## EXECUTIVE SUMMARY

In recent years, most irrigation developments in black developing communities of South Africa have been implemented as an upgrade of previous communal gardens. When individuals from these communal gardens sell the surplus production, it is commonly interpreted as an expression of interest in market oriented agricultural production. In many cases this led initiators of irrigation schemes to believe that government intervention would enhance the potential for irrigation and transform the scheme members into commercial producers. In most instances the intervention is technical and the myriad of constraints related to the social and economic status of black developing communities is not always given adequate consideration. Yet for any investment in irrigation development to be viable and sustainable, the scheme members should make decisions in terms of the time, risk and resources that they are willing to commit for the scheme to be successful. In most black developing communities these decisions are largely influenced by the social and economic circumstances of the scheme members.

This study investigated the main socio-economic factors that may limit or enhance the viability of irrigation developments in black developing communities. The study was conducted in two schemes namely the Ndaya and Esiphongweni irrigation schemes located in KwaZulu/Natal province. The underlying question for the study was - if it would be possible to optimise irrigation infrastructure grants and achieve commercial objectives with no or partial consideration of, and no defined actions for dealing with the main socio-economic issues affecting small holder irrigation.

The purpose of the investigation was to:

- Define the socio-economic context in which water driven agriculture systems in black developing communities must exist.
- Evaluate the importance of considering the socio-economic context in order to enhance sustainability of the agriculture systems mentioned above; and
- Develop guidelines and procedures for identifying actions to deal with socio-economic factors at the inception of irrigation developments.

The specific objectives were to:

- Investigate the existing farming systems within the schemes in terms of size and technology;
- Identify institutional arrangements within such farming systems;
- Identify potential target groups for potential farming systems;
- Identify steps for transformation of present irrigation farming systems;
- Prepare an action plan for the development of irrigation farming systems in black communities;
- Develop a monitoring procedure for the implementation of the guidelines; and
- Identify the human capacity needs for running and managing sustainable irrigation farms.

### Major findings and conclusions

Existing farming systems revealed that the scheme members continue to be involved with various agricultural and non-agricultural activities while maintaining their involvement in the irrigation scheme. The scheme members consider irrigation an add-on activity as part of their strategy to fulfill their food needs and cash requirements. In addition to working in the irrigation scheme, most members continue to engage in other agricultural activities such as rain-fed farming, livestock rearing, poultry production, etc. Scheme members also engage in many other small business activities such as sewing, selling drinks, constructing roofs, baking, etc. Reliance on pensions is also evident. The majority of members at both schemes consider crop production as their main employment and the most important contributor to family income. Given these social circumstances, scheme members would not solely rely on the irrigation scheme to meet their financial and food needs. A comprehensive support strategy should be

adopted that recognises the complex farming and livelihood systems within which rural communities exist. Focus on irrigation development alone, as is currently the approach, represents a narrow and ineffective approach.

Regarding the objectives for engaging in irrigated agriculture, members expect irrigated agriculture to transform their social and economic circumstances. They perceive irrigated agriculture as a growing and lucrative business and there is a great expectation regarding the economic benefits that the irrigation scheme can provide. However, the origin of the schemes from communal gardens whose objectives were social development, limits the economic potential for irrigation development. In both Ndaya and Esiphongweni schemes, demand for commercial production was not ascertained at the point of setting up the irrigation schemes. Enhancement of the potential for irrigation could be achieved by primarily building consensus around social, economic and production goals and a vision that is shared by the scheme members, through adopting participatory planning. Irrigation developments that focus on commercial objectives should be established in communities that demand them, and not be given as a grant to all.

The study confirmed that the majority of scheme members that are most interested in irrigation in both schemes are female. The youth is generally not interested in agriculture production and the parents normally force their children's participation. Results show that owners of the plots at Ndaya, mainly women, perform all activities by themselves and do most of the laborious work. At Esiphongweni, other family members assist with different chores but to a lesser degree It was also found that improvements in irrigation technology have benefited men more than women. Technological improvements have simplified some activities traditionally performed by men. For example when furrow irrigation was used, men did most of the in-field irrigation, now with the current irrigation technology such as sprinkler irrigation systems, men are less involved. Since the introduction of the irrigation schemes, women have to work longer hours than men in order to cope with their many social obligations and the traditional household management role. In essence, irrigation development would be enhanced through gender sensitivity and assessment of population dynamics. Irrigation development should specifically identify how women will participate. Concrete actions should be developed regarding women's involvement in design, negotiation, maintenance and developing objectives for the scheme.

Most social obligations, events and beliefs are not only obligatory and unplanned but they can take up considerable time, and potentially disrupt production activities at critical or peak times. For example, as much as one week of productive time could be lost when there is a death in the community. This demonstrates that social issues could have considerable impact at the operational level. Such issues, which would seem peripheral to irrigation initiators, should be identified and actions defined to deal with them when they occur.

