PROMOTING INCOME AND EMPLOYMENT GROWTH IN THE RURAL ECONOMY OF THE EASTERN CAPE THROUGH SMALLHOLDER AGRICULTURE

by

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Dedication

To my beloved siblings Siyakudumisa, Mlungiseleli and Nombulelo, and my "two mothers" Noninzi and Nosawundi

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I accept responsibility for the final product and for all opinions expressed in it as well as conclusions arrived at. And finally,

"It is not by strength that one prevails..." (1 Samuel 2:9b)

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Degree: Ph.D.
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ABSTRACT

The current process of socio-political reform in South Africa has called attention to the issue of reintegration of the previously marginalised black rural inhabitants into the mainstream economy. A vital concern is *how* this can be achieved in such a dynamic and changing environment. Of particular interest is how agriculture, and in particular, black smallholder agriculture could contribute in providing sustainable livelihoods for the impoverished sections of the African rural population. Does this sector have any economic potential to drive a process of sustainable rural economic growth and development? There currently seems to be uncertainty and unease about the role of smallholder agriculture in fulfilling such a task.

It is therefore the challenge of researchers to investigate smallholder potential and to show how far such potential could be exploited. Specifically it needs to be shown whether black smallholders are efficient in producing any agricultural items to justify their policy support. It then needs to be shown what effect promotion of any profitable tradable activity would have in the rest of the rural economy.

This study takes up this two-pronged challenge and provides economic justification for a deliberate policy to support black smallholder agriculture and to alleviate structural constraints faced by emerging commercial smallholders. A two-phase research was carried out in five districts in the central Eastern Cape namely, Mpofu, Keiskammahoek, Zwelitsha, Herschel and Middledrift. The first phase was based in the first four districts. Its main aim was to determine in which of the seven chosen activities do smallholders have a comparative advantage. The second phase based in the last district had as main objective to measure the multiplier effect of an increase in smallholder incomes in the rural economy.

It was demonstrated that smallholders in the Eastern Cape were economically profitable in production of two of the seven selected activities in which they are currently involved. It was found that indigenous beef and citrus showed the most potential which could be exploited. After having exposed this potential, the study also revealed that investment in tradable agriculture would result in a direct increase in rural income plus an extra increase in income as a result of respending of the initial income on demand constrained non-tradable items. Such a phenomenon would free up previously under-utilised resources.

It is therefore recommended that investments in smallholder support services be made in a "multiplied" sense, since the returns are twice as great as the direct returns in production of the original items. South Africa does have a wealth of primary support services (inputs, mechanisation, on-farm infrastructure and marketing) from the private sector. It is the secondary services supporting production and marketing that seem to be lacking as manifested in poor roads, inadequate communication facilities, poor extension services and inaccessible credit facilities. Policy needs to clearly identify these gaps so as to properly direct focus for farmer support. It is thus recommended that the state invests on systematic research ventures specifically aimed at identifying areas that need attention as far as support services are concerned. Another need is for government to take a lead in providing guidance as to who should do what in the implementation of the support programmes.

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CHAPTER 1
INTRODUCTION

1.1 Background

South Africa is currently undergoing a significant transformation in her political, social and economic structure. The political dimension of the transformation process has been remarkably and successfully completed as marked by the first all-race elections in April 1994 and the subsequent elections in 1999. The government has made considerable progress in peeling away the legacy of racial segregation through legal and regulatory reform and redistributive public investment programmes. Benefits have accrued to both rural and urban poor. However, it is generally perceived that there is still an element of urban bias in both policy and programme implementation. Against this background, many support a strong need for social redress since poverty in the country is most prevalent among rural blacks[1].

This process of change has called attention to the issue of reintegration of the previously marginalized black rural inhabitants into the mainstream economy. Of particular interest is the role that black smallholder agriculture could play in facilitating such a process, and specifically its role in providing needed rural livelihoods under such a dynamic environment.

In line with the general climate of reform, significant changes have also been taking place in the South African agricultural sector since the beginning of the political reforms of the early 1990's. The institutional arrangements of the old order, which favoured large-scale commercial, mainly white farms above small-scale, mostly subsistence and mainly black farms, have been changed. The agricultural sector as a whole is now exposed to international competition. However, smallholder agriculture, in particular, faces special

[1] The words 'black', 'African' and 'native' are used interchangeably, as are 'white', 'European' and 'settler'.

challenges owing to the legacy of repression to which it was exposed. The impoverishment of the African rural areas puts enormous pressure on this sector to provide livelihoods for the inhabitants.

Some of the recent research on South African agriculture is sceptical regarding the ability of smallholder farming to create significant additional rural livelihoods (see for example De Klerk, 1996; Eckert, 1996; Kirsten, 1996; Lyne and Ortmann, 1996).

However, it could be argued that for the potential role of smallholder agriculture to be adequately and fairly determined, two other considerations need to be taken into account. The first is that historical developments and the powerful effect they had on the demise of smallholder agriculture should be taken into account if the potential role of this sector in the rural economy is to be accurately assessed. The second argument is the overwhelming international evidence that points towards the ability of smallholder agriculture to act as an engine for rural growth (Delgado, 1997). The first argument is expanded on in the next section. This discussion refers to South African history in general, but with special emphasis on the Eastern Cape as the area focus of this study. Chapter 2 is devoted to the second argument.

1.2 South African Agriculture: Precolonial Era to the Present

A tremendous amount of work has been done by economic historians in tracing the history of economic development in South Africa with special reference to agriculture. Notable contributions include those of De Kiewiet (1957), Wilson and Thompson (1969 and 1971), Davenport and Hunt (1974), Beinart, *et al.* (1986), Lipton (1986), Bundy (1979), and Terreblanche (1998), among others. This section draws heavily on these and other influential scholarly work in this genre.

1.2.1 From Hunter-Gatherer/Herder to Peasant[2]

The European merchants' first encounter with southern African communities from about 1500 was with the Khoi (Hottentots) herders and later with the San (Bushmen) hunter-gatherers and Nguni/Xhosa mixed farmers. They established a barter relationship with the natives whereby, for instance, African sheep and cattle would be exchanged for European iron.

When Jan van Riebeeck and his group of Dutch settlers finally established a permanent station in the Cape in 1652, their activities under the direction of the Dutch East India Company included supplying passing Netherlands ships with refreshments. As a result of a growing need for more supplies for their expeditions, the Dutch settlers gradually established farms and acquired cattle (sometimes through seizure). Conflicts inevitably broke out between the Khoi and the settlers, as the Cape population grew and the demand for more farming supplies rose. A pattern soon developed whereby the Khoi were progressively displaced by more intensive settler pastoralism. These developments forced them into nomadism and wage labour, and even migration out of the Western Cape.

By the late eighteenth century the European settlers who had now become commercial nomadic pastoralists or *trekboers*, as they were commonly known, had covered an area of about 700km towards the east and 200km towards the north. During the same period the limits of the Xhosa settlement were slowly moving westward. This convergence of two communities, with the Khoi caught in the middle, sparked a series of conflicts that continued until the early nineteenth century.

The Xhosa were mixed farmers living in dispersed village settlements, each of which supplied most of the economic needs of its inhabitants. When mission stations were established towards the end of the 1700s Xhosa peasant communities began and spread

[2] Useful references include Worden (1994), Elphick and Giliomee (1989), Bundy (1979), Denoon and Nyeko (1984), Wilson and Thompson (1969 & 1971), Katzen (1969), Union of South Africa (1955).

quickly. Bundy (1979: 8) comments on the influence of mission stations in effecting African 'peasantisation':

> "There was a basic similarity between the missions of different denominations; on all of them 'families were urged to settle; hunters were pressed to become herders; the herders were taught to cultivate; the cultivators were taught to use a plough and irrigate; and all came into much closer relationship with the outside world'" (citing Wilson, 1971).

He also gives a comprehensive definition to characterise the typical African "peasant" as derived from various sources (Bundy, 1979: 9):

> "An African peasant was a rural cultivator, enjoying access to a portion of land, the fruits of which he could dispose of as if he owned the land; he used his own labour and that of members of his family in agricultural or pastoral pursuits and sought through this to satisfy directly the consumption needs of his family; in addition he looked to the sale of a portion of what he raised to meet the demands (taxes, rents, and other fees) that arose from his involvement in an economic and political system beyond the bounds of his immediate community" .

1.2.2 A Burgeoning Black Peasantry

Denoon and Nyeko (1984: 75) present a concise chronicle of the evolution and development of African peasantries as interaction with settlers grew. They lay out a number of factors responsible for the growth of peasant communities on the eastern Cape frontier. The demand of settlers to buy cattle, hides and ivory played a major role in the expansion of frontier trade. In exchange, settler merchants would offer, among other things, guns and horses, which boosted the power of Xhosa chieftaincies. Africans sought to expand their production and thus improve market opportunities as greater demand for their stock arose.

The progress of African "peasantisation" was inevitably accompanied by internal differentiation as chiefly families enjoyed better opportunities to acquire land for

production as compared to common families. Notwithstanding this apparent internal inequity, market opportunities continued to rise and African peasantisation followed its growth trend.

Bundy (1979) describes various events underlying African peasant expansion during the period before the mineral revolution. He identifies four main features that characterise this period. Firstly, the steady spread of agricultural innovation and diversification mostly among mission-oriented Africans as indicated above. Secondly, the cattle-killing event of 1857[3] accompanied by Governor George Grey's dual policy of land expropriation and civilisation, served to speed up integration of Africans and the settlers. Thirdly, the eastward shift of the frontier and the annexation of Ciskei and large part of Transkei brought about more land expropriations. On the other hand, however, this brought about an influx of traders into the Ciskei and Transkei, which meant increased sales of farming products by African peasants. Peasants on the eastern frontier thus effectively adjusted to the changing circumstances. Fourthly, the large tracts of land, confiscated by settlers, became too unprofitable to employ without developed commercial agriculture. As a result, land speculators and large scale land owners found a more profitable alternative in leasing the land out to tenants for cash, in kind or in return for labour.

The economic recession of the 1860s affected African peasant production. However, the discovery of diamonds in Kimberly in the 1870s led to an increase in demand for farming produce, prompting a rise in agricultural produce prices. African peasants responded well to these opportunities afforded by the mineral revolution in the 1870s, according to Bundy (1979) and Wilson (1971).

[3] An event whereby most Xhosa destroyed their entire herds of cattle in keeping with a prophecy or vision. It was erroneously believed that such sacrifice would result in prosperity for the Xhosas as well as military triumph against the English.

This marked the beginning of a significant period of peasant success. Bundy (1979) samples various accounts of the rise of African peasantry:

> "...African peasants appear to have responded more effectively to economic change than white land owners. Many white 'farmers' found it more profitable to leave their lands or to trade in African-grown produce than to increase production of foodstuffs themselves" (p. 67).

> "...In unit terms peasants were more productive farmers than settlers: large ploughed fields had a lower unit yield than careful hoe cultivation of selected soils" (p. 113) (citing Palmer and Parsons, 1977: 8).

> "...'The native can live by agriculture, but not the white man'...'Europeans cannot compete with the natives. The labour kills them'" (p. 114) (citing Johnstone, 1976: 27).

According to Terreblanche (1998: 19), the technological breakthrough for the peasant farmers during this period was the adoption of the ox-drawn plough. "By using the plough and with the support of all the members of his extended families, an African peasant was often more successful in bringing about the shift from pastoralism to cultivation than his white counterpart" (p. 19).

Keegan (1982 and 1986) has written extensively on the experiences of black tenants and sharecroppers further north in the arable Free State and the southern Transvaal areas for example (see also Trapido, 1978). This highly commercialised form of production arose in response to the emergence of markets in Kimberley and the Rand (Keegan, 1982: 196). Keegan (1982: 86) notes that African producers did indeed thrive "at a time of unprecedentedly rapid capitalisation in the rural economy" of that region. It was the partnerships between the whites owning land and the blacks possessing productive resources, capital and managerial skills, that were crucial in the rural economic expansion in the region (Keegan, 1986: 86).

1.2.3 The Repression and Demise of the Peasantry

According to the now commonly accepted historical view, the central theme of the South African history lies in the country's unique process of industrialisation. The discovery of diamonds and later gold "has transformed human relationships throughout the sub-continent, and if the gold [and diamond] had not been present, southern Africa would have experienced quite a different kind of history during the past hundred years". The development of the diamond fields in Kimberley and the gold mines at the Rand created new demands for cheap permanent labour and agrarian produce - thus impacting rural societies throughout southern Africa (Legassick, 1974: 264; Yudelman, 1983: 19; Denoon and Nyeko, 1984: 96; Worden, 1994: 57; Terreblanche, 1998: 19).

From 1890 an important policy introduced in the agricultural sector became the mainstay of the South African economy for the following quarter of a century. Terreblanche (1998: 19) refers to this as the 'labour repressive system'. The main thrust of this system was to solve the problem of labour shortage in the mines and the commercial agricultural sector. Various measures were enacted to ensure sufficient labour supply to both the white commercial agricultural sector and the mines. The Glen Grey Act of 1894, for instance, was passed in the Cape Colony due to pressure from large settler farmers to limit African competition. Through this Act a labour tax was levied on all men living in the Native reserves, and sale, rental or subdivision of land banned - ultimately introducing communal tenure in these areas (Vink and Van Zyl, 1998: 63; Terreblanche, 1998: 20, Bundy, 1979: 135).

In an attempt to solve the desperate labour shortage in the mines after the South African War, Lord Milner appointed the South African Native Affairs Commission (SANAC). The Commission recommended curtailment of Africans' access to land and farming to induce adequate numbers to enter wage labour. SANAC's recommendations culminated in the promulgation of the Natives Land Act No 27 of 1913 through which over a million peasants of the five million total African population were effectively proletarianised. Of all the restrictions introduced to restrict independent black farming, the Land Act was the

most serious (Davenport, 1986: 392). "The act supplied both mining industry and large farmers with the needed cheap and obedient African labour, while additional land became available for both large and small (and mainly Afrikaans speaking) farmers" (Terreblanche, 1998: 20-22).

After the establishment of the Union in 1910 a series of other legislative measures were introduced. These set the scene for segregation of agriculture and a comprehensive programme of support to white farmers. Keegan (1985:397) reports that such measures were aimed at supporting an otherwise 'unsustainable [and] cynical' capitalisation of white agriculture. Support measures included the Land and Agricultural Bank Act of 1912, which served to merge the colonial land banks and offer soft loans to white farmers. The Cooperative Societies Act of 1922 and its subsequent amendments secured inputs and supplied marketing services for white farmers, resulting in lower transaction costs for this sector. The Marketing Act of 1937 provided for production and marketing of more than 90 percent of all agricultural production in the white commercial farming sector. Through its various restrictions the Marketing Act also inhibited African farmers in the reserves from marketing their products.

Other support services such as research and extension, subsidies, tax concessions and special credit facilities were offered almost exclusively to white farmers. Their introduction effectively widened the gap between African subsistence and white commercial farming (De Kiewiet, 1957: 253; Wilson, 1971: 143-53; Kassier and Groenewald, 1992a: 332-33 and 1992b: 86-87; Brand, *et al.*, 1992: 355-56; Mbongwa, *et al.*, 1996: 42; Vink and Van Zyl, 1998: 64-65).

As a result of the Land Act of 1913, about 7.8 percent of the country's farmland was 'scheduled' for inclusion in the reserves. Outside the reserves, blacks owned only 0.7 percent of the land and lived on another 3.6 percent, made up of state and European-owned lands. In effect, therefore, the total land for African use was 12.1 percent of the total land in the country (Mbongwa, *et al.*, 1996: 45).

By the 1920s the industry sector and the urban workforce had been growing and commercial agriculture strengthening, but all at the expense of black peasants and sharecroppers (and white *bywoners*) (Worden, 1994: 57). By the time the territorial segregationist Land Act came into effect the reserves had been showing 'serious signs of agrarian degeneration'. From a prosperous status of self-sufficiency and even exportable surpluses, many peasant areas had, by this date, deteriorated into a state of dependence on imports and migrant wage remittances (Bundy, 1988: 221). As a result of population pressure on land and overstocking, soil erosion in the African reserves had become a serious issue by the 1930s (Davenport, 1986: 394, citing Union of South Africa, 1932). Macmillan (1930) pointed out:

> "Much of the land is, indeed, so grossly overcrowded that with every year that passes the soil is becoming less and less capable of supporting the present population, let alone even a natural increase; and even if the Reserves were larger there would still be enormous difficulties in the way of their development" (p. 201).

Macmillan (1930) mentions a number of other social and economic ills that plagued the reserves: poverty, ill health, starvation, disease, infant mortality and utter dependence on migrant wage earnings. A survey of Victoria East, a district regarded as typical of the whole of Ciskei, showed falling financial returns from African peasant production by up to 46 percent between 1875 and 1925. Concurrently, the population engaged in agriculture during the same period had more than doubled (Bundy, 1988: 223, citing Henderson, 1927). During the 1930s declining yields, an increasing scarcity of resources and rising competition for them, and 'a migrant labour level so high as to seriously deplete the agricultural workforce', all typified the worsening conditions in the African reserves. By the 1940s, the effects of pressure on resources, declining per capita real incomes and falling crop production in the reserves were also manifested in deficiencies, diseases and deaths (Bundy, 1988: 224-25).

The Natives Trust and Land Act No 18 of 1936 was introduced as 'a device to combat the serious dangers of soil erosion and overstocking' (Davenport, 1986: 392). It was born of

the recommendations of the Beaumont Commission appointed under the provisions of the Land Act to 'organise' the reserves. As early as 1916, the Commission recommended that additional land be released to the reserves, as the original scheduled land was only sufficient for about half the African population. However, it was not until 1936 that more land was released to the 1913 scheduled reserve areas, increasing the size of the reserves to 13.7 percent of the country (Mbongwa, *et al.*, 1996: 46).

1.2.4 Separate Development and The Making of the Bantustans/Homelands

> "The natives will be free to go to work in the white areas, but as far as possible the administration of the black and white areas will be separated, and such that each will be satisfied and developed according to its own proper lines" (Jan Smuts, quoted by Cell, 1982: 225).

The above statement represents the policy implication of the ideology of 'protectionist segregation' formulated by Hertzog and Smuts, and officially enacted under their 'African legislation' of 1936 and 1937. Through this policy Africans were also deprived of their franchise in the Cape and Natal (Giliomee, 1985:45; Worden, 1994:78; Terreblanche, 1998:29).

When the National Party came to power in 1948, it introduced a new policy of more rigid racial separation for blacks, and more power and wealth for whites, especially Afrikaners. Employing this policy, known as "grand apartheid" the National Party government went further than previous segregationist authorities by also segregating African ethnic groups from one another. What "apartheid" set out to achieve in South African agriculture, which it did successfully, was 'to retain the black agrarian structure established by the Land Acts, to continue white land settlement, and to advance the white agrarian economy by establishing large commercial farms' (Mbongwa, *et al.*, 1996: 51).

Inter-racial and inter-African ethnic segregation became part of national legislation through such Acts as the Natives Authorities Act of 1951, and the Promotion of Bantu Self-Government Act No. 46 of 1959. These two Acts artificially created eight national

units out of the Pedi, Sotho, Tswana, Swazi, Tsonga, Venda, Xhosa and Zulu ethnic communities. The first homeland to become self-governing was Transkei in 1963, after which nine others followed. Similar Acts were passed forcing Africans to be citizens of some homeland, and placed control of Africans, regardless of where they lived, under Bantu Affairs Administrations Boards (Mbongwa, *et al.*, 1996: 52; Cobbett, 1987: 64; Giliomee, 1985: 46).

Agriculture in African areas had fallen under the Department of Native Affairs and not under the Department of Agriculture since 1910. Black agriculture had, since then, been administered and financed separately from white agriculture. The earlier was administered under the 'native' policy, rather than 'agricultural policy'. It was on this broader national policy platform that development policies such as 'betterment planning' in the homelands were introduced (see for example Yawitch, 1981 and De Wet, 1987).

