similarly, an improvement in marketing information system is vital. Other areas of concern relate to the availability of storage facilities, the ability to adhere to high production and quality control standards, and meeting contract obligations. The suggestion by van Averbeke et al. (1998: 203) that there is a general need for the identification of suitable crops that can be grown profitably, without being sensitive to market conditions and distance, is valid. Even though sugar beet has been identified as a preferred candidate crop, no final decision has yet been reached as to the suitable crops. There is agreement, however, that emphasis should be on high value cash crops.

The success of any business venture hinges on the efficient functioning of the marketing system of which a proper transportation network is part. The village and rural infrastructure (roads and telecommunications), although not regarded by 77 percent of the respondents to be an impediment, needs to be upgraded. Poorly maintained secondary roads serve the study area. In the past, together with a poorly functioning telecommunication system, this drawback has made it difficult, if not impossible, to exploit favourable market opportunities. The absence of tarred roads means that vehicle owners are likely to charge a lot of money for transportation of goods (van Averbeke et al., 1998: 56). Consequently, the expense of delivering produce to the market can even exceed the cost of production, making the produce very expensive to the consumer (Van Averbeke et al., 1998: 21). Backeberg et al. (1996:52) further argue that 'irrigation, even with the existence of sufficient water resources, will remain an undeveloped farming activity in some former homelands until good transport and other communications have been established'.

Finance and Credit

Respondents are apprehensive about their ability to access finance. They need credit for various short-, medium- and long-term purposes. More importantly, the fact that credit is offered at market-related interest rates highlights the difficulties the farmers are likely to have in servicing their loans. This is regarded as a negative incentive for small-scale farmers, who are likely to find it impossible to invest in agriculture. Farmers at the Tyhefu irrigation scheme are also constrained by low levels of liquidity, high transaction costs, and inadequate collateral. In other words, even though the institutional restructuring of agricultural services has been undertaken to meet the financial needs of small-scale farmers, there are many requirements needed in order to qualify for financial assistance. In many cases the farmers do not comply. The possibility of providing start-up finance on favourable terms requires further investigation. Equally crucial is whether the Tyhefu irrigation scheme will be able to generate a positive cash flow in the long-term, rather than relying on credit to sustain itself.

User charges

A number of cost recovery issues at the Tyhefu irrigation scheme still need to be finalised. The introduction of user charges and cost recovery is one of the thorny areas in South Africa. Generally, the record of cost-recovery is disappointing, resulting in the termination or discontinuation of a particular service. The fact that forty three percent of the respondents were non-committal in terms of paying for services is a cause for concern. Affordability featured prominently in all the responses. When taking into account the socio-economic status of the respondents, it seems unrealistic to expect them to carry the full cost of operation and maintenance.

Conclusion

The Ndlambe community is eagerly awaiting the eventual resumption of farming at the Tyhefu irrigation scheme. They are pinning all their hopes for poverty alleviation, employment creation, income generation and the general improvement of the standard of living and rural livelihoods on this one project. There is potential for this positive development, albeit on a limited basis in the short term. Whether the Tyhefu irrigation scheme can generate sustainable rural livelihoods is questionable and subject to debate, especially in view of the constraints and challenges that lie ahead.

It is clear from the research findings that agriculture contributed to the livelihoods of the farmers in a modest way. Effectively, irrigated farming generated income that can be said to supplement overall household income. This is particularly so if one considers the unpredictable nature of the income derived from farming by all the farmers at the Tyhefu irrigation scheme. In most cases income has been low and many families lived in poverty. It needs to be realised that the Tyhefu irrigation scheme is not and will not be a panacea for the socio-economic ills facing the community. Since agricultural development is just one aspect of the rural economy, for the rest of the community other income-generating activities need to be considered. Rural development experience suggests that a complementary blend of interventions offers an integrated way of dealing with the various development problems communities face.

Diversification is widely regarded as an important risk management strategy for small-scale farmers. Since small-scale, capital-intensive commercial farming is a particularly risk-laden activity, farmers at the Tyhefu irrigation scheme, rather than concentrating on a single high value crop, need to spread their risks.

Current policy thinking on Irrigation Management Transfer is a major departure from the previously top-down, supply-driven approach. Whilst this approach represents a notable innovation, participatory development alone is a necessary but not a sufficient requirement for the success of small-scale irrigation schemes. This shift exposes farmers to new challenges and creates new demands organisationally and in terms of production practices. The real test for irrigation management transfer is the extent to which it is accompanied by a comprehensive package of support and extension services and farmer empowerment so that the viability and sustainability of the irrigation schemes is assured.

While the need for the transformation of small-scale irrigation schemes is undisputed, the hurried implementation of irrigation management transfer raises questions about the long-term viability of irrigation schemes in general. This study suggests that improving the situation of small-scale resource-poor irrigation farmers, such as the ones at the Tyhefu irrigation scheme appears to

be the secondary aim of this reform. In essence, fiscal capacity pressures (and international trends) have been the determining factor for the adoption of irrigation management transfer rather than the potential far-reaching effects of this reform on the livelihoods of the farmers and concrete evidence about enhanced performance and cost-efficiency and effectiveness in the South African situation. Farmers at the Tyhefu irrigation scheme need special support. Radical policy changes are vital before any significant improvements can be achieved in income, livelihoods, general standard of living and agricultural productivity. Without this change the possibility for independent agricultural production, let alone sustainable rural development, is minimal.

