

**Pro-poor value chain governance in the Mtateni irrigation scheme at  
Tugela Ferry, Msinga, KwaZulu-Natal**

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A minithesis submitted in partial fulfilment of the requirements for the degree of Magister  
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Institute for Poverty, Land and Agrarian Studies.  
Faculty of Economic and Management Sciences  
The logo of the University of the Western Cape, featuring a classical building facade with columns and a pediment, with the text 'UNIVERSITY of the WESTERN CAPE' below it.

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**Pro-poor value chain governance in the Mtateni irrigation scheme at Tugela Ferry,  
Msinga, KwaZulu-Natal**

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## **ABSTRACT**

### **Pro-poor value chain governance in the Mtateni irrigation scheme at Tugela Ferry, Msinga, KwaZulu-Natal**

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**MPhil in Poverty, Land and Agrarian Studies**

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This study explored value-chain governance in the Tugela Ferry Irrigation Scheme in KwaZulu-Natal, and presents data on input markets, vegetable production and output markets. Rural poverty is a major problem in post-apartheid South Africa, and smallholder agriculture has been identified by the Economic Development Department as a key component of its New Growth Path framework. Some scholars argue that since water is a scarce resource, irrigation farming should form a key focus of pro-poor land redistribution policy. The 1994 democratic dispensation saw the dismantling of the agricultural homeland parastatals which managed these schemes, causing them to collapse or near collapse. Yet they may have the potential to reduce rural poverty. While markets are key for viable production of fresh produce, some scholars assert that globally, input suppliers, food processors and supermarkets dominate the agro-food industry resulting in negative outcomes for smallholder producers. In South Africa, four major supermarkets (which together claim 55% of retail market share) were in the past located mainly in cities, but the trend now is that they are moving to small towns and townships. There are documented cases where pro-poor governance of fresh produce value chains has resulted in positive outcomes in South Africa. The re-governing markets concept which postulates that a multi-stakeholder approach to making the governance of agricultural value chains pro-poor, is offered as a solution to reducing poverty. This thesis argues that the incorporation of smallholder farmers into modern markets remains ineffective in dealing with poverty because it includes only a few smallholder farmers and those included face exclusion when they are exposed to harsh market conditions.

December 2013

## DECLARATION

I declare that *Pro-poor value chain governance in the Mtateni irrigation scheme at Tugela Ferry, Msinga, KwaZulu-Natal* is my own work, that it has not been submitted for any degree or examination in any other university, and that all the sources I have used or quoted have been indicated and acknowledged by complete references.

**Full name :** Thokozile Cynthia Buthelezi

**Date :** December 2013

**Signed:** .....



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## LIST OF ACRONYMS

ISRDP	Integrated Sustainable Rural Development Programme
NPC	National Development Commission
TFIS	Tugela Ferry Irrigation Scheme
KZN	KwaZulu-Natal
WB	World Bank
WDR	World Development Report
RDP	Reconstruction and Development Programme
IMT	Irrigation Management Transfer
GEAR	Growth Employment And Redistribution
FDI	Foreign Direct Investment
NGO	Non-Governmental Organisation
MVEPCO	Msinga Vegetable Producers Cooperative
IMF	International Monetary Fund
US	United States (of America)
EU	European Union
FFV	Fresh Fruit and Vegetable
FPMs	Fresh Produce Markets
AgriBEE	Agricultural Black Economic Empowerment
UK	United Kingdom
BMP	Best Management Practice
NPK	Nitrogen Phosphorus and Potassium

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# 1. CHAPTER 1: INTRODUCTION

## 1.1. Problem statement

Rural poverty is a major problem in post-apartheid South Africa, and smallholder agriculture has been identified by the Economic Development Department as a key component of its New Growth Path (NGP) framework. The NGP targets agricultural value chains as one of the key sectors in which efforts to support employment creation will be prioritised (NGP, 2011:26). This policy framework "... targets opportunities for 300 000 households in agricultural smallholder schemes plus 145 000 jobs in agroprocessing by 2020..." (ibid: 29). Core strategies to achieve these targets are set as practical measures and these include "Restructuring land reform to support smallholder schemes with comprehensive support around infrastructure, marketing, finance, extension services, etc." (NGP, 2011:29). Core actions in this regard are set as "Review land reform to ensure maximise creation of livelihoods through smallholder schemes based on stepped up integration with economic and social programmes;...strengthen AgriBEE support for rural coops;...address import pricing on farming inputs and improve logistics infrastructure; ...review processing and retail to improve markets for small producers." (NGP, 2011:72). In relation to 'Jobs Driver 5: Spatial Development', the employment target is described as measurable improvement in 500 000 household livelihoods, with the jobs identified in small-scale agriculture, core strategies including "... increased support for small-scale agriculture including community food gardens and support for marketing and service co-ops..." This is translated into 'core actions' as follows: "measures to upgrade existing smallholders through provision of infrastructure, marketing support, extension, financial services etc.; programme to step up support for community gardens, including urban and peri-urban sites;... support for rural marketing, consumer, service and financial co-operatives " (NGP, 2011:76). The NGP states that in order to achieve targets on the economy and employment creation, small and expanding firms, including small-scale farmers, are to be assisted via business incubators (ibid: 29).

The National Development Plan (NPC, 2011) similarly argues that smallholder agriculture can help generate 1million new jobs by 2030. The vision is that by 2030 rural communities will be supported by agriculture and agro-processing amongst other sectors (tourism, mining, fisheries). The better integration of rural areas of South Africa into the wider economy will

be achieved through successful land reform, job creation and poverty alleviation. In this regard the NPC proposes a differentiated programme of rural development which includes “agricultural development based on successful land reform, employment creation and strong environmental safeguards. To achieve this, irrigated agriculture and dryland production should be expanded, beginning with smallholder farmers where possible” (NPC, 2011:196). The NPC estimates that a total of 300 000 new jobs will come directly from agriculture if the livelihoods of 1 out of 10 of those accessing less than 0.5 hectare plots of land, are improved (NPC, 2011:199). The vegetable industry is perceived to have the potential to be the largest contributor to employment creation and improvement of livelihoods provided that the potential growth in vegetable demand in South Africa and the Southern African region is considered. Central to this demand is the establishment of access to rural markets (NPC, 2011:203).

Some scholars argue that irrigation farming should form a key focus of pro-poor land redistribution policy (Cousins, 2011, 2013), and point to the growing emphasis on expanding irrigation in policy documents such as the National Development Plan. However with regard to existing irrigated land in communal areas, a challenge posed by limited availability of land (plots) mean that policies that aim to support the emergence of small-scale commercial farmers out of smallholder farmers (“accumulation from below”) could be difficult to implement.

Some scholars who write on supermarkets and agro-food systems (e.g. Vermeulen *et al*, 2010; Emongor & Kirsten, 2009; Berdegué *et al*, 2008; Louw *et al*, 2008; Kaplinsky, 2000) and on agroecology and sustainable agriculture domain (e.g. Pretty 2009; Magdoff, 2007; Newton, 2004; Pimbert *et al*, 2001) are of the view that access to formal markets is key for viable production of fresh produce by smallholder farmers. However, such access is often difficult to achieve. Vermeulen *et al* (2008), for example, assert that globally, input suppliers, food processors and supermarkets dominate the agro-food industry, and these generally prefer to engage with large-scale commercial farmers. Can fresh produce value chains be governed (i.e. regulated by the state and other actors) in a manner that benefits smallholder farmers, who form part of the population of the rural poor?

In the national context, South Africa is dominated by four major supermarkets that together hold a 55% share of the retail market (Bienabe & Vermeulen, nd). This domination could

imply hampered competition resulting in a detrimental effect on smallholder producers. Initially these supermarkets were located mainly in cities. the trend now is that they are moving to small towns and townships, targeting low income consumers (Weatherspoon & Reardon, 2003). Key questions are thus whether or not smallholder farmers in either former homeland areas, or in land reform projects, can begin to supply these kinds of retail outlets, and what kinds of policies might support this objective?

There are a few documented cases where pro-poor governance of fresh produce value chains in South Africa has resulted in positive outcomes namely: tomatoes in Limpopo; vegetables for SPAR outlets in Thohoyandou and Giyani; and fruit and wine for the Thandi brand in the Western Cape (Berdegue *et al* 2008; Louw *et al*, 2008). Louw *et al* (2008) identified activities, such as farmer training, market coordination, logistical support, policy reform and access to credit and inputs, as critical success factors for smallholder participation in these value chains. Lessons from these experiences can be used to inform policy and programme design.

Some smallholders in South Africa produce fresh produce on plots located on smallholder irrigation schemes but the performance of these has been modest to date. The reasons for relatively poor performance include: poor infrastructure; limited knowledge of crop production among farmers; limited farmer participation in water management; ineffective extension and mechanisation services; lack of reliable markets and effective credit services; and the predominance of a 'subsistence orientation' (Bembridge, 2000; Modi *et al*, 2010; Denison & Manona, 2006; van Averbeké *et al*, 1998). At the same time, however, the positive impact of irrigated agriculture on homestead income has been observed in some cases (Bembridge, cited in Van Averbeké & Mohamed, nd).

This study explored the possibilities for pro-poor outcomes in one of the largest and most successful smallholder irrigation schemes in KwaZulu-Natal, the Tugela Ferry Irrigation Scheme (TFIS) otherwise referred to as 'Mtateni' by farmers. It investigated whether or not these fresh produce farmers are disadvantaged by the existing structure of input and output markets, the latter including supermarkets, and what interventions are required to improve the income for producers in a sustainable manner.

## 1.2. The Tugela Ferry Irrigation Scheme

### 1.2.1. Location and size

The Tugela Ferry Irrigation Scheme is situated in the Midlands region of KwaZulu-Natal (KZN) Province of South Africa. It is located in Msinga Local Municipality which is under the UMzinyathi District Municipality, and is 45 kilometres from Greytown and approximately 2 hours drive from Pietermaritzburg. The scheme is divided into seven blocks (Table 1).

**Table 1: Areas in hectares of irrigation blocks in Tugela Ferry irrigation scheme**

Block	1	2	3	4	5	6	7	Total
Area(ha)	50.2	125.3	50.7	135.2	117.8	153.5*	104.6	837.3

Source: Modi *et al* 2010.

The irrigation scheme falls under the jurisdiction of three chiefs (*amakhosi*), namely, Mthembu, Ngubane and Mabaso (Modi *et al*, 2010:264). Blocks One to Four are in chief Mthembu's territory. These four blocks are located in tribal wards (*izigodi*) known as Sijozini, Mbabane and Malomeni, each under the leadership of a headman (*Induna*) appointed by the chief. Block Five and Block Six are in chief Mabaso's area and Block Seven in chief Ngubane's area.

According to Cousins (2013:128) the scheme is one of the largest in KZN Province, covering an area of approximately 840 hectares of soils with high potential. Van Averbeke *et al*, (2011) report that this irrigation scheme is one of five gravity-fed irrigation schemes in the Province. EVN Africa (cited in Cousins, 2013) estimates that 540 hectares is under cultivation by an estimated 500 to 1000 farmers, whereas Modi *et al* (2010) notes that the scheme had an estimated total of 1500 plot holders. Cousins (2013:128) estimate this farmer population to make up a significant 15% of smallholder irrigation farmers in KZN. According to Tapela & Alcock (2009: 134), 767 hectares are under irrigation and "irrigated agriculture has become more central to many people in Msinga....contributing to livelihoods of an estimated two thousand five hundred (2500) households."

The nature of the infrastructure of the scheme (gravity-fed from a weir across the Thukela River) owes its character to its origins, which is far back in the late nineteenth century. According to Van Averbeke & Mohamed (2008), the general history of South African smallholder irrigation schemes dates back to the 1800's. Cousins (2013: 128) notes that the Tugela Ferry Irrigation Scheme (TFIS) was constructed by the Natal Native Trust between 1898 and 1902. The 1898 date was independently confirmed by two respondents in this study who mentioned that the system was established then. One respondent seemed to recall that some improvement was done to convert the muddy canals into concrete lined canals at some point during the system's existence.

Van Averbeke & Mohamed (2008) write of different eras in the development of the South African irrigation schemes. The first era is referred to as "the peasant and mission diversion scheme era" (Van Averbeke & Mohamed, 2008). The TFIS can be described as a 'peasant diversion scheme'. Van Averbeke & Mohamed note that many of the schemes that were developed during this era ceased to function by the end of the 19<sup>th</sup> century. Of interest is that the TFIS has continued to function from its inception to the present.

### **1.3. Policy contexts**

Historically, irrigation development in South Africa has always been influenced by politics, and this is true from the colonial era to the present (Van Averbeke & Mohamed, 2008). Development of new irrigation schemes occurred as a result of the implementation of economic policies which had aimed to commercialise smallholder agriculture, from the 1800's till the 1990's. According to these authors, this period includes three distinct eras of irrigation scheme development namely, the 'peasant, mission canal scheme' era, the smallholder era and the independent homeland era. The technology used to develop the so-called "peasant and mission diversion schemes" of the time was river diversion and most of these ceased to function by the end of the century. The second era was the "smallholder canal scheme" developments of the period 1930 to 1969, aimed at providing households in 'Bantu' areas with full livelihoods, and the key technologies of the time comprised of concrete weir diversion, gravity-fed surface irrigation and storage dams. The third era was the 'homeland' era dated 1970 to 1990, during which 15896 ha were developed with the aim to bring about modern schemes thus modernising agriculture. The key technology used was pressurised overhead irrigation schemes for both small and large schemes. Schemes were

diversified according to functions, namely: *estate farms* (meant for those seeking employment near home) which were large-scale and meant to be commercial in orientation; *commercial smallholder plots, also called mini-farms* (for full-time land-based livelihoods), with plots of between 5 to 12 ha; and *subsistence food plots* (for household consumption, to augment the food supply of homesteads that depended on pensions and remittances from migrant male family members), with plots of between 0.1 ha and 0.25 ha.

The 1994 democratic dispensation saw the new government prioritising policies to eradicate poverty and improve the quality of life of the rural masses, and new irrigation schemes were established, with a policy focus on food security at community or group level. The policy framework for rural development provided by the 1994 Reconstruction and Development Programme (RDP) lasted until 1996 (Francis, 2010). In relation to irrigation schemes, the RDP was influenced by an emerging international policy approach known as Irrigation Management Transfer (IMT), which involved the withdrawal of the state and the devolution of management responsibilities to farmers. The implementation of IMT resulted in the dismantling of parastatal management of the schemes, causing many of these schemes to collapse or come close to collapse (Francis, 2010). In 1996 the Growth Employment and Redistribution (GEAR) programme superseded the RDP as the guiding framework for national economic policy, with the overall objective of eradicating poverty through economic growth via attraction of foreign direct investment (FDI) (Francis, 2010). In Msinga, the Local Municipality prioritised the Tugela Ferry Irrigation Scheme (TFIS) for support under the Integrated Sustainable Rural Development Programme (ISRDP) of 2001.

The character of the Tugela Ferry scheme is well summarised by Aliber (2010:52) as involving “...a large number of very small plot-holders, little or no government assistance, little mechanisation, emerging lucrative marketing networks”. The reason for characterizing it as having ‘little or no government assistance’ could be that, unlike irrigation schemes in other provinces, no rehabilitation or revitalisation programme was administered on this scheme during the RDP or GEAR periods except for the provision of extension services (Mnkeni *et al*, 2010; Denison & Manona, 2006). In addition, there does not seem to have been much done to maintain the infrastructure (Mnkeni *et al*, 2010). In line with IMT, and structural adjustment policies more generally, I surmise that the brief of the extension services at Tugela Ferry must have been “to improve scheme management performance, to increase the profitability of irrigated agriculture and to reduce recurrent public spending on

operation and maintenance of the schemes (Shah *et al*, 2002; Vermillion, 1997, cited in Van Averbeke & Mohamed, 2008:6). With IMT aligned to GEAR the promise was “... to improve the lives of poor people by means of a process that empowered them to take control over their own resources and destiny” (van Averbeke & Mohamed, 2008: 6).

Some scholars (Fanadzo, 2012; Mnkeni *et al*, 2010; Denison & Manona, 2007) are critical of revitalisation interventions that focussed only on rehabilitation of the irrigation infrastructure, as implemented in Zanyokwe Irrigation Scheme amongst others. For a long time, dilapidated irrigation infrastructure was viewed as the single major cause of poor performance and the government invested huge sums of money in repairing infrastructure (Fanadzo, 2012, 1956). Revitalisation should have considered institutional and technical systems as other major constraints that needed remedying. A more holistic approach to revitalisation that remedied all identified constraining factors, namely, “weak or poor institutional and organisational arrangements, and lack of stable markets, poor crop management and dysfunctional irrigation infrastructure” is called for (Mnkeni *et al*, 2010:123). The TFIS was given such non-infrastructure support, as discussed below.

The Tugela Ferry Irrigation Scheme was subjected to an intervention by a non-governmental organisation (NGO). According to the secretary of the farmer’s organisation known as the Msinga Vegetable Producers Cooperative (MVEPCO), the idea was to set up a pack-house and a seedling nursery. An NGO by the name of AFRICARE was funded by the USA Department of Agriculture. The nursery operated for six months, whereas the pack-house was operational for only three months in 2003. The intervention was marked by disharmony amongst the stakeholders involved and the complete depletion of funds, leading to the withdrawal of the NGO.

Another intervention, from 2004 to 2008, was conducted as an action-research project led by a group of academic institutions namely, the University of KwaZulu-Natal, the University of Pretoria, the University of Fort Hare and Zakhe Agricultural Training Institute. The main objective of this project, “...was to carry out research in Zanyokwe and Tugela Ferry irrigation schemes with a view to develop and implement technologies and knowledge useful for farmers in order to improve their livelihoods and those of surrounding communities.” (Mnkeni *et al*, 2010: iii). The project was commissioned by the Water Research Commission and entitled “Best management practices for small scale subsistence farming on selected

irrigation schemes and surrounding areas through participatory adaptive research”. This title explains why the intervention followed a participatory model of development with a focus on addressing management constraints related to irrigation infrastructure, farming practice and marketing. According to an assessment of the impact of this intervention that was conducted during the last quarter of 2008 and the first quarter of 2009 - approximately three months after the intervention ended- the objectives were satisfactorily achieved, but sustained impact would depend upon the implementation of recommendations made by the research report. These recommendations added to the list of constraints, and called for strengthening of remedies.

#### **1.4. Rationale for research on smallholder irrigation**

Much is written about the performance of smallholder irrigation schemes in South Africa being modest at present. The reasons for low performance include: poor infrastructure; limited knowledge of crop production among farmers; limited farmer participation in water management; ineffective extension and mechanisation services; lack of reliable markets and effective credit services; and predominance of subsistence orientation. At the same time the positive impact of irrigated agriculture on homestead income has been observed (Bembridge, cited in Van Averbeke & Mohamed, nd).

A study (Modi *et al*, in Mnkeni *et al*, 2010) on Tugela Ferry Irrigation Scheme confirmed the modest performance of this scheme and pointed to constraints related to socio-economic factors amongst others. These included: lack of capital and stable markets; weak farmer organisation; lack of access to micro-finance; and farmers not producing as per market demand. The farmers were helped to understand, plan production for and access five different supermarkets. However, these gains were shortlived, as the achievements of 2009 could not be observed in 2010. This study seeks to garner information on the value chain dynamics at the Tugela Ferry scheme that could point to additional constraints.

Lack of reliable markets, one factor that undermines performance of smallholders, has been the focus of many scholars. The wider literature has suggested that incorporation of small holder farmers into formal markets could contribute to improving incomes of farmers, thereby reducing poverty (Emongor, 2008). However, such improvement depends on many factors, which can be grouped into environmental variables (government policy, competition

from other retailers and availability of products locally), the sourcing and procurement practices of supermarkets, and farmer-related variables (e.g. social capital, land and capital including irrigation infrastructure) determining access to such markets (*ibid*).

Of the analysts that have studied the TFIS, two (Modi *et al* 2010 in Mnkeni *et al*, 2010 and Cousins, 2013) have touched on production and marketing related constraints contributing to the performance of this particular scheme (elaborated on below). These studies, however, did not adopt a full value chain analysis approach to studying the scheme. This paper seeks to fill this gap.

A study to determine the success of farmers of the Tugela Ferry Irrigation Scheme was conducted by Cousins (2013). The study concluded that ‘accumulation from below’ as a policy thrust is limited in Tugela Ferry Irrigation Scheme context by two constraining factors, namely, the land tenure regime –with high levels of demand for plots not allowing access to more plots by would-be accumulators; and the fact that the output market supplied is rather undifferentiated, thus forcing producers to grow similar crop types. If successful performance is narrowly defined as the creation of commercial farmers (“accumulators”) out of smallholder farmers, then TFIS’s performance is modest and will remain so.

The key questions that arise are: what objectives should be pursued in government support for irrigation schemes like this one? Is smallholder inclusion into modern markets a panacea for poor smallholder farmers’ modest performance? A more relevant question is, what conditions would render fresh produce value chain governance pro-poor? This study explores these questions and based on its findings, the policy implications are drawn out.

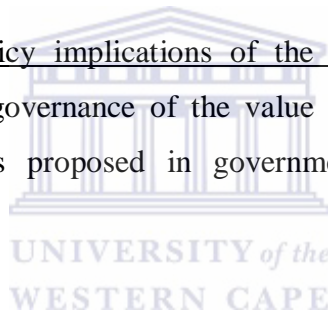
### **1.5. Scope of the study**

The overall objective of the study was to explore the current structure of fresh produce value chain at the Tugela Ferry Irrigation Scheme, and the constraints and opportunities that this structure presents to smallholder farmers. The possibility of improved governance of the value chain in order to ensure pro-poor outcomes was also investigated.

Specific research questions that the study sought to answer were:

1. What is the character of the production system at the Tugela Ferry irrigation scheme?<sup>1</sup>

2. What is the structure and character of the production inputs supply chain at the Tugela Ferry irrigation scheme? (The supply chain makes available seeds, seedlings, fertilizers, crop chemicals and equipment, plus land preparation. It involves a diverse set of role players and supply channels).
3. What is the structure and character of the wholesale and retail fresh produce markets supplied by smallholder farmers at the Tugela Ferry irrigation scheme? (The fresh produce market involves a variety of channels and role players, handling different volumes of produce at variable prices at different times of year)
4. What problems in relation to inputs supply and marketing are experienced by smallholder farmers at the Tugela Ferry irrigation scheme, and what solutions to these problems do the farmers, as well as other local actors such as extension officers and NGO staff members, propose to these problems?
5. What are the wider policy implications of the research findings, in relation to improved and pro-poor governance of the value chain and the goal of expanding smallholder opportunities proposed in government's New Growth Path policy document?



## **1.6. Research design and methods**

This is a small-scale exploratory study. No claims are made that its findings are valid generalisations, due to the lack of representativeness of the small sample of respondents, but they may be helpful in identifying some of the salient features of value chains in smallholder irrigation schemes that are explored in the study.

The research design involved the collection of both qualitative and quantitative data, as described below. The reason for this choice was that the aim was to obtain data on the opinions of farmers, input suppliers and crop buyers on certain issues as well as on farmers' economic performance, which would need computation of financial data. Qualitative data include responses to semi-structured questions that were asked in *isiZulu* and collected by means of methods such as handwritten notes and a voice recording machine. Data were available for analysis once the handwritten notes and voice records had been transcribed. Quantitative data were collected by means of methods such as a crop sheet with questions

about specific economic aspects of each crop. It allowed for manipulation of numbers to come to conclusions about the economic performance of each crop.