'Betterment' or 'rehabilitation' was implemented in the mid-1950s in a quest to combat erosion, conserve the environment and improve agricultural production in the black areas through improved land use (De Wet, 1987: 85; Beinart, 1984: 76). It involved the movement of large numbers of families into centralised, village-like residential, arable and grazing areas. In short, betterment policy failed to achieve its objective of 'creating a viable resource base in the reserves'. It... "could not deal with the problems of 'native agriculture' for what they really were: that is, political and agricultural problems, rather than administrative ones" (De Wet, 1987:121-22).

The concept of betterment, though conceived long before the 1930s, was only implemented decades later against the backdrop of the publication of the Tomlinson Commission report (formally 'The Commission for the Socio-Economic Development of the Bantu Areas within the Union of South Africa'). The Tomlinson report represented an outcome of the first exhaustive inquiry into the homelands. Its recommendations on seeking remedies for poverty in the reserves were made within the framework of a broader homeland strategy (Kirsten, 1994: 22). According to Vink and Van Zyl (1998: 66), the Tomlinson Commission saw the creation of small commercial farming as part of strategy for development in the African areas. However, the government rejected

specific recommendations regarding funding to make such a strategy possible. This thus ruled out prospects for any viable small commercial agriculture, especially given the limiting effect that population growth had on land. "The betterment that was implemented was therefore not as envisaged by the Tomlinson Commission" (Vink and Van Zyl, 1998: 66, citing De Wet, 1989).

Based on the legislative framework set up under the Promotion of Bantu Self Government Act of 1959, homeland governments were given responsibility for agricultural development, among other things. This culminated in the establishment of agricultural departments in each of the homelands. In addition, the Act on the "Promotion of Economic Development in the Homelands" (No. 46 of 1968) provided for the establishment of the Bantu Investment Corporation (BIC) and other homeland-based development corporations. The BIC's function was to channel government development funds into the homelands (Kirsten, 1994: 29).

Kirsten (1994: 29) discusses further developments in agricultural policy towards Africans as experienced during the 1970s and the 1980s as a result of institutional changes in the late 1960s. He points out some changes and adjustments to previous policy as outlined in a 1970 document of the Department of Bantu Administration and Development. These changes, following the failure of betterment to achieve any increase in production in the homelands, included the following:

- Decentralisation of all agricultural development initiatives to homeland governments under the ultimate supervision of officials from the 'republic' (i.e. South Africa excluding the homelands).

- Maintenance of the traditional land tenure system except where farming was proving unsuccessful, in which case transfer of land to more successful farmers would be allowed.

- Provision of agricultural credit through cooperative channels for purchase of agricultural inputs and erection of infrastructure.

Commercial agriculture in the homelands was virtually non-existent. This was incorrectly ascribed to lack of entrepreneurial and managerial ability among African farmers. It was therefore considered necessary to second white management personnel to establish modern large-scale irrigation, dryland and livestock projects. Such an approach was also in line with development thinking of the 1960s, which emphasised such models. Starting out with little community participation, the model was adjusted to later accommodate selected labourers to settle in the 'schemes' as 'project farmers' (Brand, et *al.*, 1992: 356).

Consulting engineers who favoured technologically sophisticated developments with a high capital requirement did the planning of the schemes. In the Eastern Cape this was justified by the dual function of the planned projects to offer both economic benefits through increased income and social benefits in the form of food security for recipient communities. These objectives were to be achieved by subdividing the schemes into a purely commercially oriented entity on the one hand and a food security oriented one on the other hand (University of Fort Hare, 1997).

It is widely documented that the farmer settlement approach of the 1970s and early 1980s resulted in large-scale losses (Bromberger and Antonie, 1993 and Van Rooyen, 1995). Van Rooyen and Nene (1998:45) argue that a number of considerations were responsible for the failure of the project approach. These include, first, the fact that systems were not directed towards promoting a class of self-employed farmers. Second, little was done to improve farming methods for smallholders outside these schemes or to solve their farming problems. Third, owing to their 'high investment and operational costs, entrepreneurial establishment [and] fiscal [un] affordability', the settlement schemes could no longer be relied upon for upliftment of adjacent communities and overall rural development (Bembridge, *et al.*, 1982).

An acknowledgement of the limitations of the project settlement approach led to a search for an alternative strategy. The establishment of the Development Bank of Southern Africa (DBSA) in 1982 marked a significant move towards integrated rural development. The DBSA acquired a mandate to achieve this goal through entrepreneurial support for

broad-based beneficiary participation. This led to the introduction of the farmer support programme (FSP) through which access to support services would be provided for a large number of smallholders (Van Rooyen, 1995: 4; Kirsten, 1994: 34). Thence, a number of studies have been conducted to evaluate the economic impact of the FSP approach towards attaining its intended objectives (see for example Ortmann and Lyne, 1995; Kirsten, *et al.*,1995; Kirsten, 1994; Van Rooyen and Botha, 1998). The general conclusion seems to be that it was doubtful if the FSP would be sustainable in the long term, at least in their 'piecemeal' format, reminiscent of its predecessor 'project settlement' strategy (Kirsten, 1994: 312; Lipton, 1996: 419).

1.3 A Remnant of African Smallholders and General Distribution

> "...Somewhere amidst the swollen population of the Bantustans, amidst the poverty of areas that have suffered from apartheid policy, there are families which have been able to cling onto sufficient land and resources to maintain some smallholding agricultural production." (Vaughan and McIntosh, 1993: 440, citing Beinart, 1988: 142).

There exists sufficient empirical evidence to show that some African smallholders in South Africa have shown enough resilience and tenacity through many years of repression to maintain commercial production. Such production has often been enabled through tenancy arrangements, through land acquisition facilitated by intermittent state intervention, and through the private sector and neighbouring white farms. Other notable African smallholder 'survivors' could be found in the remnants of the ineffectual project settlement schemes of the late 1970s and early 1980s.

African farmers have actively participated in the KwaZulu/Natal sugar industry since the 1950s, albeit in insignificant measure in terms of output (Richardson, 1986 and Vaughan and McIntosh, 1993). The turning point was the establishment of the Small Cane Growers' Financial Aid Fund (FAF) under the auspices of the South African Sugar Association (SASA) in 1973. With the advent of FAF, a source of revolving credit for small cane growers, the stage was set for a regeneration of peasant production in KwaZulu/Natal (Minnaar, 1990: 18; Vaughan, 1991: 318). To date there are about 45, 000 small scale sugar cane growers yielding gross revenue ranging between R3, 000 and

R15, 000 per grower per annum and constituting about 18 percent of total cane output in KwaZulu/Natal (Tucker, 1999).

In Mpumalanga a notable case of black small farmer regeneration is that of the former homeland of KaNgwane. The KaNgwane farmer regeneration process was influenced by a slightly different series of historical developments to that in KwaZulu/Natal in a number of ways (Vaughan, 1991; Vaughan and McIntosh, 1993; McIntosh and Vaughan, 1995). First, unlike other Bantustans, betterment planning in KaNgwane was to ultimately provide subsequent formation of 'economically viable farming units' for the rural population as envisaged in the Tomlinson Commission Report. Second, state farms in the homeland created a good basis for implementation of the economic farming units. Third, certain key officials and agencies in the region heavily influenced government policy towards establishment of independent farmers in the Bantustan. The integration of DBSA's Farmer Support Programme (FSP) in KaNgwane also gave the small farmers a little boost as seen in the resulting relative increase in crop yields (Kirsten, 1994: 219).

Naledzani (1992:108-12) mentions other forms of smallholder farming found in the Northern Province of South Africa. These include:

- Central or core unit projects: Here a parastatal supplies support services to African smallholders settled around a state-owned "service centre", which own agro-industrial services such as processing, packaging, marketing and mechanisation.

- Settlement projects, whereby smallholders are settled on economic units with net income corresponding to their level of entrepreneurial skill. Such settlement projects have also been implemented in the Lebowa area as part of the FSP approach. Implemented by the Lebowa Agricultural Corporation (LAC), these projects were set up with the aid of DBSA finance. A number of success stories have been recorded from these projects (Kirsten, 1994; Kirsten, *et al.*, 1995).

Table 1.1: South African Farming by Province and Sector (1991)

Province	Total farmland			Small-scale farmland						
	Total farmland (ha)	Total arable land[a] (%)	Total grazing land[b] (%)	Total small-scale farmland[c]		% of total farmland[d] (%)	Potential arable land[e]		Grazing land[f]	
				(ha)	(%)		(ha)	(%)	(ha)	(%)
Western Cape	11466956	14.0	73.3	0	0.0	0.0	0	0.0	0	0.0
Northern Cape	29094172	1.6	83.6	0	0.0	0.0	0	0.0	0	0.0
Free State	11674811	36.2	68.4	232200	1.4	2.0	34900	0.8	153200	67.0
Eastern Cape	14518725	8.1	87.4	5175400	30.2	35.6	529400	45.1	3472456	27.4
KwaZulu-Natal	7168844	16.7	59.9	3617400	21.1	50.5	360700	30.1	2729212	63.6
Mpumalanga	5595618	31.0	21.9	677500	4.0	12.1	137898	7.9	354609	29.0
Northern Province	9016621	18.9	74.7	3612400	21.1	40.1	530700	31.2	2863818	42.5
Gauteng	774265	56.7	25.3	0	0.0	0.0	0	0.0	0	0.0
Northwest	9628749	34.9	66.1	3807900	22.2	39.5	951975	28.3	2360898	37.1

Sources: Development Bank of Southern Africa (1991), South Africa (1997). (Also adapted from Ngqangweni, et al., 1998).

Notes:
[a] Percentage of farmland that is potentially arable per province.
[b] Percentage of farmland that is for grazing per province. "a" and "b" do not add up to 100% as other land uses exist.
[c] Distribution of small-scale farmland by province (In this definition 'small-scale' farmland refers to the former homeland areas. Current data still do not reflect smallholders outside the former homeland areas)
[d] Percentage of farmland under small-scale farming per province.
[e] Percentage of small-scale farmland that is potentially arable per province.
[f] Percentage of small-scale farmland that is under grazing per province.

Apart from an extensive database built up by the DBSA there is still a general lack of data regarding the current importance of the smallholder sector within South African agriculture. The former homeland areas in which small-scale agriculture is based were for long excluded from the national statistical databases for ideological reasons and because of complexity of measurement.

Recent surveys in the African farming areas reveal a number of informative observations. For instance, a document by the DBSA (1991) reports that the ratio of arable land to rural population in African smallholder farming areas is 0.2 ha per capita compared to 2.5 ha per capita in the white farming areas. These statistics indicate the severity of land shortage in the smallholder farming areas. Table 1.1 presents additional information on provincial distribution of smallholder farmland. Among the nine South African provinces, KwaZulu/Natal, Northern Province, North-West and Eastern Cape provinces have the most land under smallholder agriculture. However, it is common knowledge that a large proportion of this land is under subsistence farming[4]. It must be noted that Table 1.1 assumes that "small-scale " land is found in provinces with homelands. Hence the zero total small-scale land in Gauteng, Western Cape and Northern Cape provinces.

1.4 Background to the Problem of Poverty and Inequality in South Africa

> "...The present has grown out of the past, and so if the future is to be different it is essential to understand the way in which the present has been formed, in order that we may act to overcome the past and, hence, reshape the future." (Wilson and Ramphele, 1989:190).

In the above statement, the authors refer to what they term "the burden of the past", that is, the legacy of conquest and colonialism, and the more recent policy of apartheid, which they trace as the roots of South Africa's current poverty and inequality. They identify a number of processes through which this 'burden' was entrenched.

[4] Due to lack of data the exact proportion of land under subsistence production in these areas is not specified.

The first could be traced back to the long process of conquest by European settlers that culminated in the Land Act of 1913, through which the settlers ensured "that the land won by conquest should not be lost through the market" in the new emergent industrial society (p.191). The second, which followed the conquest, was slavery through which the distribution of land between blacks and whites was determined. The third process was the systematic repression of the industrial labour movement that resulted in, among other things, the low level of black wages. The fourth relates to the allocation of South African public expenditure. The allocation of state expenditure to education, housing, health, agriculture, job-creation, and energy was biased in favour of whites.

The authors maintain that the existing unbalanced pattern of wealth and income distribution is rooted in the development of the South African economy, particularly its industrial revolution. They observe that it is the dimension of deliberate policy of impoverishing people that makes poverty in South Africa different from that in many other parts of the world. However, they also admit that South Africa's poverty is not necessarily different to that of other poverty-stricken countries with respect to other more universal non-political forces. The background to the political dimension of poverty has been sufficiently traced in the previous sections of this chapter. Attention will now shift to the more 'universal' dimensions of poverty as they apply to South Africa.

South Africa is essentially an urbanised industrial economy. A large number of people have migrated from the land-based economy in the rural areas to seek work in the cities. Inevitably the poor have been increasingly subjected to the structural weaknesses of the economy, notably inflation and especially unemployment. Before getting to these more 'universal' aspects associated with poverty a general picture of the distribution of poverty in South Africa is given.

1.4.1 Measurement and Distribution of Poverty in South Africa

There is no official or commonly agreed poverty line for South Africa. Pillay (1996:37) suggests that the "poor" can be defined as the poorest 40 percent of households and the bottom 20 percent can be defined as the "ultra poor". He contends further that in terms of expenditure levels, the cut-off point for the poor can be considered to be a R300 per month 'adult equivalent' below which people are considered poor. For the ultra poor this cut-off point is approximately R171 per month. Using this poverty line to measure the extent of poverty, 52.8 percent of the population in South Africa can be considered to be poor while 28.8 percent are ultra poor (Pillay, 1996:38, citing World Bank, 1995). Table 1.2 below shows the extent of poverty in South Africa using other poverty lines.

Table 1.2: Comparison of Selected Poverty Lines for South Africa, 1993

Type of Poverty Line	Cut-Off	Population Below Poverty Line (%)
Min. per capita caloric intake (@ 2500 Kcal/day) (monthly)	R143.2	39.3
Min. caloric-adjusted per capita intake (@ 2500 Kcal/day) (monthly)	R185.4	42.3
Min. Living Level (MLL) (monthly)	R164.2	44.7
Supplemented Living Level (monthly)	R220.1	56.7
World Bank's 'International Poverty Line' (daily)	US$1.00	22.1

Source: Adapted from Pillay (1996), citing the World Bank (1995)

The first four criteria in Table 1.2 show that the proportion of population under the poverty line in South Africa varies between 39 and 57 percent. The World Bank's rough

international measure of one US Dollar a day shows 22 percent of the population in severe poverty in South Africa.

Who and where are the poor in South Africa? The Project for Statistics on Living Standards and Development (PSLSD) survey showed that most of South Africa's poor live in rural areas. The poverty share, that is, the percentage share of the poor in the rural areas, is three-quarters of the total poor. The rate of poverty in the rural areas in general was found to be 74 percent. Approximately 42 percent of the poor in South Africa are found in Eastern Cape and the Northern Province combined (see Figure 1.1).

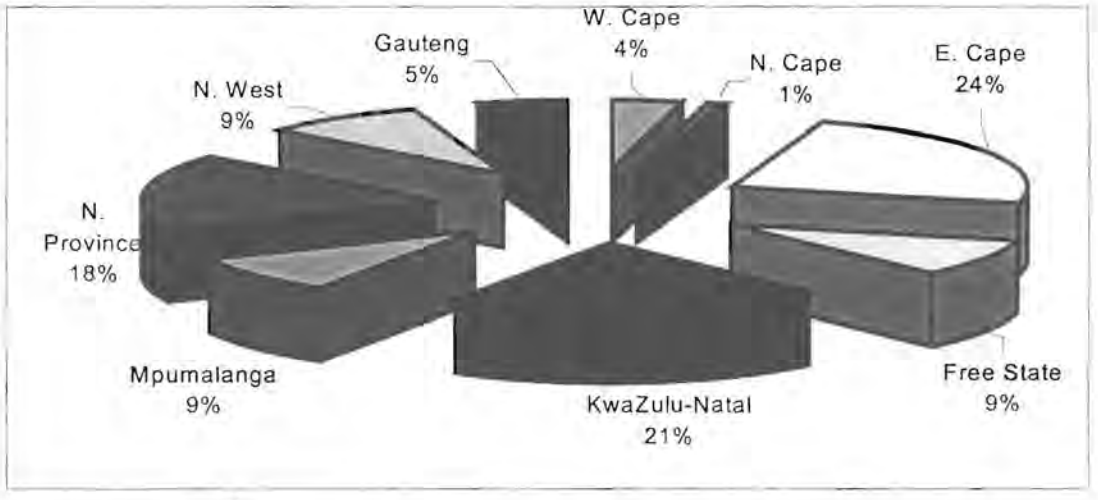

Figure 1.1: South African Provincial Poverty Shares

Source: Adapted from Pillay (1996)

Poverty and inequality are indicated in various other ways. The following sub-sections will dwell on some of the most common 'universal' indicators of poverty namely, unemployment, human development aspects (literacy, life expectancy and personal income), and income distribution.

1.4.2 Unemployment

The devastating effect that unemployment has on people's lives is a consequence of the loss of their main source of income and also the psychological feeling of uselessness (Wilson and Ramphele, 1989). Unemployment is therefore one of the most obvious and important indicators of poverty (Pillay, 1996:32).

In Figure 1.2 below South Africa's unemployment rate is compared with that of seven other upper-middle income countries. Its aim is to illustrate the gravity of the problem in South Africa. Of the seven upper-middle income countries chosen for comparison, the Czech Republic has the lowest unemployment rate at 3 percent - 90 percent lower than South Africa's figure. In other words, South Africa's unemployment rate is eleven times that of the Czech Republic, one of its upper-middle income counterparts. Of the countries analysed, the next lower rate of unemployment after South Africa is that of Argentina at 18 percent. South Africa's unemployment rate would have to fall by 45 percent to catch up with its counterpart Argentina.

Pillay (1996:33) reveals that approximately 4.7million people, that is, one third of South Africa's labour force, are unemployed (citing the October Household Survey, 1994). This figure includes 26 percent of the men and 41 percent of the women in the labour force. Among Africans 4million people, or 41 percent, are unemployed. The situation is even worse for African women-2.2million or 50 percent are unemployed, making them the group most affected by unemployment.

In an urbanised industrial economy like South Africa, non-agricultural employment becomes increasingly important as rural people continue to leave their land in search of urban employment. Sadly, however, as illustrated in Figure 1.3 below, total employment in the non-agricultural sectors, including the public sector, has been decreasing. This figure uses data released by the South African Reserve Bank in June 1999. More interesting is the fact that total public sector employment has particularly been on the decrease between 1991 and 1998.