Notes

1. In 1995 the national Rural Development Strategy was unveiled. The main criticisms of it included its failure to address the potential of the rural economy and issues of local governance. The revised Rural Development Framework in 1997 in addressing these concerns placed increased emphasis on rural municipalities in creating sustainable rural livelihoods and poverty alleviation. It has since become apparent that this is too overwhelming a mandate for most rural municipalities. Capacity constraints have made it impossible for them to fulfil their developmental role.
2. The lessons of previous development projects including irrigation schemes necessitate a move away from top-down, dictatorial and paternalistic approaches to participatory ones. This is the primary emphasis of irrigation management transfer worldwide.
3. The concept of small-scale farmer is highly contested and value-laden. Whilst small-scale farming is viewed as an important policy objective by the government and an important sector of agricultural development, the concept remains ill-defined and controversial. Not only are several terms used to define small-scale farmers, there is also an increasing realisation that this group is not homogenous. The terms used include small holder, resource-poor farmers, subsistence farmers, peasant farmers, food-deficit farmers, household food security farmers, land reform beneficiaries and emerging farmers (Machete and Mollel, 1999: 3). In addition several criteria are used to classify them in terms farm size, purpose of production, income level and racial group. In this study small-scale farming refers to black farmers who are found largely in the former homelands, whose primary objective is market-oriented farming. Implied is the assumption that these farmers are constrained in terms of their capacity (human and financial) and complementary resources such as research, support and extension services, access to markets, marketing and key production inputs.
4. The establishment of WUAs provides small-scale irrigators with greater scope for self-management. Maritz (n.d.: 6) states 'although WUAs are water management institutions their primary purpose is not water management. They operate on a restricted local level, and are in fact cooperative associations of individual water users who wish to undertake water-related activities for their mutual benefit'. The

ability of the WUAs to assume their responsibilities is a formidable challenge. International experience has shown that developing the capacity of WUAs is a long-term process, and that it takes several years before they can be able to assume full responsibility. No doubt the Departments of Water Affairs and Agriculture need to play a crucial role in capacitating WUAs.

5. Loxton Venn and Associates are consultants who planned the Tyhefu irrigation scheme. The Tyhefu irrigation scheme was first administered by management agents Interscience (Pty) Ltd., a subsidiary of Loxton, Venn and Associates, on behalf of the Ciskei government until 1984. They remained as advisors to the Ciskei government. Interscience (Pty) Ltd was in charge of planning and implementing cropping programmes, budgeting and financial control and evaluating performance (Bembridge (1986: 605). From 1985 to 1997, Ulimocor, Ciskei Agricultural Corporation, managed the Tyhefu irrigation scheme. This takeover did not mean the end of the influence of old management, since they became advisors to Ulimocor. In the meantime, Loxton, Venn and Associates management staff were re-employed by Ulimocor. In effect, therefore, changes in management did little to change the structural principles on which the scheme was based. Essentially decision making was still vested with the old management.
6. At the initial meeting of DALA/DWAF Task team in 1997 one of the main problems identified was the selection of a suitable legal entity to replace the water-related functions of the parastatals (DALA/DWAF, 1997: 5). After some deliberation the WUA concept was explored. The Task team, subsequently, recommended that a WUA be created at each irrigation scheme. Each WUA is required to have its own constitution to suit its particular needs and circumstances – it can therefore decide on what functions, duties and powers it wishes to have (DALA/DWAF, 1997: 12/13). The constitution of each prospective WUA must be approved by the Minister of Water Affairs and Forestry before its formation.
7. This is a structure that will take over the irrigation scheme assets once they have been handed over by the government. The understanding at the moment is that the government will repair all assets in bad condition.
8. The PSC is one of the institutional structures established at the Tyhefu irrigation scheme at the beginning of the rehabilitation process. It acts as an important link between the community and other stakeholders. It is a temporary structure which will be disbanded once the Tyhefu irrigation scheme becomes operational. Its main task is to oversee the whole rehabilitation process and to work hand-in-hand with all the stakeholders.
9. The Water Users' Association (WUA) was established in terms of the Water Act No. 36 of 1998. The primary purpose of WUAs is to provide for the effective representation of small-scale irrigation farmers on the irrigation schemes at a local level as well as managing water on behalf of their members. Specifically, responsibilities will include levying an equitable and affordable tariff on water users, and the use of all funds for the benefit of the scheme. Bembridge et al. (2000: 63-64) elaborate: 'the WUA should be able to take over scheme assets, take over collective loans, operate accounts and institute by-laws enforceable by its members... It would be responsible for arranging input supplies, draught power, and marketing'.

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