In this study, primary research involved a number of key informant interviews that were used to gather both qualitative and quantitative data. Semi-structured interviews were conducted with twelve (12) farmers, four (4) of whom were interviewed when testing the research instruments used in the study (Appendix 1). Slight changes were then made to the instrument to make it more relevant and useful, after which data collection was continued. Most of these farmers are located in Block Four of the scheme, with one in Block Seven. The aim was to describe the production methods and marketing strategies that farmers employ, as well as how they perceive their challenges and opportunities. A second group of respondents consisted of eight farmers from Blocks One, Two, Three and Four. These interviews were conducted by the author as part of a larger study undertaken by Cousins (2013)<sup>2</sup>. The aim was: to find out how the farmers were doing their farming; conditions under which they farmed; how they perceived the success of the scheme and problems they faced (Appendix 4). Thus a total of twenty farmers were interviewed for this study. An additional four farmers were interviewed to collect quantitative data on the economics of farming at Tugela Ferry (Appendix 5). The sample of farmers was randomly selected and it depended on availability of farmers during field visits. Farmers were visited in their plots and requested to give their cell numbers so that an interview could be scheduled.

Other key informants interviewed include seven (7) suppliers of farming inputs to irrigation farmers at Tugela Ferry. The objective here was to explore the structure and functioning of input markets and how they affect the production performance of farmers (Appendix 2). The sample of input suppliers was selected by getting farmers to tell which supplier they bought their inputs from. The farmer identified input suppliers were interviewed and asked to mention their competition. The sample was concluded when input suppliers could not mention new role-players.

Also interviewed were twelve (12) crop buyers, in order to explore the structure and functioning of fresh produce markets supplied by irrigation scheme members, and how these influence the agricultural and marketing practices of farmers (Appendix 3). Two supermarkets (local SPAR and Aheers Supermarket in Greytown), were included in the study. These two supermarkets were documented from interviews with farmers. Interviews were carried out with SPAR manager and Aheers fruit and vegetable manager. These key

informant interviews yielded information on supermarket dealings with the farmers. Other crop buyers included in the study were bakkie traders and street hawkers. The sample was selected by observation of crop buyers when they came to the farms to purchase produce. They were requested to give their cellular phone numbers so that interviews could be scheduled. Information collected from the interviews was used to categorise the crop buyers and data included: interviewee name; place of trade; type of clients; type of crops traded and vehicle ownership. The sample size was concluded when a new category could not be identified. Results revealed that there were 4 major categories of crop buyers namely, supermarkets, wholesaling bakkie traders, bakkie hawkers and street hawkers.

Four sets of semi-structured interview questionnaires were developed to collect qualitative data from farmers, input suppliers, and different kinds of crop buyers. Data from transcribed questionnaires were placed in a spreadsheet which allowed for a thematic analysis to be conducted. A crop sheet for collecting quantitative data from farmers was developed with a view to assess the economic performance of farmers on the scheme. The responses for each farmer and each crop were summarized in a spread sheet and a thematic analysis was undertaken.

### **1.7. Overview of the thesis**

The thesis is organised in six chapters. This is an introductory chapter that outlines the background and rationale of the study, the key questions it seeks to answer, and the research design and methods that were adopted. Chapter Two presents a literature review of debates on agricultural global value chains and of studies of irrigation schemes for smallholder farmers in South Africa. It discusses the key concepts and theories that informed the study. The third chapter presents key findings on the structure and character of the production inputs supply chain in the Tugela Ferry Irrigation Scheme. Chapter Four discusses four key issues related to the production system at the TFIS, namely: the character of the tenure system that is operational in the scheme; the character of the production system; problems experienced by farmers and the economics of vegetable production at the scheme. Chapter Five focuses on the wholesale and retail markets operating in the scheme, and in this regard discusses the character of crop buyers, the quantity and quantity of fresh produce traded, price setting mechanisms, and problems and potential solutions from both farmers' and buyers' perspectives. Chapter Six is a concluding chapter that summarises the research findings, draws some tentative general conclusions and highlights the wider policy implications of the findings.

## **2. CHAPTER 2: AGRO-FOOD VALUE CHAINS, SMALLHOLDER FARMERS, AND SMALLHOLDER IRRIGATION SCHEMES IN SOUTH AFRICA: A REVIEW OF THE LITERATURE**

### **2.1. Introduction**

This chapter reviews the literature on global agricultural value chains and how the governance of these chains impacts on smallholder producers, and thus on the problem of poverty. It further reviews the literature on smallholder irrigation schemes in South Africa and the constraints experienced by farmers on such schemes. Singled out in the chapter are the key concepts and theories which have informed this study.

### **2.2. Agricultural value chains and smallholder farmers**

#### **2.2.1. Globalisation, poverty and smallholder farmers**

Poverty is a social ill that has been observed by scholars to have existed amidst economic growth all over the world, over time. Poverty in the ‘developing world’ has been the main focus of the development discourse. Globalisation is one process that proponents thereof have suggested would address poverty generally, and in the ‘developing world’ in particular. In the developing world, deep rural poverty can be said to be one of the drivers of rapidly increasing rates of urbanisation; in other words, rural poverty often gives birth to urban poverty. The systemic displacement of the rural populations of the world over time has resulted in the urban sprawl that is so rampant in the world today, as evidenced by the huge urban slums of contemporary history (Weis, 2007).

According to Bairoch and Kozul-Wright (1996), the globalisation debate focuses on the question of whether or not it has delivered on the promise of economic development, characterised by strong economic growth and the rapid convergence of economies around the globe. These authors state that the strong globalisation thesis argues for “the liberalization of trade and the diminishing role of the state” (Bairoch and Kozul-Wright, 1996:26), as a basic requirement for the promise to be attained. But many authors argue that globalisation has *not*

delivered on its promise. Instead it has made matters worse, as evident in increasing inequality amongst countries and the continued poverty of the vast majority of the peoples of the world (Kaplinsky, 2000b).

It would seem that different global regimes have always tried to include smallholders in global markets. During the era of colonialism and the formation of a global capitalist economy, "...the making of colonial economies involved the breaking of pre-colonial modes of peasant subsistence" (Bernstein, 2010:43). This involved dispossessing the indigenous people of land in some regions (Latin America, North America, East, Central and Southern Africa) and non-dispossession in others (South Asia, West Africa and most part of Sub-Saharan Africa; see Bernstein, 2010:49). Where dispossession did not take place, export production was promoted via clearing of more land (as in parts of West Africa) forced commercialisation (South Asia), and encouraging farmers and pastoralists to enter the monetary economy as producers of agricultural commodities or as labour (Sub-Saharan Africa). Another group of African peasants took the initiative and voluntarily and successfully integrated themselves in export markets (Bernstein, 2010:51).

The end result was that the peasantry of the colonies was incorporated as producers of export commodities, as well as food staples for domestic and export markets. In this way the 'self-announced mission' of the colonial powers to bring civilisation in Africa and Asia included making the peoples of these continents participate in emerging global markets and the monetary economy. The post-independence era was seen by some as allowing the state to continue the 'civilising processes with the promise of economic growth under the ruling ideology of 'developmentalism' (Bernstein, 2010:59).

According to Bernstein (2010:73-75) there is a storyline to tell of agricultural modernisation during the 'developmentalism' era of the 1950's to 1970's. This author writes of state-led development that was sanctioned and supported by international financial institutions such as the World Bank (WB) and the International Monetary Fund (IMF). The modernisation of agriculture in the Third World was the aim, and policies aimed at achieving this were put in place. Agricultural policies included the promotion of Integrated Rural Development Programmes which had the aim of promoting a more productive agriculture. The intended outcome was deepened commodity relations which were to be achieved by smallholder development or large-scale farming, private or public.

According to the WB, aid donors, private agribusiness and many governments in the South, creating a more productive agriculture meant putting in place certain technical conditions (improved varieties, cultivation methods, greater fertilizer use, soft credit and technical advice to farmers through extension services), with many of these to be supplied by either the state or agri-business. This model of the ‘modernisation of agriculture’ involved greater integration of farmers (large and small) into global markets. The whole package included credit schemes, subsidies on fertilizer, facilitated marketing and upgraded physical infrastructure, and putting in place relevant institutions (cooperatives and parastatal agricultural agencies), with prices administered by the state for key commodities (Bernstein, 2010; Norberg-Hodge, 2000). This was how an export-led agriculture was conceptualised and promoted. Norberg-Hodge (2000:8) puts it clearly: ‘a Northern economic model based on industrial production, trade and economic growth, was systematically imposed throughout the Third World’.

The experience of overproduction of the North and its price-depressing element was imminent, but at the same time, this same model was proposed and adopted by the South. According to Weis (2007), over-production that followed the use of industrial agricultural methods in the US and EU depressed global market prices, and this made it impossible for poor farmers in the developing world to compete. The modernisation model put farmers in a ‘...precarious position with no leverage over the price they must pay, neither over the inputs and equipment, nor over the price they receive for their production, farmers are easily squeezed by profit-driven agribusiness’ (Norberg-Hodge, 2008:8).

What went wrong with the grand plan of ‘developmentalism’? According to Bernstein (2010), neoliberal globalisation was triggered by the recession of the 1970s. Silver and Arrighi (cited in Bernstein 2010:79) label the recession as a “deep capitalist crisis” which was reflective of world capitalism’s failure to deliver on the promise of developmentalism. The international labour and development-friendly regime of previous decades was replaced by a capital-friendly regime. In explaining neoliberal globalisation, Bernstein (2010:84) notes that it represents a particular ideology and political programme, which meant amongst other things that state-led development was to be set aside, resulting in a decline in government and aid funding for agricultural development, especially of small farmers. This author further notes that the emphasis on supplying the domestic market of ‘developmentalism’ was replaced by a focus on promoting export production of high-value commodities in horticulture, thus continuing the deepening of commodity relations, coupled with the removal of direct and indirect subsidies, especially for small farmers. He concludes that “...the impact of neoliberal

globalisation on farming tends to affect smaller and poorer farmers in the South negatively in many areas, generating new waves of de-agrarianisation or de-peasantisation.” (Bernstein, 2010:85).

A key question is thus: in the light of experience to date, should smallholder farmers be integrated into modern markets, in this era of supermarket and agro-processor driven agriculture, and if so, would this strategy help alleviate stubborn rural poverty and world hunger? As indicated before, the incorporation of smallholder farmers into markets is not a new concept in the rural development discourse, and in the past it disadvantaged a majority of them. The WB seems to have come full circle, through its World Development Report of 2008, advocating a notion of agro-food governance that will be ‘democratic’ in its approach and for the inclusion of smallholder farmers in the global food system, with the much needed support of the state in the form of agricultural investments (a prescription for African states) in order to create a good climate for investment. According to this development agenda, agribusiness is expected to engage in public-private initiatives and promote “agribusiness for development” (Amanor, 2009:248).

Amanor (2009) is sceptical of this smallholder agenda, as proposed by the WB, and is of the opinion that it represents an “agribusiness agenda”, since it serves the interests of the latter. The “agribusiness for development” model promotes the emergence of medium-scale farmers who can engage with agro-food chain buyers, thus excluding the majority of smallholders. The WB’s options for smallholders, in the light of the liberalisation of agriculture, are thus: farmers should respond to changes in markets by forming producer organisations in order to achieve the required economies of scale, and be more efficient in their production<sup>3</sup>; or move out of farming and into agricultural labour markets and the non-farm rural economy, as well as migrating out of the rural economy to seek employment elsewhere (WDR 2008:72).

Amanor (2009:260) is critical of the manner in which small farmers have been successfully included in modern markets, and refers to this as “the organization of narrow networks of producers integrated into agribusiness with support from agribusiness, donors, international NGO’s and government...”. Weis (2007:26) also questions the wisdom of small farmer incorporation into market relations and global market integration, given prospects of long-term global price declines and distorted competition. Norberg-Hodge (2000:8) and Weis (2007:24) raise the issue of farmers being squeezed by agribusiness, which has reduced farmers’ share of price of food in the food chain. Indeed, if “industrial” forms of agriculture

have led to overproduction in the North, with many farmers squeezed out of farming, then what will stop that trend from developing in the South? The WB seems to have anticipated most these concerns in its “emerging vision of agriculture”, except for the key issue of potential overproduction.

Extending the Bank’s argument on the heterogeneity of the rural world, Bernstein (2007:19) offers an alternative view to opponents of the “inclusion of smallholders”. Firstly, he suggests that class differentiation exists in farming, and tied to that is the fact that distinctions between labourers and employers, and farm income and non-farm income, are not so simple and are often blurred due to the fragmentation of rural “classes of labour” straddling different sectors as they diversify their livelihoods. Secondly, he argues that market-led policy interventions exacerbate existing forms of class differentiation and create new ones. He advises that class dynamics be acknowledged and investigated, and that the consequences of capitalist development must be anticipated. Thirdly, he argues that small farmer development policies will create only some winners Bernstein (2007:17), therefore we should cast aside the delusion of “win-win” solutions. According to Bernstein (2007:19) these acknowledgements may facilitate the formulation and implementation of policies “...with a greater likelihood of relative benefit to classes of labour, including those who combine or ‘straddle’ farming with other employment and self-employment”. This author acknowledges that “...it is difficult to see how this might be achieved without greater and more effective measures to ‘govern the market’” Bernstein (2007:19).

Acknowledging the hegemony of capitalism and working within it, seems the only viable option to many analysts, hence the prevalence of contemporary discourses of “pro-poor value chain governance” or “re-governing the markets”. But in order to govern markets for the benefit of smallholders and labourers, the existing governance of global food chains needs to be fully understood.

### ***2.2.2. Value chain governance and smallholder participation***

The prescriptions of the WB are based on observed dramatic changes in agriculture since its 1982 Report (WDR 2008:8), and in particular the emergence of dynamic new markets that are led by “private entrepreneurs in extensive value chains linking producers to consumers and including many entrepreneurial smallholders...”. In this context the WB suggests some redefined roles for the state, using its capacity and new forms of governance to engage

“strategically in public-private partnerships to promote competitiveness in the agribusiness sector and support the greater inclusion of smallholders and rural workers” (WDR, 2008:8).

According to the literature, the global trend is that modern markets have replaced traditional markets and this has happened very quickly with the outcome that many small scale producers have been excluded, escalating the problem of rural poverty (Reardon *et al*, 2003; Louw *et al*, 2007; Louw *et al* 2008a; Amanor, 2009; Challies, 2008). Many of these authors claim that the spread of modern, dynamic markets is reshaping the way that food supply chains are governed, and that small-scale agriculture has often not been able to adapt to these rapid changes. Relationships between farmers and value chain clients vary, but tend to revolve around the procurement and sourcing practices of buyers (retailers or processors). Buyers in retail chains impose standards that are not achievable by smallholder farmers, who are ill-prepared, leading to their exclusion from the value chain (Weatherspoon & Reardon, 2003; Berdegúe, Biénabe & Peppelenbos, 2008; Reardon *et al*, 2003).

Amanor (2009:254) points out that these supermarkets outsource production, and specialise in marketing and the organisation of supply chains. He describes supermarkets as being oligopolistic by nature and reliant on information technology to compete for consumers, in the process raising entry barriers through the scale of their marketing. Amanor refers to bullying tactics by supermarkets, which include forcing farmers and suppliers to absorb costs related to promotions and thus selling below cost; requiring suppliers to absorb costs of special packaging, bar-code changes and advertising; requiring suppliers to source goods and services from designated companies and ordering a surplus from a supplier at a predetermined price which is then sold at a higher price to the consumer. In addition, terms of payment tend to be in favour of supermarkets, allowing late payments to suppliers. Another point raised by this author is that large manufacturing companies are reported to have accused supermarkets of imposing their retailing power by enforcing price concessions. This is equated to blackmail by these companies (Amanor, 2009:254).

The literature stresses the importance of a good understanding of the current global value chain structure, if the desire is to restructure the value chains to be inclusive of small scale farmers, because identification of possible points of entry is made easier. To begin with it is helpful to start by mapping all functions of the value chain, then identifying the key actors and how they relate to one another (Vermeulen *et al*, 2008). It is noted by these authors that

globally, input suppliers, food processors and supermarkets dominate the agri-food industry and as such they are key role-players in value chains.

The *input* market with regards to seed and protection chemicals, is dominated by a few transnational corporations, namely Bayer, BASF, Dow, Du Pont, Monsanto and Syngenta. Dinham (cited in Pimbert *et al* 2001) observed that concentration in the input industry proceeded rapidly in the 1990's such that six companies controlled 80% of pesticide sales by 2001, compared to twelve in 1994.

Similarly, *agro-processing* is concentrated in eight multinationals, with the big three named as Unilever, Phillip Morris and Nestlé. Downstream of farming, the value chain is characterised by “the increasing dominance of massive, corporate connections between farmers and consumers in the chain, from processors and distributors like Altria, Nestle, ConAgra and Archer Daniels Midland to retailers ranging from Wal-Mart to McDonald's” (Weis, 2008). In relation to *retail*, three global retailers that have consolidated enormously since 1992 are, Carrefour, Ahold, and Walmart (Pimbert *et al*, 2001).

At a national level, the output market in South Africa is dominated by four major supermarkets who together claim a large proportion of retail market share, namely, Woolworths, Spar, Pick and Pay and Shoprite/Checkers (Emongor, 2008:43). Emongor's study revealed that by 2007 the retail market share of these big four had grown to 70%. Whilst initially these were located mainly in cities, the trend now is that Shoprite/Checkers and Pick and Pay in particular are moving to small towns and townships, thus targetting low income groups of consumers (Weatherspoon & Reardon, 2003; Emongor, 2008:45).

In South Africa, Shoprite/Checkers and Pick and Pay are singled out as examples of retail chains that use a combination of approaches to procure their fresh produce, namely, their own distribution centres, together with contracts with growers; they also source from formal fresh produce markets (FPMs) (Weatherspoon & Reardon 2003).

The high degree of concentration in these value chains has been described in terms of a figure shaped like an hour glass, with many producers, few retailers and many consumers (Pimbert *et al*, 2001:10). High levels of sophistication, global coverage and vertical integration are characteristic of procurement systems in modern agro-food markets.

Concentration brings with it market power. Within the current structure, retailers hold high levels of market power, and this has major implications for policies on smallholder inclusion in these value chains, because those holding power determine value chain governance.

Power-plays by key roleplayers are well documented in global as well as regional markets (Emongor and Kirsten, 2009). When the retailers shift the costs of meeting quality standards to their suppliers, the latter feel the pinch and are often squeezed to the point of exit, as was the case of Zambia's 'baby vegetable' and tomato industry (Emongor & Kirsten, 2009). According to these authors, small-scale farmers in Botswana and Zambia with the ability to produce individually and in groups (co-operatives) were able to supply supermarkets in the fresh fruit and vegetable (FFV) value chain. Supermarkets sourced fresh produce from local and international suppliers, and from both large and small-scale farmers who supplied them in terms of verbal contracts. In Zambia, supermarkets preferred to deal with farmers on a one-to-one basis rather than with the co-operative. The dualism created by such preferences was characterised as follows: a small number of small-scale farmers supplied the supermarkets to the exclusion of the majority of farmers.

According to Emongor (2008), the included minority of farmers were characterised by the use of more resources (hired labour, chemical inputs) and were therefore 'commercially-oriented', whereas the majority were 'subsistence-oriented'. As supermarkets change their procurement systems from decentralised to centralised systems there comes a "need for increasing technological, managerial, organisational and financial changes" which suppliers must comply with (Emongor, 2008:75). This move, according to Emongor (2008), is brought about by market pressures, with supermarkets prompted to increase their market share. This author suggests that these practices may become too costly for smallholder producers resulting in many falling out of the supply chain. A case in point is that of Shoprite which "...completed its centralisation of its fresh fruit and vegetable (FFV) supply chain in Zambia in 2005" (Emongor, 2008:74).

This finding resonates with Chikazunga's (2013) study in Limpopo, which revealed that formal markets were not popular among smallholder farmers and as a result there was a low participation by farmers in such markets. Greenberg & Paradza (2013: 59) note that when retailers are faced with intense competition "...they may use tactics to squeeze suppliers, some of which is evident in South Africa." These authors suggest that tactics used by retailers include focussing primarily on price to the exclusion of long-term relationship building.

Consumer demands for high levels of food safety have also been used to exclude small farmers. This was the case for French beans produced in Kenya for British retailers, where smallholders were replaced by a few, large, well-capitalised, white-run export firms and smallholders' market share dropped from 75% (1992) of the business to 30% (1998) (Friedberg, 2003:9).

A business model with apparent potential to support smallholders is reported in the case of jatropha production in Mali. In this case, 4000 small-scale farmers have a good working relationship with a processor who produces biodiesel. The Netherlands government-owned company buys jatropha from farmers, and farmers own 20% of the firm through a union. The company controls the carbon credit income; in 2007 around 75% of this had been used to provide technical assistance to farmers. The processor is the key player in the value chain because it is the only buyer (Vermeulen & Cotula 2010).

Key dynamics revolve around the ownership of processing facilities, retailer requirements, and technical services attached to production and/or processing. The structure of these segments of the value chain tend to determine power relations, meaning that if the buyer is the only one in the market then the buyer dictates the terms of governance. Guo *et al* (cited in Vermeulen & Cotula 2010:48) assert that if there is insufficient “competition among contracting firms, informed farmers and rule of law” it may lead to domination of smallholder farmers. The sourcing and procurement practices used by supermarkets are a major concern as they might stifle local agricultural development if sourced produce is not from local producers (Emongor, 2008:79). This author concurs with Guo *et al* (cited above) that mechanisms to reduce transaction costs could include “contracting, farmers' groups and government intervention by setting efficient regulatory institutions”.

### ***2.2.3. South African experiences of successful inclusion of smallholder farmers in value chains***

Louw *et al* (2008c) declare that there are alternative market options open to smallholder farmers in South Africa, including informal markets, greengrocer shops, fresh produce markets (FPMs) and independent franchise stores such as SPAR. These authors offer a list of ingredients for successful inclusion of smallholder farmers in value chains, and suggest a multi-stakeholder approach. The authors argue that South African businesses need to re-think their business models, which should incorporate developmental goals whilst also pursuing

profit. They further advise that business needs to be open to the establishment of mutually beneficial partnerships, such as contract farming and mentorship arrangements. The formation and strengthening of producer or farmer associations to market and process produce is recommended, in order to reduce transaction costs and enhance negotiating power. The involvement of government and agribusiness is vital. These authors identify several critically important activities (farmer training, market co-ordination, logistical support, policy reform and access to credit and inputs), underpinned by an attitudinal shift to trust, and the commitment of all stakeholders in the industry. The multi-stakeholder approach suggests that stakeholders must be inclusive of the public and private sectors, civil society represented by the NGO community, and farmers. The overall objective should be to develop the resilience of small-scale producers/farmers via enhancement of their adaptability to dynamic change.

#### *The tomato value chain in Limpopo and Mpumalanga*

Several successful cases of smallholder inclusion in agro-food value chains provide useful lessons. Louw *et al* (2008c) cite a case study of the tomato value chain in South Africa. The processing segment of the tomato value chain in South Africa displays healthy competition between different actors. Producers are growing tomatoes in Limpopo and Mpumalanga provinces of South Africa. There are many tomato processors led by Tiger Brands and Giant Foods. Hawkers compete with processors for the supply of tomatoes.

Here, Giant Foods buys 60% of tomatoes from smallholders in the radius of 300 km from their processing plant. Farmers have growing contracts based on agreed tonnage, with no input provision. Pesticide residues are tested in the lab and visual checking of produce is undertaken on delivery, in terms of the quality accreditation system used. Farmers had self-administered standards before Giant Foods came into the picture. Tiger Brands involves several stakeholders in a partnership between a donor, an NGO and themselves. Farmers have agreed to growing contracts which enable them to secure credit from local banks. Farmers are supplied with inputs and finance and Tiger Brands provide technical support to ensure the flow of tomatoes. Positive outcomes include: farmers have been enabled to improve the quality of their produce and compete with large-scale farmers, plus this arrangement offers a guaranteed market. This positive account must be weighed against that provided by another author, whose study of the same case revealed that there was a low participation of smallholder farmers in these kinds of markets (Chikazunga, 2013:16). This study further

showed that many smallholder farmers preferred a market channel that was ‘traditional’ (i.e. supplying traders and hawkers) as opposed to ‘modern’ (i.e. supplying agro-processors, supermarkets and Fresh Produce Markets). The reasons for this preference are that the traditional channels are more conducive as they have fewer demands on farmers, and farmers selling to these traditional channels make higher incomes than farmers selling to modern markets (Chikazunga, 2013:21).