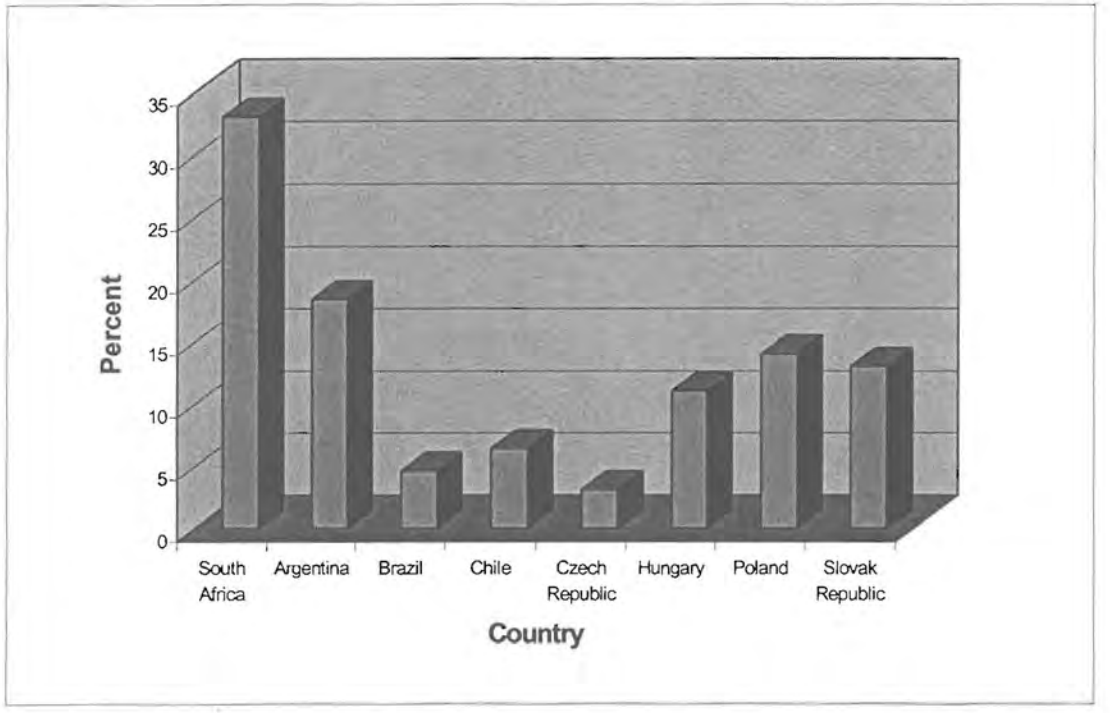

Figure 1.2: Unemployment in South Africa and Selected Upper-Middle Income Countries

Note: South African figures for 1994, and the rest of the countries for 1996

Source: Adapted from Pillay (1996) and the World Bank (1998)

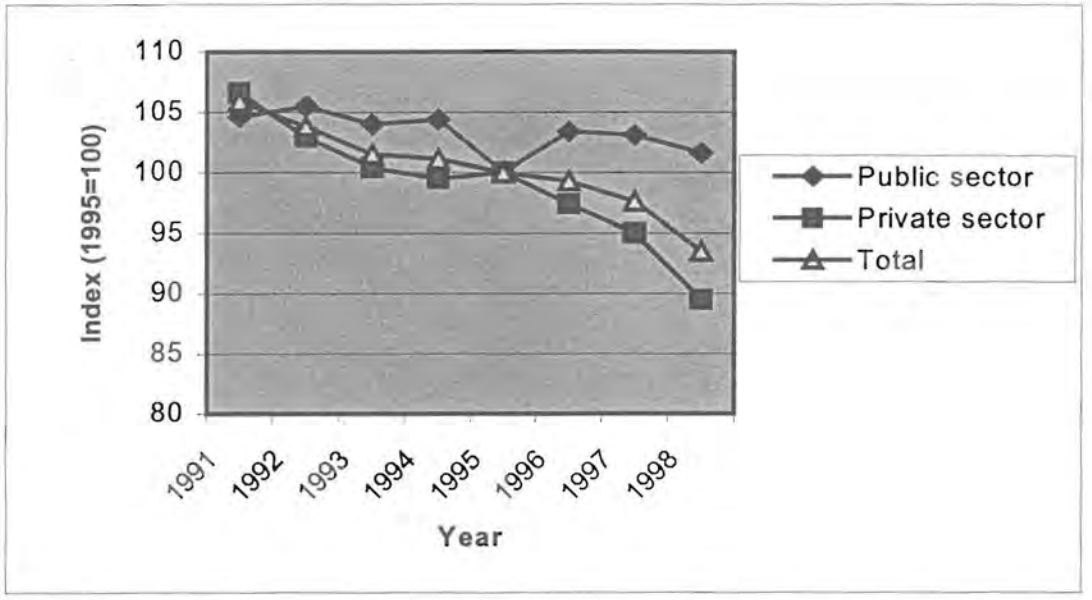

Figure 1.3: Employment in the Non-Agricultural Sectors in SA, 1991-1998

Source: Adapted from South African Reserve Bank (1999)

1.4.3 Human Development

The United Nations Development Programme (UNDP) devised a macro-indicator of poverty called the Human Development Index (HDI). An underlying principle of the HDI is that people must have basic human capacities and a range of opportunities to be able to make informed choices. The HDI is based on life expectancy and adult literacy as indicators of capacities and income as indicator of opportunities. An index of 1, the maximum value, indicates a high level of human development. According to the Development Bank Southern Africa (1995), South Africa's HDI is 0.69, showing a 'medium' level of human development, in the same league as that of countries such as Libya and Lebanon.

However, there are noted inequalities in the level of human development between provinces. The Western Cape ranks with Brazil and the United Arab Emirates with its high HDI while the Eastern Cape's low index is comparable to that of countries like Rwanda. These figures are only averages, which also conceal huge disparities within the population. Looking at income distribution gives a better picture of which segments of the population are affected by the different levels of human development.

1.4.4 Income Distribution

With a Gini index[5] of 58.4 (World Bank, 1998), South Africa, an upper-middle income country, has one of the most unequal patterns of income and wealth distribution in the world.

[5] Gini index measures the extent to which the distribution of income (or, in some cases, consumption expenditures) among individuals or households within an economy deviates from a perfect equal distribution. An index of zero represents perfect equality while an index of 100 implies perfect inequality (World Bank, 1998).

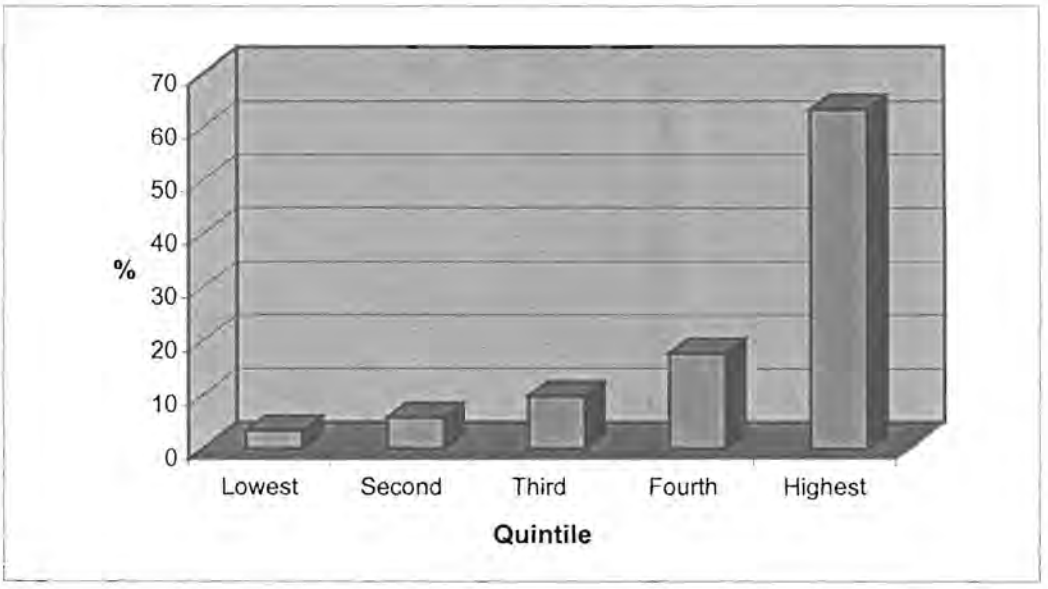

Figure 1.4: Percentage Share of Income or Consumption in South Africa (%)

Source: Adapted from the World Bank (1998)

This concern was also expressed in the Poverty and Inequality Report (PIR) submitted to the office of the vice-president and the Inter-Ministerial Committee for Poverty and Inequality in 1998 (May, 1998). Figure 1.4 plots World Bank (1998) data to illustrate this pattern of distribution. It reflects the percentage of income or consumption accruing to segments of the population, ranked by income or consumption levels. For example, the segment ranked lowest by personal income receives a mere 3 percent share of total income in South Africa.

Figure 1.5 plots some figures reported by Pillay (1996) based on the 1993 PSLSD data. These data reveal another aspect of South Africa's income distribution, that is, racial inequality. The PSLSD data reveal that white household income is over 6 times that of African households, over 3 times that of Coloured households and 1.6 times that of Indian households. Analysis of household per capita data shows ratios of the same degree (see Figure 1.5 for an illustration). A recent analysis done by McDonald and Piesse (1999) emphasises the need to take into consideration the racial and spatial (rural-urban) components of income.

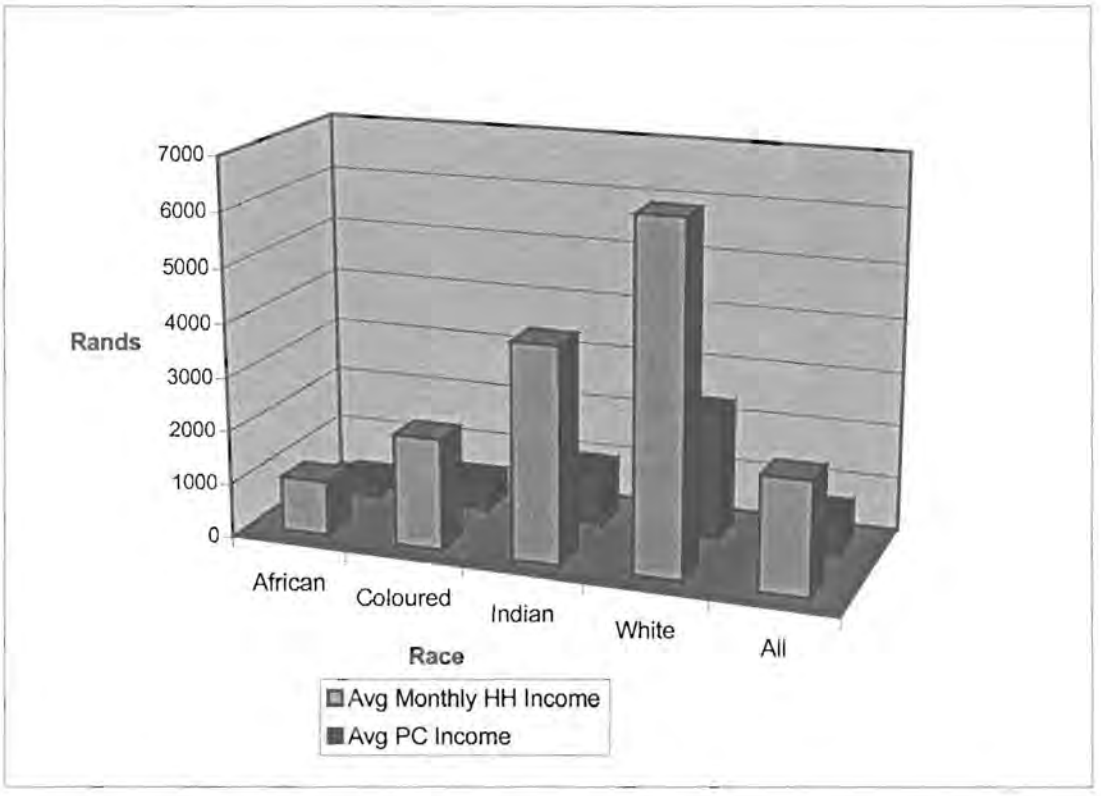

Figure 1.5: Average Monthly Household and Per Capita Incomes in South Africa (in Rands)

Source: Adapted from Pillay (1996)

1.5 Introduction of the Research Problem

Sweeping political changes in South Africa have been effected successfully if not miraculously through a negotiation process culminating in the first all-inclusive national elections of April 1994. However, the challenges of poverty and inequality affecting large sections of the population still remain. Fighting these ills is the next major challenge to the nation. In the words of Terreblanche (1998:46):

> "From an economic point of view, the South African transformation will not be complete before a new symbiosis has been forged between (the black controlled) state and (the mainly white controlled) capital. To be in line with today's world, South Africa has no choice but to

develop an appropriate and sustainable system of democratic capitalism to replace the previous system of racial capitalism."

The road to the much-needed economic reform and the idealised state-capital symbiosis will be particularly rocky. The re-introduction of the South African economy into the global system comes with its challenges especially for those affected by poverty, many of whom are black and reside in rural areas. Over a third of rural households continue to engage in (smallholder) agricultural production. If one considers those farmers involved in smallholder farming on part-time basis this figure goes up markedly. Almost half of the agricultural population (2.5 million) is estimated to work at least part-time on smallholder operations (Delgado, 1998:165, citing Simbi, 1998).

One of the government's policy strategies is to maintain limited state intervention in agriculture to correct market imperfections (South Africa, 1995) especially for the benefit of the underdeveloped smallholder sector. As it is, the smallholder agricultural sector is unlikely to effectively compete with its more advanced large-scale counterpart in the quest for a stake in the newly globalised market without some form of government intervention. At least in principle the current government seems to acknowledge this fact:

"Experience has shown that unqualified reliance on market forces to allow the benefits of economic growth to 'trickle down' to the poor is not effective where the underlying institutional context has remained the same" (May, 1998:1)

It is therefore the challenge taken up by this research to try to assess smallholder comparative advantage and potential linkages from successful smallholder production activities. This will then serve to inform policy makers of possible avenues to support the emergence of smallholders and to exploit such opportunities as the search for better solutions to rural poverty alleviation continues.

1.6 The Statement of the Problem

Creation of employment and alleviation of poverty among the majority of impoverished black South Africans has been receiving increasing attention in government policy. Since the government of national unity took over in 1994, the national economic policy focus has shifted accordingly towards the issue of growth with employment and wealth redistribution. Notably, recent research in agriculture has been devoted to the specific issue of creation of rural livelihoods, and the role of African smallholder agriculture therein (Lipton, *et al.*, 1996a and Lipton, *et al.*, 1996b). The question is what could be done to create and maintain a viable source of livelihoods for the 16 million black rural residents, and a further one million employed on white commercial farms (South Africa, 1996).

The apparent insignificance of African commercial smallholder farming has engendered general scepticism about the sector's potential to generate needed rural livelihoods. Such scepticism is based mainly on evidence from negative consequences of the repressive nature and faulty design of past agricultural policies to support African smallholders. According to Lipton, *et al.* (1996: x), worldwide evidence has shown that 'poor people do not neglect opportunities that enable them to improve their living standards'.

This study takes on the challenge of showing whether South African smallholders have any role to play in providing a source of livelihoods for the impoverished African rural population. Specific questions raised in this study can be stated as follows:

- Do small-scale agricultural producers in South Africa have a comparative advantage in any commodities? Or should they rather abandon their agriculture and opt for wage employment outside agriculture?

- What impact will increases in smallholder agricultural incomes have on overall rural income and employment growth?

A closely related issue is:

- What are the policy-related and non-policy forces behind any comparative advantage in smallholder agriculture, and how can policy affect these forces?

1.7 The Hypotheses

The hypotheses for this research are as follows:

- Smallholder farmers can produce certain agricultural commodities both profitably from the view of the farm, and also efficiently from the view of society in general.

- Improved smallholder production will boost overall rural incomes in two ways. First, directly through increased smallholder agricultural incomes, and second, indirectly as such income is re-spent on local non-agricultural goods and services that otherwise might not have a market because of lack of effective demand for them.

1.8 Definition of Operational Terms

The central focus of this study is a group of farmers referred to as '**smallholders**'. This term is used interchangeably with 'small farmers', 'small-scale farmers', and 'peasants' throughout the text. The context in which 'smallholder' is used here is threefold. First the definition by Lipton, *et al.* (1996: viii) of 'small farm' has been adopted in the use of the term: "It depends on the quality of land: its capacity to produce net farm income. Half a hectare of reliably watered peri-urban land, suitable for vegetable farming, is a 'bigger' farm than 250 hectares of low quality grazing land in the Karoo". The second context in which this term is used in this study is based on the fact that smallholder farmers in South Africa have been historically black, hence the occasional reference to 'African' and 'black' smallholders in the text. Thus, for the purposes of this study, whenever 'smallholder' or its above-mentioned variants are used in the text, they refer to those of black or African origin[6]. Thirdly, this study is only concerned with a specific type of African smallholder: rural farmers with access to a piece of land, employing family labour and sometimes hiring additional labour to produce crop and/or livestock items whose surplus is marketed.

[6] Refer to footnote no. 1 (p. 1) for an explanation on how reference to race is treated in the text.

Another term frequently used in this study is '**comparative advantage**'. An agricultural item produced in a specified location under defined technological and market conditions is said to have a 'comparative advantage' if the opportunity cost of domestic resources used in producing it is less than the corresponding earned revenue. In other words, such an item uses the domestic resources efficiently to earn revenue. Although the concept of 'comparative advantage' is usually employed in the context of international trade, it could also be applied within a country, provided the commodity in question is 'exported' or 'imported' across specified regional boundaries. The terms 'social profitability', 'efficiency' and 'economic efficiency' are also freely used throughout the text to refer to the same concept.

1.9 The Research Process and Methodology

This study is based in five of the 43 magisterial districts of the Central Region of the Eastern Cape province, namely Mpofu, Middledrift, Keiskammahoek, Zwelitsha and Herschel. The research process consisted of two main phases. The first phase was carried out to compute indicators of comparative advantage of smallholder farmers in seven selected crop and livestock activities using the Policy Analysis Matrix (PAM) as a tool. During the second phase, one of the five districts was chosen to estimate growth multipliers as indicators of potential growth in overall local rural income and employment through growth in smallholder agriculture.

The objective of the first phase was to identify which of the most common smallholder activities have a comparative advantage. It needs to be established whether or not smallholders have a comparative advantage in any agricultural activities. If they do, then such a comparative advantage should be fully exploited. It follows then to investigate what impact would a promotion of efficiently produced smallholder commodities have on rural incomes and employment. It is therefore the objective of the second phase to measure potential linkages from tradable smallholder agriculture.

1.10 Outline of the Thesis

Chapter 2 of this report reviews international evidence on smallholder agriculture's role in general agricultural and economic growth and development, dwells on some of the challenges facing smallholders throughout the world and also discusses these issues as they relate to South Africa. Chapter 3 describes the study area and aspects of smallholder agriculture in the Eastern Cape province. Chapter 4 discusses the theoretical foundations of the concept of comparative advantage and presents the results of its empirical application in the study area. In Chapter 5 the concept of growth linkages is dealt with together with its application to the study area. The results from both phases of empirical investigation are synthesised in the final chapter (Chapter 6). Chapter 6 also wraps up the study by presenting general conclusions and policy recommendations.

CHAPTER 2
SMALLHOLDER AGRICULTURE IN ECONOMIC DEVELOPMENT

2.1 Background

The world is as equally painted with contrasts and paradoxes in politics, society, and economics today as it has been since time began. One of the most conspicuous of these phenomena is the unequal distribution of the benefits of growth in consumption experienced since the beginning of the 20th Century[7]. Despite the unprecedented scale in which the standards of living have increased since the commencement of the century, more than a billion people are still deprived of basic consumption needs. Almost a third of the population in developing regions of the world live below the common international poverty line of one US Dollar a day. The 20 percent of the world's population in highest-income countries account for 86 percent of total private consumption expenditures while the poorest 20 percent account for just over a mere one percent

These stark contrasts are experienced both between and within regions/countries. All industrial countries, though characterised by high consumption, still experience poverty and deprivation. Up to 17 percent of the population in industrial countries is poor. These poverty concerns are accompanied by similar worries about such thorny issues as sustainability of the environment. Again the poor are the most hit by the costs of environmental degradation. For example, 80 percent of the estimated 2.7 million deaths caused annually by air pollution are from among the rural poor in developing countries.

[7] These dynamics are comprehensively reported in the United Nations Development Programme (1998) and the World Bank (1998). This section draws heavily on these sources.

Leading up to the inauguration of both a new century and new millennium, the future of development has been put on the dialogue table by governments under the auspices of the United Nations, largely as a result of alarm over the above-mentioned observations. The common view that emerges from such discussions is that there is a need for a renewed commitment to eradicate poverty and to protect the environment, among other things.

Yet, before any future development strategies can be charted, one major consideration has had to be noted, as it applies to developing countries and to Africa in particular. One of the defining characteristics of most developing countries is that a high percentage of the labour force is engaged in agriculture and other rural activities[8]. In Africa, this is even more pronounced. Agriculture in sub-Saharan Africa[9] accounts for 70 percent of total employment, 40 percent of merchandise exports and one-third of Gross Domestic Product (GDP) (Jaffee, 1992:62; Delgado, 1996:151). Since most of Africa is evidently at an earlier stage of development than Latin America and Asia, 'getting agriculture moving' (after Mosher, 1966) is required to steer the continent's economic development (Eicher, 1992:79; Rukuni, 1994:1). In their book on agrarian transformation, Tomich, *et al.* (1995) advocate and justify the central role that smallholders in particular would have to play in advancing transformation in most developing regions including Africa. The next section discusses documented conventional wisdom associated with smallholders and their role in development.