Members in both schemes considered land sizes of 1 to 5 ha per person as adequate for commercial irrigated agriculture. The scheme members did not perceive access to extra land as a constraint. However, the lands where the gardens are located belong to a section of the community and therefore local rules would come to play if further land acquisition was necessary. This study has found that one of the social factors that would affect allocation of the land to a few individuals on current land areas is that the original landowners reserve the right to deny relinquishing rights of their ancestral land to only a few individuals. Thus, social dynamics such as the tacit power of the original landowners, determine further land allocations. This may require designing for evolution i.e. dealing with land size at inception to allow for expansion when the need arises.

Low levels of education limit access to information and understanding of commercial farming concepts and development processes. The levels of education predominant in these schemes do not offer much leverage for farmers to operate in complex agricultural production systems. It was also found that the farmers do not have adequate technical expertise to operate a profit making crop production entity. For the majority of the members their main experience in crop production has been through trial and error and they do not possess all the skills required for commercial production such as irrigation scheduling, crop management and protection, financial management etc. This suggests that to be sustainable, there is a need to train the members specifically in commercial agriculture and impart knowledge on the basis of commercial farming. Extension support available was inadequate and unreliable to sustain a

commercial entity. This means that members could not depend on the extension services to provide production information timeously.

Scheme members perceive the current irrigation infrastructure satisfactory for their water needs, but this is based on their current production levels. Technological constraints such as lack of information and lack of understanding of operational and maintenance costs, pose limitations to irrigation development. There was no clear understanding of the maintenance and energy costs of the current irrigation infrastructure. The members confirmed that they require an irrigation system that they can easily maintain which makes the current infrastructure unsuitable. The members also suggested that provision of irrigation infrastructure should be coupled with acquisition of agriculture equipment. Making information available at the inception to the members so that they make informed choices regarding the type of technologies to be adopted would enhance irrigation development. It is also important that both men and women are involved in the design, training for maintenance and effective use of the system.

Regarding institutionalisation, the majority of scheme members at Ndaya would prefer to work on their own whereas the majority at Esiphongweni would prefer to work in a group. This discrepancy is probably due to the fact that at Ndaya, the scheme members are composed of people that are not related whereas at Esiphongweni most scheme members belong to the Zulu clan, which creates a level of trust. The majority of members do not want to be involved in the management of the scheme. Members felt that the responsibility for determining which crops to grow at the scheme should lie either with the Farm Manager or Extension Worker or the committee. This shows that there is high dependency on the prominent member (or on somebody with an elevated status) to make important production decisions. The results show that many members are willing to enjoy the benefits but lack confidence to take responsibility for important decisions. The study also found that where there is a level of trust such as at Esiphongweni, management decisions are taken collectively. In contrast, at Ndaya, management suffers because of lack of collective responsibility. Inexperience with group controlled irrigation, general level of mistrust and lack of assurance for sharing the costs and the benefits, limits the opportunities for organizing effective groups that take collective responsibility in the schemes. Setting up small groups of like-minded people would enhance potential.

The isolated loclity of the schemes generally restricts income generating and market opportunities. Because the schemes were established as a social entity, they were not developed with marketing in mind. Market access is further constrained by the lack of price information as well as high transportation and transaction costs.

There is limited possibility to turn the current investment into an opportunity since the overall cost and benefit makes little economic sense for rural communities. The costs of running the schemes are high. Under these circumstances, other non-agriculture investments that perform better could increasingly become attractive to the members. They may also consider it worthwhile to grow crops for subsistence only instead of investing time and resources for commercial production. In addition, considering the current production levels and the current socio-economic circumstances, the scheme members would not be able to maintain the infrastructure and sustain the scheme. For the scheme to be considered sustainable, a different set of conditions should prevail such as the identification of niche markets, high value crops, high management standards, disciplined financial and crop production management etc. Future development of irrigation schemes and sustainability of the current schemes would depend on improved returns on investment. The development of the schemes should always include an assessment of the potential returns to investment, and should also define the exact set of socio-economic conditions that should be considered to achieve the said returns.

**Recommendations for enhancing potential when setting up schemes in the future**

The general conclusion of the study is that many socio-economic factors influence the livelihoods of black developing communities. Whether the scheme was established as a social or commercial entity, communities will not stop the socio-economic activities that sustain their livelihoods. Irrigation development has to recognise this and setting up of irrigation schemes should primarily acknowledge the socio-economic circumstances of the user communities. It is therefore recommended that at the inception:

- The socio-economic aspects are identified and given primary consideration. Irrigation developments could define actions for dealing with such socio-economic issues as, the existing complex farming systems; the influence of gender, specifically the position of women; the impact of social obligations; land resources and access etc. The gravity of each of the aspects should be considered and actions to deal with these should be adopted immediately. This may require an investment in preparation of the farmers prior to setting up of irrigation schemes by allocating adequate time during planning.
- Full profile of the community should be done with the intent of harnessing support for site-specific objectives. This would also harness community demand. A participatory approach could be adopted to identify community offerings and define actions for encompassing and getting consensus around farmers' objectives.
- A complete system of support to deal with all factors at once is desirable other than identifying an individual or a couple of constraints and just dealing with those.
- Promoting a broad based strategy for crop production and agriculture production of which irrigation is a focal point is desirable.
- A feasibility study should be conducted at the outset of developing the irrigation schemes, giving indication of the available land resources and a long-term strategy for improvement and possible expansion when need arises.
- Targeting irrigation to small groups of people is more desirable as it raises the economic stakes at an individual level and increases the potential for success of the irrigation schemes. When the small group is well-equipped and well-educated group, the potential is even higher.
- Dealing with gender and population dynamics should occur at planning stage as a primary consideration.
- There needs to be a balance between achieving overall objectives of delivery and quick injection of money, and matching expectations and the rate at which the community develops.
- Adopt a strategy combining empowerment, awareness and capacity building and training to facilitate prospects for continued prosperity.