#### *Assorted vegetables value chain: SPAR Thohoyandou and SPAR Giyani*

The franchised nature of SPAR is such that independent retailers are allowed to procure from outside distribution centres at their discretion (Louw *et al*, in Louw *et al* (2008c)). The SPAR group has a strategy of high-level community involvement. Informal but ‘official’ quality standards are adhered to via visual inspection on arrival of produce. The two supermarkets in Thohoyandou and Giyani differ in their achievements regarding involvement of smallholder farmers, although they were procuring from approximately the same number of smallholder farmers (14 and 15 respectively), at some point. Thohoyandou SPAR started big with 23 farmers supplying them, but this shrank to 15 over time (Jacobs, 2009). Giyani started with six farmers and gradually built numbers to 14 (Louw *et al*, 2008c). While the range of vegetables was limited to cabbage and spinach in the case of Thohoyandou, it was wider for the Giyani store, and included butternuts, tomatoes, carrots, beetroot and green onions. Delivery requirements were reported to be fulfilled by farmers in both cases, while delivery schedules varied among farmers and the store reserved the right to refuse produce in cases of oversupply. The Giyani store maintained a closer relationship with farmers by providing *technical assistance*, flexible and interest-free *production loans* and *input purchase*, with farmers having a say in the determination of *time frames* for payment. In the case of Thohoyandou, technical assistance was later withdrawn (Jacobs, 2009). Although the total number of farmers in the area is not known, it is worth noting that the number of 15 small farmers included in these value chains remains very small.

#### *Fruit and wine value chain: Thandi Fruit*

The business model adopted by Thandi Fruit, an exporting company, is cited as a success story by Berdegue *et al* (2008) and Louw *et al* (2008c). In this case the positive outcome is

the benefit that accrues to the farm workers and their families who are included as landowners and shareholders in the Thandi brand. This business model proved to be successful for a good ten years in domestic and international markets despite a trade regime that was skewed and competition that was unforgiving.

A partnership between workers, growers and processors and marketers of fruit and wine made this model a success for all involved. Workers from seven fruit growers, who joined together as suppliers of fruit to the export company Capespan, are involved, as are workers on three grape farms who also joined in to supply grapes for wine making. Businesses that bought in as processors include three wine cellars and a marketing company.

In addition, the South African government policy on AgriBEE, and the involvement of a UK government department played equally important roles. The AgriBEE policy required that 25% of ownership should be in the hands of blacks by 2010, and 35% by 2014, hence the efforts to incorporate workers into these businesses. The UK's Department of International Development offered to match every cent that the company of wine makers spent on marketing products in the UK.

In conclusion, key issues identified in the literature review that have informed this study include the fact that modern agro-food value chains are structured such that key role-players hold market power that enables them to exclude smallholder producers, thus exacerbating instead of alleviating poverty in the rural landscape.

Agricultural value chains must therefore be “re-governed” to make them pro-poor, and public-private partnerships have great potential. The “re-governing markets” concept postulates that an understanding of the nature and structure of the value chain makes it possible to identify potential segments suitable for smallholder inclusion and that public policy, agribusiness, civil society and organised smallholder producers have a role to change the governance of value chains to be smallholder friendly.

### **2.3. Irrigation schemes for smallholder farmers in South Africa**

As noted in Chapter One, smallholder irrigation is currently seen by policy makers as a key potential source of employment and income in rural areas. However the current performance of smallholder irrigation schemes in South Africa is modest, the reasons being: poor infrastructure; limited knowledge of crop production among farmers; limited farmer

participation in water management; ineffective extension and mechanisation services; lack of reliable markets and effective credit services; and predominance of subsistence orientation (Mnkeni *et al*, 2010; Gomo, 2010; Denison & Manona, 2006; Perret *et al*, 2003; Perret, 2002; Bembridge, 2000). This is in line with the World Bank's view, as cited by Bembridge (2000:1), that the performance of small-farmer irrigation system has been below expectations, thus discouraging investment. Note that the expectations were of high economic and financial returns.

Nevertheless, several studies report a positive impact of irrigated agriculture on rural household income. The contribution of agriculture to income in households engaged in irrigated farming compared to those engaged in dryland farming was found to be 30% against 6% to 12%, in a study of the Dzindi scheme, and 24% in the Tshiombo irrigation scheme (Lahiff, 2000, cited in Van Averbeke and Mohamed, 2008). Even though farming is of minor importance as a source of cash income, relatively speaking, plottolders value their plots as an asset to use in times of need.

Lack of or ineffective institutions regulating, land markets, water distribution and infrastructure maintenance is a challenge in many schemes. Plottolder succession and livelihood diversification are factors contributing to some of these challenges (Letsoalo and Van Averbeke 2006c cited in Van Averbeke and Mohamed, 2008). Rising costs of mechanised land preparation is another challenge to poor plot holders, who make additional, land available to better-off farmers, who can exchange the costs of land preparation for access to land. Land preparation using animal draught was found to be a cheaper option but one not exploited by most farmers. Neglected also is integration of crop and animal production (Van Averbeke and Mohamed, 2008).

A study undertaken in KwaZulu-Natal, in two regions where agriculture is mostly rain-fed and some irrigation schemes use gravitational methods to grow vegetables, reiterates the common problems faced by small farmers: limited access to factors of production, credit and information and markets for land and produce (Ortmann & King, 2007). With regard to land markets, property rights are seen by these authors as a problem under the tribal authority system of plot administration, since it makes it impossible to secure credit using land as collateral, and farmers are unwilling to invest on land where their tenure is not secured. Output markets access is inhibited by high transaction costs due to low levels of education and lack of physical infrastructure including telecommunications.

Marketing is often identified as a major challenge in smallholder irrigation schemes, and it is sometimes argued that farmers stand to benefit more if they co-operate in order to achieve economies of scale (Van Averbeké & Mohamed, 2011:16). These authors suggest a number of different output markets where farmer co-operation would yield benefits such as: markets for bulk commodities; markets attached to farmer support programmes e.g. sugar cane; production contracts meant to secure required threshold levels; and produce markets in distant metropolitan areas where indigenous foods are not available.

Magingxa & Kamara (2003) describe the diverse tactics used by farmers to access markets as: farm gate sales to hawkers, traders and local consumers; semi-active marketing which involves accessing markets from long distances; organised transportation and active sales to potential long distance markets; as well as contract farming.

Smallholder farmers are often in a disadvantaged position when it comes to marketing. The constraints are well summed up by Magingxa & Kamara (2003) as follows:

Many do not well understand the market, how it works and why prices fluctuate; they have little or no information on market conditions and prices; they are not organized collectively; and they have no experience of market negotiation... Smallholder farmers in Sub-Saharan Africa face a range of marketing and exchange problems, among which informational constraints are high on the list. Producers experience a weak bargaining position *vis-à-vis* traders because often they do not have timely access to salient and accurate information on prices, locations of effective demand, preferred quality characteristics of horticultural produce, nor on alternative marketing channels... In addition, most of the literature related to smallholder agricultural marketing... reiterates that the problem of market access is linked to the following constraints: price risk and uncertainty, difficulties of contract enforcement, insufficient numbers of middlemen, cost of putting small dispersed quantities of produce together, inability to meet standards. Other compounding problems relate to physical market access like physical infrastructure –roads, market facilities, power and electricity. (Magingxa & Kamara, 2003:6)

To overcome these problems, these authors suggest “...cooperatives, collective marketing associations, and other mutual alliances to increase their buying and selling power in the market place.” In some instances, large commercial farmer cooperation was secured resulting

in mutually beneficial alliances and supply of produce at agreed prices. Other innovations recommended include a rural assembly point system and vertical integration into the value chain of some firms (Magingxa & Kamara, 2003:6).

In relation to the high costs of purchased inputs, an emerging view in the international literature is that high levels of agro-chemical inputs should be reduced due to their observed negative impacts on society and the environment (IAASTD, 2008; Weis, 2008; McMichael, 2007). Weis (2008), for example, is highly critical of agro-industrial monocultures and their dependence on synthetic fertilizers. This author writes that the use of fertilizers has grown by a factor of 10 whilst global grain yields per hectare grew by a factor of only 2.4 between 1950 and 1990. He further claims that farmers in Canada are trapped in debt and bankruptcies. Looking closer to home, the study on Dzindi irrigation scheme revealed that farmers' perception of commercial farming was that it involved employing full-time workers, agro-chemical inputs and tractor use (Van Averbeke & Mohamed, 2006:150). The thinking that equates commercial production with the current agro-chemical regime is increasingly under challenge.

According to Mkhabela (2005), the South African government launched agricultural development programmes which include subsidy schemes for seed and seedlings, fertilizers, and extension services. This developmental programme was implemented in the Tugela Ferry irrigation scheme (the subject of this study). The aim was to reverse a perceived decline of productivity over past decades (Mkhabela, 2005).

The Tugela Ferry Irrigation scheme has been given attention in the past decade as evidenced by a number of attempted interventions. This irrigation scheme is reasonably researched and interventions were implemented to mitigate some of the input and output market related challenges, such as the pack-house described in Chapter One. Subsequent to the failure of those interventions, a group of academics forged an alliance and implemented what it called a "best management practice" programme (BMP) on the scheme (Modi *et al*, 2010).

The BMP-approach intervention was embarked upon based on two assumptions firstly, that the scheme was underperforming due to low productivity and secondly, that the best route to farmer's success is to incorporate them into formal markets. The action-research programme was structured to look into the possible causes of low productivity. The study identified four key constraints: weak or poor institutional arrangements (related to governance of the

scheme); lack of stable markets and capital; dysfunctional irrigation infrastructure; and poor crop management.

Concerning the first constraint (institutional arrangements), action-research findings revealed that farmer associations and their umbrella body were malfunctioning. It became apparent that too much was expected of the farmer organisation in the form of the Msinga Vegetable Producer's cooperative (MVEPCO), because it was expected to take responsibility for infrastructure management, farming management and marketing management. Strengthening institutional arrangements would involve the revival of MVEPCO to continue being the umbrella body and focus on dealing with farming and marketing related issues. MVEPCO was expected to organise markets for various products, purchase inputs and solve problems experienced by primary co-operatives.

Regarding the lack of stable markets, the study revealed that production was not informed by demand and quality standards as set by formal market buyers. The remedy administered was capacity-building workshops through which farmers were made to appreciate five aspects namely, market-linked crop production; careful planning of production to ensure regular supplies and avoid surpluses; grading and good produce quality in achieving good prices and regular sales; knowledge of alternative marketing channels and lastly, market information including times of the year when produce fetch high prices. Poor crop management was given attention by putting an emphasis on improving productivity in order to meet requirements of those markets yet to be developed or secured.

In conclusion, some key findings from the literature help us to understand constraints on the performance of smallholder irrigation schemes. These include the high and rising costs of purchased inputs and mechanised land preparation, which are partly responsible for the unprofitability of smallholder farmers' enterprises. Smallholder farmers have a challenge in performing the marketing function of their business enterprise. Inhibiting output market access are: lack of collective action; high transaction costs due to low levels of education and lack of market-related physical infrastructure; informational constraints; price risk and difficulties of contract enforcement; and insufficient number of middlemen and inability to meet standards.

## **2.4. Key concepts and theories used in this study**

Key theories informing this study include the notion of an ‘agro-food value chain’, and associated procurement systems which are highly sophisticated, operating at a global level and vertically integrated in organisation, leading to high concentration, and high levels of market power that enables them to exclude smallholder producers. The input market is dominated by a few transnational corporations, namely Bayer, BASF, Dow, Du Pont, Monsanto and Syngenta. In the current structure, retailers hold high levels of market power and this has major implications for policy on smallholder inclusion in these value chains, because those holding power tend to dominate value chain governance.

The notion of “re-governing markets” is another useful concept, suggesting multi-stakeholder partnerships that might include agribusiness, government, civil society as represented by NGOs, and smallholder farmers’ organisations. With a common vision of developing the resilience of small-scale producers via enhancement of their adaptability to dynamic change, value chains can be rendered “pro-poor” in their governance.

## **2.5. Conclusion**

This chapter discussed the literature on globalisation and the integration of smallholder farmers into global markets, and emphasised the common conclusion by scholars that globalisation has not delivered on the promise of economic development and poverty alleviation via smallholder inclusion. The debate on smallholder inclusion in modern markets was summarised, with proponents advocating for a state interventions, in partnership with private business and civil society, aimed at making governance of the value chains ‘pro-poor’ in character. The opponents of this view are wary of such inclusion, contending that it usually involves the incorporation of only a few smallholder producers and the exclusion of many. In addition, those smallholder farmers who are incorporated face the risk of being squeezed out of the market as time goes on, given prospects of long-term global price declines and reduced levels of competition.

There are, however, a number of documented business models that appear to benefit smallholders. The often-cited South African case studies include the Limpopo tomato value chain, the vegetable value chain with SPAR as a key role-player in Thohoyandou and Giyani, plus a fruit and wine value chain, the Thandi Fruit model.

Many scholars concur that smallholder irrigation schemes in South Africa are underperforming, relative to their potential. Common constraints listed by analysts include

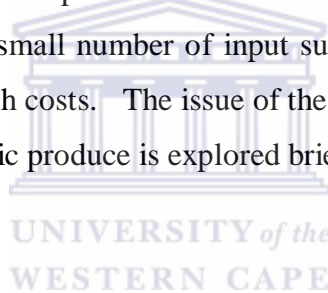
high costs of production and inadequate infrastructure for the distribution of produce. Some constraints are related to limited access to input markets and output markets. There is consensus that there is potential for these schemes to alleviate rural poverty if these constraints can be addressed.



### **3. CHAPTER 3: THE STRUCTURE AND CHARACTER OF THE PRODUCTION INPUTS SUPPLY CHAIN AT THE TUGELA FERRY IRRIGATION SCHEME**

#### **3.1. Introduction**

This chapter discusses empirical evidence on the structure and character of the production inputs supply component of the fresh produce value chain found at Tugela Ferry Irrigation Scheme. Two major categories of purchased production inputs are discussed in depth, namely seedlings supply, and ‘other’ purchased inputs such as fertilizers and crop chemicals. Inputs which can be classified as ‘services’ include tractor ploughing services and the hire of labour, are discussed as well. This chapter explores whether or not the fresh produce value chain in Tugela Ferry is dominated by a small number of input suppliers, making inputs difficult to access by farmers due to their high costs. The issue of the availability of alternative kinds of farming inputs required for organic produce is explored briefly.



#### **3.2. Seedlings supply**

Vegetable seedlings are one of the most important external inputs required by farmers at Tugela Ferry, because these high value crops have the potential to generate cash, and it is therefore important to ensure that healthy seedlings of high yielding varieties are planted. A wide range of vegetable types and varieties of seedlings is available among the four seedling suppliers, but Tugela Ferry farmers buy mainly tomatoes and cabbages.

In order to determine the main role-players in the seedlings market, the farmers as buyers were interviewed first to identify their suppliers, who could then be interviewed. Fifty percent (50%) of farmers, most of whom are from Block Four of the scheme, indicated that they buy seedlings from a company by the name of Top Crop Nursery when they buy as a group and their orders are delivered in bulk, but that when they purchase seedlings as individuals they often buy from another company known as Sunshine Seedling Services (see Plate1).



**Plate 1: Sunshine Seedling Services Representative**

The farmers encounter the challenge of having to fetch their purchased seedlings from RTS, an outlet located in Greytown which is another supplier of agricultural inputs that specifically targets small scale farmers and gardeners (see Plate 2). Sunshine Seedlings Services has an arrangement with RTS around the fetching of seedlings by farmers. A third supplier is Sizanani Nursery, the contact details of which were provided by farmers in Block Three. Top Crop Nursery and Sunshine Seedlings are close to Pietermaritzburg, and Sizanani is in New Hanover, about 10 kms from Greytown. When these suppliers were asked about their competition, they mentioned each other. An additional seedling supplier and two ‘other’ inputs suppliers were named as CPS Seedlings, Union Cooperative in Dalton, which has commercial farmers as its members, and HygroTech in Pietermaritzburg.



**Plate 2: Sunshine Seedling Services and RTS**

Three seedlings suppliers in this region supply commercial farmers as well as smallholder farmers in irrigation schemes. Seedlings are bought from these three suppliers by commercial farmers in Dundee, Empangeni, Pietermaritzburg, Tola Valley, Midlands, Howick, Weenen and Muden. CPS Seedlings (see Plate 3), which is not supplying the Tugela Ferry Irrigation Scheme farmers (because they work strictly on orders placed by farmers) provided a list of “delivery costs per area” which indicates the areas that they supply (see Table 2).



**Plate 3: CPS Seedlings Nursery**

**Table 2: List of Areas Purchasing Seedlings from CPS Seedlings**

LIST OF AREAS SERVICED BY CPS SEEDLINGS					
1	Greytown	11	Howick	21	UMzimkhulu
2	Kranskop	12	Richmond	22	Nkwaleni
3	Seven Oaks	13	Colenso	23	Harrismith
4	Muden	14	Boston	24	KwaMbonambi
5	Rietvlei	15	Ladysmith	25	Louwsburg
6	New Hanover	16	Ixopo	26	Melmoth
7	Albert Falls	17	Winterton	27	Paulpietersburg
8	Tola Valley	18	Vryheid	28	Babanango
9	Weenen	19	Newcastle	29	Matubatuba
10	Mooi River	20	Harding	30	Mkuze

Source: CPS Seedlings

Most commercial brands of vegetable seeds are available. All four seedling suppliers' use Starke Ayres seeds, three of these suppliers use McDonalds' seeds, two use HygroTech seeds, and the Proseed brand is used by one, while Mayford seeds are also used by one of the suppliers. The dominance of Starke Ayres and McDonalds brands is evident.

Suppliers mentioned that small-scale farmers were demanding a range of tomato varieties, referring to them by name (as in Hitech, Star 9001, Zeal, Rodade, etc). According to one supplier, small farmers tend to favour cheaper, open pollinated varieties because they are affordable to them, but also because farmers have little experience of the high yielding varieties, which they shy away from because they are “unknown territory”. This supplier also asserted that South African seed companies do not promote the use of hybrid varieties by small-scale farmers, and extension officers are also not helpful in this regard. This supplier went on to say that it is also pointless to advise farmers to use hybrids because if water availability is not guaranteed, failure of the crop is likely. However, according to another seedling supplier, farmers ask for the variety Zeal (a hybrid), and if not available, then Rodade (an open pollinated variety). Seedlings are generally available in small-size packs (see Plate 4), making them accessible to Tugela Ferry farmers (although their costs are rising). RTS, working in collaboration with Sunshine Seedlings, offer small packs of 50, 250 and 500 seedlings to accommodate small farmers. The smaller packs come at higher unit costs.



**Plate 4: Small Packs of Tomato Seedlings at RTS**

Two suppliers (Top Crop and Sizanani Nursery) insist on a minimum of 1000 seedlings per order before they deliver.

According to the suppliers, the demand for seedlings by small-scale farmers has been growing even though seedling prices have been rising. Fertilizer costs have been increasing by 7% to 8% per annum, according to one supplier, but seedling prices have been kept low because of competition, citing prices for 2010, 2011 and 2012 of R385, R415 and R 480 a unit of 1000 tomato seedlings respectively. This supplier attested that demand has been growing because “more and more people are farming...we get flooded with thirty to forty farmers at a time during tomato season and we sell about half a million tomato seedlings.”

No discounts are given for bulk buying of seedlings, and suppliers do not promote, encourage or recognize bulk buying. The two companies which insist on one thousand seedlings as a minimum order stated that they do not offer bulk discount prices even though farmers put together their money when they order seedlings. “These orders are treated as individual orders by the office”, attests one respondent. As for the other company, orders are for small quantities and individual farmers fetch the seedlings themselves. Reduction of input costs through forms of collective action is therefore not possible when it comes to bulk buying of seedlings.

In relation to farmer’s knowledge of production the market (i.e. different crop varieties), suppliers’ views were somewhat contradictory, one saying that farmers do not really know much about what is on offer, and the other replying in the affirmative. A third one stated that farmers know how to grow crops but extension officers need to help them with soil testing and advising on what other inputs to use. One suggested that a lot can be done to keep farmers abreast of new developments in vegetable production systems. As far as these suppliers were concerned, farmers derived their knowledge primarily from their own past experience, but also from advice provided by extension officers. The notion that extension officers are not fully supportive of farmers was expressed by some suppliers as well.

A very weak relationship exists between extension officers and seedling suppliers. The Department of Agriculture occasionally invites a supplier to participate in the extension programme, by presenting information to farmers on farmer days. The two suppliers who have tried to work with extension officers have experienced failure, in one case it was in relation to a pepper seedling purchase arrangement, and in another in relation to the vegetable pack-house project (see Chapter Five) and the purchase of seedlings.

When suppliers were asked about the kinds of services they offer farmers, their responses included the following: advising them on crop varieties to suit farmers’ pockets and local

climatic conditions; informing them of new developments in vegetable production systems; advising them on what and how to spray against pests and diseases and referring them to appropriate sources for technical advice.

All suppliers expressed the view that small-scale farmers do not engage in sufficient planning for their enterprises, which results in them ordering seedlings too late, leading to frequent market gluts and inadequate crop diversification. One of the suppliers plants some seedlings in anticipation of late orders, whereas another one expressed her disappointment with the farmers as follows: “Farmers at Msinga expose themselves to the glut situation. Hence I always advise them to plant butternuts, green pepper and chillies, and not only tomatoes and cabbages.”

The dominance of well-established producers of seed is clear, with Starke Ayres and McDonalds as the leading two. Hybrid varieties are not planted by smallholder farmers due to lack of promotion and farmer education, as well as the lack of reliable water supplies. Of the four accessible seedling suppliers, smallholder farmers are limited to purchasing from only three of them due to their inability to plan their purchases well in advance.

This market structure of “few suppliers and many buyers” places these seedling suppliers in a strong bargaining position *vis a vis* farmers. Although it can be argued that the limited range of crops grown by farmers is not due to an inadequate supply of seedlings, it is also clear that farmers are highly dependent on these suppliers for their seedlings, their choice of crop varieties, and advice on what crop protection chemicals to apply. The lack of up-dated information on new developments in vegetable production, coupled with lack of adequate finance to buy and grow high yielding varieties, limits farmers to the varieties that seedling suppliers suggest to them. Farmers feel that they are at the mercy of suppliers who deliver varieties without adequate labelling, with the result that farmers do not know the specific variety that they have planted. Farmers often complain about the unaffordability of buying and growing tomato seedlings, but they risk their scarce cash resources hoping to benefit from this high value crop; this risk cannot be blamed on seedling suppliers entirely.

### 3.3. 'Other' purchased inputs supply

A wide range of external inputs is supplied to farmers by the three suppliers which were interviewed. These inputs include seeds, crop protection chemicals and spray equipment, fertilizers, implements and tools, and protective clothing.

Commercial brands supplied to farmers include: EFFEKTO; Combat and Starke Ayres for protection chemicals; PANNAR and Agricol for maize seed; and Omnia and Argento for fertilizer. Maize seed as well as fertilizer is sold in small packs of 2kg, 5kg, and 10kg, in addition to standard 50kg packs. It would seem that farmers are not constrained by lack of access to these inputs.

The key role-players in the inputs market were identified in interviews with farmers. The list was then completed by interviewing the suppliers themselves. The study revealed that farmers purchased their inputs from local suppliers based in Tugela Ferry town, in Greytown (45km away), and also as far away as Pietermaritzburg. All farmers interviewed indicated that they bought their fertilizer and crop protection chemicals from a retail outlet known to them as Ikhwezi<sup>4</sup>, which is located in Tugela Ferry. Two out of twelve farmers named Buildit as a source of inputs, and two others mentioned NLK (now known as TWK)<sup>5</sup>(see Plate 5) in Greytown, whereas three did not specify the supplier in Greytown (which could be either NLK or RTS<sup>6</sup>) as their alternative source of fertilizer.