2.2 Smallholder Agriculture in Development: Conventional Wisdom

> "In farming bigger does not necessarily mean better..." (Tomich, *et al.*, 1995: 114).

Many of the missed opportunities for increased agricultural productivity and the accompanying costly mistakes by developing countries have been due to emphasis on the notion that large-scale farming is superior (Tomich, *et al.*, 1995:114-115). Peasant or small-scale farming has been considered an inadequate foundation for development.

[8] Tomich, *et al.* (1995) coined a catchy acronym for such countries namely, CARLs (*c*ountries *w*ith *a*bundant *r*ural *l*abour).
[9] Sub-Saharan Africa in this context excludes South Africa and Namibia.

Bates (1988:507) reports that a common view held in these countries was that, owing to their commitment to subsistence, small farms produced 'a highly variable level of marketable surplus, thus imposing risks upon consumers and the state'. Large-scale farms on the other hand, believed to produce a more reliable flow of marketable surplus, were relied upon. Small farmers were considered 'subsistence-minded' and restricted by such factors as tradition, fatalism, lack of innovativeness, low aspirational levels, limited time perspective and lack of deferred gratification (Rogers, 1969: 115; Tomich, *et al.*, 1995: 115).

Other historical factors have combined to influence the notion of superiority of large farms. According to Bates (1988:507), commentaries on the rivalry between the 18th century super-powers France and England influenced a common conclusion about the merit of large-scale farms. England's economic superiority attributed to her agricultural productivity, was believed to be linked to the greater technical and economic efficiency of her large-scale farmers. France's economic backwardness, on the other hand, was blamed on insufficient technical progress and diminutive farm size. This view further influenced subsequent assertions against small farms by Karl Marx and Vladimir Lenin, which were later reinforced by Kautsky among others (Hayami, 1998:301, Ellman, 1981:981).

Marxist-Leninism, which underpinned the Soviet agricultural strategy, played a major role in shaping the view of the inadequacy of small-scale farms in driving development. This particular idea advocated prevalence of economies of scale in agriculture and was subsequently implemented through Stalin's 'collectivisation' programme in the former Soviet Union between 1929 and 1935 (Tomich, *et al.*, 1995: 115, 291). Another view, strengthened by the advent of the Green Revolution, was that large farms had adopted new technologies, while small farms remained backward and inefficient (Berry and Cline, 1979:ix).

The issue of whether or not small farms are more productive than large ones has been a source of major controversy among scholars over the decades, and deserves further

discussion in this chapter. The next section therefore introduces the farm size-productivity debate, traces its beginnings and discusses its controversies. It will also attempt to reconcile the different views and search for common ground on the subject.

2.3 The Farm Size-Productivity Debate: From Controversy to Convergence

This issue is about whether there exist increasing or decreasing returns to scale in agriculture. The publication of the results of the Indian Farm Management Studies in the 1950s, showing an inverse relationship between farm size and productivity, has engendered decades of research efforts on this subject, particularly on Indian agriculture[10]. Quite a number of similar studies have also been conducted in other parts of the world[11]. These follow-up studies mostly exposed shortcomings to the generalisations of the initial Indian investigations to widely differing natural and climatic conditions found in developing parts of the world (Cornia, 1985:514-515). After a systematic literature review Tomich, *et al.* (1995:125) assert that, in general, there evidently seems to be a 'decline in output per unit area as the total area of a farm increases'. In spite of a few qualifications to the 'inverse relationship' phenomenon such as those related to land quality and technological change (Deolalikar, 1981), such a relationship still holds in many developing countries.

Information on the existence or non-existence of economies of scale in agriculture is required to justify land reform programmes and to guide policy choices on optimal farm size in low-income countries (Cornia, 1985:514; Berry and Cline, 1979:1-2 and Tomich, *et al.*, 1995:119).

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[10] See for example Bardhan (1973), Ghose (1979), Lau and Yotopoulos (1971), Mazumdar (1965), and Sidhu (1974), among others.

[11] Cornia (1985) did a comprehensive study in fifteen developing countries; Berry and Cline (1979) conducted earlier pioneering work that combined evidence from a number of developing countries.

Since low productivity is the root of poverty (Tomich, *et al.*, 1995:17), rapid economic growth in low-income countries is strongly warranted for rural poverty to be alleviated. In their study on tropical Africa, Anthony, *et al.* (1979) profess that such economic advancement would largely depend on the improvement of smallholder agriculture. In the face of a prevalent view that smallholders behaved 'uneconomically', Theodore Schultz (1964), supported by Myint (1965) and Lewis (1970) promoted more positive thinking about smallholder decision making. Schultz "...convincingly argued that peasants in traditional agriculture are rational and efficient in resource allocation, and that they remain poor not because they are irresponsive to economic incentives but because only limited technical and market opportunities are available to which they can respond" (Hayami, 1998:303).

Jones (1980) goes back to early history in an effort to dispel the myth of subsistence production in African agriculture. He holds that it has been erroneously believed that African societies of pre-colonial times were "characterised by highly localised economies" that ensured internal self-sufficiency. It was commonly held that Africans had few economic contacts with one another and that individual families were self-sufficient entities with no need to specialise for trade (cited by Lofchie, 1980:2). His opening statement (p.10), "Agricultural trade in tropical Africa is ancient and complex", is the crux of his findings to dispute the myth of the 'uneconomic' behaviour of African smallholders.

Smallholders are responsible for most farming activities in large part of Africa and other developing regions of the world. Berry and Cline (1979:128) concluded in their study on economies of scale in agriculture that: "...agricultural strategies focusing on small farms start with a major advantage: the demonstrated capacity to achieve high productivity of what is usually the scarcest resource, land...largely through greater application of the abundant resource, labour" (see also Eicher and Baker, 1982:51). Japan followed this 'land-saving, labour-using' or 'unimodal' strategy (Tomich, *et al.*, 1995) during its early development. Taiwan (Japan's former colony) repeated the same pattern but in an even more impressive manner. According to Johnston and Kilby (1975:242) Taiwan's rates of

increase in output and total factor productivity were both higher than in Japan. As will be discussed below, Africa, on the other hand, has experienced mixed fortunes and varying levels of success with smallholder productivity.

2.4 Smallholder Agricultural Productivity in Africa[12]: Historical and Contemporary Perspectives

Research on African smallholder activities began in earnest in the 1960s prior to which agricultural scientists focussed largely on export cropping and commercial farming. Since the beginning of the end of colonialism there has been a 'boom' in studies of smallholder agriculture[13] (Reardon, 1998: 444). For the purpose of this review, the focus will be on selected cases where smallholders have played a major role in fostering economic growth and development in Africa. The magnitude of such an exercise will unavoidably lead to the omission of significant material. However, to remain concise, this review must be highly selective.

It is widely accepted that smallholders or peasants not only dominate crop production in Africa and other developing areas, they have also been and still are today the majority of mankind (Hayami, 1998:300; Holden and Binswanger, 1998:50). Eicher and Baker (1982:47) describe smallholder farming in sub-Saharan Africa as a system in which farmers rely primarily on family labour, a small stock of capital and abundant land relative to Asian countries. It is on the increasing productivity of these farmers that the alleviation of widespread poverty in developing areas of the world depends (Eicher and Staatz, 1998:ix; McCalla, 1998:52).

Over the past few decades, African smallholders have had to cope with various kinds of pressures, giving rise to a few 'paradoxes' and 'contrasts'. In the face of these shocks,

[12] Africa in the context it is used here refers mostly to sub-Saharan Africa; north Africa and the Republic of South Africa are excluded unless otherwise mentioned.
[13] Eicher and Baker (1982) carry out a systematic review of literature on sub-Saharan African agricultural development.

Delgado (1997:147) holds that, contrary to what is presumed by outsiders, production growth in African smallholder agriculture has been generally impressive.

The declines experienced in land and labour productivity in 1970s, have been steadily reversed in the 1980s and 1990s. Block (1994:622) estimates total factor productivity (TFP) growth of 1.63 percent per annum from 1983 to 1988 in sub-Saharan Africa. Thirtle, *et al.* (1993:474) report an even more stellar performance in Zimbabwe - over 4 percent annual TFP growth in communal farms during the 1980s. However, the observed 'progress' in African smallholder agricultural productivity seems to have done little to counteract what Byerlee and Eicher (1997b: 4) call a 'downward spiral of poverty and malnutrition' in the continent. As Johnston (1980:69) also laments: "...there are clear and disturbing indications that the expansion of food production has failed to keep pace with the growth of population in a number of sub-Saharan countries". Despite these challenges, Africans could still brace themselves for recovery as long as the few observed agricultural production successes are sustained and replicated to the rest of the continent.

A number of significant success stories have been recorded in various parts of Africa. These provide a 'ray of hope' for stepping up food production (Byerlee and Eicher, 1997b: 4) so as to better cope with undernourishment of the magnitude highlighted by Alexandratos (1995)[14]. One of the most informative pieces of research to this effect is that by Byerlee and Eicher (1997a). The volume in question focuses on maize, the most important food crop for sub-Saharan consumers, and synthesises historical and current experience on the maize "revolution" in Africa. A few other individual country studies are worthy of mention. For instance, in their recent book, Rukuni and Eicher (1994) review Zimbabwe's maize- and cotton-based "agricultural revolution" during the 1980s.

[14] Alexandratos (1995) estimated that "...even if economic growth resumes, sub-Saharan Africa will have 300 million undernourished people by the year 2000, nearly half of the world's total" (cited by Byerlee and Eicher (1997b: 3).

A number of smallholder success cases are also recorded in Bates and Lofchie (1980). This review proceeds by tracing historical developments in smallholder productivity, beginning with the post-independence high of the 1960s, then the mid-70s decline, and winding up on the recent era of recovery initiated during the 80s. It concludes by looking at lessons from other parts of the world and future prospects for an African agricultural renaissance.

2.4.1 The Independence Movement and the Rise of Smallholder Farming in Africa

Between 1955 and 1965 most African countries gained independence from their colonial masters. The year 1960 is generally approximated as the watershed year (Acharya, 1981b: 113). This 'turning point' came with renewed commitments by the governments of the newly independent countries to stimulate economic development. Consequently the post-independence period was characterised by intensive government intervention, especially in the agricultural sector. The focus in agriculture was towards accelerated commercialisation of the sector (Hinderink and Sterkenburg, 1987).

Eicher (1992:79) recalls the great optimism of the 1960s when colonialism fell and independence was launched in sub-Saharan Africa. He cites Young (1982:71): "It is difficult to recapture the sense of exhilaration that attended African liberation at its high-water mark in 1960 when no fewer than sixteen states achieved independence. The crumbling of colonialism seemed but a prologue to other triumphs". The 'boom' in studies of smallholder agriculture identified by Reardon (1998:445) is a reasonably good pointer to the fact that smallholder agriculture was not excluded in the euphoria of this period. In fact, as Pardey, *et al.* (1997) established, spending on African agricultural research grew in the 1960s and early 1970s. They point out that in the decades since independence, investment in public national agricultural research systems (NARSs) has more than quadrupled (see also Byerlee and Jewell, 1997:127-8).

Eicher and Baker (1982:69) note that African smallholder research was not limited to NARSs, but that since the mid-1960s, a tendency developed whereby research ties between local African and American and European researchers were increasingly forged. Investment in research and extension, infrastructure, institutions and other support services and innovations have been central in strengthening smallholder capacity to contribute to the growth and transformation of African economies. The trend at the time was that of rapid expansion of cropped area accompanied by rapid expansion of smallholder farming. Cash crops like cotton, groundnuts and horticultural products could be introduced rapidly owing to two main reasons. Firstly, unused land was available for planting of these crops. Secondly, their introduction did not aggravate the main constraints in the farming system of that time namely, seasonal labour bottlenecks, since their labour profiles differed from that of base cereals (Delgado and Mellor, 1984).

Kenya is often cited as a shining example of successful smallholder promotion in sub-Saharan Africa (Heyer, 1981, Johnston, 1981 and Tomich, *et al.*, 1995, Bigsten and Collier, 1995). Much of the success has been attributed to a favourable policy environment (Heyer, 1981:90; Tomich, *et al.*, 1995:377), and to an extent, good weather (Baynham, 1989:225). Whatever way it has been viewed, Kenyan smallholder success had its foundation on strong research programmes that were instituted shortly before independence among large-scale European farmers (Migot-Adholla, 1979:158; Johnston, 1986:165). One of the most significant was the comprehensive maize research programme launched in 1955 (Hassan and Karanja, 1997:81). The maize and other research programmes acted as a firm base for smallholders to exploit profitable innovations thus made available as European farmers gave way to African smallholders (Johnston, 1981:74).

The Swynnerton Plan[15], published in 1954, marked the beginning of a definite policy of government encouragement of Kenyan smallholder production for urban and export markets[16]. However, as Heyer (1981: 102) observes, the Plan "was based very

[15] "A plan to intensify the development of African agriculture in Kenya" by R. Swynnerton (1954).
[16] See Thurston (1984) for more detailed information on the Swynnerton Plan.

consciously on the controlled development of an élite group of 'progressive farmers'" especially on coffee, tea and pyrethrum. This plan introduced individual tenure in African agriculture and promoted cultivation of export crops by Africans, thereby 'revolutionising African agriculture' (Migot-Adholla, 1979:157). Large-scale farms were subdivided, leading to an expansion of small farm area. This resulted in an increase in small farm output. Heyer (1981:106) notes that by 1967 the proportion of marketed output coming from smallholders had reached 50 percent. An exodus of European farmers gave rise to further expansion of the small farm area in settlement schemes, after Independence in 1963. During the first decade following independence an increase in smallholder cultivation was noted as a major stimulant of the impressive economic growth experienced during that period – an annual growth of almost 7 percent! (Baynham, 1989:225).

One of the most significant products of the Swynnerton Plan was the gradual shift of tea, coffee and exotic dairy production from plantations/estates to smallholders. De Wilde (1980:127) reckons that these 'new' smallholder cash commodities were highly profitable compared to previous smallholder activities. According to Tomich, *et al.* (1995:380) by 1966 smallholder coffee production had overtaken estate production (citing Kenya, 1974). Smallholder tea and coffee expansion has continued to be a major source of farm cash incomes and foreign exchange earnings in Kenya (Tomich, *et al.*, 1995:380).

Tanzania has often been compared with Kenya, as their similar basic conditions make them convenient cases for comparative investigations (Barkan and Okumu, 1979). They "...have been perceived as prototypes of capitalist and socialist development and as such, have been viewed as a pair of concrete examples of what is likely to happen, and not happen, when an African country chooses one or the other of these two approaches to development" (Barkan, 1979:4). Tanzania's peasant production has its roots in the work of missions who introduced cotton and coffee[17]. As in the case of Kenya successive colonial authorities made extensive investments in research. Such investments, made

[17] This part of the section benefited from insights from Ruthenberg's (1964) comprehensive study on agricultural development in Tanganyika (now mainland Tanzania).

possible by foreign aid, led to visible progress in improving the output in African farms. Shortly after independence in 1961, Tanzania's agriculture performed impressively (see Tomich, *et al.*, 1995:367). During the early 1960s, small farm production of pyrethrum, coffee and most major export crops as well as food crops like millet, sorghum and root crops dominated mainland Tanzania's agricultural picture (Ruthenberg, 1964; De Wilde, 1980). However, as discussed below, the 'take over' of Tanzanian agriculture by smallholders was short-lived.

Malawi's African smallholder agriculture, on the other hand, has had a consistent colonial experience of mixed fortunes. Tod (1984:8) characterises this sector as one that "has been promoted and dropped, favoured and discouraged". By independence smallholder agriculture in Malawi was still largely subsistence oriented, with only trickles of export output. However, after Independence the sector became the object of acclaim as its performance surpassed that of the estates. By 1964, smallholder crops accounted for 55 percent of agricultural exports while estates accounted for the balance. Acharya (1981a) praised Malawi (along with Kenya and Ivory Coast) for having sustained the most favourable environment for private peasant agriculture.

Ivory Coast has been considered one of the outstanding post-independence examples of rapid expansion of cash cropping (Delgado, 1997:147). Export of agricultural products was the main engine of the so-called 'Ivorian economic miracle' (Lee, 1980; Handloff, 1988). Total agricultural exports grew at almost the same rate as GNP, or just over 7 percent per annum, between 1960 and 1975 (Lee, 1980:607). Because of the successful agricultural development strategy of the 1960s and 1970s Ivorian agriculture was able to diversify out of agriculture. By the early 1980s rural Ivory Coast had a much higher level of electrification, piped water and schooling than most of its neighbours.

Notwithstanding the prevalent post-1960s trend of 'growth without equity' in some of the above-mentioned African country examples, nothing should be taken away from the agricultural miracles experienced in these countries during that period. In spite of the well-documented shortcomings of the post-independence growth trends, many

achievements were also noted (Delgado, 1995). If the 1960s witnessed isolated success stories, the 1970s were generally characterised by stagnation in most of Sub-Saharan Africa. This is discussed in more detail in the next sub-section.

2.4.2 Period of Stagnation: What Went Wrong?

As portrayed above, the 1960s period boasted increases in total agricultural production and food production. However, during the 1970s agricultural production did not keep pace with population growth rates. The picture drawn from numerous research publications is that of stagnant agricultural production and decreasing food production per capita during this period (Byerlee and Heisey, 1997:10). This crisis situation negatively affected farm incomes and increased Africa's dependence on food imports. The scenario, however, varied from one country to the other. Employing FAO statistics, Hinderink and Sterkenburg (1987:94) sketch an informative picture of sub-Saharan Africa showing only Sudan, Ivory Coast, Malawi, Swaziland, Rwanda, Burundi and Cameroon with a consistent increase in agricultural production during the 20-year period between 1961 and 1981. In addition, Kenya, Zambia, Zimbabwe and Central African Republic managed to recover from an initial post-1960s period of stagnation and decline. The rest of sub-Saharan Africa (excluding South Africa and Namibia) experienced either a consistent decline in agricultural production since the 1960s or a sudden decline after an initial post-independence boom.

Byerlee and Eicher (1997b: 3) contend that Africans bear the brunt of the world food problem today because the food balance sheet for Africa shifted from positive to negative in the early 1970s. They point out that food production in Africa grew at half the rate of population growth from 1970 to 1985. According to Johnston (1980:69), "there are clear and disturbing indications that the expansion of food production has failed to keep pace with the growth of population in a number of Sub-Saharan countries." He presents FAO regional indexes of per capita food production for Africa as compared to Asia and South America from 1972 to 1976 (Table 2.1). These clearly show that Africa's food sector did

not only perform poorly during this period, but also lagged behind that of other developing regions.

Table 2.1: Food production per capita in Africa, South America and Asia (1961-65 = 100)

Region	1972	1973	1974	1975	1976
Africa	99	92	98	96	97
South America	101	101	104	103	111
Asia	103	106	105	109	109

Source: Johnston (1980:69)

There has been a continuous search for solutions to the resultant problems such as dependence on imports, poverty and degradation of natural resources. A closer look at policy paths pursued by different countries after independence would help in answering the big question often asked, "What went wrong?"

Hinderink and Sterkenburg (1987) draw a neat account of development pathways taken by Sub-Saharan African countries after the advent of independence[18]. However, they point out that contrary to common belief, there were only limited inter-country differences in agricultural policy in Sub-Saharan Africa. Common general characteristics of policies have emerged and are summarised as follows (Hinderink and Sterkenburg, 1987:69):

- **One-sidedness:** Policies were biased towards production increases and not towards the wider rural development approach which includes improvement of living conditions of agricultural producers.
- **Export-orientation:** More emphasis was on export crops to the detriment of food crops for the domestic market.

[18] This part of the sub-section draws on Henderink and Sterkenburg (1987).

