

## SECTION A: RESEARCH BACKGROUND

### CHAPTER 1 INTRODUCTION

#### 1.1 Irrigation development in South Africa

In most of South Africa, conditions are dry and crops are subject to moisture deficits during part or all the growing season. Under such conditions, full or supplementary irrigation is an attractive technological approach to increase food and fibre production. At present, South Africa has an estimated 1,2 million ha of land under irrigation. On 33% of this total area, surface irrigation is practised. The rest is under overhead irrigation (55%) and micro-irrigation (12%). Full irrigation is practised on about  $\frac{3}{4}$  of the total land area (78%) supplementary irrigation on 14% and opportunistic irrigation on 8% (Bruwer and Van Heerden, 1995).

Irrigation was introduced to South Africa soon after the arrival of European settlers. Several small-scale irrigation projects were developed during the period 1652 to 1912. These projects were often part of town developments, and canals enabled plot owners to irrigate their gardens (Bruwer and Van Heerden, 1995).

From 1912 to the 1930s, development of irrigated land became more co-ordinated, and several large-scale irrigation projects were established, involving the erection of fairly large-scale dams (e.g. Great Fish scheme under the Lake Arthur and Grassridge dams). In many of these early schemes, water allocations were inadequate to practise full irrigation, and irrigators often failed to meet repayments of the infrastructure resulting in debts being written off by the state (Bruwer and Van Heerden, 1995).

The great depression of the 1930s caused by drought and a worldwide decline in the economy, gave rise to the "poor white" problem in South Africa. The 'poor white' grouping consisted mainly of unskilled people who had very little opportunity to find employment. The development of large-scale irrigation schemes was one of the ways in which the South Africa Government tried to address the "poor white" problem. Example of schemes developed during that period are Viooldrift, Boegoeberg, Ret river, Pongola Boskop and Vaalharts, (Bruwer and Van Heerden, 1995).

## 1.2 Relative Importance of Irrigation

Agricultural output in South Africa is greatly influenced by the inconsistencies in rainfall. Irrigation plays a vital role in stabilising production and facilitating the production of high-value crops. Although over 1% of the agricultural land is irrigated, the contribution to the gross domestic product is about 4.5%, of which an estimated 25% and 30% of gross agricultural production (Backeberg and Klopper, 1991). The same finding was supported by a study of the Department of Water Affairs and Forestry (1986).

Water is an essential factor in crop production. In areas where natural rainfall is not plentiful, irrigation water is often the base of production. As a matter of fact, irrigated agriculture is considered to be the best way to alleviate food shortages in Africa in general and in Sub-Saharan Africa in particular. Thus, the availability and cost of obtaining water for irrigation is of major economic concern.

Agricultural irrigation in South Africa represents close to 60% of the total water requirements resources (Backeberg and Oosthuizen, 1995). In South Africa, irrigation water is scarce and hence its efficient and optimal application is of paramount importance.

## 1.3 Small-scale farmer irrigation in South Africa

Small-scale farmer irrigation schemes in South Africa comprise approximately 46,000 ha or 4% of the total area irrigated. However, from a rural development and socio-economic point of view, such schemes are of cardinal importance, since more than 223,000 people are dependent, at least partially for a livelihood on small-scale farmer schemes. Despite huge investments the performance of most small-scale farmer irrigation schemes are beset by varying combinations of economic, institutional and social problems (Bembridge, 1986a).

A review of the limited literature available shows that with a few exceptions, the economic success of small-scale farmer irrigation schemes in South Africa falls far short of the expectations of planners, politicians, development agencies and the participants themselves ( Bembridge, 1986 a). And the existing small-scale farmer irrigation in South Africa conform to one of five types:

- **“Top down” bureaucratically managed smallholder schemes:** These are fully administrated by government. Practically all farming operations are carried out by the management on behalf of farmers. Usually, there is no selection of participation on the basis of farming ability. The majority of schemes in South Africa conform in varying degree to this category. Such projects have high recurrent costs and returns to farmers are only a fraction of recurrent costs.
- **There are a number of jointly managed schemes in which some functions are performed by the irrigation development agency, while others are the function of project participants.** Such schemes are usually aimed at eventually developing farmers to produce their own food and a surplus for sale. There is

also little selection of farmers on farming ability . This type of scheme is usually a large financial burden to the state.

- **Community schemes** are usually small in size, operated and maintained by the water users themselves and/or their representatives. There are relatively few such schemes.
- **State or corporation financed schemes**, such as sugar cane where farmer participants are selected on entrepreneurial and farming ability, as well as on their financial and other resources. Government provides infrastructure . Farmers pay a subsidised water charge and farmers are left to their own decision-making and management. Such schemes are rare in South Africa.
- There are a number of **large estate schemes**, which are state or private sector financed, often managed by agents aimed at maximum use of resources through production of high return cash crops such as tea, coffee and various fruit and vegetable crops. Although some schemes have a number of out growers on a pilot scheme basis, there is generally little farmer participation, except in the form of supervised labour.

#### 1.4 Background to the Current study

An important component of the South African agricultural policy is to increase income of the poorest groups in society through opportunities for small-scale farmers. The national agricultural policy (Ministry of agriculture & Land Affairs,1998) gives particular attention to small-scale agriculture with three strategic aims:

- making the sector more efficient and internationally competitive.
- supporting production and stimulating an increase in the number of new small-scale farmers and
- conserving agricultural natural resources.

Land reform involving the provision of access to a large number of landless South African households is a policy actively pursued by the present government. Providing rural households with access to agricultural land is one of the land reform strategies, which also lead to the alleviation of rural poverty. According to Lipton (1996), small-scale farming may be one of the only options available to South Africa to absorb the expected increase in the number of the local work seekers, whereby small-scale irrigation systems are considered best suited to the dry conditions prevailing in most of the country.

South Africa as stated above, is a land with a history of water shortage, which is one of the major problems facing South Africa particularly in view of the increasing population and expansion of industry. In the field of agriculture, this increases the need for a rational water utilisation and an efficient agricultural production. However, the settlement of small-scale farmers is a priority of the country therefore for

sustainability, success in terms of sound management and production efficiency is of major importance. This applies particularly to the irrigation schemes with particularly scarce and valuable resources.

Irrigation settlements in Nkomazi area of Mpumalanga are characterised by sugar cane yields that vary tremendously between the small producers. Some farmers are successful while others fail dismally. Identifying successful farmers and selecting the factors that have the potential of efficient production is likely to have a socio-economic benefit in the less developed areas and for future farmer settlement schemes.