Plate 5: TWK, a supplier of inputs in Greytown

When farmers were asked what informed their preference for one supplier over another, their reasons were availability and price difference, and that Buildit “supplied only fertilizer”. Of note is the fact that Buildit had stopped selling inputs by 2012, when the final round of interviews was conducted. As for farming equipment and tools, farmers’ first supplier of

choice is Ikhwezi, followed by NLK (TWK). It is no surprise that Ikhwezi is popular as it is nearby the scheme and therefore easily accessible. It costs R30 per bag to transport a 50kg bag of fertilizer from Greytown to Tugela Ferry, and R15 per bag from Tugela Ferry to the farmers' fields or home.

One supplier based in Tugela Ferry argued that the inputs supply market is highly competitive and said that in his opinion inputs were affordable to farmers because Tugela Ferry suppliers competed with Greytown suppliers and kept a close watch on their prices.

Another role player is government, which occasionally supplies farmers with inputs on a limited scale. One supplier said that government recently supplied farmers with potato seed and fertilizer, and that this reduced the scale of farmer purchases from him, so government handouts reduce market demand to some extent.

Input use by the farmers is influenced by the attitude of the disseminators of knowledge about inputs to the farmers. According to the three main input suppliers, most farmers' knowledge of how to apply farming inputs is gained from their own practical experience, with some communicated by extension service officers, as well as suppliers themselves but that there are major gaps in their knowledge because they are not able to keep abreast of new developments in farming. One input supplier remarked that "there is still a lot to be done in keeping the farmers abreast of developments. Input suppliers are not offering farmers any other service except assisting farmers to select inputs to solve problems they experience with crop diseases". Farmers narrated a story of a recent outbreak of a tomato disease which could not be controlled as useful advice could not be secured from either suppliers or extension service staff.

When asked about organic farming methods and inputs, one supplier was of the opinion that farmers will not want these because they are 'slow' compared to inorganics, and that although there is a trend towards organic farming in other countries, locally the emphasis is on inorganic methods. Another was of the opinion that the market for organic produce is growing, with government also promoting environment-friendly products, and that he could supply these inputs should a demand for them arise. Suppliers are aware of alternative farming methods and types of inputs, but they said that the more important need is to improve the training of farmers in conventional methods of farming. Common problems are the fact that extension services are not always effective, and the lack of planning and coordination by

farmers. The structure of the ‘other’ input supply market is such that there are mainly three outlets that the farmers access, with one based locally in Tugela Ferry itself.

### 3.4 Tractor hire

Land preparation at Tugela Ferry Irrigation Scheme is performed mainly by hired tractors belonging to the municipality, at a cost of R150 per plot (see Table 3). Some plots are ploughed by spans of donkeys and others by hand using hoes, because tractors are not always available when needed, and because some farmers cannot afford the cost. Two respondent farmers owned tractors of their own. When one of these tractor owners was asked about the profitability of the tractor service he offered to others, he complained about the high costs of fuel, and said that farmers were unwilling to pay a price that is satisfactory to the tractor owner.

**Table 3: Tractor Hire and Labour Employed by Farmers in Four Selected Crops**

Farmer	Crop	Plots held	Block	Farm operation	Type of labour/service	Cost
1	Tomatoes	4.5	Four	Clearing the plot		
				Ploughing	Tractor	R 150
				Planting	3 family members	
				Watering	Self and neighbour	
				Weeding	3 family members	
				Spraying	self	
				Harvesting	Self and neighbour farmers	
2	Tomatoes	4	Seven	Clearing the plot	Self,husband,2 workers	R240
				Ploughing	Tractor	R150
				Planting	4 workers	R120
				Watering	Self,1 worker	R100
				Weeding	3 workers	R810
				Spraying	self	
				Harvesting	Unknown number of days and workers	R1000
2	Cabbage	4	Seven	Staking	5 workers	R900
				Clearing the plot	5 workers	R350
				Ploughing	Tractor	R150
				Planting	5 workers	R150
				Watering	6 workers	R180
				Weeding	3 workers	R240
				Spraying	self	
Harvesting	Self and daughter,3 workers	R90				
	Other	3 workers	R180			

3	Sweet Potatoes	7	Two	Clearing the plot	self	
	Potatoes			Ploughing	Tractor	R220
				Planting	self	
				Watering	self	
				Weeding	self	
				Spraying	n/a	
				Harvesting	Self and 3 workers	R300

### 3.5. Labour

Most farmers work on their plots themselves with the help of family member or fellow farmers and/or casual hired labour (see Table 3). Casual labour is paid in cash or produce. The evidence in this table seems to suggest that cabbage and tomato crops need more hired labour than sweet potatoes.

### 3.6. Conclusion

The farmers in Tugela Ferry Irrigation Scheme are accessing three out of four seedling suppliers and three out of five 'other' input suppliers, which could be interpreted to mean that the structure of the inputs market entails healthy competition. According to farmers from Tugela Ferry, however, this is not the case, expressing the view that lack of competition locally is forcing them to incur travel costs to access distant input suppliers. Although suppliers are of the opinion that there is enough competition to keep prices down, the farmers expressed the view that inputs are unaffordable. The fact that the demand for inputs that has been on the increase could be an indication that, due to high levels of unemployment in the area, more people are now seeking to farm as a form of livelihood or 'safety net', as suggested by one farmer and one supplier.

Common problems exist in relation to government extension services that are widely perceived to be not very effective, and also in relation to the lack of planning and coordination by farmers. The availability of a wide range of similar varieties and brands of inputs means that the range of crops that farmers grow is not limited by insufficient supply of inputs. Constraints could be due to other factors. The availability of seedlings, fertilizer and crop protection chemicals in small packages indicates recognition of the importance of the smallholder farmer market by suppliers. This means that farmers are not constrained by bulk packaging, but, on the other hand, small packages come at a higher cost per unit than large

packs. Bulk buying discounts are not promoted or offered by seedling suppliers, and farmers are not in a position to negotiate such discounts because they are poorly organised.

The possibility of farmers adopting low-input production systems such as organic farming is constrained by the lack of information and advice on these alternative approaches. A limited amount of advice from a small number of suppliers-some situated long distances from the scheme - together with the ready availability of agro-chemical inputs, dictates the pursuance of conventional, inorganic agriculture by farmers. Mechanisation is limited at present to land preparation, with other operations still being highly labour-intensive in character, many being undertaken by farmers themselves, with some help from other farmers and family.



## **4. CHAPTER 4: CROP PRODUCTION AT TUGELA FERRY IRRIGATION SCHEME**

### **4.1. Introduction**

This chapter focuses on the production component of the agro-food value chain at Tugela Ferry Irrigation Scheme. Firstly, it discusses the land tenure arrangements at the irrigation scheme. Secondly, it describes the production methods used by farmers. Thirdly, it highlights common problems experienced by farmers, and finally it discusses the economic viability of the farmers' crop production enterprises. The chapter explores how the character of the inputs supply chain analysed in the previous chapter impacts on crop production, strongly influencing the production system's character. It also discusses the constraints and opportunities that are presented by the production system in operation.

### **4.2. Land tenure**

The overall character of land tenure in the Tugela Ferry Irrigation Scheme is 'customary' meaning that land tenure is overseen by traditional chiefs (*Amakhosi*) who chair traditional councils (Cousins, 2013:129). Cousins reports that although plot<sup>7</sup> allocation is administered by the chiefs, government officials played a role at some point in history and that in recent years farmers' committees became involved in overseeing plot usage. Whilst most plots are inherited, others are re-allocated by the chief through Block Committees, yet some plots are inherited by daughters-in law from mothers-in-law. According to this mother-in-law inheritance system, ownerships vests with the family although the right to use rests with the daughter-in-law (*ibid*).

There is a system of informal land rental in place, according to which plot holders rent or lend unused plots. The plots at Tugela Ferry Irrigation scheme range from 0.08 to 0.15 hectares in size (Cousins, 2013:129). This author reports on the various lending or rental terms. Cash payments ranging between R150 and R200 are payable in many agreements. The farmer, lending the plot, can also decide to ask for the plot user to pay for a tractor hire service employed on another bed (if he/she continues to till). Another arrangement could

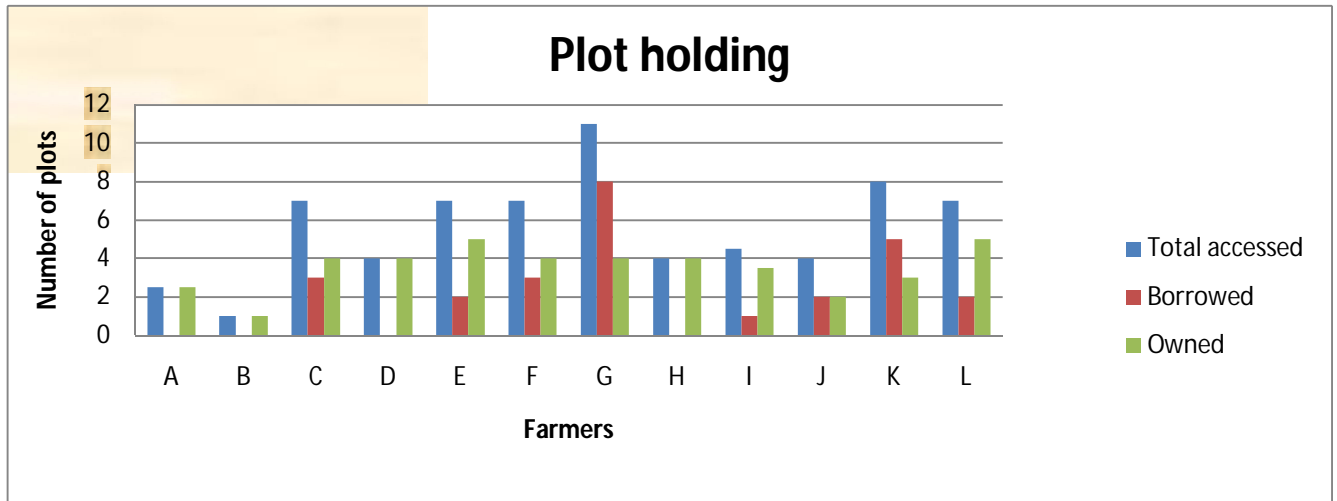
involve payment in crop produce through which the recipient of fresh produce is assured food access for family consumption. This type of share-cropping is typical of a land lending agreement between extended family<sup>8</sup> members, but it is not limited to family members.

One farmer explained how the land holding system works in practice:

“We do not have the same number of beds. The number range from anything between two and six beds per person or family. It depends on how they got the beds and when or even how much resource in terms of money do they have. Take for instance Mr B...he does not have many beds in his name, but he is one of those people who are using other people’s beds because he can afford to do it whereas the owners cannot. I think his beds are around five or six but because he is well resourced financially and because he is hard working, he is using more beds”.

A different, yet common, arrangement involves use of a borrowed plot in exchange for provision of labour needed on the lender’s plot. Through this informal land rental market, a degree of differentiation (socio-economic), based on the number of plots used, emerges.

Cousins (2013:129) reveals that on average farmers hold three plots in their name, borrow or rent 1.3 plots, and cultivate a mean number of 4.3 plots (with a range of one to twenty). These findings are corroborated in my study, which revealed that 50% of my respondents accessed and cultivated close to double the standard number of plots that were allocated originally according to a “four plots per wife rule” (Figure 1). The farmer with the smallest number of plots in cultivation (with only one plot) represents those farmers who inherit plots from their mother-in law on getting married and joining the homestead. The farmer who accesses the largest number of plots (11 in total) belongs to that category of farmers who are in irrigation blocks where rental payments in cash are not the norm. This is the case in Blocks Four and Seven, where cash is payable to the block committee as a contribution towards the electricity bill and the pump maintenance costs.



**Figure 1: Number of Plots Owned and Borrowed and Total Plots Accessed by Each Farmer**

This brings us to the question of security of tenure under customary law. When asked about this issue, respondents explained that even though there was no document attesting to land rights, the tenure system is such that (as one respondent put it):

“The land belongs to the chief and he allocates beds to families which then stay within families, generation after generation. In this case the beds belong to KwaXimba family name -which I am a child of- and will remain with them which is why I am a borrower because I am married... So in terms of length of time, I will use beds until I cannot use them anymore”.

One farmer asserted with assurance that “no one will take my beds from me, including the chief”.

Access to unused plots by those who need and want to use them remains a challenge. Some beds are said to be lying fallow in Blocks Two, Four and Five and different reasons for this are given. Some respondents observed that in Block Two close to 50% of plots are unused after the harvesting of maize. According to one respondent, the chief does not seem to have a way of solving this problem, although other respondents are of the opinion that the lending and borrowing is due partly to the chief’s disapproval of the practice of allowing plots to lie fallow. Plots that lie fallow are seen by some farmers as problematic because this practice encourages the presence of rodents that destroy winter crops. In Block Three some plots are lying fallow, despite the fact that there is a long waiting list of people who qualify to be

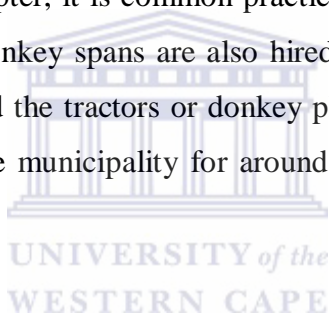
allocated plots. In Block Five some plots are unused, presumably due to water problems, but another reason, as cited by one respondent, could be that if an elderly owner “has sons who are not yet married, it might create problems to allow an outsider to use the plots in the meantime, only to be expected to relinquish them when the sons get married.” Plots are clearly seen as an invaluable asset which needs to be kept in the family. The informal land rental market is thus not in operation for all plots across the scheme.

### 4.3. The production system

#### 4.3.1 *The overall character of the production system*

This section discusses the overall character of the production system, highlighting ploughing methods, crops grown, crop rotation and irrigation methods.

As described in the previous chapter, it is common practice that a tractor is hired to prepare the soil for planting, although donkey spans are also hired for ploughing by a few farmers. Those farmers who cannot afford the tractors or donkey ploughing use hand hoes to till the plots. Tractors are hired from the municipality for around R150 per plot, a price that some farmers find unaffordable.



**Table 4: Crops Grown (n=24)**

N=19	Cabbage	Tomatoes	Maize	Sweet Potatoes	Potatoes	Spinach Swiss chard	Onion	Butter-Nut	Dry Beans
1	X	X	X	-	-	-	-	-	-
2			X	X	X		X		
3			X						X
4			X	X		X			
5	X	X		X	X				X
6			X	X	X				
7		X	X			X			
8	X	X							
9	X	X	X						
10	X	X							
11	X	X	X	X	X		X	X	
12	X	X				X			
13			X		X				
14		X	X	X		X			
15		X							
16	X		X	X					

17	X	X		X					
18	X	X	X		X		X	X	
19	X		X		X				
20		X							
21	X	X							
22	X	X							
23	X						X		
24				X					
<b>No of farmers%</b>	14=58%	15=63%	13=54%	9=38%	7=29%	4=17%	4=17%	2=8%	2=8%

According to Cousins (2013:130) the most important cash crops include green maize, tomatoes, cabbage, sweet potatoes and green leafy vegetables. This author states that when comparing Tugela Ferry Irrigation Scheme to other schemes in other parts of South Africa, production of crops for home consumption is limited and most production is for sale, but he also observes that small amounts of cash crops are taken home for own consumption. In my study individuals who grow crops mainly for consumption and sell only the surplus were also observed.

The farmers in my study can be broadly categorised into those that grow and sell low-cost, low-value crops and those that grow and sell high-cost, high-value crops. Almost all farmers grow maize, with some preferring to grow a cultivar of early green maize known as 4141 which is planted in June, and others preferring to plant the popular cultivar SC 701. High value crops include tomatoes and cabbages, with farmers rating tomatoes as the most “profitable” crop and therefore widely grown with the hope of generating cash.

Some farmers are commercially driven in that they grow mainly high-value crops, which in the case of the small sample of farmers in this study means, tomatoes, cabbages and green maize, which are grown by, 63%, 58% and 54% of farmers respectively (Table 4).

These crops are grown using purchased seeds and seedlings plus synthetic fertilizers and chemicals for crop protection, inputs which come at a high cost to the farmers. The farmers that are not so keen on high-value crops do not use heavy application of agri-chemicals, and some sell their crops as well.

Choice of tomato and cabbage varieties is strongly influenced by seedling suppliers, if not dictated by them. These two crops are the most complicated to grow because they come in numerous cultivars for different seasons. Farmers are effectively at the mercy of the seedling

suppliers, since they lack the knowledge required to enable them to make informed choices, and instead they rely on each other's limited knowledge. One respondent said that:

“When we ordered tomato seedlings we named the two varieties we preferred but different varieties were delivered, and the explanation was that the seed supplier was out of stock at the time. We know that the two, Bravo and Disco, produce big size tomatoes and are the more expensive and popular with farmers. When it comes to cabbage we do not know varieties well by name, we rely on Mr C, our fellow farmer and we ask the supplier when we order to sell us what is good for that season or we tell him to bring us cabbage that matures in three months or four months. This cabbage we have grown here looks like it is a four months type and we did not know this, neither do we know the name of the variety. When he has delivered we cannot take it back.”

In relation to green maize, crop buyers exert an influence on farmers' choices by demanding a particular cultivar. A December 2010 market glut of green maize was caused by a delay in the supply of irrigation water during the planting season, according to farmers, and this resulted in many farmers planting at the same time. The cultivar 4141 is usually planted early because it can withstand coldness in early June, and takes three months to mature. In this instance farmers were forced to plant it later, and it could not compete with the crop buyers' favourite, which is the cultivar SC701.

The farmers in Tugela Ferry Irrigation Scheme employ crop rotation techniques, mainly dictated by the seasonality of crops. According to Cousins (2013:130) crop rotation is practised roughly according to seasons as follows; maize is on the ground from August to December, although those who plant early maize do so in June. The next crop is tomatoes planted in January, which get harvested by April (although some farmers are still harvesting until August/ October at the latest). May to August is planting time for cabbage and spinach. As is to be expected, farmer planting dates for cabbage (see Figure 2) correspond with seedling supplier dates (see Figure 3).

**Figure 2: Cabbage Transplanting Dates**

Cabbage cultivar	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Conquistador												
Kabishi												
Star 3301												
Star 3311												
Star 3315												
Tenacity												
Green cor												

Source: CPS Seedlings

**Figure 3: Tugela Ferry Irrigation Scheme Farmer Planting Dates**

Crop	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Tomato												
Cabbage												
Mealies												
Sweet.Potato												
Onion												

Crop spacing and depth, crop rotation and intercropping practices are undertaken following the advice of fellow experienced farmers. It was observed that mono-cropping is the norm, and one farmer confirmed that the SC701 maize variety does not do well if intercropped with pumpkin, whereas the 4141 variety does not get compromised. One farmer indicated that she knows that after growing sweet potatoes she must follow with beans to “cleanse” the soil and another expressed knowledge gained from previous extension officers that if there has been an outbreak of disease on a tomato crop, tomatoes should not be planted as the next crop on this plot, or alternatively that a crop can be repeatedly grown but then stopped when it does not do well any more.

Farmers indicated they did not remember attending any workshop or training course specifically on production methods. One farmer who is a block committee member expressed her dismay as follows:

“There is never a time when our soil is taken for testing to help us know which fertilizer is needed or what disease is the soil infected with. The second issue is that we are not trained in crop rotation to deal with disease. We just grow one crop over and over more so because we are after money. To add on the lack of training, we do not know enough about crop protection chemicals. As I speak I have grown cabbages but I do not know what chemicals to use. Solutions would be training workshops which we wish for.”

The main irrigation method used on the scheme is a gravity-fed furrow system, but two irrigation blocks (Four and Seven) use electric pumps to draw water from the river, and thereafter use a gravity-fed, furrow system. The physical infrastructure of the canal system is described by Modi *et al* (2010) as follows, and illustrated in the accompanying photographs:

“Water for the scheme is diverted from a weir in the Thukela River into a stilling basin on the Southern (right) bank.”



**Plate 6: A Weir across the River**



**Plate 7: Wheels for opening and closing the sluice at diversion point and the stilling basin**

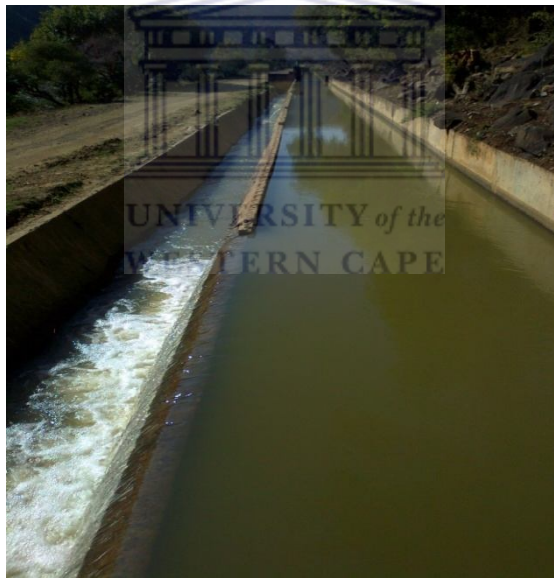
“From the stilling basin, water flows into a concrete pipe of approximately 1.4 km with a

capacity of 400 litres per second.”



**Plate 8: Concrete Pipe approximately 1.4 km long protected by a Retaining Wall**

“The first pipe section is followed by a 0.6 km section of open channel and another concrete pipe of 1.2 km both with a capacity of 400 l/s, before the main canal starts at block one with a capacity of 450 l/s.”



**Plate 9: Open Concrete Canal of 0.6km**

“After block 2, water is diverted to the left bank via a siphon that passes under the river into a canal with a capacity of 150 l/s which originally supplied water to blocks 5, 6 and 7. The canal that continues on the right bank serves blocks 3 and 4, and initially has a capacity of 250 l/s which decreases to 100 l/s. The water is distributed in the blocks with a network of concrete distribution canals with individual capacities of 60 l/s. Some blocks have storage dams.”



**Plate 10: Storage Dam**

“Water is led to the fields by concrete infield distribution canals.”



**Plate 11: Infield Distribution Canal.**

“Watering is by flooding the field.”



**Plate 12: Infield Furrow**



**Plate 13: Irrigating by Flooding the Field**

Farmers are very casual about watering. According to 62.5% of respondents, farmers at Tugela Ferry have learned the gravity-fed method of irrigation from fellow farmers, who learned about it from extension officers in the past. One farmer observed that: "...people here are not watering properly, they water a lot unnecessarily to such an extent that young plants are seen covered in water that stands stagnant for some time..." Another farmer commented that, "there is no special way of watering, we just use our judgement" and "we learn from other farmers and it is not complicated."

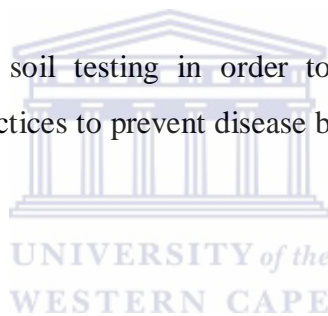
#### **4.3.2 Fertilizer use**

Questions were asked on the acquisition of farming knowledge by farmers, focusing on fertilizer and crop protection chemical usage as well as on what crop varieties to grow at the scheme. The object was to find out as to how farmers were introduced to the inputs which

they use. Interviews reveal that there are two categories of farmers, those that have been farming since the times of previous extension officers and are experienced therefore (42%), and those that are less experienced because they joined the scheme much later when the talked about previous extension officers had long left. All farmers acknowledged that they rely heavily on the knowledge they receive from fellow farmers. However, the more experienced farmers indicated that in the past, extension officers had introduced fertilizers to them, whereas the less experienced farmers indicated that they had learned only from the experienced farmers, and strongly denied gaining any knowledge from the current extension service.

An overwhelming majority of farmers (83% of respondents) said they did not remember attending any workshop organised by extension officers on the use of fertiliser. One farmer remembered an announcement being made that they will be called to be told about soil testing –but this never took place.

The farmers are not practising soil testing in order to follow an appropriate fertilizer programme, or soil sanitation practices to prevent disease because proper extension service to guide them is lacking.