**Upgrading of Current Case Schemes**

Due to the low income margins, careful strategic interventions would be required to increase farm income opportunities for participants in the schemes. These could include the following options:

- The Esiphongweni scheme will benefit from the comprehensive agricultural support process currently adopted by the National Department of Agriculture, where as the Ndaya irrigation scheme will benefit by adopting a commodity approach and conducting a feasibility study to identify what commodities are suitable for the area. A second thrust could be to activate market needs for high value products such as exotic crops, medicinal crops, etc. For this option a focused Research and Development effort would be required. The approach should combine adapting production methods, use of high value crops, and appropriate institutional development such as extension support, marketing arrangements and information access. Coupling this with concrete action in addressing such socio-economic issues as gender biases, education and training, livelihoods, decision making, capacity building etc would enhance irrigation development
- Improved market access through the development of a localized central facility to reduce transportation costs. With the necessary market opportunity development, however, surplus production could be stimulated and profitably disposed of for cash income. This would clearly establish a more diverse farm business typology.
- "Low-cost production systems" should be promoted as the major thrust for the schemes. The sustainability of a low input cost strategy would also depend on whether government would provide the necessary resources for such a conversion to occur so that the irrigation system is cost effective.
- Management capacity: cost saving input supply, cooperative market development and new commodity development provide interesting opportunities. However, all these require business

management capacity and coordinated action. Substantial and expensive management support systems would be required to turn such a vision into reality.

**Recommendations for further research**

- Identify the potential land parcels that could be used as a focus for future commercial production oriented irrigation development in black developing communities and ascertain the demand for commercial irrigation.

- Evaluate the performance of the community group controlled schemes and other arrangements that are developing within black developing communities. This could include a synthesis of the procedures and guidelines from feasibility to planning to implementation of irrigation schemes that are community controlled.

- Simplified resource materials are required that identify the different irrigation technologies available, the advantages, disadvantages and implications of adopting a particular technology given the peoples socio-economic circumstances.

- There is a need for procedural guidelines for targeting women that are specific for group level irrigation development in black developing communities.

- As a further output of this study, it is suggested that a booklet should be prepared outlining the guidelines for identifying and defining action for consideration of socio-economic issues. This can be used as a field manual when conducting assessments for irrigation development in black developing communities.

**Achievement of objectives of the study and actions to be taken**

The study achieved its objectives. Using participatory methodology, the farming systems were investigated and therefore satisfied the first two objectives of the study. To identify institutional arrangements within the farming systems, the participatory assessment identified the general mechanisms and rules for social organisation such as rules for land control and access; rules for obtaining additional land resources; organization of groups for irrigation management and rules for conflict management. The target group was defined through direct questions that dealt with who in the community was the most interested in irrigated agriculture, and through general observations. The identification of steps for transformation of present farming systems and the preparation of an action plan were achieved through synthesis of the results. Strategic actions embracing objectives 4 and 5 were formulated and are given in sections 5.1 and 5.2 of Chapter 5. To achieve objective 6, guidelines and monitoring aspects were developed and are also given in Chapter 5. The guidelines are designed to assist with definition of actions for developing local institutions for water and management of schemes in developing communities; for targeting irrigation at community level and identifying and implementing a development path for rural communities for irrigation development. The final objective was to identify the human capacity development needs for running and managing sustainable irrigation farms. The investigation looked at the collective ability of the scheme members to manage the irrigation development. A synthesis of human capacity building requirements is given in sections 5.10 of Chapter 5.

**Capacity Building**

The research project provided an opportunity to provide exposure and build capacity of young black professionals in research methods. Four previously disadvantaged students benefited while working as technical staff for the project, namely: Mr Musa Funeka, B.Sc. Agric Honors student, University of Zululand; Ms Thable Mzimela, B.Sc Agric Honors student, University of Zululand; Ms Joyce Thamaga, University of Natal; Mr. Brian Mbatha of University of Natal. The participants were assisted through directed reading, one-on-one consultations, and group discussions. The main areas of focus were Farming Systems, Research Methodology, Basic Principles of Research, Community Participatory Methodology. The facilitators at the workshop were Dr. Theodore U. Ferguson (Knowledge and Globalisation, Farming Systems), Prof. Peter Ewang (Farming Systems) and Mr. Patrick Mbanjwa (Community Participatory Methodology). The technician participants used this training as a

springboard to move on to related areas of work mainly in government departments and parastatals. Most of them are working directly with communities and on socio-economic aspects.