- **Interest groups:** In their choice of policies, governments have tended to serve the interest of interests groups rather than agricultural producers themselves.
- **Limited research priorities:** Low research priority was afforded to the agro-climatic and socio-economic circumstances under which smallholders operate.
- **Low agricultural investment:** Priority was for the expansion of manufacturing industries. Agricultural investment took only a limited proportion of total government expenditure.
- **'Projects' as form of intervention:** There was emphasis on large-scale projects as a dominant form of external intervention. New smallholder-based innovations were largely ignored.
- **External influence:** External agencies and donors had some influence in the formulation of agricultural policy.
- **Role of the price mechanism underplayed:** Policy-makers paid insufficient attention to the price mechanism as a means of stimulating smallholder production.
- **Land policy:** Land policy played an important part in agricultural policy in general. Land transfer and individualisation of land rights particularly received ample attention.
- **Mediocre support services:** The insufficient provision of agro-support services acted as disincentive to smallholder output increases.
- **Lack of continuity in policy:** Agricultural policies continuously changed in many Sub-Saharan countries since independence.

To round off the stagnation question, Hinderink and Sterkenburg (1987:69) warn that agricultural policy formulation in Sub-Saharan Africa during the 1970s occurred in an unfavourable external environment. Such an environment was characterised by a sharp decline in the terms of trade of non-oil exporters, increasing debts and debt servicing as well as rising prices of imports - especially oil and fertiliser. Another unfriendly factor was the decrease in foreign aid below set targets together with reduced imports by industrialised countries in association with world stagflation. These authors are, however, quick to admit that such unfavourable external conditions were often aggravated by poor agricultural policies.

2.4.3 Prospects for Recovery?

Block (1994: 619) presents some evidence of a notable recovery of African agricultural productivity initiated during the 1980s. Delgado (1997:147) reckons that the 1970s declines in smallholder agricultural productivity had been reversed in the 1980s and 1990s (see Block, 1994 for statistical records). In this regard, Zimbabwe is quoted as the star of the 1980s with respect to smallholder contribution to agricultural production. Smallholders in Zimbabwe defied all negative beliefs about lower productivity and proved that 'peasant farming in not inherently unproductive' (Weiner, 1988:68). After introducing smallholder support programs following independence, a second maize-based green revolution was launched in Zimbabwe as maize production doubled between 1980 and 1986 (Eicher and Kupfuma, 1997:25).

A broader view of Zimbabwe's recent smallholder 'revolution' is documented in Rukuni and Eicher (1994). The smallholder production boom of the 1980s was mainly focussed on maize, sorghum and cotton. Muir and Blackie (1994:198) note that the smallholder share of marketed grains and cotton jumped from less than 10 percent before independence to around 50 percent by 1986. This was facilitated partly by the commitment of the new majority-ruled government to concentrate on improving research, extension and credit facilities for smallholders[19].

A few studies have, however, warned against over-glorification of the smallholder sector in Zimbabwe, owing to a number of reasons. Stack (1994:258) reveals that all segments of the smallholder sector have not benefited from the impressive performance. She reports three findings to qualify her warning. Firstly, since independence, maize production and sales in communal areas have been highly concentrated in favourable areas with adequate rainfall. Secondly, households with greater farm level resources contributed most to aggregate growth in maize production and sales in the 1980s. Lastly, she points out that net maize sellers are primarily located in favourable growing areas.

[19] See accounts by Mashingaidze (1994), Mariga (1994), Cole and Cole (1994), and Ndlovu (1994) about the maize, cotton, tobacco and livestock sub-sectors respectively.

This puts into question the equitability of general agricultural policy in Zimbabwe. Cliffe (1988) has also come out strongly against generalising about the Zimbabwean smallholder 'success story' for the whole country. He contends that the benefits of better access to credit, inputs and marketing were confined to a minority of regions and 'better-off' peasants. He adds that such gains have not eased the problems of poverty faced by the majority of rural dwellers.

Eicher and Kupfuma (1998:565) appropriately label the Zimbabwean smallholder agricultural experience as a 'compelling but qualified African success story'. They emphasise that the strengths of the smallholder-led food production 'model' of Zimbabwe should be viewed with equal appreciation of its limitations. Most importantly, African countries seeking to replicate Zimbabwe's smallholder revolution should carefully study its mixed record in reforming support institutions for smallholders. Notwithstanding these mixed fortunes, the Zimbabwean experience provides a ray of hope for African economic recovery, and re-establishment of smallholder agriculture in the forefront of such a process. It demonstrated how a favourable environment could enhance the realisation of smallholder potential to act as an engine of economic growth. This has also been illustrated in the experience of many other countries, which are currently at a more advanced stage of agricultural transformation. The next section elaborates more on these experiences as it attempts to build a foundation of lessons for South Africa.

2.5 The Role of Smallholder Agriculture in Development: Lessons from Outside Africa

Many countries in East and Southeast Asia have generally been regarded as pioneers of rapid growth. They maintained a steady pace of rapid economic growth for thirty years (Timmer, 1998: 540), and agriculture has been at the forefront of that growth. Their governments have traditionally placed a high priority on agricultural growth to achieve a range of other broader national objectives (Australia Department of Foreign Affairs and Trade, 1994). In countries such as Indonesia this growth was transformed into a remarkable record of poverty reduction (Timmer, 1998: 545). Such developments bear

great lessons for countries seeking rapid economic transformation. The next subsection therefore revisits the East and Southeast Asian experience. The central question in this review is, "How did they do it?"

2.5.1 The East- and Southeast-Asian Growth Experience

According to Timmer (1998: 540), "Rapid economic growth was invented in East Asia". Citing World Bank (1992) statistics, he qualifies his statement: Between 1965 and 1990, only ten countries with populations larger than two million experienced per capita income growth of 4 percent per year or more; and all but two were in East or Southeast Asia. These eight countries and their growth rates are China (5.8%), Indonesia (4.5%), Thailand (4.4%), Malaysia (4.0%), South Korea (7.1%), Singapore (6.5%), Hong Kong (6.2%) and Japan (4.1%). Timmer (1998) carries out an informative discussion of the Indonesian economic development experience. The Indonesian policy objectives were set out to be growth, stability and equity. The potential trade-offs between these three objectives were successfully avoided by putting agriculture at the centre of the development trilogy, and using the rural economy as a positive contributor to growth. The following figure illustrates this process.

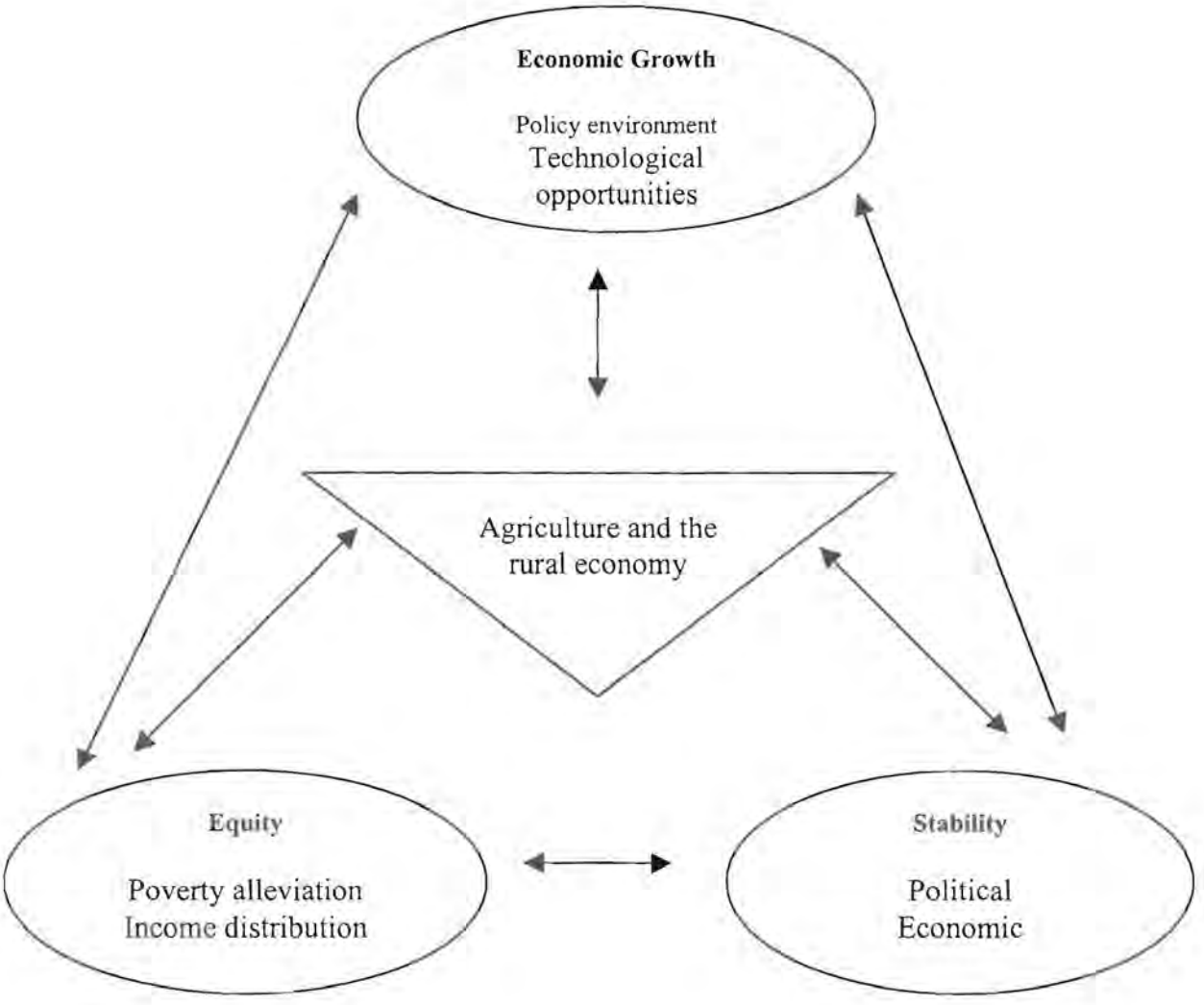


Figure 2.1: The Development Trilogy in Indonesia

Source: Adapted From Timmer, 1998

Agriculture has played a major role in many countries by stimulating growth in non-agricultural sectors through various means. In a comprehensive volume edited by Mellor (1995) various authors review a total of eight country case studies on how agriculture has fared in stimulating growth in non-agricultural sectors[20]. In his conclusion the editor

[20] This section benefited significantly from the findings presented in Mellor (1995).

identifies three ways in which agriculture in these countries has grown to effect this influence - through area expansion, intensified output mix and technological change. These are elaborated on below.

2.5.2 Agricultural Growth Pathways

2.5.2.1 Growth through Area Expansion

Thailand, Argentina and Costa Rica are identified as countries which depended on area expansion for enhancement of agricultural growth. Siamwalla (1995:150) reveals that from about World War II until 1980, Thailand was in fact the only Asian country whose agricultural growth was dominated by an expansion in cultivated area per agricultural worker. The resultant state of land abundance gave rise to a strong comparative advantage in Thai agriculture. Fortunately, policymakers became aware of this phenomenon and sought to exploit it by putting correct policies in place. A more liberal trade and exchange rate regime was made the cornerstone of Thailand's approach. The Thai government also invested heavily in transport infrastructure throughout the 1960s and 1970s. Although prompted mainly by security considerations, the road-building programme benefited agricultural growth in Thailand.

Argentina also experienced growth in arable land per capita of the total population. However, it did not exploit the comparative advantage as reflected by its unfavourable public policy towards agriculture (Mundlak and Domenech, 1995). Agriculture also played an important role in the Costa Rican economic growth (Celis and Lizano, 1995). As in the case of Thailand, the government exploited agricultural comparative advantage, as brought about by area expansion, by promoting favourable macro-economic policies.

2.5.2.2 Growth through Intensified Output Mix

One of Mellor's (1995) major findings from the synthesis of eight case studies was that high rates of agricultural growth could only be sustained if the composition of output was

changed. This was demonstrated in the case of Costa Rica, Colombia, Taiwan and the Indian state of Punjab (see Celis and Lizano, 1995; Berry, 1995; Mao and Schive, 1995; and Bhalla, 1995). In these countries, a change in product mix and a shift to some 'high-value' commodities made a significant contribution to production and factor productivity. Mellor (1995) warned however, that a shift to some specialised exports could result in other sectors being left out, as was the case in Costa Rica for example.

2.5.2.3 Growth through Technological Change

Taiwan, Punjab and the Philippines introduced major technological improvements along with appropriate institutional infrastructure, to increase commodity production on the existing land base (Mellor, 1995:311; Mao and Schive, 1995; Bhalla, 1995; and Bautista, 1995). Taiwan's main strength was the huge contribution by both private and public institutions, with the government playing the major role of getting development going (Mao, 1995:31). The development of small-scale irrigation and use of fertilisers and pesticides in Punjab greatly enhanced expanded use of new crop varieties and therefore achievement of high yields (Bhalla, 1995). The research breakthroughs at the International Rice Research Institute (IRRI) gave rise to rapid technological change in the Philippines (Bautista, 1995). A major shortcoming, however, was the lack of a strong indigenous Philippine capacity to serve national technological needs, which IRRI couldn't meet.

A closer assessment of the experiences of Indonesia and the Philippines provides very interesting material for any country in its early stages of transformation. A striking aspect of the Philippine experience is its illustration of the fact that rapid agricultural growth is not enough. Mellor (1995:317) emphasises that accelerated growth should be accompanied by poverty reduction. This is achieved through a reduction in relative food prices as a result of expanded food supplies or an increased capacity to import food financed by agricultural exports; increased employment in agriculture itself; and increased employment in non-agricultural employment, particularly in rural areas. Timmer (1998) provides an exhaustive discussion of this process of search for equity, as

observed in the case of Indonesia. The bottom line is that agriculture, especially smallholder agriculture, cannot be ignored. In fact, it should be at the centre of the government's focus to achieve equitable and sustainable growth.

2.6 Enhancing Smallholders' Role: Conclusions

> "The most important lesson is to use the agricultural sector and the rural economy to provide the foundation that permits the development strategy to pursue growth, stability and equity simultaneously and to pursue them in a complementary rather than a competitive fashion" (Timmer, 1998: 542-43).

From the preceding discussion it was clearly shown that the above statement is easier said than done. The painful lessons learnt by different countries whose experience was reviewed in this chapter are evidence of this. Successful achievement of growth, stability and equity is a wish and ideal for all countries. Unfortunately, a myriad of internal and external factors has combined to shape development paths that have failed many countries. Each country has a unique set of conditions. Therefore, there is no single set of prescriptions for all countries to follow in order to attain the required success. However, much has depended on how well and timeously countries have seized development opportunities made available to them (see Tomich, *et al.*, 1995).

One of this chapter's points of departure is that the benefits of growth in consumption world-wide since the beginning of the 20th century have been unequally distributed. This is seen in the persistence of poverty both between and within rich and poor countries alike. This challenge is even more magnified in developing countries that have to cope with underdeveloped economies. In such economies, agriculture is the mainstay of a large proportion of the population. It only makes sense therefore that agriculture should form a foundation for development in these countries. The economic development path of Indonesia, which Timmer (1998) so powerfully traces, again is an illustration of how to use agriculture as a foundation for economic development. Figure 2.1 above shows how this process works. Agriculture is placed at the centre of the development trilogy, and the rural economy used as a positive contributor to growth. The problems of poverty,

economic and political stability, and rapid economic growth are then addressed simultaneously.

Another point of departure for this chapter is that many of the missed development opportunities by different countries have been due to the downplaying of the role of smallholders in particular, as an integral part of their economic strategy. According to Timmer (1998: 548), an essential implication of using the rural economy as a positive contributor to growth is that the productivity of rural labour would have to be raised. In most settings such a strategy would inevitably require agricultural development with a focus on small farmers. This is what Tomich, *et al.* (1995) term a 'labour-using, land-saving' strategy. They argue that this strategy is better suited to areas with abundant rural labour but scarce land. The immediate objective should therefore be to increase productivity among a large and growing number of small farms. Mellor (1995) argues that such a strategy goes further than achieving higher productivity of small farms through technological change. As much as it effectively exploits comparative advantage, such an improvement leads to increased effective demand for non-agricultural goods, which in turn leads to additional growth in rural income. This concept is the focus of this thesis, and is further explored in the next chapters. To be complete, however, this chapter must also discuss some constraints facing smallholders in accomplishing the needed task of kick-starting an economic transformation process in developing economies.

2.7 Constraints Facing Smallholder Agriculture in Developing Economies

Schultz (1964) showed convincingly that small farmers in traditional agriculture are "poor but efficient". In this view smallholder farmers remain poor because they have to contend with lack of technical and economic opportunities to which they can respond. It is also believed that if these constraints are removed, these farmers would generally be capable of making rational economic decisions. Van Rooyen, *et al.* (1987:213-14) group the constraints facing smallholder farmers in traditional areas into two categories, namely:

- **System constraints:** these include natural risks affecting farming in general; limited supply of marketing services; poor physical and institutional infrastructure; inappropriate legislation and policies; restrictive administrative and social structures; and other constraints associated with land tenure and acquisition of agricultural resources.
- **Allocative constraints:** these are those factors which directly affect the farmer in making optimising decisions, and over which the farmer has some control. These include liquidity problems, labour shortages, lack of skills, knowledge and education.

According to Delgado (1997:148), economic conditions, especially in Africa, are thought to be challenging and have sometimes resulted in non-prosperous outcomes for smallholders. He identifies three structural challenges that African smallholders have had to face namely, the environmental-demographic nexus, missing markets, and transaction costs.

2.7.1 Environmental-Demographic Constraints

After the Earth Summit held in Rio de Janeiro in 1992, concerns about local, subnational, national and global sustainability intensified (Staatz and Eicher, 1998: 30). One of the issues identified at the summit was the pressure that population growth exerts on fragile lands, and therefore on agricultural production. Delgado (1997: 148) points out that demographic growth rates in Sub-Saharan Africa are of the same magnitude as those of agricultural production. If such a trend continues unabated, it is feared that smallholder behaviour under limiting demographic conditions would lead to falling agricultural productivity, major food crises and increased rural poverty.

Evidence since the 1930s reveals a decrease in the size of the average farm across the continent (Delgado, 1997:148). Johnston (1980:68) argues that countries that used to be considered land-surplus can no longer live up to their reputation because of the fragility of their farming systems. Delgado (1997) gives an example of East Africa and the Sahel (Reardon, 1998). Their capacity can no longer sustain the increases in food production

required to meet the needs of a growing population. Eicher (1992:86) also testifies to this fact. He points out that a new class of 'resource-poor' farmers has emerged in Africa as a result of rapid population growth and declining farm size. Morris and Byerlee (1998:458) also observe an emerging trend in Asia of what they describe as a dramatic slowing of expansion in the area planted to cereals, traditionally a major source of production gains.

Countries like Kenya are facing the challenge of a clouding of rapid agricultural growth by a fast population growth rate. Mellor (1995: 313) argues that agricultural growth per capita can be significantly improved by restraining the rate of population growth. Argentina has proven this possibility by converting its dismal rate of agricultural growth, particularly in relation to its resource base, into at least a positive per capita rate.

2.7.2 Missing Markets and Transaction Costs

Markets are said to be missing when they do not exist in their conventional institutional forms or are poorly developed (Delgado, 1997). De Janvry, *et al.* (1991) provide an insightful explanation into the concept of missing markets. They state that missing markets are an extreme example of market failure. Market failure is defined as a condition whereby the cost of a transaction through market exchange creates disutility greater than the utility gain that it produces - as a result the market is not used for the transaction. Under such a condition either a surrogate institution will emerge to enable execution of the transaction, or the transaction will not occur at all.