#### ***4.3.3 Pest and disease control***

With regard to the use of crop protection agro-chemicals, 42% of farmers said they had not attended any workshops on this topic in recent years. Of those that use crop protection chemicals, 33% mentioned that they rely mainly on supplier guidance for chemical purchases and application, but the majority (66%) depend on fellow farmer advice. Of note is that there is a significant minority of farmers (25%) who grow crops that do not need heavy chemical usage. In relation to contamination of crops by chemicals, farmers do not agree on the number of days they should refrain from harvesting after applying crop protection chemicals. Some think it is seven days whilst others think it is three days, while one stated clearly that it depends on the type of a chemical used. As many as 86% of farmers indicated that they found it difficult to adhere to guidelines on preventing contamination by crop protection chemicals, which by implication means that they are exposing consumers to a health hazard.

To determine the practice of agro-chemical usage, farmers were asked questions on safety aspects. On the issue of how to protect themselves from harm by chemicals, 50% of farmers

confessed that although they knew about the danger of chemicals and how to protect themselves, having learned from fellow farmers, as well as suppliers, they find it difficult to adhere to the guidelines. With regards to safekeeping of agro-chemicals, most farmers said that they preferred to leave them hidden away in the fields rather than taking them home, for fear of abuse by members of family. Three farmers indicated they knew of suicides using such chemicals.

Without effective extension services, farmers using crop protection chemicals are left in a compromised position. Farmers complain about the high costs of inputs, but if they are to farm according to modern agronomic practices both more expenditure and more effort will be required of them. Although many farmers are quite experienced, they need constant guidance because of the dynamic farming environment they operate in.

#### ***4.3.4 Alternative production systems***

I was interested in finding out if farmers knew about alternatives to the farming practices they were accustomed to, such as organic farming methods. When respondents were asked if they ever used kraal manure on their plots, 50% were positive, but expressed the view that if it was to replace inorganic fertilizer, kraal manure would be needed in high volumes, which in turn would require transportation. One farmer indicated that kraal manure need not to be applied in large quantities as it is 'hot' and would require a lot of watering, and that it would not be applied as frequently as fertilizer. This respondent also suggested that inorganic fertilizers tend to 'corrupt the soil'. Of the four that indicated that they do not use kraal manure, one said it was 'old fashioned', and another said kraal manure is scarce these days and that great quantities would be needed to fertilise plots and this would mean high transportation costs.

When asked about compost making, all nine respondents that answered the question indicated that they had never made it, also indicating that they lacked the requisite knowledge. Only one claimed to know how to make compost, which she had learned from a failed project<sup>9</sup>, but that she could never make compost for the whole plot. Three farmers mentioned the burial of crop residues as an alternative way of fertilising the soil. Two of these said that they chopped and buried crop residue and it made a difference, while one who is well resourced<sup>10</sup> indicated that she knew about the benefits of crop residues, but that if she is in a hurry to plant the next crop there is no way she is going to wait for crop residue to rot before she plants.

Regarding the use of biological pest and disease control measures, all five farmers who responded to this question had not made or used these, although one of them knew about a home-made chemical mixture and another claimed to know only of using soil as a deterrent for the maize stalk borer, which worked if they did not use a chemical. The reasons given for not making and using such alternatives were that they are time consuming, and the conventional use of chemicals is easy by comparison.

#### **4.4 Problems experienced by farmers**

##### **4.4.1 Water supply**

When farmers were asked what their three major problems were, the majority of farmers (76% of respondents) cited water supply challenges as the number one issue. Depending on which irrigation block it is, water is diverted by a weir to run through the main supply canal or pumped from the river by an electric pump. The need for pumped water in Block Four<sup>11</sup> was rated as the biggest problem by a majority of farmers from this block. Respondents claimed that the pump was highly unreliable as it could not cope with the high demand for water. According to them the pump broke down often and at the times when farmers need it the most, thus delaying their planting, which adds to the market glut problem. Equitable water distribution is also a challenge in Block Four, with growers of certain crops (tomatoes and cabbage) given priority at the expense of others. The reason for prioritising tomatoes and cabbage is said to be that these seedlings are delicate as well as expensive, and therefore need special attention. Additional challenges with the pump are that the high maintenance and electricity costs are borne entirely by the farmers.

According to most farmers (62.5% of respondents), the supply of water is inadequate due to the dilapidated and leaking state of the canal system (see Plate 14). This applies to Blocks One, Two and Three.



**Plate 14: Leaking Canal System**

#### ***4.4.2 Marketing***

The second biggest problem is related to the market demand for the produce that the irrigation scheme generates. As many as 48% of farmers cited lack of “the market” as a big problem. When farmers refer to this problem, they use the term “market” loosely and appear to mean a lack of buyers for their crops. One farmer qualified the term “lack of market” by saying that “we need a market that is dedicated to us and will work for us”. Two farmers said that the lack of storage facilities to delay post-harvest losses was a major problem. One voiced the lack of “market-related farmer training” and another mentioned depressed prices during periods of oversupply (i.e. gluts).

#### ***4.4.3 Affordability of inputs***

The third most cited problem was related to inputs accessibility. Inputs refer to purchased inputs as well as tractor hire and financial services.

Labour shortages were raised by one farmer, who was of the opinion that people who want to work on plots “were scarce of late”, hinting that this was due to the social grants that they receive from government. However, during field work, it was observed that some women working for others on their plots came with babies on their backs. They came to the fields looking for work and they were happy to be paid in kind (i.e. with produce) if there was no cash on offer (e.g. the R30 per day that is often paid for casual labour). A significant 33% of farmers expressed the view that purchased inputs were prohibitively expensive, so much so that they did not even bother to calculate production costs because then, in their words, “we would be depressed and discontinue farming”.

Two farmers mentioned the problem of lack of access to crop finance, which resulted in some farmers not being able to apply adequate fertilizer, thus making them less competitive when it came to the appearance of their produce. The ability to afford and apply adequate fertilizer and crop protection chemicals is seen as ‘good farming practice’ amongst farmers, and those who can purchase these inputs boast about being able to be generous in their application of inputs, with the result that their produce ‘sells itself’ by virtue of its appearance. Only 14% of farmers complained that tractor hire services are expensive and inadequate.

#### ***4.4.4 Crop damage***

The fourth problem is related to crop damage by livestock. A significant 24% of farmers said that the lack of reliable fences around the fields was a problem that hinders successful farming. It was mentioned that in some areas plots lie fallow because of the risk of livestock damage.

#### ***4.4.5 Extension services***

The last, and least mentioned problem, was that of inadequate extension services. Only 14% of farmers cited this as a major problem. They were unanimous in testifying that extension service staff are no longer coming to the fields or calling them for training. However the seriousness of this problem is illuminated when farmers are asked more specific questions.

Several interviews in which extension services were discussed were conducted with farmers from Block One and Block Two. The questions asked were in relation to what the farmers see extension staff doing and the last time they interacted with such staff, and farmer comments were captured (see Table 5 below). All respondents were unanimous on the point that fertilizer and seed/seedling bulk buying was the only activity that extension officers were engaged in. Farmers told of time periods of not less than three months with no contact with extension officers, with one saying only that “it is long time ago” since farmers had such contact. A farmer who is well resourced in terms of implements and skill had this to say when asked what activities extension officers used to engage in when they were more active:

“Quite a lot, as I have mentioned before. The hard working extension officers used to come to be with farmers in the fields, and corrected us when we were wrong. They collected money to buy seeds and seedlings, bought and delivered them to farmers.

The lazy farmers would be spotted in the process. They could even supply farmers with seeds only to be expected to pay after harvest sales. There used to be demonstration plots worked on by all those interested farmers in turns, planting, fertilizer application, weeding and watering”.

**Table 5: Extension Officer Activity according to Farmers**

Farmer	Extension officer observed activity	Last date of contact	Farmer Comments
1	Not sure but people came to introduce free tractors		I do not know who Extension officers are
2	Seedlings order and tractor booking	2010	They keep in the office most of the time and I am not sure what their role should be
3	Seedlings order and tractor booking	No answer	They are no longer willing to come to the fields
4			Previous ones were more active
5	Order seedlings	2011 February	Some EO don't even know what is grown at any particular time, they come once a year
6	Help farmers to buy inputs	Early 2011	They call no meetings; I don't even know when the current extension officer came to start working in this block although I am a block committee member.
7	Fertilizer & seed bulk buying	2009	I do not remember a meeting called for farmers
8	Bulk buying of fertilizer	2011 March	New officer is not as good as the previous one, no meeting in two years
9	No answer	A long time ago	Farmers' negative comments could be discouraging extension officers

The extension officers' side of the story is presented in an interview that I conducted with one assistant extension officer. The main problem for them seems to be the lack of resources from the government's side. Without adequate transport, extension officers find it difficult to access those areas of the irrigation scheme assigned to them. This interview revealed that one of the duties of extension service staff is to introduce the growing of unpopular crops with a view to diversify the number of crops grown, providing some financial support in the form of free seed, as articulated as follows:

“... It was the Department's initiative because the question posed was “what can we encourage the farmers to grow?” and the answer became, potatoes, because of the season and the fact that farmers do not grow them that much for they complain that the seeds are too expensive. The idea was that if they are given support in the form of

seeds they would then see the yield that would downplay the expensiveness of seeds, then they would become eager to buy and grow potatoes... farmers did not have to apply any chemicals and potatoes do not flower.”

In this instance potato seeds and fertilizer were sourced by the Department of Agriculture to be distributed to farmers in groups of farmers per season. According to the assistant extension officer the ‘potato seed programme’ was implemented whereby;

“Potato seeds were given to a sample of farmers by the department... it was just support to help farmers, it came with fertilizer. It was meant for them to grow and sell for themselves...I (as an extension officer) will look into how much was the yield and for how much will they sell. I will then hear from her (farmer) if this was helpful... we had to start with 5 farmers per Block... we selected according to activeness and the background of life... did you see just how great these potatoes are. They are meant for making chips. They come out large such that there are no small ones to be kept as seeds. (The Department will not be supplying these farmers again). ...it is up to them now to order the seeds through us (extension officers) then we buy it for them because we do support them in this way.”

The programme was still in operation at the time of field research, with another five farmers per block due to receive support. Although the potato support programme is suggestive of some extension service provision, this interview also confirmed the sub-optimal provision thereof. The extension officer was asked a question on the recent tomato disease that farmers had to experience without any guidance. The response was: “It is just that some people do not know the blight and others do. It is only blight that is bothering them.... The chemicals they should use are BAYER brand, available in Pietermaritzburg, which is far for the farmers. So the chemicals that farmers use are weaker”. According to this account, the local input supplier does not stock this brand because it is too expensive, being packed in 5litre containers which few farmers can afford.

#### **4.4.6 Collective action**

Farmers at Tugela Ferry tend to operate as individuals, with only occasional efforts at co-operating with each other as a group. Respondents indicated that as far as purchase of inputs is concerned, they sometimes clubbed together for buying fertilizer or crop protection

chemicals. Besides that, extension officers organised bulk input buying on occasion, putting together a list of farmers wanting to buy seed or seedlings and collecting money from them. But this was not done on a large enough scale to warrant big discounts to farmers. Each farmer pays for her/his individual order, and grouping together only helped to make it economical for the supplier to prepare and deliver seedlings. However, one farmer said that when extension officers organised bulk fertilizer purchases in this way “[it] was very beneficial to us because fertilizer was cheaper this way”. Some farmers talked of clubbing together to buy a bag of fertilizer, which did not help much because each plot usually needs a whole 50 kg bag of fertilizer.

Farmers were asked if they collaborated in any produce marketing activities, and their response was in the negative (except for farmers referring buyers to other farmers when their own produce is finished). One farmer recalled a time when farmers tried to implement a rule that they share customers, but it did not work well, and it discouraged some from looking for their own customers.

Two instances of collaboration in marketing were mentioned by some respondents: when there is a customer who wants to buy a truck load, farmers call each other to load it. If an individual farmer does not have enough produce to fill the customer’s order, then she can call other farmers to top up the truck. Also, if a farmer gets a telephone call from a buyer requesting produce she does not have, the contact gets referred to those who do have produce to sell. Farmers also sell on each other’s behalf when a customer arrives on the fields and the owner is not around. This is however done in self organised small groups around a particular crop.

During periods of oversupply in the past, some farmers tried to club together to hire a bakkie to sell produce in the town of Stanger. This initiative was met with resistance from Indian farmers who were protecting their local market, and the Tugela Ferry farmers were chased away. When farmers were asked specifically if they had ever thought of looking for more customers, they felt that they lack the necessary knowledge. One farmer posed the question back, asking “where do I start to look, and how? We just feel that we are let down by shops around this town, schools also should be supporting us, as well as the hospital.”

The evidence seems to suggest that the farmers are not well organised to engage in collective action, either for input procurement or for marketing their produce. The idea of collective action works well if farmers are institutionally organised (farmers’ formal organisation),

which in this case they are not. Farmers seem to see their role as being nothing but growers of fresh produce who need support services from government. Government is expected to provide everything from irrigation infrastructure, to efficient extension services, adequate tractor hire service, subsidisation of purchased inputs, fencing and connections for farmers to markets.

What was observed is that it is very demanding for farmers to both farm and to perform marketing activities at the same time. When a crop buyer arrives, they leave whatever they are doing and attend to the customer, and this involves harvesting, measuring, counting and loading the produce. This poses the question: when will the farmer engage in active marketing? Does the farmer have the time to both farm and undertake marketing?

#### **4.5. The economics of fresh produce at Tugela Ferry Irrigation Scheme**

An analysis of the economics of production at Tugela Ferry, as estimated by Cousins (2013, 131), suggests that incomes (gross) of successful farmers operating on six plots compare favourably with their counterparts in Dzindi Irrigation Scheme, as analysed by van Averbeké and Khosa (2011), with estimated per hectare per annum incomes of R25 920 and R25 461 respectively.

It is instructive to compare these estimated incomes from irrigation plots with old age pensioner and farm worker incomes. For a plot farmer to make an income that is close to an old pensioner's grant of R1140 per month, she would have to work on 9 plots to earn R1175 per month and 10 plots to earn an income close to a farm worker's salary (R1305<sup>12</sup>, not to mention a meagre R30 per day paid for labour locally) to the value of R1375 per month (see Table 8). All these are based on the assumptions of two crops per plot per annum at a mean gross margin of R783.80 per crop, as extrapolated from Cousins' data (see Table 6). However, looking at the figures in Table 8, showing the range of gross margins per crop as estimated by Cousins, it is clear that there is potential for farmers to make gross margins in the region of R3000 and more per crop of tomatoes, cabbage and sweet potatoes.

When farmers were asked about the fairness of the prices they sell at, and the profitability of their enterprise, a majority indicated that they are fully aware that they do not make profit and for that reason they don't even bother to calculate their income and expenditure. The cited

causes for non-profitability are market gluts associated with cash crops (tomatoes, cabbage and maize) as well as diseases that are not easy to control.

Evidence collected from five crop sheets of crops grown by three farmers in my sample depicts this picture well (Table 7). Farmer 1 made a gross loss of R474 on tomatoes due to disease and a gross margin of R1940 (124%) return on capital invested in a cabbage crop. Farmer 2 made a loss on cabbage due to the glut and a 30% return on capital invested in a tomato crop. Of interest is that sweet potatoes ranked as the second most reliably profitable crop. The significance of the sweet potato case is that many farmers shy away from growing it because it is not a high-value crop compared to tomatoes and cabbage. Farmer 2 made sales of R13000 on a tomato crop at a cost of R9970, with a gross margin of R3030, whereas Farmer 3 made close to the same amount of profit (R2705) on sweet potatoes. (NB Costs are exclusive of water pump related costs in Block Four, which range from R15 and R50 per plot per month).



**Table 6: Positive Gross Margins for Maize, Tomato, Sweet Potato and Cabbage Crops**

Crop	Number of growers making a profit (n)	Profit makers as proportion of all growers (%)	Positive gross margin (mean)	Positive gross margin (median)	Range
Maize	30	91%	R1439	R1344	R208 – R2916
Tomatoes	12	46%	R3166	R3545	R17 – R7163
Sweet potatoes	16	73%	R1172	R1243	R240 – R2785
Cabbages	5	56%	R3840	R4450	R1394 – R5146
All four crops	64	71%	R1868	R1367	R17 – R7163

Source: Cousins (2013)

**Table 7: Gross Margins for Three Farmers**

Farmer	Crop	Cash sales (Rand)	Total variable costs (Rand)	Gross Margin (Rand)	% Return on variable costs
Farmer 1T	Tomatoes	2200	2674	-474	-18

Farmer 1C	cabbage	3500	1560	1940	124
Farmer 2T	Tomatoes	13000	9970	3030	30
Farmer 2C	cabbage	4000	4400	-400	-9
Farmer 3	sweet potatoes	4025	1320	2705	205

Note: costs exclude water pump related contribution which range from R15 to R50 per plot per month for 4months

Table 8: Comparison of plot income to other incomes

Type of income	1Plot	4Plots	6Plots	9Plots	10Plots
Plot income p.a	1 567.60	6 270.40	9 405.60	14 108.40	15 676.00
Plot income p.m	130.63	522.53	783.80	1 175.70	1 306.33
Old age pension p.m				1 140.00	
Farm worker min wage p.m					1 375.00
<b>Assumptions:</b>					
Gross margin per crop R783.80 per plot					
Growing two crops per annum per plot					

Although production is geared for sale, these farmers are not truly “commercial” in their thinking, in my view, in that they continue to farm even when they make losses, hoping that things will turn out better next time. My observation is that they also benefit from holding and using plots because some produce is consumed at home, and some keep small sections at the end of their plots as a “home garden”. The truth is that a farmer is never without something to cook even if it is not from her garden/plot, because they can consume produce

that could not be sold. Farming for them seems to be more of a cultural habit or norm, whereby a woman's duty is to provide food for her household and therefore a meaningful daily engagement or a chore.

This could be used as an alternative measure of success of the irrigation scheme, in that plot holders are gainfully engaged, benefitting in more than one way; hence they keep plots even though they do not make a profit.

#### **4.6. Conclusion**

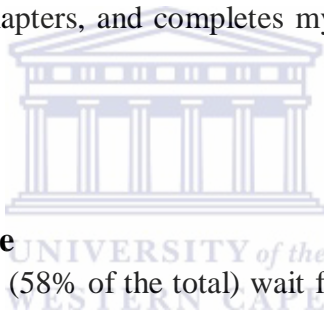
In this chapter the character of the production system at Tugela Ferry Irrigation scheme was assessed with a view to ascertain the constraints and opportunities it poses to farmers. The evidence reported here points to the prevalence of customary land tenure, which gives security of tenure to the plot holders, but also limits access to higher numbers of plots, although the informal land rental market affords access to more plots in some sections of the scheme.

The production system is characterised by the intensive cultivation of plots from season to season. Inputs used include: gravity-fed irrigation water; minimal mechanisation which entails the use of a hired tractor for land preparation; and synthetic fertilizers and chemicals for pest and disease control. A narrow range of crops is grown, mainly for selling on the informal market, with some produce kept for domestic consumption. The production system is inorganic in its nature, in common with global trends towards the industrialisation of farming systems, and thus poses social, economic and environmental concerns to both farmers and consumers of produce. This production system poses a constraint to farmers because of the rising costs of fossil fuel energy used in tractor land preparation and synthetic agri-chemicals production, and also because it degrades the soil. A list of problems cited by the farmers includes: an unreliable water supply, lack of access to markets, high input costs, and crop damage by livestock, lack of extension services, and lack of collective action. But the irrigation scheme also presents local people with opportunities for employment of labour and a year round livelihood.

## **5. CHAPTER 5: WHOLESALE AND RETAIL FRESH PRODUCE MARKETS AT TUGELA FERRY IRRIGATION SCHEME**

### **5.1. Introduction**

This chapter discusses empirical evidence on the wholesale and retail markets supplied by farmers of the Tugela Ferry Irrigation Scheme. The profile of buyers of fresh produce is described, followed by a description of the quality and quantity of the fresh produce grown and traded, and related price setting dynamics. Farmers' and crop buyers' perspectives on problems and solutions around these markets are also discussed. This analysis of the 'downstream of production' or 'post harvest' components of the value chain complements the material presented in previous chapters, and completes my assessment of the fresh produce value chain as a whole.



### **5.2. Buyers of fresh produce**

A majority of respondent farmers (58% of the total) wait for buyers to arrive at the fields so that they can do business with them. Other activities that farmers engage in include: displaying produce on the roadside thereby attracting buyers; selling produce to by-passers (see Plate 15); taking produce to Tugela Ferry to sell to consumers (thus competing with hawkers and a SPAR supermarket); and going to Tugela Ferry in order to look for bakkie traders (categories of traders to be explained later) or hawkers to sell produce to. A significant number of farmers (33%) indicated that hawkers were their major buyers, and another 33% mentioned bakkie traders as their main buyers. Only one farmer in the study was supplying SPAR. Bakkie traders are said to come from as far afield as Empangeni, Durban, Pietermaritzburg, Newcastle, Ladysmith, Nquthu, Vryheid, as well as nearby towns such as Dundee, Greytown and Kranskop.



**Plate 15: Farmers Hawking on the Street**

Interviews with crop buyers revealed a finer classification of buyers. Amongst buyers that own vehicles, there are traders<sup>13</sup> and hawkers<sup>14</sup> who compete with street hawkers<sup>15</sup> and supermarkets. The sample included new entrants and old buyers. All the bakkie traders in the sample have been in the business for less than five years whereas the bakkie hawkers have been in the business for at least five years. Street hawkers have been longest in the business, ranging from ten years to twenty five years. The time in business could be indicative of the conclusion that retailers (bakkie hawkers and street hawkers) are a more stable market than wholesalers (bakkie traders). This is supported by one bakkie trader who testified that bakkie traders do not last long for reasons not explored in this study. The scheme is therefore important for it does not only sustain farmers but hawkers who have been reliant on it the longest. Bakkie traders include those whose main business is wholesale supply to hawkers and village or township shops, and also those who do some retailing of their own especially at pension pay points. Bakkie hawkers were observed selling produce from the back of their vehicles at Tugela Ferry, Pomeroy, Greytown, Dundee and Kranskop. Local street hawkers do business in Tugela Ferry as well as on the main road next to the Block Four section of the irrigation scheme. Some bakkies were seen carrying produce and buyers in an arrangement where hawkers hire transport as a group. These vehicles drive some distance away from the scheme. The sample for the purpose of the study consisted of three bakkie traders, five bakkie hawkers, three street hawkers and two supermarkets (see Table 9).

**Table 9: Crops Purchased by Buyers**

	Supermarkets (n= 2)	Street hawkers (n= 3)	Bakkie hawkers (n = 5	Bakkie traders (n =3)
<b>Maize</b>	0	1	0	1
<b>Tomatoes</b>	1	3	3	3
<b>Cabbage</b>	1	2	3	2
<b>Spinach</b>	1	1	1	0
<b>Sweet potatoes</b>	0	2	3	1
<b>Potatoes</b>	0	0	0	0
<b>Green pepper</b>	1	1	0	0
<b>Butter nut</b>	1	0	0	0
Place of sale of produce	Tugela Ferry & Greytown	Tugela Ferry, Pomeroy, Uitval, Dundee, Msinga Top	Uitval, Dundee, pension paypoints, Msinga Top	Uitval, Kranskop, Tugela Ferry

The crop purchased most frequently by these buyers is tomatoes, followed by cabbages, then sweet potatoes. The study revealed that 77% of crop buyers buy tomatoes, 69% bought cabbage and 46% bought sweet potatoes. The crop bought least frequently is spinach. (It should be noted the evidence presented here is not representative of the full range of crops produced at Tugela Ferry, because it excludes green maize, which is one of the top three crops grown and traded. Green maize is also bought frequently, but I was not able to undertake field research at the height of the maize season.)

This evidence seem to suggest that wholesaling is mainly performed by bakkie traders who supply hawkers, whereas retailing is done by bakkie hawkers who share the market with street hawkers and SPAR. It could be argued that the output market is competitive, with many farmers of produce and many buyers, but the downside of this is the frequent oversupply of produce, which negatively affects local crop buyers (but not consumers) as well as farmers, by depressing the price.

### **5.2.1. *Loose arrangements between buyers and farmers***

Farmers are in a precarious position because they are subjected to price volatility in an environment where formal relationships or contracts to protect them from price fluctuations are not an option. With market forces seemingly determining the prices paid for produce, farmers appear to have submitted to their plight, while a certain category of buyers of produce is able to procure produce at depressed prices and retail at good prices.

The study revealed the existence of a range of farmer-buyer relationships that range from virtually nothing to some fairly loose arrangements. Two local hawkers made mention of an arrangement whereby when produce is in plentiful supply they are able to push farmers to supply produce on credit, to be paid after the produce is sold. A bakkie trader mentioned that he tried to make an arrangement with a farmer to keep produce for him, but due to lack of trust, the farmer sold her produce to the next buyer who came along. SPAR indicated that they enter into a loose arrangement whereby farmers are kept on a list of 'good suppliers', who might get contacted to supply produce. This is very different to a contract farming arrangement that binds both parties to a commitment, and thus exposes the buyer to the risk of non-delivery. This supermarket prefers to keep the opportunity open to any farmer.

A farmer who is a block committee member supplied information that Pietermaritzburg Fresh Produce Market prices are what farmers use as a yardstick for price determination. Asked whether farmers sometimes refuse the price that SPAR is willing to pay, the supermarket manager's response was that "I don't even need to negotiate the price with them because there are many farmers. I just go to the next farmer"

### **5.3. The quality and quantity of fresh produce supplied**

According to the buyers, the Tugela Ferry irrigation scheme produces high quality crops which are sought after by buyers because of their freshness and size. The location and thus proximity of the scheme is another advantage to many buyers. One of the three bakkie traders trading in tomatoes, cabbages and sweet potatoes expressed the view that he prefers to start buying from the farmers on the scheme rather than from elsewhere because their produce is fresher, larger in size, healthy looking and has a longer shelf life. This is a buyer who does not mind helping farmers with harvesting of produce.

A different view was expressed by two out of the five bakkie hawkers interviewed. One remarked that although he was generally satisfied with the quality of Tugela Ferry cabbages, he notices that the cabbages “harden” after only three days. Another said they do not last for four days. The local SPAR manager voiced the desire to support local farmers, and said that this was advantageous for the supermarket because their produce is fresh. What would rate as bad quality cabbages, for instance, would be cracked cabbages, which local farmers do not supply because they know that SPAR expects good-looking produce.

It can be concluded that product quality is satisfactory to most buyers of Tugela Ferry produce. There were, however, a few negative comments too that, sometimes consumers mention that: tomatoes are sour; cabbages harden after three days; and that sweet potatoes from a particular section of the scheme are not good-tasting.

Twenty four farmers were interviewed to determine the crops mostly grown by farmers and therefore what is available to crop buyers. The most-grown crops were found to be tomatoes, cabbage and green mealies (see chapter 4). Most farmers were growing tomatoes, representing 63% of the total, followed by cabbages, grown by 58%, then green mealies, grown by 54%. A second group comprises sweet potatoes, grown by 38%, potatoes, grown by 29%, and spinach, grown by only 17%, and onions, also grown by 17%. A third group of crops ranked as follows: dry beans, grown by 8%; and butternut, grown by 8% of farmers.

This seems to indicate that farmers gravitate towards high-value crops, represented by the “big three”, namely tomatoes, cabbages and green mealies, resulting in a shortage of other crops. The main driver of this could be the high unemployment rate in the area, which creates a need for cash generation. The overall impact is that a glut situation often occurs for these three crops. Of interest is that gluts seem not to occur for sweet potatoes, which could perhaps be interpreted to mean that this crop is not as widely grown as Cousins (2013) study suggests.

An attempt was made to try and understand the severity of the impact of the oversupply of crops on farmers’ enterprises. The study revealed that 67% of farmers experience shortages of buyers of the “big three” cash crops, which they ascribe to the oversupply of those cash crops during particular periods. A minority of 25% indicated that they do not experience oversupply in any of the crops that they grow, mainly early green mealies grown in June, potatoes, sweet potatoes, spinach and dry beans.

Bakkie traders are in a good position to explain the possible causes of oversupply. This is the case because they are familiar with the availability of produce in the region. They are the ones with market information, and that puts them in a strong bargaining position *vis a vis* the farmers. According to bakkie traders, other farming centres around the region include Mooi River and Weenen (which are both supplied by commercial farmers) and Keates Drift and Muden. These farming centres contribute to market gluts. During periods when produce is scarce, alternative sources include Johannesburg Fresh Produce Market, Weenen, Ladysmith and Greytown.

Produce from Tugela Ferry is somewhat limited both in the range of crops produced (see Table 8) and in its availability throughout the year. According to this Table, the crop bought most often is tomatoes, which are traded by all buyers, followed by cabbage and spinach. Green maize is also widely grown by most farmers but I was not able to collect data from farmers on this crop, hence it does not feature on this Table. A study from a farmer's perspective only would have led to the false conclusion that farmers are driven by buyers' demands to focus their production only on the big three crops (green maize, tomatoes, and cabbage). There could be some truth in this, in that some bakkie traders tend to want to deal in a limited range of crops, as in the case of the one trader from Kranskop who is in his third year in business but has always bought only cabbage and maize. Other types of buyers are disadvantaged by the limited range of crops produced on the scheme. While farmers long for an influx of bakkie traders because they load one crop at a time, hawkers, by virtue of being retailers, attempt to diversify their stock and would therefore like to sell a wider range of produce, and perhaps this is the reason why some hawkers own their own bakkies. Potatoes, butternut, peppers, onions are demanded by local consumers, but are not grown by many farmers at Tugela Ferry.

#### **5.4. Price setting**

According to 67% of farmer respondents, the initial price of a crop is set by the farmers who are the first to sell a particular crop in that season, and this is based on the price increases of inputs. But one farmer felt that the price was not based on costs at all, whilst two others said the price was set at farmer meetings.

A farmer who is a block committee member and one of the early harvesters in Block Four, whom other farmers consult for the price for that particular season, said that:

“We watch the retail prices at Tugela Ferry and at Pietermaritzburg Fresh Produce Market that is supplied by white farmers. If, say for instance, cabbage is retailing at R12 locally, we know that it is retailing at R15 in Ladysmith and other places further afield, then we charge R6 per head but as the season progresses it drops to R3. A discount of R2 per head is given from R6 if heads are 1000 and more. Tracking what happened this year (2012), in May cabbage was set at R6, by June it was going for R5 till September and retail was R10 locally then. The drop of the price was due to competition from white commercial farmers in the region. ”

The evidence seem to suggest that most fresh produce prices are market related, and that retailers are marking up prices by one hundred percent most of time, to the expressed dissatisfaction of farmers. On the fairness of the price, the farmers express their dissatisfaction in many ways, as shown in Table 10 below.

**Table 10: Farmer’s Views on Price Fairness**

Do you think that farm-gate price of different crops is a fair price and is it profitable to you? (When production costs are taken into account).
We don’t bother about profit calculation because we know we make losses.
It is an accepted fact that farmers do not recover costs and so don’t bother to calculate to check on profitability.
Price setting does not take costs into consideration.
Cannot be fair because price gets depressed during oversupply to very low levels.
Not fair, we don’t bother to calculate profitability because then we’ll stop farming if we keep noting that we are making losses. But we know we are not making profit.
I am satisfied with the recent sales, because potato seed was given for free.
If one manages to sell most crops at initial price or large quantity, one becomes satisfied.
I sold for R2000 and most was sold, my costs were less.
How do you know about the fairness and otherwise of the farm-gate price?
I sold at 3 maize cobs/R5, those harvested later than me, sold at more cobs for R5.
We don’t recover our costs most of the time, or we just breakeven.
We are pleased if we manage to harvest and sell, profitability is not our aim, because we know we don’t cover costs sometimes.
Not fair, does not cover costs.
Just know that inputs are too expensive and irrecoverable from sales

When asked about the fairness of the price they pay farmers, most buyers were happy to be paying the price they paid then, the more so because prices become negotiable as the season

progresses. But one of the buyers acknowledged that he does not think that fair prices are paid to the farmers in view of the high costs of production, which he took time to research in order to assist some farmers in the past. One buyer was hoping to squeeze farmers even further, for example wanting them to go down to commercial farmers' price of R14 per dozen of green maize cobs (i.e. R1.17 per cob), as opposed to 150 cobs for R300 that farmers charge (i.e. R2 per cob).

In summary, it appears that farmers set the initial harvest price based on fresh produce market prices; and then price changes occur in response to forces of demand and supply as buyers monitor and negotiate. It could be argued that farmers are price takers, for the most part.

## **5.5. Problems and potential solutions**

### **5.5.1. *The farmers' perspectives***

The family of one farmer was interviewed and their response encapsulates well the challenges that a farmer has to face at Tugela Ferry Irrigation Scheme. The daughters of this female farmer had negative feelings about becoming farmers themselves. They expressed the view that farming is very risky and is about "win and lose", as they put it, meaning some years one does make money and in others a total loss is made. They cited the previous season's tomatoes that were destroyed by disease and frost to the extent that there was no harvest at all, and seedlings costing R1000 went to waste. Hail was another factor which affected farmers. When further asked why then farming was continued, the response was that there was nothing else for that farmer to do because of the high unemployment rate, and being "uneducated" added to the difficulties.

The next question I wanted to find answers to was whether or not buyers were exerting any pressure on farmers regarding produce quality, or any other requirement. The only cited quality requirement was that produce had to be attractive to the eye, and farmers knew that all they needed to do was to apply enough fertilizer (e.g. 50kg per plot), crop protection chemicals and water well, and that they had mastered these farming practices. One farmer who is supplying the local SPAR supermarket told of requirements being manageable because they were able to deliver the quantities demanded (since they own a bakkie) and

SPAR kept on calling them to deliver. Those farmers that did not sell to SPAR cited the terms of delivery to be an obstacle for them, due to high transport costs and the limited quantities that SPAR demands.

The negative pack-house experience of the past was mentioned as a reason why farmers were shying away from selling to formal markets in the form of supermarkets, processors and national produce fresh produce markets. Farmers expressed a sense of helplessness when it came to prices dropping to unsustainable levels during periods of oversupply. They are at the mercy of buyers who are in a strong position to negotiate prices further down.

### ***Farmer perceived problems and solutions related to market access***

Some views expressed by farmers were as follows:

- Market gluts are a sign of lack of staggered cropping schedules. Farmers blamed this situation on the seasonality of crops and unreliable water supplies. One farmer expressed the view that it is difficult to anticipate commercial farmer actions, hence availability of produce always coincides with theirs.
- Many farmers lack the know-how to engage in marketing and often run short of buyers, although a few keep a list of buyers whom they contact when a crop is about to be ready for harvesting. Revival of the pack-house idea is suggested by some farmers, but others think that the town of Tugela Ferry provides a market large enough for local role-players. Another suggestion is that quantities demanded by SPAR are limited due to competition from hawkers on the street.

Other issues cited by farmers as affecting the success of their farming enterprise include: the shortage of buyers willing to buy at the right price; insufficient storage facilities for harvested crops; lack of roads to their homes (if they were to keep produce at home); lack of transport and lack of market facilities.

#### ***5.5.2. Crop buyers' perspectives***

The list of major problems cited by crop buyers (and shown in Table 11) suggests some of the possible causes of oversupply/undersupply situations. These include farmers' lack of production planning that is in line with the wider range of crops that the market demands.

Other crops demanded include grains and dry legumes, potatoes, butternut squash, chillies and green peppers. Competition from other centres of farming helps to flood the market as well. SPAR notes that seasonality plays a major role in creating an oversupply of tomatoes that often begins around the end of July or the beginning of August every year.

Inconsistency of supply of produce negatively affects role players in the value chain at a local level. The oversupply of produce floods the market with produce and farmers cannot recover their costs thus undermining their farming efforts. They are subjected to the price squeeze as they have to accept the low prices when they have spent dearly on production inputs. Buyers from areas which are long distances away and where produce is scarce are able to purchase produce at depressed prices, and their price mark-ups are high. An example of this is some cabbages bought from farmers for R5 per head but retailed at R10-12 per head by a village shop at Msinga Top, more than 18km away from the scheme (Plate 16). Local bakkie traders and hawkers trade less often during periods of oversupply, and have to cope with competition from farmers who retail in order to get rid of produce quickly.





**Plate 16: Village Shop at Msinga Top**

Periods of scarcity occur when local bakkie traders and retailers seek sources of produce further afield in order to meet local demand. One bakkie-owning hawker put it in perspective when he explained: “I never stop completely to sell cabbage during periods of oversupply. I limit my stock to 30 or 50 heads to sell for two to three days, and then I stock oranges to augment my stock. But when produce is scarce, that is when I buy 200 heads to sell within two to three days”.

**Table 11: Major Problems raised by Crop Buyers**

<b>Problem</b>	<b>Raised by</b>	<b>Suggested solutions</b>
Lack of farmer planning in planting	All buyers	Diversify crops
Unexpected shortage of produce due to weather and water shortage	1 Street hawker A	
No shelter to operate under	1 Street hawker A	Provision of shelter on the road
Severe competition from swelled number of hawkers due to unemployment	1 Street hawker A	Market place like Weenen to create jobs
Inadequate crop produce to sell in summer	1 Street hawker B	
Measure of unit for green mealies is not competitive	1 Bakkie trader Z	
Farmers are limited in land access	1 Bakkie trader N	
Lack of access to lock-away storage on streets	1 Bakkie hawker M	Provision of lock-away storage facilities and selling stands
Market demand for other crops not met	1 Bakkie hawker S	Farmers to plan all year round Production
Farmers don't plan production well	1 Bakkie hawker S	
Shelf life of produce an issue for some	1 Bakkie hawker S	
Farmers not willing to give bulk discounts	1 Bakkie hawker S	
Criminality element on the road	1 Bakkie hawker C	Community to deal with Criminality
Road condition in the fields bad during rainy season	1 Bakkie hawker C	
Some farmers do not spray well for insects	1 Bakkie hawker C	
<b>Total number of buyers</b>		
Street hawkers	3	
Bakkie hawkers	5	
Bakkie traders	3	
Supermarkets	2	

Some conclusions can be drawn from this list of crop buyer problems. Tugela Ferry Irrigation Scheme supplies high quality fresh produce except for the occasional sourness of tomatoes, the short shelf life of some cabbages, and sub-standard quality of the sweet potatoes from a particular section of the scheme, but this produce cannot get good prices despite its good quality. Many hawkers face severe competition amongst themselves. Lack of access to lock away storage is an issue for hawkers. The market demand for other crops like potatoes, green peppers, butternut squash and chillies, is not met at present.

## **5.6. Formal market access by farmers**

In order to explore factors that inhibit farmer access to formal markets, as identified in the literature review and summarized in Chapter Two, questions were asked of managers of two supermarkets, SPAR in Tugela Ferry and Aheers in Greytown, which some farmers are supplying to or have a history of supplying. Aheers indicated that they focus on buying from the formal fresh produce markets because of guaranteed quantities and quality.

Regarding costs associated with assembling small quantities from small farmers and associated transaction costs, the manager at SPAR said that they do not incur much of these because they buy quantities that are needed for a particular period, and then re-stock as necessary, because the scheme is near-by. SPAR keeps a list of farmers whom they call on when in need. This the manager said: “Farmers are the ones who must market their produce; we suffer no costs because we leave it to the farmers to sell to us and deliver as agreed.” Physical infrastructure is not a problem because the scheme is next to the town, the road is in good condition, and communication is via cell phones. The only limiting factor is that it is only those farmers own transport or who can afford to hire transport, which have access to this market. Delivery requirements by SPAR include good quality produce as per approved sample, and delivery of a certain quantity per agreed period to be delivered in small amounts.

Aheers’ requirements are more demanding as they require a truckload of produce three times a week –the reason why they buy from Pietermaritzburg Fresh Produce Market. However, the manager mentioned that if they need stock they buy what is brought by small farmers and assess its quality by eye inspection only.

SPAR customers are satisfied with the quality of produce from the scheme, according to the manager. Why is it not possible for SPAR to mobilise the absorption of produce by the chain stores when in over-supply? The response was that “I once tried with Pick and Pay and it did not work because they had their own suppliers. SPAR branches have their own suppliers as well, so I would not try it; I too would not buy from other SPAR shops.”

On the question of a pack-house making procurement easy for SPAR, the answer was in the negative, and the respondent said: “It will not work for me; I also don’t think that it will work here because it was once tried and people did not benefit. Why would they want to sell to the pack-house and get their money only on some future date when they could get cash selling it themselves?” Aheers, on the other hand, would consider buying from a pack-house as long as

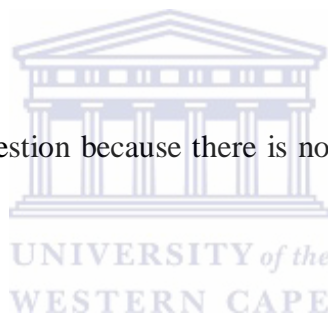
they would make delivery. Aheers was not buying from Tugela Ferry farmers because their crops lack variety.

On contract farming, the SPAR manager echoed other crop buyers on the presence of a big market for potatoes that goes untapped by farmers. SPAR sells 24 tons of potatoes per week and would consider contract farming for potatoes in order to create their own preferred suppliers, because white farmers around this area reserve them for their preferred buyers. As for cabbages, when not in oversupply SPAR sells anything between 8 to 16 tons per week.

Aheers is concerned about volumes, and the manager said that Tugela Ferry Irrigation Scheme farmers cannot deliver sufficient quantities, e.g. three truck loads (equivalent to 1 to 5 tons) of tomatoes a week. They also buy from anyone who delivers, as long as quality is good and the price is right, not caring from which farm the produce comes.

### ***Organic produce***

Organic produce is out of the question because there is no demand for it in the local market which is supplied by the scheme.



### **5.7. Conclusion**

The farmers of Tugela Ferry Irrigation Scheme find themselves supplying an output market that has many role-players engaging in both wholesaling and retailing functions within the value chain. Wholesaling is performed mainly by bakkie traders who supply hawkers further afield. Retailing is done by hawkers of different kinds depending on their proximity to the scheme and vehicle ownership, as well as by SPAR supermarket. These numerous role-players eke a living out of fresh produce from the scheme. This structure of “many buyers and many farmers” both imposes constraints on and also opens opportunities for farmers. Inconsistent supply of produce from the scheme is not only a disadvantage to the farmers but also to the buyers. At times of market gluts, many farmers cannot sell their produce and it often goes to waste, if not sold at below production cost. The many buyers are not enough to absorb the oversupply which plagues the region. During the periods of undersupply of produce, buyers source produce further afield. Buyers would like to access more diversified fresh produce all year round than is currently available. Opportunities that the output market

structure presents include the possibility of value-added processing of surplus produce, and proper production planning to avoid surpluses.

The Tugela Ferry farmers lack the ability to organise themselves in order to institute collective action with a view not only to access inputs but also to access formal output markets. Operating in informal output markets, the farmers are not subject to stringent buyer requirements, except that produce must be appealing to the eye. The farmers perceive their market-related problems to be concerned with access to the “right” markets. They confess that they do not know how to perform marketing as a function with a view to access these right markets. Others mentioned that they lack transport and marketing facilities, as well as good roads. Crop buyers on the one hand cited the uneven supply of produce which they rightfully blame on the farmers lack of planning, and unreliable water supply at production level.



## **6. CHAPTER 6: SUMMARY, CONCLUSIONS AND POLICY IMPLICATIONS**

### **6.1. Introduction**

This study explored the salient features of one of the largest and most successful smallholder irrigation schemes in KwaZulu-Natal, the Tugela Ferry Irrigation Scheme (TFIS). It investigated the structure and functioning of the fresh produce value chain, and assessed whether or not the fresh produce farmers at TFIS are disadvantaged by the existing structure of input and output markets. It also investigated whether or not the farmers are disadvantaged by the character of the production system, and in particular the degrees to which farmers' choices of production methods are constrained by the nature of the inputs market. This chapter briefly summarizes and then discusses the wider significance of my research findings, and explores their policy implications.

### **6.2. Inputs supply**

A wide and similar range of synthetic inputs and seedlings are purchased by the farmers. The main commercial brands are produced by a maximum of five input manufacturers. Seeds used for seedlings are supplied in five brands only (Starke Ayres, McDonalds, HygroTech, Proseed and Mayford) whilst the maize seed used on the scheme comprises only two brands (PANNAR and Agricol) and only two fertilizer brands (Omnia and Argento). Most crop protection chemicals used comprised the products of only three companies (EFFEKTO, Combat and Starke Ayres). The concentration of inputs supply in only a few large companies manufacturing such inputs is evident, with Starke Ayres a major player in both the seed and the crop protection chemicals markets. This kind of concentration is in line with global trends where the agricultural inputs market tends to be dominated by a few companies (Vermeulen *et al*, 2008).

The structure of the local input supply chain comprises four suppliers of seedlings and three suppliers of synthetic agro-chemical farming inputs. Farmers are limited to buying from only three seedling suppliers. The Department of Agriculture plays a minimal role in sourcing and supplying inputs at no cost to farmers. The ratio of suppliers to farmers could be interpreted

to mean that there are far too many farmers purchasing from only a few suppliers to allow much competition between suppliers, taking into account the fact that the large farmer base includes smallholders from the nearby irrigation schemes as well as large-scale commercial farmers in the region, (from Mooi River, Muden and Weenen) in as far as seedlings are concerned. All seedling suppliers are located a long way from the scheme, which results in high delivery costs. The fact that seedling suppliers insist on upfront payment for an order of a minimum a number of seedlings puts farmers in a relatively weak position, without much recourse if the delivered seedlings are not exactly what the farmers ordered, leaving them without an option to cancel the order. The same applies to the location of suppliers of 'other' input suppliers. Out of the three 'other' inputs suppliers, only one is local, in Tugela Ferry, and two are based in Greytown, about 45km away.

Inputs are packed in small quantities in an effort to accommodate small farmers. Whilst this makes the inputs accessible, it means that farmers are paying more per unit, and smaller packs can result in suboptimal application of inputs, which affects production negatively.

Based on this evidence it can be concluded that the small number of input suppliers dealing in a limited number of brands, the distance between the scheme and suppliers plus rising input costs disadvantage the farmers. This is in line with a global trend that Weis (2007:13) writes about referring to the globalizing model of the food economy of the US which is likened to an "hourglass" In the same vein, Pimbert *et al* 2001 write of concentration in the input industry which proceeded rapidly in the 1990's such that six companies controlled 80% of pesticide sales by 2001, compared to twelve in 1994.

### **6.3. Production system**

The study revealed that the key features of the production system at Tugela Ferry Irrigation Scheme include: the customary land tenure system and an informal land rental market; the use of hired tractors for most land preparation; the use of family labour and only some hired casual labour; the growing of five main cash crops (both high-value and low-value) using inorganic agri-chemical inputs; the practice of crop rotation as dictated by seasonal variations in growing conditions, and dependence on an unreliable<sup>16</sup> water supply from the gravity-fed furrow system.

Is customary land tenure a severe constraint on production in smallholder irrigation schemes? Some scholars argue that customary land tenure is problematic because it constrains the ability of farmers to secure credit, using land as collateral, and because farmers are not willing to invest in land if there is inadequate security of tenure (Ortman and King, 2007). Bembridge (2000:3) argues that “traditional land tenure systems and rigidity concerning size of unit are often a severe constraint upon irrigation development”. If the policy goal is “yielding a return on investment”, customary land tenure might be constraining to farmers who wish to expand and become “accumulators from below” (Cousins, 2013).

This goal needs to be evaluated in terms of the tenure security afforded by customary tenure systems, and in Tugela Ferry specifically, the need for plot holders to award lessees’ rights of use for only a short period of time, for fear of the land being lost outright if it remains too long out of the hands of the members of the extended family (Tapela and Alcock, 2011: 140). It is important to plotters to keep hold of their land as “[S]uch land rights extend several generations into history and provide an important safety net for members of that family group” (ibid).