Due to the fact that many areas of Sub-Saharan Africa are at the early stages of agricultural transformation, small and large farm households do not necessarily have access to the same technology, information, asset base, input supplies, or market outlets. As a result, different farm households are likely to face different transaction costs for selling the same output mix. Broadly speaking, transaction costs affecting the exchange of agricultural commodities in developing countries include spoilage; costs from wide differences in quality; costs of overcoming lumpiness of initial investments in production,

processing, and marketing; costs from inflexibility and lags in production plans; costs in dealing with seasonal variability in output in thin markets with poor storage; search costs; costs of screening trade partners; bargaining costs; monitoring costs; and costs of contract enforcement (Delgado, 1997:149; Bardhan, 1989).

According to Delgado (1999:168), most high value-added agricultural products are typically subject to high transaction costs to final value because of the high degree of processing involved in such products (citing Binswanger and Rosenzweig, 1986). He also points out that due to these high transaction costs, poorer farmers are excluded from participating in potentially remunerative commodities. In addition, poor smallholders face barriers to entry into markets for activities produced by other better-off small and larger operators. Alternative avenues for smallholder market participation include vertical integration with processors and marketers of commercial quality activities such as aquaculture, export quality green vegetables, cotton, tea and cut flowers. However, lack of assets, information, and access to services will hinder smallholder participation in these potentially lucrative markets as well. These and other constraints facing smallholders necessitate deliberate reforms and innovations for their removal.

Delgado and Siamwalla (1997) advocate the need for governments to increase access of poor farm households to information, infrastructure and institutional development for collective action. This would help alleviate constraints associated with semi-openness of most of African economies, i.e. as a result of high transaction costs.

2.8 Conclusions: Relevance to South Africa

Most of Africa is still at the early stages of agricultural transformation. A significant segment of the population still derive their livelihood from agriculture. A large section of the African population is still rural and actively engaged in agriculture. Smallholder farmers in particular are said to be a dominant type of farmer in Africa and other developing countries. There is thus some consensus in the literature that a smallholder agriculture-driven process of growth in Africa is required for economic progress to be

achieved. There is also a common finding in the literature that countries that ignored or underplayed the role of agriculture in their policies, missed important economic growth opportunities. Misguided notions about the inferiority of small farms to their large-scale counterparts has played a role in the implementation of such policy choices.

It was also shown in this chapter how, during the past few decades, different countries took advantage of the growth prospects offered by smallholder agriculture. During the post-independence period, many lessons have been learnt. Smallholder agricultural productivity in many countries increased impressively, at least for some time. Kenya, Ivory Coast, Malawi and Swaziland are among some of the African countries whose agricultural production consistently maintained an impressive growth record from the 1960s until at least the 1980s. In some African countries agricultural production has simply refused to pick up. In others it has been a story of mixed fortunes. Notwithstanding these experiences, stories such as the recent Zimbabwean and East Asian miracles and their limitations, only serve to inform countries seeking to revolutionise their economies through smallholder agriculture of important pointers for achieving this goal. The Zimbabwean and East Asian experiences demonstrate the importance of ensuring an enabling environment for a more meaningful smallholder-based agricultural transformation process.

South Africa is normally considered somewhat different from most of the African continent in that smallholders do not dominate agricultural production. It is on large-scale commercial farms that most of the food and fibre is produced both for the local and export market. Furthermore, it has been shown that land shortage in South Africa might not be such a big issue as it is in the rest of Africa (Lyne, 1991; Lyne, *et al.*, 1991). South Africa and the rest of Africa are only brought together in this study because of their common history of repression of Africans by Europeans, the traditional institutions (e.g. chieftaincy) in black areas, and the subsequent efforts to redress past inequalities through such programmes as land reform. However, even in South Africa, as already pointed out, the smallholder agricultural sector is home to a significant number of different types of operators in the black rural areas. Like their African counterparts, smallholder farmers in

South Africa are subject to some pressing constraints that pose a special challenge to any agriculture-based economic development process. Deliberate focus should be directed towards lifting these constraints, thereby creating an enabling environment for smallholders to exploit growth opportunities. This study attempts to give proper direction for such focus. An important reasoning in this study is that the development of smallholder agriculture in South Africa, unlike in much of Africa, is not essential to industrialisation or growth of the main cities. Such development, however, is essential to growth, including non-agricultural growth in the less-developed former homeland areas as it is elsewhere in Africa.

CHAPTER 3

THE SURVEY AREA AND SMALLHOLDER AGRICULTURE IN THE EASTERN CAPE PROVINCE

3.1 Introduction and Background

Encompassing the former Eastern Province/East Cape, the Border and north-eastern Cape areas, as well as the former homelands of Transkei and Ciskei, the region today known as the Eastern Cape was for many years during the colonial period, an area of dispute between different groups. A number of frontier wars were fought between the Xhosa tribe and the European settlers for control over the territory. Until the mid-1800s when the Xhosa were eventually defeated, the Eastern Cape had been their home. A series of important developments, such as the founding of the Union of South Africa, the promulgation of the Land Acts, and the system of separate development, led to the eventual designation of the former Transkei and Ciskei as Xhosa homelands in the 1970s. In the context of these developments, they became "independent" entities in 1976 and 1981 respectively. Even after independence, these two homelands were still politically and economically dependent, with a considerable chunk of their budget provided by South Africa. For example, over 90 percent of Ciskeian household incomes were earned in South Africa by migrant labourers[21]. Since 1994 the two territories were incorporated into the new South African boundaries as part of the Eastern Cape Province.

The main purpose of this chapter is to present an overview of the study area and describe the smallholder farming environment in the Eastern Cape Province. It will first give a general view of the Eastern Cape, then carry out a description of the survey area.

[21] These and other facts are reported in a document by the University of Pretoria's Post Graduate School of Agriculture and Rural Development (1998).

3.2 The Eastern Cape Province: Overview[22]

Map 3.1 The Eastern Cape Province within South Africa

3.2.1 Basic Facts

The Eastern Cape province (see Map 3.1) is the second largest of the nine South African provinces in terms of surface area. With the third-largest population (7.1 million in 1994) after KwaZulu-Natal and Gauteng, it covers about 14 percent of South Africa's total surface area. Physically, the province is often referred to as an area of contrasts. It borders with the warm Indian Ocean responsible for the sub-tropical coastal belt climate in the east, and the Karoo semi-desert in the west. The province is divided into three regions namely the Central, East Griqualand and Western. These are further divided into

[22] The three main sources for this overview are Erasmus (1998), Scogings and Van Averbeke (1999) and some Central Statistical Service (1997) figures.

five subregions. This study is based in five of about forty districts of the central region (see Map 3.4).

The Eastern Cape's population density of 38.2 persons per square kilometre is higher than the average of 33.8 for the whole country. Over 43 percent of the provincial population are under the age of 15 and over 54 percent of the adult population are female. The Black population in the province forms an overwhelming majority, that is, 87 percent of the inhabitants, 83 percent of whom use Xhosa as their home language. Afrikaans is spoken by 8.3 percent, English by 3.5 percent and other languages spoken by the remaining tiny proportion of the population. The population has the second lowest life expectancy (60.7 years) of all the provinces in the country. This contrasts with the national average of 62.8 years. Its adult literacy rate of 72.3 percent is well below the average of 82.2 percent for the country.

In 1994 the total unemployment rate was 45.3 percent, the second highest in the country. The per capita income for 1993 was approximately R4, 151(US $690) compared to the country average of about R8, 704 (US $1,450). The main contributor to the Gross Geographic Product (GGP)[23] is manufacturing, with community, social and personal, general government and other services also contributing significantly. Most of the province's economic activities are centred in the metropolitan areas of Port Elizabeth/Uitenhage and East London/Kingwilliamstown, which together contribute close to 75 percent of the GGP. Some of the urban concentration occurs around the cities of Queenstown and Umtata.

[23] The Gross Geographic Product (GGP) represents provincial or regional contribution to the Gross Domestic Product (GDP).

The Eastern Cape has the lowest annual average household income of all the provinces—R24, 000 (US $4,000). A significant proportion of rural blacks in the former homeland areas lives below the poverty line. A recent estimate from all the former homelands, of population living below the poverty line is 84 percent (Kruger, 1995, cited by University of Pretoria, 1998). Slightly less than a third of all dwellings in the province have running tap water. About 41percent of these still use wood as their main energy source for cooking, with paraffin and electricity as their second and third sources respectively. According to recent surveys the main source of income for the population in the province is regular wages followed by pensions, unemployment insurance, food aid and other welfare payments (see Figure 3.1). The number of people involved in formal wage employment in the Eastern Cape is low compared to the national figure (60 percent).

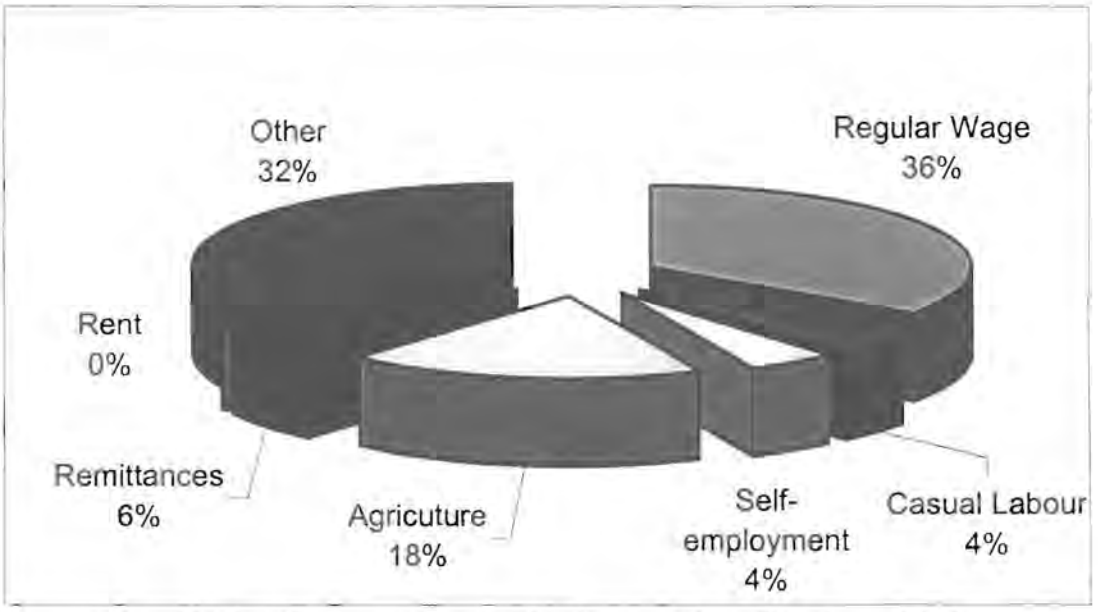


Figure 3.1: Main Sources of Income in Eastern Cape Province, 1994

Source: Adapted from Davies (1996)

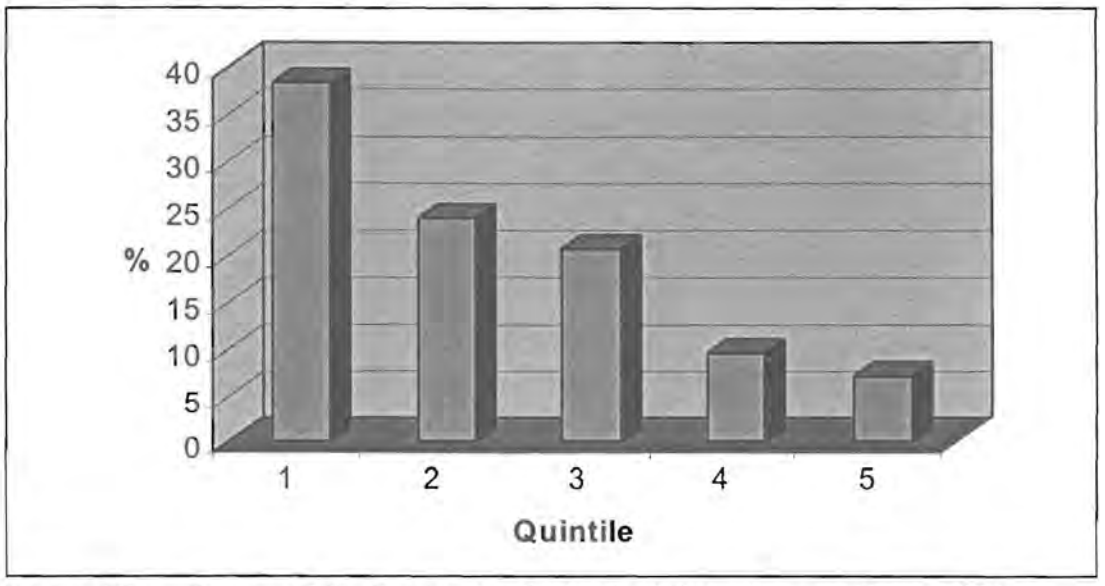


Figure 3.2: Income Distribution by Quintile (%) in Eastern Cape, 1994

Source: Adapted from Davies (1996)

In a recent publication on poverty in South Africa, Davies (1996) expressed concern that not only is a significant proportion of the population in the Eastern Cape poor, but there are also intra-provincial disparities in the distribution of income and wealth. Figure 3.2 plots some of the data on income distribution within the province. Almost two-thirds of the households in the Eastern Cape fall into the two lowest income distribution quintiles and more than 80 percent are in the three lowest quintiles.

The Eastern Cape has two economically distinct areas: the mainly white-inhabited East Cape/Border/north-eastern Cape; and the former homeland areas of Ciskei and Transkei. Table 3.1 illustrates some of the differences between the former homeland areas and the Eastern Cape as a whole.

Table 3.1: Differences between the Former Homeland Areas and The Eastern Cape Province

Indicator	Former Ciskei	Former Transkei	Eastern Cape
Average Household Size	7.8	6.5	5.2
Labour Absorption Capacity	30	16	45
Percent of HHs Earning <R1000/month	87	97	71
Personal Monthly Income Per Capita (R)	83	128	1358
Total Fertility Rate	5.5	6	4.6
Infant Mortality (per '100)	50	90	58
Life Expectancy	65	55	60

Source: Adapted from Davies (1996) (citing DBSA, 1990 and 1991; Kruger and Buthelezi, 1994; Mpambani, 1994).

Table 3.1 clearly portrays the impact of the apartheid policies on inequality between previously white areas and the former Bantustans/homelands. The case of Transkei, for example, illustrates this. The labour absorption capacity of only 16 percent shows the state of economic desperation in this area. This is further reflected in the percentage of households that earn below R1000 per month (97 percent), and the level of personal monthly income per capita (R128).

3.2.2 Land Use and Tenure

About 7 percent of the land in the Eastern Cape province is potentially arable. Just over a tenth of the arable land is irrigated. Grazing land comprises 81 percent with forestry and natural conservation comprising 1 percent and 4 percent respectively (see Figure 3.3).

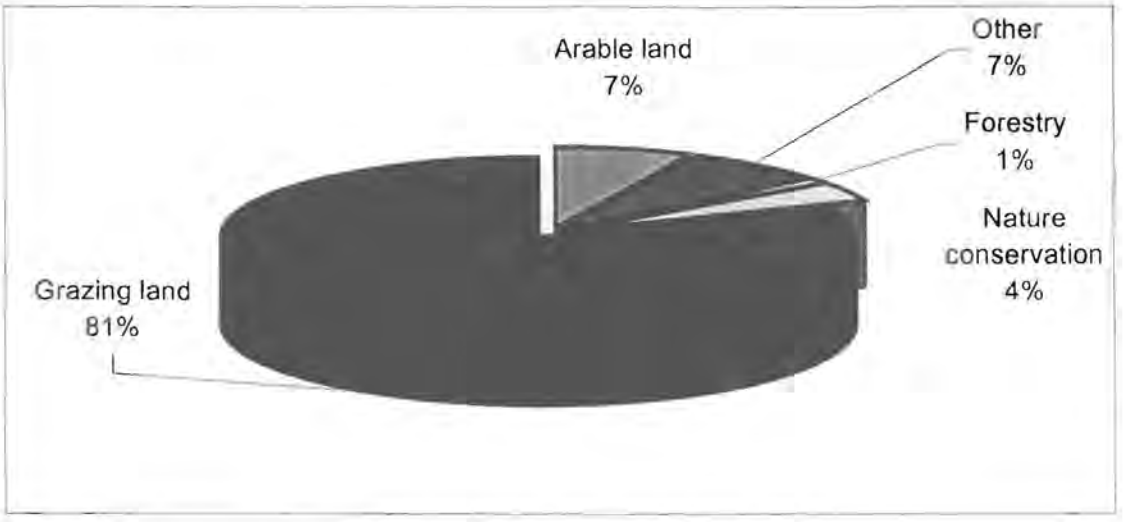


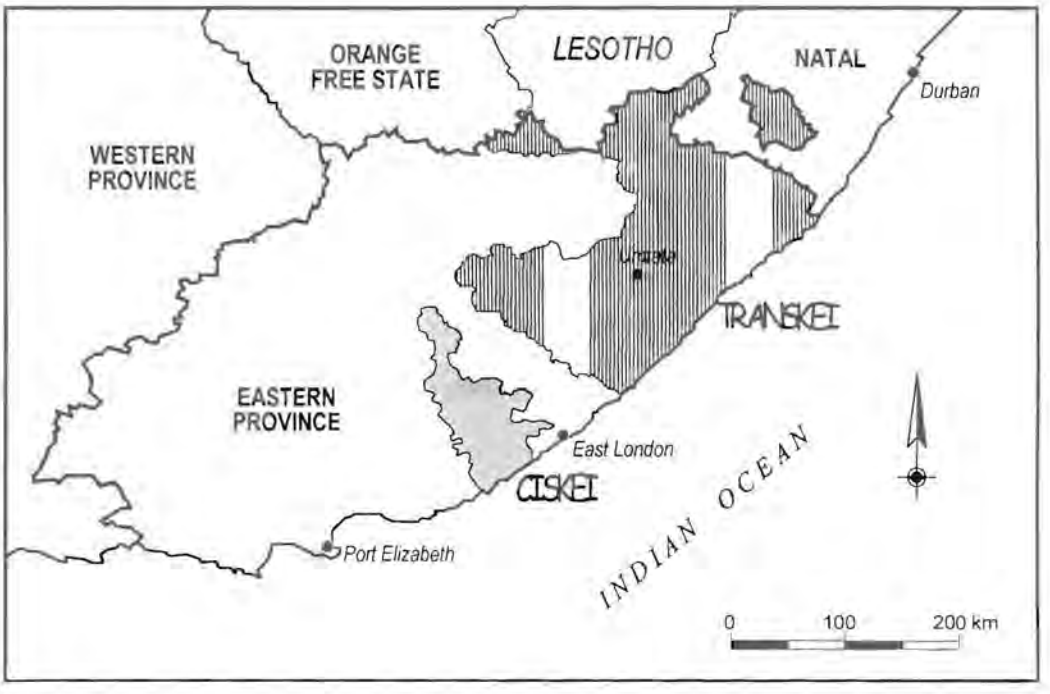
Figure 3.3: Eastern Cape Land-Use Pattern

Source: Erasmus (1998), citing Central Statistical Service, 1988

The coastal areas of the province are especially suited to intensive farming owing to their reliable winter rainfall. The interior is relatively drier and is therefore conducive to more extensive farming with goats, sheep and cattle.

Land tenure in the Eastern Cape Province is very diverse, due to historical socio-political factors. Political developments in the past gave rise to a dichotomous system whereby development was carried out separately for 'white' and for 'black' areas. In the Eastern Cape province, whites have historically inhabited the East Cape portion whereas the two former homelands of Ciskei and Transkei accommodated mainly blacks.

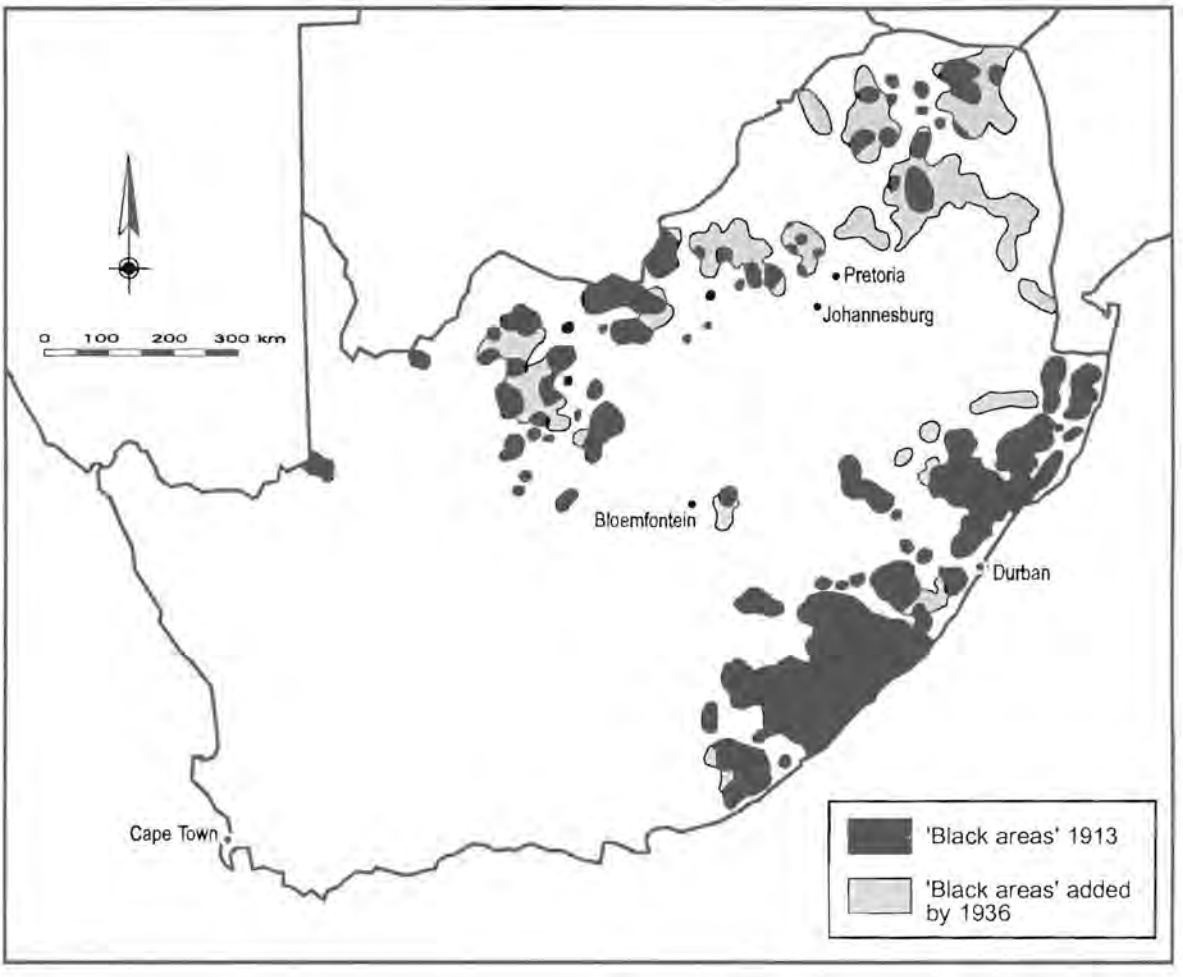
Map 3.2: The Former Homelands of Ciskei and Transkei within the Eastern Cape



3.2.2.1 The Former East Cape

In the former East Cape area most land is held under freehold tenure. Of the 11 million hectares of the East Cape, approximately 2 percent is public land, consisting of municipal and state lands. Much of the state land is under forest or protected area. Municipal land consists mainly of commonages that were established under the former Cape Colony. These commonages were created to accommodate towns people's farming needs. Initially quite large (up to 10,000 hectares), these commonages were gradually reduced in size as their importance decreased and as they were increasingly seen as environmentally destructive. The East Cape land tenure system also includes what was called "black spots". These were small pockets of land in the East Cape occupied by Africans who had resisted forced removals under the Apartheid system. Land in these areas was held under quitrent title. (see 'Black Areas added by 1936" in Map 3.3).

Map 3.3 The Black Areas designated under the 1913 and 1936 Land Acts



Source: Denoon and Nyeko (1984)

3.2.2.2 The Former Ciskei and Transkei

According to Tapson (1984), cited by Madikizela (1997:51), land seems to be viewed as having four main functions in the homelands, namely:

- A security system for its occupants and an essential component of their physical and psychological well-being;
- An economic support system for a greater economy which is hereby relieved of major costs such as family housing, infrastructural development and pension plans, which it would otherwise have to bear;

- A political resource used to gain political strength through the granting of favours;
- An agricultural resource, but only after satisfying the first three roles.

As a result of the influence by colonial interventions (see Scogings and Van Averbeke, 1999:14-15), the overall distribution of land tenure systems in the former Ciskei is fairly complicated. During the nineteenth century, chiefs of African tribes loyal to the colonial governments granted three forms of tenure to their people namely: unsurveyed communal tenure; surveyed quitrent; and freehold tenure. A fourth tenure system, Trust Tenure, was established on freehold land that was once allocated to white settlers in the Cape Colony. Since the Land Acts of 1913 and 1936 restricted whites from owning land in the Native Reserves, such land was acquired by the South African Native Trust who then leased it to landless Africans. The four tenure systems in the former Ciskei occur in close proximity to each other. However, in the Transkei, there is considerable homogeneity in land tenure with most land held under communal tenure. The four types of land tenure in the two former homelands are discussed below.

Freehold Tenure

Under this system the owner is accorded full ownership and freedom to alienate and use the land at will, but subject to statutory restrictions. African freeholders are not allowed to sell their land without state approval. They are also prevented from accommodating any other person on the land outside their immediate families.

Quitrent Tenure

A grantee of a quitrent title is allocated a surveyed residential site, a surveyed arable plot of about 4 to 6 hectares, and user rights to a commonage. One of the main differences between freehold and quitrent systems is that in the latter an annual rent is payable. The Upgrading of Land Tenure Rights Act of 1993 makes provision for the holders of quitrent land to convert their tenure to freehold free of charge.

Communal Tenure

This system of tenure, often referred to a "traditional land tenure system", is formally rooted in the system of betterment planning explained in Chapter 1. Under this system, a headman empowered to allocate land belonging to a "Tribal Authority", replaced the village chief. Under communal tenure, members of a settlement share certain rights in the land attached to their settlement. They hold the land under conditions of usufruct, as opposed to private ownership. Access to a residential plot is acquired through a "certificate of occupation". In addition to an arable land allocation, the bearer household is entitled to raise livestock on the commonage and to harvest wood and water from it. The ownership of the crop harvest rests with the individual grower household, but the crop residue becomes communal property.

Since the advent of the national political changes of the early 1990s, a village chairman has now replaced the headman in the handling of matters of common interest to the community, including land matters. Through the Communal Property Association Act of 1993 communities or groups can hold a registered title to land (as in freehold tenure), while allowing them to make their own decisions on the allocation of ownership and user rights to the land. Beneficiaries of the land redistribution programme of the national government have thus far used this new system.

Trust Tenure

Land under trust tenure consisted of formerly white-owned land situated in proclaimed native areas, which was eventually made available to the South African Native Trust through the Native Trust and Land Act of 1936. This land was subsequently allocated to Africans on a system of leasehold tenure.

3.2.3 Agriculture

Agriculture contributed between 7 percent and 9 percent to the Eastern Cape Province's Gross Geographic Product (GGP), and recorded 0.4 percent real growth between 1980 and 1991. The most economically important sub-sector in the Province is livestock, with 76 percent contribution to the gross value of agricultural production, followed by horticulture with a 21 percent contribution. The least important sub-sector is field crops, accounting for only 3 percent of agriculture's gross income (Eastern Cape Province, 1995). It appears that agriculture still constitutes only a minority share of the income of the farm-based Eastern Cape population. On aggregate, approximately 90 percent of the value of agricultural production in the former homelands of Ciskei and Transkei is not marketed, leaving a mere 10 percent for the market (Eastern Cape Province, 1995).

The Eastern Cape province covers a total surface area of 17 million hectares of which 24 percent, mostly in the subtropical half, is inhabited by Africans practising mixed farming on communal lands. This part of the province has a population density of 90 people per square kilometre compared to 20 people per square kilometre for the rest of the province. The rest of the province, i.e. the western and northern parts, has been used mainly by white commercial livestock farmers for the last two centuries. Only recently has a trickle of emerging black commercial farmers established themselves on some land leased from the state.

3.2.3.1 'White' Farming in the Former East Cape

Scogings and Van Averbeke (1999) report that the dry western areas of the East Cape are characterised by extensive small stock farming mainly for wool, mohair and mutton. The high rainfall areas in the northern and central parts boast commercial beef and dairy with some ostrich and poultry. An estimated 6,429 commercial farming units in the Eastern Cape cover a surface area of about 10 million hectares, which is about 12 percent of the total farmland area of South Africa (South Africa, 1997). The livestock sub-sector, found mostly in the northern and central districts and characterised by comparably larger farming units (averaging 1,400 hectares), occupies most of this land. The smaller coastal farms averaging 586 hectares boast mainly higher-value products such as pineapples, chicory, wheat and irrigated citrus and vegetables. Figure 3.4 below illustrates the distribution of income gained from the three agricultural sub-sectors in the East Cape area namely, field crops, horticultural crops and animal products. This figure highlights the dominance of the livestock production sub-sector. This sub-sector is also the largest employer of labour in the agricultural sector in the Eastern Cape as a whole. The gross income from the livestock sub-sector surpasses that of the next important sub-sector, namely horticulture.

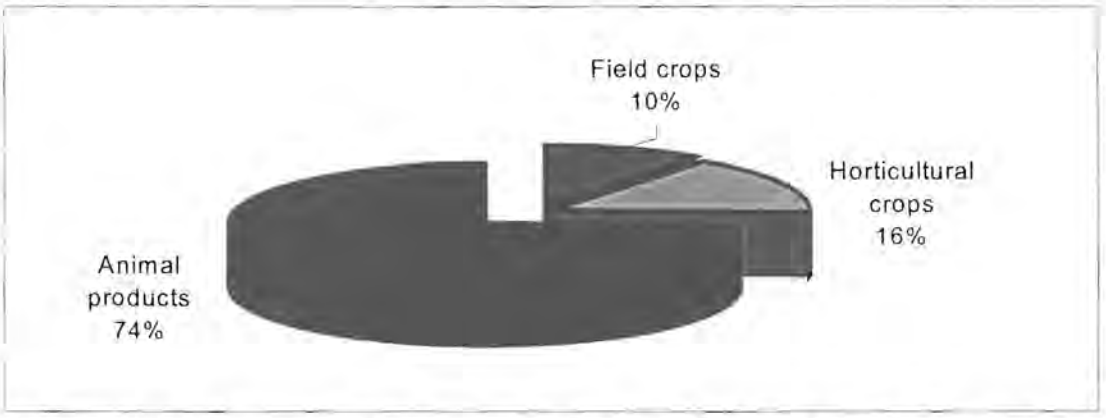


Figure 3.4: Percentage Distribution of Income Gained from Three Agricultural Sub-Sectors in the Former East Cape, 1995

Source: Adapted from Erasmus (1998), citing Directorate of Agricultural Information (1995)

An observed occurrence during the past few years has been a shift of production focus away from pure domestic production towards game farming or, in some cases, a mixture of the two enterprises. There is now a spread of game farms, game ranches and conservancies. Commercial livestock production in the East Cape is carried out on natural veld, but with mineral supplementation during times of fodder deficiency in the veld. Farmers here direct their production management at improving the herd or flock by means of selection or culling and regular entry of superior genes, i.e. breeding.

Field crop (maize, wheat and fodder) production has been consistently decreasing owing to factors such as lower profitability of maize production, financial position of farmers, the price-cost squeeze effect, withdrawal of marginal cropping land, and the erratic nature of rainfall. Citrus and vegetable production, on the other hand, continues to be the mainstay of the horticultural crop industry. The citrus crop is export-oriented with the local market also slowly gaining ground.

3.2.3.1 'Black' Farming in the Former Ciskei and Transkei

In the former homelands Ciskei and Transkei, the Xhosa practise mixed farming in three main components namely, livestock, crop production on one or two fields, and vegetable production in home gardens. The land settlement pattern, which directly affects the farming pattern, is based on the betterment planning system introduced in the homelands more than two decades ago. This system involved separation of land belonging to a village community into three categories namely, residential, arable and rangeland.

It is estimated that 87 percent of the planned area in the former Ciskei is under some form of range management. For decades the communal rangelands in the homeland areas have had to cope with a number of livestock which is more than would be recommended for similar vegetation types in the adjacent white commercial farms. Hence the problem of land degradation is rife in these areas. Part of the reason for this degradation is the lack of methods for assessing carrying capacity of livestock in the former homelands.

Livestock production in the former Ciskei and Transkei is semi-commercial. Livestock in these areas has other important functions besides a tiny contribution to the cash economy. These include draught power, milk, manure, status, investment, bride price, ceremonies and subsistence. In these areas, management of livestock is largely extensive with only one or two major forms of intervention, notably kraaling and dipping. In a few cases when there are emergencies such as drought, cattle owners supply supplementary feeding to their stock. Figure 3.5 below illustrates the relative importance of the three sub-sectors namely, field crops, horticulture and animal products in the economy of Ciskei and Transkei in terms of income contribution.

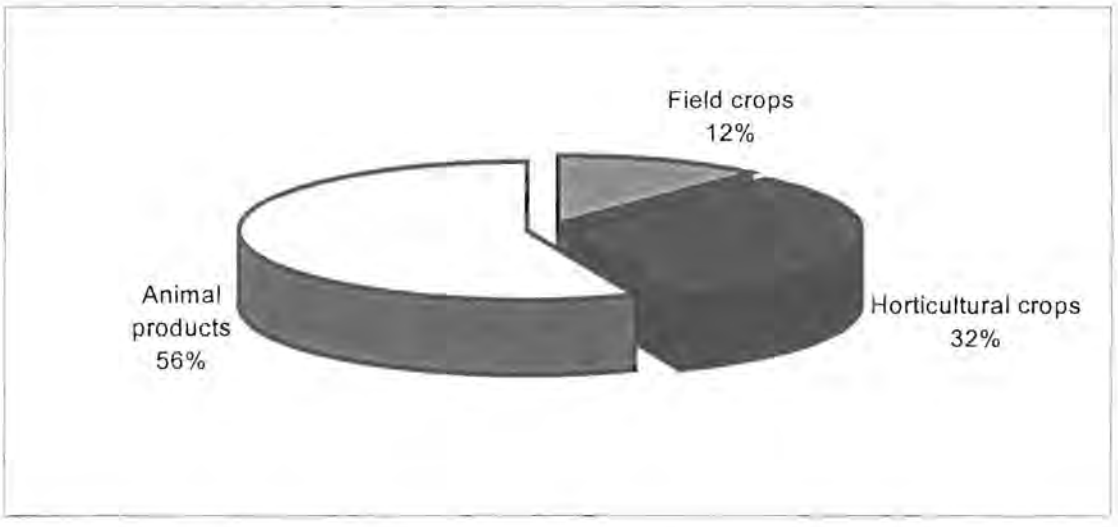


Figure 3.5: Percentage Distribution of Income Gained from the Three Sub-Sectors in the Former Ciskei and Transkei, 1995

Source: Adapted from Erasmus (1998), citing Directorate Agricultural Information (1995)

Map 3.4: The Districts in the Study Area

3.3 The Survey Area

Map 3.4 shows the area covered by this study. The study was conducted in five districts as highlighted, namely, Mpofu, Keiskammahoek, Middledrift, Zwelitsha in the southern part of the central region (sub-region 2) and Herschel further north (sub-region 3). The first four districts fall under the former Ciskei homeland territory and the fifth district forms part of the former Transkei. Below the districts are compared with respect to some basic demographic and socio-economic indicators.

3.3.1 Socio-Economic Indicators

The first indicator to highlight is the human development index (HDI). Developed by the United Nations Development Programme (UNDP), the HDI uses life expectancy and adult literacy as an indication of people's capacities, and income is used to suggest the opportunities available to them.

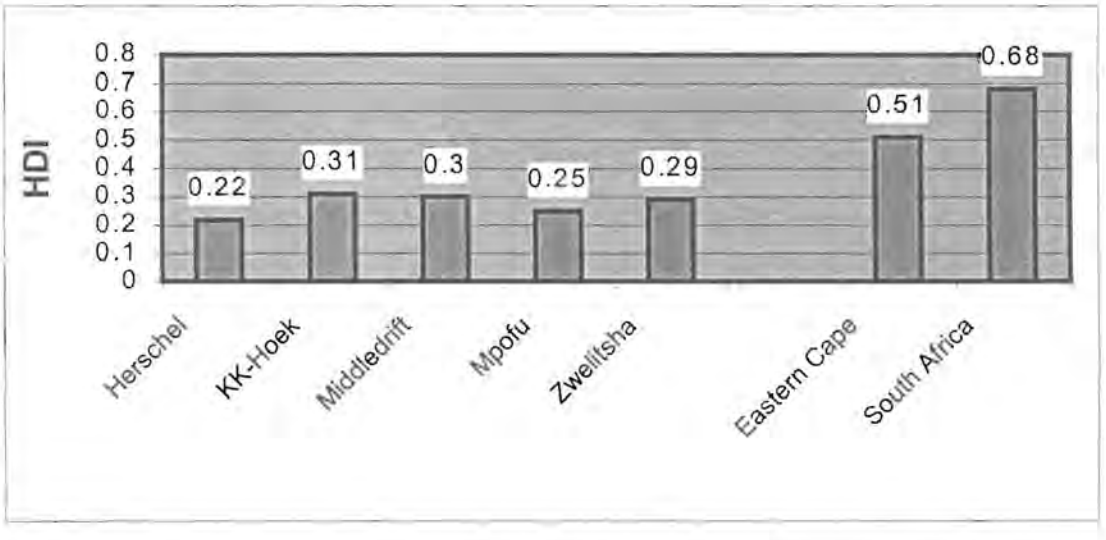


Figure 3.6: Human Development in the Study Area by District, 1991

Source: Adapted from Erasmus (1998), citing Whiteford, et al. (1995)

This is based on the premise that human development in a country is measured by people's freedom to choose and act upon their choices. Therefore in order for people to make informed choices, they must first have some basic human capacities and a reasonable range of opportunities. In Figure 3.6 an indication of the level of human development in the study area is highlighted through an inter-district comparison.

The HDI for South Africa in 1991 was estimated to be 0.68 (out of a possible 1), which falls within a medium range when compared to other countries. This figure has neither dropped nor improved according to the latest data published by the United Nations Development Programme (1999). South Africa therefore compares with countries like the Philippines, Peru and Uzbekistan. The Eastern Cape's HDI is slightly below the country figure at 0.51. This figure is comparable to that of Papua New Guinea and Cameroon. It is the second lowest figure among all the South African provinces. Only the Northern Province fares worse. According to a SALDRU (1994) survey, over 710 000 poor households or 4.1 million poor people in the Eastern Cape - which is the most sensible explanation of the low level of human development in the province (cited by Erasmus, 1998:4).

A closer look at the districts included in this study is particularly informative. The values plotted in Figure 3.6 above refer to Africans only. The HDI in the five districts studied ranges between 0.22 and 0.31. All five districts have a low level of human development among the African population—lower than Rwanda and just above the worst of all countries, Niger. These figures are considered dismal when compared to figures ranging between 0.9 and 0.96 among the white population in the Eastern Cape.

The next indicator is the level of growth of GGP from agriculture, forestry and fishing, the major primary economic sectors in the Eastern Cape province. Figure 3.7 below compares levels of growth in GGP from agriculture among the five districts studied.