According to Bembridge (2000), land tenure in most South African smallholder irrigation schemes remains customary in character, although there is also a need for reform, as expressed by scheme members. This author reports that irrigation scheme members are often somewhat divided on the issue of selling or leasing the plots to others. Those who are not in favour of leasing or selling cite such reasons as: no money was paid for the plots; the land belongs to the chief and for use by the community and current holders will want to use their land at some time in the future. According to Tapela and Alcock (2011:140) those who rent out their land alluded to constraints posed by short-term lease arrangements, such as the fact that “...the short-term use of leased land severely disrupts production and perpetuates insecurity among smallholders.”

My study confirms that farmers hold mixed sentiments on land tenure, as evidenced by the widespread practice of informal plot rental in some sections of the scheme. Concentration of land in the hands of a few farmers who are better resourced would not be justified in conditions<sup>17</sup> that create a high demand for irrigation scheme plots, as argued by Cousins (2013:135). This makes it socially unacceptable for individual farmers to access many plots when others are on a long waiting list for plots. The informal rental market makes it possible for new entrants to join the scheme even though the demand far outweighs the supply of

plots. Tapela and Alcock (2011:140) report that although the more “successful” farmers used at least 4 plots, “there seemed to a need... to guard against capture of plots belonging to indigent small-holders by the more affluent”. Customary land tenure is therefore not necessarily a major constraint if policy goals include social inclusion and cohesion rather than being biased towards purely economic objectives.

Regarding the range of crops grown and traded, the study revealed that the most common crops grown for sale are the “big three”, green maize, tomatoes and cabbages. The farmers can be roughly categorised into those that are commercially driven and those that are semi-commercial, who sell the surplus after their needs for domestic consumption have been met. However, there is also a group that grows low-cost, low-value crops for sale. This group is made up of three crops that rank next in popularity, namely, sweet potatoes, potatoes and spinach/green leafy vegetables. Of note is that two out of the nineteen farmers in my sample were growing up to five and six crops, including butternuts, onion and dry beans. A combination of factors influences the range of crops grown. These include: the farmer’s need for cash; seedling suppliers’ decisions on the varieties made available for sale; the farmers’ inability to plan production as a group; and the buyer’s preference for a certain variety of maize.

Other key features of the production system are the use of inorganic agri-chemical inputs, hired tractors for land preparation, and family plus hired labour. Interviews with both farmers and suppliers revealed that the paradigm of “modern agriculture” is well entrenched and is not about to retreat. The minimal services that suppliers claim to render to the farmers who come to their shops include advising them on suitable crop varieties and crop protection chemicals, and referring them to relevant “technical experts” from agri-chemical companies. All three suppliers of seedlings and “other” inputs deal only in inorganic agricultural inputs. Suppliers are aware of the emerging trend of growing demand for organic agricultural products, but the fact of the matter is that these are not yet in demand in relevant local markets.

The farmers in the Tugela Ferry scheme are of the view that to be competitive they must adopt “modern ways of farming”, and this includes the growing of “modern cash crops” that need ample synthetic fertilizer and crop protection chemicals, as well as tilling the land with a tractor. Yet the use of inorganic agricultural inputs comes at high costs to farmers. The study showed that the farmers that are growing high-value cash crops are highly dependent

on external inorganic inputs as promoted and supplied by the suppliers and are not exposed to alternative inputs, although there is an -albeit limited- awareness of the existence of a range of alternative, organic inputs among suppliers as well as farmers. These inorganic agricultural inputs are not only prone to periodic price hikes, thus negatively affecting the economic viability of the farmers' enterprises, but they also impose high social and environmental costs. The farmers in my study did express strong views on the unaffordability of these inputs. The study also reveals that crop protection chemicals pose a health hazard to farmers, as well as consumers, as guidelines for their safe use are generally not adhered to. The farmers expressed an awareness that synthetic fertilizer 'corrupts' the soil, which needs higher and higher levels of application over time, and that tractor use compacts the soils, which then need ploughing after each harvest. These are precisely the negative impacts on society and the environment that the international literature on the modern agro-food industry is highly critical of (IAASTD, 2008; Weis, 2008; McMichael, 2007).

The study also showed that crop rotation is practiced by farmers at Tugela Ferry as dictated by the season rather than by good agronomical practice. This is a further indication of the lack of effective extension services (see below). Tapela and Alcock (2011:140) report a respondent that practiced a "four crops per year per plot" crop rotation, as follows: in May cabbage is planted, followed by green maize in July, butternut and green pepper in December, then beans, potatoes and sweet potatoes in February. This is an example of a diversified farming enterprise that responds to the seasons but is also likely to maintain soil health.

The gravity-fed canal system was in a state of severe disrepair<sup>18</sup> at the time of research, which often results in an inadequate water supply. Farmers on some blocks are using electric pumps instead of canals and furrows, but the high operation and maintenance costs of pumping water remain severe constraints on these farmers.

The study revealed a long list of constraints, as cited by farmers in order of priority as follows: an unreliable water supply; lack of access to markets; high input costs; crop damage by livestock; lack of effective extension services; and lack of collective action. This is in line with findings of other scholars in the literature on South African smallholder irrigation schemes (van Averbeke *et al*, 2011; Gomo, 2010; Mnkeni *et al*, 2010; van Averbeke & Mohamed, 2006; Maginxa *et al*, 2006; Monde *et al*, 2005; Perret, 2002; Bembridge, 2000; van Averbeke, 1998 ).

#### **6.4. Output markets**

The main buyers of produce from farmers at the Tugela Ferry Irrigation Scheme are bakkie traders and hawkers, who tend to specialise in wholesaling and retailing functions respectively. There is a certain amount of overlap of these functions, however, with some bakkie traders also engaged in retailing produce at pension payout points. Some hawkers also own their own bakkies. Hawkers operate on the streets of towns and on the main road. Retailing is also sometimes undertaken by farmers. Buyers also purchase from other irrigation schemes and from large-scale commercial farmers, thus increasing the number of farmers seeking to supply these buyers. The oversupply of produce that often plagues the Midlands region tends at some point to depress prices, in a context where farmer-buyer relationships range from non-existent to fairly loose arrangements which are not beneficial to farmers. The informal nature of the output market echoes findings from Chikanzunga's (2013) study in Limpopo.

With regards to the quality of produce, the study revealed that buyers are unanimous in their view that the overall quality of Tugela Ferry Irrigation Scheme produce is satisfactory because of its freshness and large size. A few also made negative comments, however: sometimes tomatoes are said to be sour by consumers; cabbages harden after three days; and sweet potatoes from a particular section of the scheme do not taste good.

The Midlands region often experiences periods of both oversupply and undersupply of fresh produce, and this has an impact on the availability of produce. The market often gets flooded with the "big three" crops (maize, tomatoes and cabbages) but not by other crops. Prices for fresh produce are determined by the market forces operating in the region. Farmers who witness that the retailers are able to add a hundred percent mark-up on their produce express dissatisfaction with the prices they receive. The perceived high quality of their produce does not guarantee farmers a better price.

Other common marketing problems cited by farmers include: high transport costs when delivering to supermarkets; market gluts for tomatoes, cabbages and green maize; lack of knowledge of how to market effectively; buyers dictating the growing of the more expensive cultivar of green maize; a shortage of buyers willing to buy at the right price; the lack of storage facilities for harvested produce; the lack of good roads; and lack of alternative market facilities. Solutions to these problems suggested by some respondents included: farmers

needing to plan and diversify their cropping; the establishment of a processing and marketing facility, and provision of shelter and lock-away facility for hawkers.

Buyers, on the other hand, complained about the narrow range of crops grown by farmers on the scheme as well as the inconsistency of their supply. Their need for guaranteed quantities and high quality, and different varieties, drives the Greytown supermarket, Aheers, to procure from Pietermaritzburg Fresh Produce Market instead of from Tugela Ferry farmers. SPAR, based in Tugela Ferry, buys only limited quantities from local farmers, despite being located close to the scheme. Both supermarkets insist on farmers delivering their produce to the store themselves, which inhibits access for most farmers, who lack transport of their own.

At a local level, the structure of the output market accessed by the farmers typifies that of many farmers against few buyers that is written about in the wider literature (Pimbert *et al*, 2001; Weatherspoon & Reardon, 2003; Emongor, 2008;). Based on that I conclude therefore that this structure of the output market imposes some constraints on, but also opens some opportunities for, smallholder farmers at Tugela Ferry. The many farmers that sell on these output markets to relatively few buyers, tends to disadvantage smallholder farmers. Not only do the farmers of the Tugela Ferry Irrigation Scheme compete among themselves for buyers, they are also in competition with farmers in nearby irrigation schemes as well as white, large-scale commercial farmers in the region. Opportunities exist for farmers to supply these wider markets on a larger scale because their produce is favoured by buyers. But they need to coordinate production to avoid undersupply and oversupply, and they also need to widen the range of crops grown, to accommodate the buyers' needs for such crops.

## **6.5. Policy implications**

### ***6.5.1. Defining success and failure***

The view in the wider literature that the under-performance of smallholder irrigation schemes in South Africa is due to a commonly found set of constraints, that include lack of adequate access to land, and inadequately functioning input and output markets, is therefore supported by this study. The question that arises, however, is this: if the Tugela Ferry Irrigation scheme is under-performing, why is it still operational? Could it be that criteria for “success” need to be re-defined to include policy goals other than narrowly commercial (i.e.

purely economic) goals? Bembridge (2000:5), for example, advocates for the rehabilitation of smallholder irrigation schemes by suggesting that “[It] has the potential to increase food security, individual household income, and employment (including self employment as well as to stimulate development in communities as a whole”.

Tapela and Alcock (2011:139) write of success criteria as viewed by farmers:

The amount of income earned from farming is viewed as an important success factor by small-holders... measured in terms of achievement of specific livelihood objectives. Respondents consistently allude to farming having enabled them to build houses for their families, buy vehicles, educate their children and ensure food security for their households. A number of smallholders who have been able to achieve livelihoods objectives using income from farming are elderly, widowed women, who have single-handedly provided comfortable homes, food security and education for their children and grandchildren. Without access to productive land in the irrigation scheme, these women farmers may have been confined to a life of abject poverty.

Yet another potential success criterion cited by these authors is “attainment of social-wellbeing... a sense of self esteem emanating from being gainfully employed and from contributing to the livelihoods of others in the community”.

#### **6.5.2. Access to resources**

Cousins (2013:136) draws out policy implications from his research at Tugela Ferry, arguing that soil and water of good quality are key resources needed in sufficient quantities by the black small-scale farmers. I concur with the list of resources being needed, but I feel a need to caution against “sufficient quantities” when it comes to land. Making more land available to ‘accumulators from below’ might lead to the concentration of land in the hands of a few. Cousins (2013:136) asserts that “ even if agrarian reform is broad-based in nature...only a minority of small-scale farmers are likely to succeed as petty commodity producers, or make a transition to capitalist farming”. Acceptance of this reality means that a way must be found for supporting the majority that will not make it. This implies that a smallholder model,

involving farms of less than a hectare in extent should also be considered when land redistribution is being implemented. The size of these plots or farms should not be too large, requiring mechanisation. Land tenure should be in line with what is socially acceptable in that area.

Modern agricultural practices are notorious for demanding large amounts of water and this scarce resource needs to be used with caution in a country like South Africa. Water-saving farming methods should be considered.

### **6.5.3. Marketing**

Cousins (2013:136) advocates for diverting some produce from informal markets to formal markets. This has potentially negative implications for local food security if food gets transported away from the region. There is some truth in that if there are gluts, diversion of food away from the region might be beneficial to the farmers but the glut situation is an unfortunate occurrence that depresses prices and it needs to be controlled than used as a reason why food must be distributed via formal markets. If support and intervention is given to promote supplying to formal markets, it must not be done at the expense of the informal fresh produce markets. Hence I am more in favour of “developing what is already on the ground”. What is on the ground are “informal” fresh produce markets which seem to benefit the majority of smallholder farmers in two ways (market access and payment for produce) when compared to ‘formal’ markets. The buyers come to the farms to collect their purchases of produce and pay cash on the spot as opposed to supermarkets expecting farmers to deliver at farmers’ expense and payment at some future date (all depending on the agreement-local SPAR pays on delivery). Coupled with that is the fact that the farmers have a comparative advantage (relative to formal fresh produce markets e.g. Johannesburg Fresh Produce Market) in relation to the freshness and size of their produce. This is to explain that informal retailers prefer to buy from the farmers rather than a wholesaler in Fresh Produce Markets.

The SPAR supermarket in Tugela Ferry expressed market gap in relation to the availability of potatoes from local farmers. Large-scale commercial farmers reserve potatoes for their preferred buyers in an arrangement that helps secure their market share. But if produce from the Tugela Ferry scheme was to be channelled to preferred buyers, the ordinary traders and street vendors would lose their livelihoods, and the output market would be less competitive. Although farmers at the scheme often complain of the lack of a market for their produce,

especially during periods of glut, they have fresh memories of the pack-house experience, which subjected them to grading of their produce and promised payment at some future date, but which failed to materialise. The comprehensive list of marketing and exchange problems discussed by Magingxa & Kamara (2003), is corroborated by my study in most part, except that farmers in my study that still supply Spar (and those who used to supply Aheers) had no contracts with these retailers.

#### **6.5.4. Inclusion versus exclusion**

I conclude that incorporation of smallholder farmers into modern markets will result in the inclusion of only a few farmers and the exclusion of many, as both the opponents (for example Greenberg & Paradza, 2013:61-62) and proponents (for example Louw *et al*, 2008a) of incorporation agree will be a likely outcome. My study includes evidence that SPAR supermarket keeps a short list of preferred suppliers, thus excluding many others, and Aheers supermarket used to be supplied by some farmers, but they never kept their details and these farmers are now effectively excluded from this output market.

The wider literature has mixed views on the inclusion and exclusion of smallholder farmers. Proponents of inclusion in formal value chains include scholars in the “re-governing markets” grouping (Berdegue *et al*, 2008 ; Berdegue *et al*, 2001; Louw *et al*, 2008a; Louw *et al*, 2008b) who provide a number of reasons, why small-holder farmers must be incorporated and under what conditions. Emongor and Kirsten (2009:83) conclude that smallholder farmers participating in formal markets earned more incomes than those who did not, but a study by Chikanzunga (2013:21) concluded the opposite. The World Bank (2008:73-93), in its prescriptions for third world countries, anticipates the results of exclusion of some smallholders from participating in formal value chains and relegates them to on-farm employment, off-farm employment and migration.

The multi-stakeholder approach as recommended by the “ re-governing markets” grouping suggests that stakeholders must be inclusive of the public and private sectors, civil society represented by the NGO community, and farmers. The overall objective should be to strengthen the resilience of small-scale producers/farmers via enhancement of their adaptability to ‘dynamic change’.

Indeed the enhancement of farmers' adaptability to 'dynamic change' within the 'modern' markets could involve quite extensive support from all the parties agreeing to collaborate in order to make the value chain inclusive of some farmers. Whether that would indeed be pro-poor, is another question. The issue to reflect on is the wisdom of focusing substantial effort and resources to facilitate entry of smallholders into corporate value chains. The multi-stakeholder approach as recommended by the proponents of "inclusion" could mean that farmers enter into contracts with retailers. The dynamics that might be set in motion, which need to be anticipated, include:

- The substantial investments into a marketing infrastructure and adoption of practices that will suit that particular retailer (Greenberg & Paradza 2013:59).
- The unfavourable terms of inclusion that could result in farmers not seeing profits for their labour and farmers finding themselves bound into relations where critical information is not equally accessible to both parties resulting in choices (e.g. on which transport to use) that are not in the best interest of the farmer (Greenberg & Paradza, 2013:60).

Other possible dynamics to be considered include establishment of a retailer-sponsored and managed fund which builds up retailer supply chains under the pretext of the "public interest" in advancing smallholder production (Greenberg & Paradza, 2013:62), and global competition catching up with the included farmers (ibid). Although retailers might provide finance and input supplies this does not mean that they will not use various tactics<sup>19</sup> to squeeze the farmers when faced with intense competition (ibid: 59). These are some of the possibilities to be taken into account when the "inclusion" concept is entertained.

Is inclusion an end in itself? What about the possibility of exclusion after inclusion? Greenberg (2013:4) writes of an increasing cost-price squeeze that small- and medium-scale commercial producers face currently in the agricultural sector, thus threatening their long-term survival. So, even if these farmers are incorporated into "modern" markets, they will be exposed to a harsh economic climate, with the likelihood of being squeezed out at some point. Aliber (2013:11) warns of the danger of "adverse incorporation" that transpires overtime. Greenberg & Paradza (2013:63) conclude that "supermarkets will not solve all the problems of food insecurity and the inability to distribute food to those in need in South Africa and beyond."

The “re-governing markets” concept should not be given more attention and support than it deserves. In my opinion if the “re-governing markets” effort benefits a few smallholders in the long-term then it is not worth substantial attention and support. Supporting spontaneous development “on the ground” in places like Tugela Ferry should include efforts to improve the functioning of those informal markets that already exist, and also seek to develop other markets for the small-scale farming that is currently sustaining the informal traders and retailers (Emongor, 2007). The literature on informal markets suggests an alternative to the incorporation of smallholder farmers into “modern” markets.

#### **6.5.5. Food security**

A policy framework that supports rather than discourages subsistence farming would go a long way to ensure food security at farmer household level. Greenberg (2013:4) asks the question: “... [is] subsistence agricultural production a valued part of the landscape that warrants a strategy and support in its own right...as a part of diverse food production and distribution systems?” This study identified farmers who have access to one plot which they use for growing crops for consumption, as well as selling the surplus. Tapela &Alcock (2011:142) suggests a move away from “narrow conceptual definitions of subsistence and commercial farming” to the appreciation that in practice the two overlap, as observed in Tugela Ferry Irrigation Scheme.

My data point to the high demand for plots on the scheme, as evidenced by a long waiting list. A majority of farmers fall within a ceiling of four plots per family, with some farmers holding one plot only. This is indicative of the fact that the majority are less resourced than a few that farm more than the standard four plots and therefore poor. Under these conditions it is socially desirable for policy to support this majority. Does this mean, keeping the majority farmers poor? This is about acknowledging that this poor majority needs a different kind of support that will be of benefit to them as a big group and not only a few. The value of informal value chains is that “...subsistence oriented producers and those who sell to local, informal markets internalise the margins that would otherwise accrue to the formal marketing and distribution systems” (Aliber, 2013:13). However a compelling idea of “localism”, which is conceptualised through “the latest emerging government policy themes of Zero Hunger and Agro-processing Strategy” whereby state organs are to procure from smallholder farmers” Aliber (2013:14) needs to be explored. This could be a “protected” market for these farmers.

Bembridge (2000:48) reports on evidence that the objectives of both commercial plot-holders and food plot-holders are to produce for food as well as for sale. This author reports particularly on the objectives of food plots being food security, increasing incomes and development of farming skills, and concludes that any intervention is justified on the grounds of poverty relief where conditions of poverty exist.

#### **6.5.6. Farming systems**

My final recommendation is that policy should promote the adoption of low-cost input farming methods. To make the input supply chain pro-poor would entail weaning the farmers from the synthetic agri-chemicals that are set to rise in cost over time. Greenberg (2013:4) indicates that these inputs are based on fossil fuels, natural resources that are becoming scarce and more expensive over time. Denison & Manona (2007:22) note the high-cost production approach that is practiced on small-scale farms, and are critical of it for being inappropriate, since it is in line with the needs of large farmers in the mainstream commercial sector and not with the needs of smallholder farmers. This approach demands high yields to be profitable, rendering farmers highly dependent on input markets, and is high risk. These authors suggest an alternative to this method of farming as they assert that “conservation agriculture presents a chance to break out of the vicious circle that binds farmers in input debt and poverty” (Denison & Manona, 2007:23). This input debt was not given thorough attention in my study but one farmer indicated that at times, farmers sort credit from informal ‘loan sharks’ but then the extent of indebtedness would not, perhaps, compare to what Denison & Manona (2007) are referring to. However this point on input indebtedness is worth keeping in mind as a worse off idea than input vouchers, for instance.

### **6.6. Conclusion**

In conclusion, I have argued that inclusion of the smallholder farmers in formal market relations does not help in reducing poverty of a majority of farmers. My study identified a farmer that used to supply Aheers Supermarket some years back and one that was a member of a selected small group that continued to supply local SPAR under unfavourable conditions. In order to cater for the majority of farmers at Tugela Ferry, the informal market needs to be supported and developed further and other ‘protected’ markets e.g. government procurement

must be part of the programme. In order to meet the demand of these markets, the following recommendations are made.

### ***Input markets***

Public funds invested to afford subsidies for fertilizer, seed, seedlings and crop protection chemicals are a simplistic approach to assist resource-poor farmers. Input vouchers (“...targeted vouchers to enable farmers to purchase inputs...” World Bank, 2008:13) and grants (especially to small seedling suppliers) could be used to reduce input costs. This intervention should be a short-term measure to assist but in the long-term, farmers are to be assisted to shift to more environmentally friendly methods of farming. The public extension service must be adequately resourced to co-ordinate inputs supply and to provide the farmers with the needed training in alternative farming methods. Animal traction and hand-hoeing are to be promoted to ensure labour intensive farming in line with socially acceptable, communal land tenure which limits land access to a standard of 4 -6 plots per homestead. Mechanised land preparation using hired tractors is to be used and subsidised in the interim whilst animal traction is being strengthened.

### ***Production***

Water supply challenges are better left as a government responsibility in terms of revamping the canal system. The farmers should be left with the responsibility of tilling the land and cleaning the canal system next to their plots. The farmers are to be helped by extension service officers to plan their production according to the informal market and the ‘protected’ government procurement. More jobs will be created in harvesting and delivering to the local fresh produce. This government intervention is in line with lessons that could be learnt from the study by Manyelo (2011: 53-57), which revealed that when the government was involved in directing production, and partly marketing as well as provision of production finance, the missing ingredient became ensuring that all the produce was absorbed in the value chain, required in order to make it possible for farmers to repay their production loans. Highly perishable produce ( e.g. tomatoes and cabbage) could be processed into dried and bottled products. A state-initiated processor that could be co-owned with black, local private business is an idea to be entertained.

### ***Output markets***

The bakkie traders and street hawkers are to be supported by making their operation as wholesalers and retailers a meaningful engagement. Government support could involve establishing a local fresh produce market that will supply them with a wide range of produce. This local fresh produce market would be a processor (potential employer) to make produce ready for government procurement orders. Extension service officers should have a marketing section that serves as an interface between the farmers and the procurement sections of the government departments. The needs of hawkers should to be anticipated and catered for. Such needs include lock-away shelters/stalls on the streets, which the municipality could hire out to them.

The state-initiated value chain is a needed intervention in Tugela Ferry and the government should not be in a hurry to exit, instead it should be a long-term role player for as long as it is necessary. The entities (fresh produce market, processor, organic input suppliers) that would be established in the process of government intervention could be sold as going concerns to local entrepreneurs.

The outlook of the intervention would therefore include a combination of the state-directed value chain (government procurement); informal value chains (traders and hawkers) and a formal value chain. The Manyelo (2011) study offers lessons to be learnt on getting this model of local economic development going. The Thohoyandou SPAR model is to be promoted as prescribed by the proponents of the “re-governing markets” concept but not at the expense of the informal value chain actors. This model entails what I would call a “pro-poor” value chain governance in that it does not displace a majority of farmers, instead it makes it possible for the farmers to remain in farming and improve their incomes. It also accommodates the creation of forward and backward links of farming thus enhancing the growth of the local economy.

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## APPENDICES

### Appendix 1: Farmers questionnaire/checklist

#### SEMI-STRUCTURED INTERVIEW SCHEDULE/CHECKLIST FOR FARMERS

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Place: \_\_\_\_\_

#### INTRODUCTION

##### Explain research objectives and their wider significance

The aim was to describe the production methods and marketing strategies that farmers employ, as well as how they perceive their challenges and opportunities.

To find out the nature of production methods used by the farmers in the scheme.

To find out marketing strategies used by the farmers of the scheme.

To find out the input and output markets accessed by the farmers as well as the challenges and opportunities faced by farmers.

This information will inform intervention strategies that the government could develop and implement to support small farmers of the scheme.

##### Assurance of anonymity

#### INPUTS

##### A) Knowledge aspects

1. How did you learn about which fertilizer types to use on different crops?
2. Have you ever attended any training courses/workshops on fertilizer use?
3. Have you ever shared your knowledge of fertilizer use with other farmers?

##### CHEMICALS

4. How did you learn about which chemicals to use for different pests and diseases (ext officers, other farmers, family members?)
5. Any training courses/workshops attended on chemical use?
6. Have you ever shared your knowledge of chemical use with other farmers?
7. How do you make sure crop protection chemicals do not end up in crops you sell to clients?
8. Is it easy to stick to guidelines of spraying and harvesting (crop protection chemical contamination)?
9. Do buyers insist on poison free crops?
10. Do you take precaution to protect yourself (self-consumption)?

##### B) Vegetable and crop varieties

11. How did you learn about the advantages and disadvantages of varieties (ext officers, other farmers, family members?)
12. Have you ever attended any training courses/workshops on different varieties advantages and disadvantages?
13. Have you ever shared your knowledge of varieties with other farmers?

##### C) Production methods

How did you learn about:

14. irrigation methods?
15. crop spacing and planting depth?

16. crop rotation?
17. inter-cropping etc? (Ext officers, other farmers, family members)
18. Have you ever attended any training courses/workshops on production methods above?
19. Have you ever shared your knowledge of production methods with other farmers?
20. Do you ever discuss these issues with fellow farmers?

**D) Alternative fertilizers and crop protection**

21. Have you ever tried to use kraal manure?
22. Have you ever made compost?
23. Make and use biological pests and disease control measures (herbal insecticides, repellents)
24. Have you ever heard about (biological pests and disease control? From whom?
25. Are you using them if not why?

**E) Safety aspects of chemical use**

26. When applying pesticides or fungicides, do you wear protective clothing like mask, boots, and gloves? Do you wash yourself after spraying?
27. Where did you learn about safety aspects? (Ext officers, other farmers, family members, suppliers)
28. Where do you store your fertilizers and chemicals? / Are they locked away/ has anyone ever poisoned themselves by accident e.g. drinking from bottle once contained poison?

**F) Sources of supply of inputs**

29. Where do you purchase fertilizers?
30. Why not from other fertilizer dealers? What are advantages and disadvantages of different suppliers?
31. Where do you purchase your crop protection chemicals?
  1. Why? Why not from others? Etc
32. Where do you purchase your seeds? Your seedlings? Why? Why not from others?
33. Where do you purchase your tools and equipment (e.g. knapsack sprayer, hoe, and spades)? Why? Why not from others etc.
34. After purchase, how do you transport the inputs to your home? How much does it cost?
35. Please describe all your marketing practices/activities.
36. Who are your current customers you sell to (hawkers, traders, local consumers, long distance clients)?
37. Where do they come from?
38. What crops do they buy?
39. How did you secure these clients? Do your clients buy all your produce?
40. Do you ever experience shortage of buyers/clients? Which crops and when?
41. Do you as farmers collaborate to satisfy a demand for any crop at any one time?
42. Do you collaborate on any marketing activity at all?
43. Do you have any long distance customers that you deliver to? Have you ever thought of taking your produce to markets long distance away? If yes which or where?
44. What problems do you face in selling your produce (green mealies, cabbage, tomatoes, sweet potatoes, potatoes etc)?
45. Are any of these issues affecting the success of your farming enterprise (infrastructure, roads, telecommunications, market facilities, power and electricity, glut)?
46. Have you ever thought of looking for more clients? If no why not and if yes what happened to the thought?

**PRICES**

47. How is farm gate price determined? Is it taking into account costs?
48. What is the latest price that you sold at and when was that? (tomatoes, cabbage etc)
49. Who are your existing clients, and how did you find them? ( Prompts: hawkers, traders etc)
50. How do you know about the fairness and otherwise of the farm-gate price? Do you think the farm-gate price is fair and is it profitable?
51. Do clients buy all your produce at what price, determined by whom?
52. What challenges do you meet in satisfying buyer needs/requirements?
53. What are these requirements if any?

54. Are there buyers who dictate difficult requirements? (production, processing, wholesaling)
55. If you are not happy with the price that buyers are willing to pay what alternative do you have?

### **MARKETING**

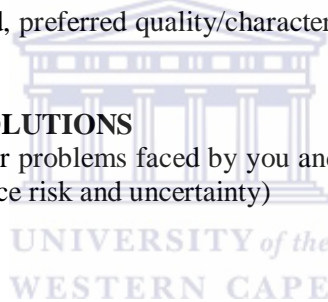
56. Do you think there is enough middlemen to buy produce of all farmers at any one time?
57. Do you know anything about market related pricing? (Lack of timely access to salient and accurate information on prices e.g. Potato price changing within a year).  
During times of oversupply do you sell in other places where there is an effective demand? If so where? If not why?
58. Have you ever thought of selling to supermarkets, processors, national markets locally and far away towns? (Alternative marketing channels).
59. Do you know the big buyer preferred quality characteristics of produce? (Supermarkets/processors)
60. Do you meet expectations of your big customers in terms of quality, quantity, and consistency?
61. Is meeting standards of customers/consumers a challenge to you?
62. What problems do you encounter in selling your produce? (Prompts: infrastructure, roads, telecommunication, market facilities, electricity, glut).

### **INFORMATIONAL CONSTRAINTS**

63. Do you experience any informational constraints related to marketing? (Prompts: prices, location of effective demand, preferred quality/characteristics of produce, alternative markets etc.)

### **PROBLEMS AND POSSIBLE SOLUTIONS**

64. What do you regard as major problems faced by you and fellow farmers regarding marketing your produce? (Prompts: price risk and uncertainty)
65. What are possible solutions?



## **Appendix 2: Input suppliers' questionnaire/checklist**

### SEMI-STRUCTURED INTERVIEW SCHEDULE/CHECKLIST FOR INPUT SUPPLIERS

Interviewee: \_\_\_\_\_ Company: \_\_\_\_\_

Interview Date: \_\_\_\_\_

#### **INTRODUCTION**

##### **Explain research objectives and their wider significance**

To find out whom the key role-players are in this industry

To find out how input markets work and how this affects or influences agricultural practices of farmers in the Mtateni irrigation scheme.

This information will inform intervention strategies that the government could develop and implement to support small farmers of the scheme.

#### **INPUTS TYPES**

1. What inputs are bought by farmers of Mtateni irrigation scheme? Is there a stock list I can have? (What seeds, chemicals, fertilizer, equipment, knapsack sprayers, tools).
2. What scientific names are these (seeds, protection chemicals, fertilizers)
3. What brands of inputs (seeds, protection chemicals, fertilizers)
4. What type of seeds do you use? ( hybrid, open pollinated etc)
5. Do you supply GM seeds? If so what are they called? Are there brands of inputs that are inaccessible to farmers ( due to cost etc)
6. Which inputs are demanded more by farmers and why? Which brands sell well and why do you think this is the case?
7. Do farmers know which inputs to purchase?
8. Do they know very well how to apply those inputs? How do you know this?
9. As far as you know what informs farmers' choice of inputs? How do you know that farmers are buying the right chemical for disease and pests bothering them?
10. What services if any do you offer to farmers?
11. Have farmers come to you complaining of a disease/pest that could not be dealt with stuff they bought from you? If yes what was the solution?
12. Has the demand for inputs been growing over the years? How has demand changed over time?

#### **KEY ROLE-PLAYERS**

13. Which other supplier of inputs do farmers buy from? Which inputs are bought elsewhere by farmers? Is this the only outlet that is run by you in this area?
14. Is repackaging of inputs done to suit small farmers? Which inputs are these? Does the government source inputs from your outlets to support farmers with? Do farmers collaborate to buy in bulk? What other role is played by the government in ensuring input access by farmers?

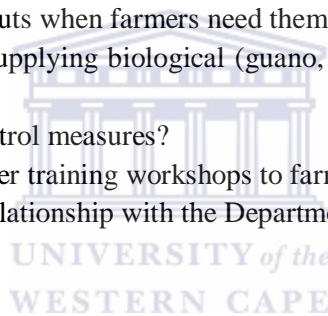
15. Looking at your list, which major brands of inputs are you supplying? (Bayer, BASF, Dow, Du Pont, Monsanto, Syngenta)
16. Who else buys seedlings from you thus competing with the irrigation scheme farmers causing delays of seedling deliveries? Are there white farmers around this region that you supply with seedlings Do you find yourself having to deliver later than farmers would prefer?
17. What is the cause of late deliveries?
18. Does late delivery not hit your business back? (Farmers planting at the same time causing the glut.)
19. What plans if any are you making to avoid late deliveries?

### **PRICES and terms of trade**

20. Where did farmers buy inputs before your company started to sell inputs? When did your company first start selling crop inputs to Mtateni farmers. Have input costs been rising over the years (**fertilizers**, seeds, seedlings, and disease and pest control chemicals) and what causes this in your opinion?
21. Are inputs affordable to farmers?
22. What prices did you charge farmers on inputs last season and this season?
23. How do you pack units?( per plastic bag)
24. Do you ever run short of inputs when farmers need them badly?
25. Have you ever thought of supplying biological (guano, compost, kraal manure) fertilizers to farmers?
26. What about organic pest control measures?
27. Do any of your suppliers offer training workshops to farmers?
28. Do you have any working relationship with the Department of Agriculture?

### **PROBLEMS AND SOLUTIONS**

29. What major problems are faced by input suppliers (regarding farmers, manufacturers of inputs etc)?
30. What kind of problems do farmers present to you for help?
31. What are possible solutions to these problems?



### **Appendix 3: Crop buyers' questionnaire/checklist**

#### SEMI-STRUCTURED INTERVIEW SCHEDULE/CHECKLIST FOR CROP BUYERS

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Place: \_\_\_\_\_

#### **INTRODUCTION**

##### **Explain research objectives and their wider significance**

To find out who the key role-players are in the output market.

To find out how the fresh produce market works and how this affect or influence agricultural practices of farmers in the Mtateni irrigation scheme.

This information will inform intervention strategies that the government could develop and implement to support small farmers of the scheme.

##### **Assurance of anonymity**

##### **KEY ROLE-PLAYERS-structure of the market**

1. Which crops do you sell to your customers?
2. Do farmers of Mtateni Irrigation scheme supply you with any fresh vegetables?
3. If not why do you prefer these suppliers rather than small farmers of the Mtateni Irrigation scheme?
4. Have you ever thought of buying crops from farmers of Mtateni irrigation scheme?
5. If not why is this the case? **Could it be factors from 20-27 below?**
6. If you are buying from them which crops are you buying and why? (Prompts: cost saving, developmental attitude, Agri BEE).
7. For how long have you been buying from local farmers? How many farmers over the years? What volumes?
8. Who are other buyers in the market?
9. Do you ever experience oversupply or undersupply of any crop at any one time?
10. What do you think causes this?( prompts: too many buyers or too many sellers)

##### **Prices and terms of trade**

11. What is the nature of an agreement between you and farmers? ( payment terms and testing for quality etc)
12. Do you ever turn some produce away due to oversupply or bad quality?
13. How is the price you pay for the crops arrived at?
14. Do you pay different prices for the same season's crop sometimes and what causes this? Who determines this price?
15. Are farmers always happy to be paid the price you pay them? Is this a fair price in your view?
16. Do you know if farmers are forced to sell at below cost sometimes?
17. What do you do to help farmers against negative price fluctuation?(contract farming)

18. Do you insist on particular farming methods and inputs (cultivars, fertilizer)? If so do you offer any technical or financial support to ensure production?
19. Do farmers take their produce somewhere else when they are not happy with the price you are willing to pay them.

### **MARKET ACCESS AND FACTORS INHIBITING**

20. Is it costly to assemble small quantities from dispersed small farmers?
21. Don't you suffer high transaction costs due to low levels of education of farmers?
22. Is physical infrastructure (roads, telecommunications, market facilities, power and electricity) available to farmers a problem to you in your dealings with the farmers?
23. What are your produce delivery requirements? Are farmers able to keep up to your requirements (quantity, quality-perishability, consistency, pesticide residue content) If not why not or how so?
24. Are your requirements as a result of customer demands or what? (consumer –driven)
25. Do you experience any pressure about food safety from anybody?
26. Do customers complain about shelf life of your fresh vegetables bought from farmers?
27. Do customers complain about the taste or any aspect of quality of crops you sell?

### **ORGANICS**

28. Have you ever thought of selling organically grown crops to your consumers/clients?
29. Do you think there is a demand for these? If so which crops are mostly demanded? And where are these consumers located?

### **PROBLEMS AND SOLUTIONS**

30. What major problems are faced by crop buyers (regarding working with farmers and consumer demands etc)?
31. What are possible solutions to these problems?

### **ADDITIONAL QUESTIONS TO SUPERMARKETS**

32. Have you ever thought of sourcing produce for you fellow chain stores in times of plenty crops.
33. If not, why is the case?
34. If you thought what happened to the thought?
35. Do you think a pack house would make procurement easy for you?
36. What about contract farming or an agreement with some farmers to grow certain crops? What crops would these be?
37. What about organic produce?

## **Appendix 4: Farmers' questionnaire/checklist-Cousins' study**

### SEMI-STRUCTURED INTERVIEW SCHEDULE/CHECKLIST FOR FARMERS

**Interviewee:** \_\_\_\_\_ **Date** \_\_\_\_\_ **Block** \_\_\_\_\_

#### **INTRODUCTION**

##### **Explain research objectives and their wider significance**

This is a follow up on a survey that was done on 171 farmers previously. The aim is: To find out as to how the farmers are doing their farming and under what conditions.

To find out how successful this scheme is.

To find out the problems faced by farmers.

The outcome will be a written report to communicate to the farmers and government. May be government will do something about problems faced by the farmers.

##### **Assurance of anonymity.**

#### **LAND TENURE**

1. How many plots/beds do you have?
2. Is there any document that is proof that these beds belong to you?
3. Without documented proof of ownership, how secure are you that these beds belong to you and that no one can take them away from you?
4. How many beds have you borrowed?
5. How does this borrowing work?( Prompts: money exchange, share cropping etc)
6. How long is the agreement period to use borrowed beds?
7. Do conflicts arise around lending arrangements between the lender and the borrower? If any, how do they get resolved?
8. Are there plots that lie fallow and why?

#### **HISTORY OF THE SCHEME**

9. How old is this canal irrigation system?
10. When did it get renovated to be concrete?
11. Are there any changes from the olden days to the current period in the way the irrigation scheme was used by the farmers?
12. When did farmers start to grow crops in order to sell?
13. How would you describe buyers of produce?

#### **EXTENSION SERVICES**

14. Who is your current extension officer?
15. How often do you the extension officer assigned to your block?
16. Do extension officers ever call farmers to meetings?
17. How did you gain the knowledge you have about farming?
18. Do you remember a time when extension officers used to call farmers into a meeting or gathering when something would be taught to farmers?

19. Do extension officers help with organising bulk buying of inputs? Do they help with marketing?
20. What makes extension officers not give needed services?

### **BLOCK COMMITTEES**

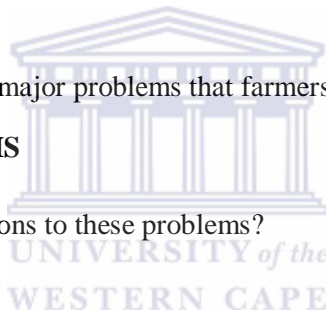
21. Is there a block committee at work?
22. What is the role of block committees?
23. Do you know how committee members are elected?
24. Are farmers happy with the functioning of block committees?
25. If block committees are not functioning well, why do you think is the case?
26. Does the Department of Agriculture do anything to support the block committees?
27. Does any word from the Department of Agriculture carried by committees ever reach you as farmers that they (committee members) were called to some meeting or workshop?
28. Do you know if extension officers train committee members on how to work with the farmers?
29. What kind of things does the committee do? (Organise inputs bulk buying, fencing, Marketing, water distribution conflicts etc.)
30. How is water distribution managed?
31. Does conflict flare up around water distribution and how does it get resolved?

### **THREE MAJOR PROBLEMS**

32. What do you think are three major problems that farmers face?

### **SOLUTIONS TO BIG PROBLEMS**

33. What do you think are solutions to these problems?



## Appendix 5: Farmers' crop sheet

### Tugela Ferry Scheme: Crop Recording Sheet

<b>Date:</b> _____	<b>Farmer:</b> _____	<b>Block:</b> _____
<b>No of plots owned:</b> _____	<b>No of plots borrowed/rented:</b> _____	
<b>From Whom:</b> _____	<b>In return for:</b> _____	
_____		
<b>Crop</b> (e.g. Tomatoes): _____ <b>Variety:</b> _____		
Area planted: _____ metres X _____ metres = _____ sq.metre _____ <b>Crop spacing:</b> _____		
Date planted: _____ Date of first harvest: _____ Final harvest: _____		

How was the plot ploughed (handhoe,donkey,tractor)? \_\_\_\_\_ cost: \_\_\_\_\_

#### **Chemical fertilizer applied before planting:**

Name/ type	Supplier/ location	Quantity/kg	Cost
Total			

#### **Organic fertilizer applied before planting: ( Kraal manure,compost)**

Name/ type	Supplier/ location	Quantity/kg	Cost
Total			

#### **Chemical fertilizer applied as top dressing:**

Name/ type	Supplier/ location	Quantity/kg	Cost
Total			

**Seeds:** Were seeds kept from the last year's harvest?: \_\_\_\_\_

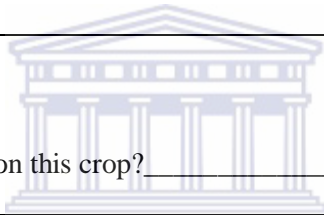
If purchased, amount in grams: \_\_\_\_\_ Cost: \_\_\_\_\_

Seedlings: quantity purchased \_\_\_\_\_ From where? \_\_\_\_\_ Cost: R \_\_\_\_\_

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Chemicals used to control pests and diseases:

Pest/disease	Name of chemical	Supplier name & location	Quantity/grams/Kg	Cost
Other inputs				
Total costs				R



Labour: How many people worked on this crop? \_\_\_\_\_

Operation	Family labour	Hired labour	Payment
Clearing the plot			
Ploughing			
Weeding			
Planting			
Watering			
Spraying			
Harvesting			
Marketing			
Other operations			
Airtime			

Total costs	R
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**Yields and marketing** (bucket,crates,kg,bags):

Usage	Quantity/kg	Measure
Farmer consumption		
Gifts to others		
Worker payment		
Sales for cash		R
Wasted		

**Buyer type:**

Buyer	Name	Qty	Measure	Price/unit	Sales
Consumers					
Hawkers					
Bakkie traders					
Shops					
Other					

**Marketing costs:**

Cost Type	Qty times measure( taxi fare,bags)	Total Cost
Travel		
Materials(package)		

Telecommunication		
Other		

**Calculating the gross margin:**

COST	Amount		A. Income from crop sales	
Ploughing				
Fertilizer			B. Costs	
Seeds				
Chemicals				
Labour			C. Gross Margin	
Marketing				
Other				
Total cost				



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## NOTES

- <sup>1</sup>This section will draw on the findings of a study that was undertaken by Prof Ben Cousins, my supervisor, in parallel with my study.
- <sup>2</sup>The objective of Cousins' study was to find out how successful the irrigation scheme was and what problems were faced by farmers. The paper presents research findings on production and marketing of fresh produce Tugela Ferry smallholder irrigation scheme.
- <sup>3</sup>Note, however, that this probably implies the adoption of industrial farming methods.
- <sup>4</sup>Ikhwezi is a name of a farmers' cooperative that supplied farmers with inputs. This cooperative ceased to exist as an entity some years ago, and an individual then opened his private business in input supply in Tugela Ferry. Farmers continue to associate the name 'Ikhwezi' with his business. The formal name of the business is Mike's Agric Trading cc. This business was busy establishing a second outlet on the eastern side of the bridge over the Thukela River at the time when the study was conducted.
- <sup>5</sup>NLK is the old name for TWK and farmers continue to call it as such, but this business has changed owners and names many times with the latest being TWK, the Afrikaans acronym for Transvaal Wattle Growers Cooperation Ltd.
- <sup>6</sup>"RTS means nothing" is what the owner said when asked what the acronym stood for.
- <sup>7</sup>The terms 'plot' and 'bed' are used interchangeably.
- <sup>8</sup>One respondent of my study explains this extended family arrangement as follows: "I have three borrowed beds which were given to my husband's brother by my mother-in-law. They were used by the second wife who left for Johannesburg. The family gave them to the first wife who then offered them to me because she had her own and she could not afford to use them. The fourth bed was taken away from my mother-in-law because she was on pension. These beds remain in the name of my brother-in-law.....the agreement was that our mother-in-law's beds must not lie fallow.....I suggested that we share the beds with the first wife but she declined saying that she is struggling with her own beds.....she said that if I am tired to use them they would be returned to the chief."
- <sup>9</sup>This refers to the intervention that was led by an NGO by the name of AFRICARE. This intervention was aiming at helping farmers access an organic export market.
- <sup>10</sup> She works for the owner of SPAR supermarket in Tugela Ferry, who provides finance for inputs.
- <sup>11</sup>Block Seven is another block with two pumping stations. Farmers in Block Four are charged R15 per plot, which is increased to a maximum of R25 if the pump needs maintenance. Block Seven farmers are made to pay R50 per plot and sometimes fail to pay their electricity bills.
- <sup>12</sup> This is the wage before it was raised in 2013 by the Department of Labour.
- <sup>13</sup> These are bakkie owning wholesalers who buy from farmers with the sole intention of supplying retailers of all kinds including street hawkers, pension paypoint hawkers and village shops.
- <sup>14</sup> These are owners of bakkies who prefer to buy from farmers and retail from the back of their vehicle at pension paypoints or on streets' pavements of towns.
- <sup>15</sup> The street hawkers are retailers who buy from farmers or bakkie traders. They sell to consumers passing by on streets of towns.
- <sup>16</sup> The Department of Rural Development and Land Reform was working on revamping the infrastructure during the fieldwork period. The Department of Agriculture was repairing the first section in 2012. By 2013 work had commenced thus disturbing production in certain blocks.
- <sup>17</sup> According to Cousins (2013: 135), these conditions can be characterised as "... high population densities, a general shortage of arable land, poor infrastructure, few local employment opportunities, continuing dependence on migrant wages and remittances... social grants and deep and widespread income poverty"
- <sup>18</sup> The state of severe disrepair of the canal system was expressed by farmers a major cause for insufficient water supply (chapter 4). Block Four and Seven were cut off from the system and the reason why electric pumps were installed. The author observed the leaking canal as per Plate 14. Modi *et al*, in Mnkeni *et al* (2010:166) reports on the state of the canal's disrepair as follows: "... Water supply is constrained by the poor state of the canal, lack of regular maintenance as well as poor (non-existent) operation of the water control infrastructure. Farmers also complain of leaking balancing dams, which are supposed to provide a buffer against periods of water shortage." These authors account on the damaged canal system as follows: "The siphon that connects the canal between block 5 and 6 on the left bank was destroyed by floods in 1987, thereby isolating blocks 6 and 7 from the rest of the scheme in terms of water supply. The problem was solved by installing two pumps with pipelines to abstract water directly from the river to the distribution canals." (ibid: 160).

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<sup>19</sup> These tactics could include: imposition of returns of no sales and in-store breakages and losses; long periods before payment; focus on pricing and set aside building long-term retail-supplier relations; confidential rebates which can drive suppliers out of business; insist on supplier to take back damaged or expired goods; breakages and poor management higher when retailers do not own the stock; packaging cost is borne by the suppliers Paradza (2013:59).