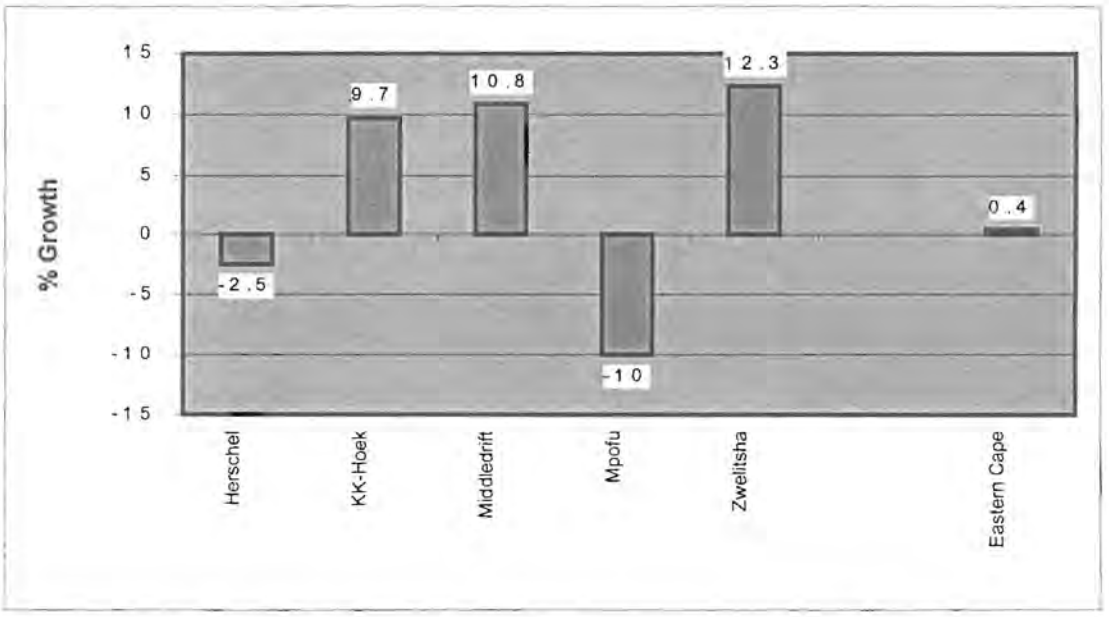


Figure 3.7: Average Annual Growth in GGP from Agriculture by District, 1980-1991

Source: Adapted from Erasmus (1998), citing Meintjies, et al. (1995)

Although the contribution of agriculture to Eastern Cape's GGP decreased due to drought and other factors, the real growth in GGP from agriculture was positive at 0.4 percent. Of the five districts included in this study, Zwelitsha had the highest positive rate of growth in GGP from agriculture between 1980 and 1991 at just over 12 percent per annum, with Keiskammahoek and Middledrift not too far behind. Herschel pulled a disappointing showing at –2.5 percent while Mpofu was worst at –10 percent. It is interesting to note that these figures appear to correlate closely with the levels of human development in the districts. This suggests that factors affecting agricultural performance have had something to do with the depletion of development opportunities and therefore generally worsening levels of human development.

3.3.2 The Survey Area for the First Research Phase

As explained in Chapter 1, the goal of the first survey phase was to study production practices of smallholders so as to assess their comparative advantage in selected crop and livestock items. To achieve this goal, the survey had to be conducted among case study *commercially oriented* smallholders. Smallholder commercial farming in the former homelands of Ciskei and Transkei is largely restricted to large-scale irrigation, dryland and livestock projects introduced in the 1970s as part of a broader strategy to develop these areas; the rest of farming is mainly for subsistence purposes. Even though this set-up no longer exists in its original form, some farmers have remained behind on the land and continued with their farming operations. In 1996, the Eastern Cape Provincial government together with the National Department of Agriculture and Land Affairs developed a new policy for these schemes. It was decided that they should be privately transferred to land right holders and farmers. In this study it was decided therefore that the survey should be done among this group of private commercial smallholders.

Initial development took place on municipal land and land expropriated from large white farmers. Parastatal corporations promoting use of hired labor from surrounding homeland villages managed these farming enterprises. This system was later adjusted to settlement of some community members as 'project farmers' operating under the control of corporate project management (Van Rooyen, 1995). Small-scale farmers were allotted land on which to farm, but with virtually no powers of decision-making. The central management comprising parastatal officials made all the major farm management decisions. Small farmers were by and large treated as labourers in these estate-type schemes (Sonandi and Van Averbeke, 1995). The ultimate aim was to privatise the individual plots to these small farmers after they had learned the required technical skills. This was implemented in the early 1990s when the 'project farms' were made available for privatisation through a progressive process. It started out by leasing the plots out to qualifying individuals. The implementation of such projects has left only a few former homeland farmers benefiting from resulting 'pockets' of development (Richter and Tapson, 1995). These schemes have failed to address the general problem of

underdevelopment and poverty prevalent in the rural areas. They are largely viewed as unsatisfactory because of factors such as high investment and operational cost; lack of focus on independent entrepreneurship development; fiscal unaffordability; lack of impact on adjacent communities; and failure to promote overall rural development (Van Rooyen, 1995).

3.3.2.1 Background to the Establishment of the Agricultural Schemes

The commercialisation drive in the former Ciskei and Transkei was facilitated through the establishment of two parastatals, the Ciskei Agricultural Corporation (Ulimocor) and the Transkei Agricultural Corporation (Tracor). The Ciskei Agricultural Corporation was established in 1983 through the Ciskei Corporations Act of 1981. Its main tasks were overlooking planning, financing and executing all agricultural, forestry and related projects. Since then, Ulimocor has been involved in the running of pineapple, citrus, livestock, dairy, vegetables and maize projects throughout the former Ciskei on land transferred from the then 'republic' of South Africa to the former homelands, which subsequently became property of the South African Native Trust as stipulated by the Natives Trust and Land Act of 1936. By 1994, its provision of services was effected through more than 20 service centres catering for over 1700 smallholder farmers in the former homeland who were mostly based in the development schemes (Ciskei Agricultural Corporation, 1994). Services provided by the parastatal included assistance in training and extension, technical support (machinery hiring), marketing, and until 1993 management of production.

During the late 1980s Ulimocor "commercialised" its support services to farmers as a step towards its eventual withdrawal from direct operation of the schemes. Farmers then had to pay a nominal fee for services received from the parastatal. Following the political changes in South Africa, the new Eastern Cape provincial government became continuously faced with the financial burden of subsidising operations in these schemes. This eventually resulted in the government opting to completely withdraw from these schemes, thus marking the end of the parastatal institutional system in the Eastern Cape.

The commercialisation strategy in the Eastern Cape's former homelands of Ciskei and Transkei, bears some resemblance to the "commercialisation *via* cashcropping" development paradigm as applied to West African smallholders, beginning as early as 1910. Delgado (1995) identifies this as the dominant development paradigm beginning under colonial rule and intensifying after World War II. This strategy was primarily aimed at growth in areas of comparative advantage through technical assistance, extension and capital transfers from abroad. Under this paradigm, agriculture's role was limited to provision of resources for industrialisation.

Delgado (1995) notes general success of the commercialisation *via* cash cropping strategy in West Africa in the 1960s and early 1970s. In the case of the Eastern Cape and the rest of the former homeland areas from the 1980s through the early 1990s, this strategy has not been successful. The tradition of independent farming by smallholders was quite different between West Africa and the Eastern Cape in the time periods concerned. However, another main difference in the commercialisation *via* cash cropping between West Africa and the former homelands of South Africa lies in the fact that in the Eastern Cape in the 1980s, the strategy was not based on a deliberate move to exploit known comparative advantage of cash crops. Furthermore it was a top-down strategy with limited community involvement. Finally, in most cases, the farming system introduced was foreign to participant farmers (University of Fort Hare, 1997).

3.3.3 The Survey Area for the Second Phase of Investigation

For the second phase of the study one of the districts in the study area, namely Middledrift, was chosen for a more intensive focus. The survey was conducted in two of the villages in the district. The two villages surveyed differ in a number of aspects with respect to land use, infrastructure and general socio-economic characteristics. The first village, Ann Shaw, bears features that are attributed to a "small town" while the second one, KwaNdindwa, is regarded as a remote rural location. The fully electrified Ann Shaw town is situated two kilometres from the main tar road while the same road is approximately 20 kilometres from the KwaNdindwa village, which is without electricity.

The central business area of Middledrift district, which is two kilometres away from Ann Shaw, has a post-office with public telephone facilities, a supermarket and a number of food and agricultural input stores. KwaNdindwa inhabitants, on the other hand, have to travel at least 20 kilometres to get access to comparable facilities. According to the survey data for this study, an average household in Ann Shaw boasts R3, 808.30 (US $635) worth of household assets such as televisions, radios and refrigerators compared to R1, 544.00 (US $257) for an average household in KwaNdindwa. This indicates a significant difference in life style between the two villages. Table 3.2 below gives a summary list of some commercial enterprises in the two sample sites.

Table 3.2: Listing of Formal and Informal Commercial Enterprises in KwaNdindwa and Ann Shaw, Middledrift, Eastern Cape

Small Town Ann Shaw	Rural KwaNdindwa
Formal activities:	Formal activities:
• General dealer (food, clothing, butchery)	• General dealer
• Supermarket	• Brick maker
• Fast food restaurant	• Small grocery store
• Small café	
• Brick maker	Informal activities:
	• Paraffin, sweets, cigarette hawker
Informal activities:	• Fresh vegetable hawker
• Shebeen (liquor hawker)	• Handicraft hawker
• Fruit and vegetable hawker	• Fresh-cut pork hawker
	• Home-sewn clothing hawker
	• Shebeen (liquor hawker)
	• Livestock (cattle, sheep & goats) seller

In other respects however, the two villages share some common features. Maize, vegetables and livestock are the main agricultural commodities produced throughout Middledrift district. On average a household has access to 0.08 ha of cropland per capita, which comprises a small backyard vegetable plot and a larger crop field situated a distance away from the main dwelling. There is no clear direction as to who administers

land issues under the current local government set-up. In the past a traditional authority headed by an area chief or a village-based headman would handle such matters.

3.4 Summary

The main aim of this chapter was to present an overview of the Eastern Cape province and a description of smallholder farming in the province and in the study area. The Eastern Cape encompasses the area formerly known as the East-Cape/Eastern province, the Border and the north-eastern Cape, as well as the former homelands of Ciskei and Transkei. During the colonial period this was an area of disputes between different groups. Since then a number of significant economic, social and political developments have taken place leading to eventual designation of the Ciskei and Transkei territories in the 1970s. The two homelands subsequently became "independent" though still fiscally dependent on South Africa. Following the 1994 democratic elections the two territories were formally reincorporated into the new South African boundaries as part of the Eastern Cape Province.

Of the nine provinces of South Africa, the Eastern Cape has the second-largest surface area and the third-largest population. It is divided into 43 districts that make up its three regions. The province is characterised by high population density, low life expectancy, low adult literacy, high unemployment, and low household income. A significant proportion of the black population lives below the poverty line. There is also a noted disparity in the distribution of income and wealth, thus negatively affecting the black population.

Only a small percentage of the land in the Eastern Cape is potentially arable. Most of the agricultural land is under grazing. In the mainly white 'East Cape' part of the province, most of the land is held under freehold tenure. In the mainly black former homeland areas of Ciskei and Transkei land is held under freehold, quitrent, communal and trust tenure. Livestock is the principal agricultural sector in the province.

The survey area for this study covers five of the 43 districts in the province namely, Mpofu, Keiskammahoek, Middledrift, Zwelitsha and Herschel. All the five districts have a low level of human development - dismally lower than that of the adjacent white districts.

The adjacent Middledrift district was the main focus of the second phase of this research. The survey was conducted in two villages, namely Ann Shaw and KwaNdindwa. Ann Shaw is considered as a typical "small town", while KwaNdindwa is a remote location. Quite a considerable amount of non-agricultural commercial activity takes place in both villages.

CHAPTER 4
SMALLHOLDER COMPARATIVE ADVANTAGE IN THE EASTERN CAPE

4.1 Introduction

The first phase of this research studied the comparative advantage of smallholder farmers in the Eastern Cape. Given the modest resources at hand, the size and huge diversity of the smallholder agricultural sector in South Africa, and the lack of reliable secondary data on smallholder farm production costs and outputs from which to make a sample frame, no attempt was made to describe *representative* smallholder farms and activities. Rather, the objective was to give insights into what is *possible* on a broad scale - given the observed activities of samples of relatively successful smallholder agriculturists, who are currently involved in farming and selling significant portions of their output in the market. This phase sought to show whether there were agricultural activities that smallholder farmers can undertake both profitably and efficiently in today's South Africa. It needs to be shown whether small-scale producers of agricultural commodities in South Africa have a comparative advantage in anything, or whether such producers should continue to abandon their own agriculture in favour of work in industrial plants or on commercial farms.

4.2 The Concept and Study of Comparative Advantage

4.2.1 Theoretical Foundations

The concept of comparative advantage has its roots in the international trade work of the classical economists Adam Smith, David Ricardo, Robert Torrens and John Stuart Mill. The theory of comparative advantage is thought to have been formulated by Robert Torrens, but is generally associated with David Ricardo (Mathemera, 1997).

At the end of the eighteenth century, Adam Smith professed that mutually beneficial trade is based on the principle of *absolute advantage*. In other words, a country may be more efficient in the production of some commodities and less efficient in the production of others relative to another nation. Irrespective of the cause of the difference in efficiency, both countries can benefit if each specialises in the production of what it can do more efficiently than the other. This concept was challenged only four decades later when Ricardo and Torrens argued that mutually beneficial trade is possible when only *comparative advantage* exists. Since then, *absolute advantage* has been considered only a special case of the general principle of *comparative advantage* (Chacholiades, 1990).

A country is said to have a comparative advantage in the commodity in which that nation's degree of superiority (efficiency) is higher, and a comparative disadvantage in the commodity in which its degree of superiority is lower, relative to another country. Therefore, as opposed to absolute advantage, comparative advantage is a relative concept (Chacholiades, 1990:17-18). The law of comparative advantage states: "When each country specialises in the production of that commodity in which the nation has a comparative advantage, the total world output of every commodity necessarily increases (potentially) with the result that all countries become better off" (Chacholiades, 1990:18).

Since Adam Smith's (1776) *Wealth of Nations*, the most important argument in trade theory has been the notion that government interventions can inhibit productivity by limiting access to markets. According to Masters (1995: A-5), although it's been proven historically that economic growth is greatest under more open trade regimes, this does not imply that complete *laissez-faire* (that is, absence of governmental interference in economic affairs) is optimal, or that there is nothing governments can do to influence trade patterns. The development of the concept of comparative advantage has led to the identification and quantification of the sources of comparative advantage. These include technological efficiency (Ricardo, 1817); factor intensity of different industries (Heckscher, 1919; Ohlin, 1933) (later challenged by Leontief, 1953); use of industry-specific resources (Viner, 1937); domestic demand (Samuelson, 1962); and exchange rates (cited by Masters, 1995).

4.2.2 Challenges to Comparative Advantage

Masters (1995:9), identifies two main challenges to comparative advantage: one focussing on developing countries starting around 1950, and the other focussing on industrialised countries starting in the early 1980s. During both periods there were popular demands for government action to support vulnerable industries against rapid changes in production and trade levels.

In developing countries the need was for restriction of imports to avoid dependency on other countries. Economists offered two arguments for restricting trade in developing countries: Import-substitution or 'inward' industrialisation; and domestic development strategies. Prebisch (1950) and Singer (1950) independently formulated the thesis that over time the terms of trade would turn against countries that export primary products and import manufactures. They therefore advocated a development strategy based on import substitution of manufactured goods rather than promotion of agricultural exports. Hirschman (1958) introduced the concept of 'linkages' as a tool for investigating how investment in one type of activity resulted in investment in other income-generating activities. He argued that developing countries would benefit more from the linkages of import substitution industries than those of export industries. These linkages thus justified trade restrictions and an inward-looking strategy (cited by Masters, 1995:9; Staatz and Eicher, 1998:10-11)

Industrial country trade theories of the 1980s, on the other hand, favoured subsidisation of exports with strategic policies to capture market share. Based on the case study-based approach (as opposed to the hypothesis-testing approach), it was concluded that industries are successful because of the fundamental economic conditions around them. The policies needed to support competitive advantage turned out to be the same as those needed to support comparative advantage. These are, for example, the provision of education, research, and other public goods, as well as enforcement of anti-trust rules, disclosure and labelling requirements and safety regulations (Masters, 1995: 10).

The challenges to comparative advantage have strengthened the theory by extending it to a broader variety of conditions and circumstances. The common consensus now is that potential gains from trade restrictions are far outweighed by the gains from open trade. Even in cases where 'vulnerable industries' were protected in some countries, it was generally discovered that the costs of supporting these industries exceeded the eventual payoff in the long run (Masters, 1995:11).

4.2.3 Measurement of Comparative Advantage

Knowledge of comparative advantage is essential in developing countries, as this will inform policy makers of avenues through which existing patterns of comparative advantage could be exploited. However, a major practical difficulty in developing countries, according to Morris (1990:1), is that comparative advantage is not easy to determine empirically. This is because simply comparing costs of production between two regions or countries is not conclusive, since the comparison is not based on absolute production costs. Even if relative production costs are known, government policies and market failures often distort them. Ways, therefore, need to be found to factor in such distortions so as to determine true patterns of comparative advantage.

Two types of summary measures have been developed in the study of policy impacts on social welfare. One type focuses on the private and social costs of public sector investment, for example the Net Present Value (NPV), and the Economic Internal Rate Of Return (EIRR) (Gittinger, 1972). The second type of summary measures focuses on the static effects of price-distorting policies, for example, the Effective Protection Coefficient (EPC), and the Domestic Resource Cost (DRC) (Bruno, 1972; McIntire and Delgado, 1985; Morris, 1990; Masters and Winter-Nelson, 1995).

According to Nelson and Panggabean (1991:703) such summary measures tend to summarise too much, which could lead to omission of significant results of the analysis. The Policy Analysis Matrix (PAM) (Monke and Pearson, 1989) was developed to address this problem. The strengths of the PAM technique lie on at least three facts (Nelson and

Panggabean, 1991:703). Firstly, it allows varying levels of disaggregation; secondly, it simplifies the analysis of policy-induced transfers; and finally, it makes it possible to identify the *net effect* of a varying set of complex policies and to sort out the individual effects of those policies.

Partial equilibrium methodologies such as DRCs and PAMs, however, will always have their limitations. For example, the indicators provide information on which activities are the most efficient users of inputs and the most profitable given certain prices. It is not known whether some prices will change after farmers switch into a particular activity, potentially affecting the relative efficiency of the activity. With these limitations in mind, this study employed the PAM technique drawing to determine the comparative advantage of commercial smallholders in the Eastern Cape. The technique made a number of useful indicators of policy effects relatively easy to calculate using obtainable data. It also enabled easily interpretable and consistent comparison ranking of different productive activities within and across regions.

4.2.4 Specific Cases Studied

The activities presented in Table 4.1 were selected to study comparative advantage of Eastern Cape smallholders. They were carefully selected to cover a wide range of land uses in the Eastern Cape Province as follows:

Table 4.1: Selection of Case Study Farming Activities

Sub-sector	Activity	Location
Livestock	Indigenous cattle	Mpofu/Seymour, Ciskei
	Exotic cattle	Mpofu/Seymour, Ciskei
	Dairy	Keiskammahoek, Ciskei
Horticulture	Cabbage	Zwelitsha, Ciskei
	Citrus	Mpofu/Seymour, Ciskei

Sub-sector	Activity	Location
Field crops	Irrigated maize	Keiskammahoek, Ciskei
	Dryland maize	Herschel, Transkei

The case studies are discussed in more detail below. Each of the case descriptions made were arrived at after intensive focus group interviews and individual farmer visits. They therefore refer to stylised examples of farms instead of actual farms. The aim of the descriptions is to provide a general picture of what smallholders in the Eastern Cape are involved in.

These farmers were selected because they represent a profile of independent African smallholders in the Eastern Cape province. The history of their development was discussed in Section 3.3.2.1 above. Despite their apparently unpopular political and economic reputation, they still represent what African smallholders can do once given an opportunity to conduct independent commercial farming.

Indigenous Cattle

The sample area selected as case study of indigenous cattle production is located in the Mpofu/Seymour district. Emerging beef lessee-managers in this district produce for the growing market of abattoir and abattoir suppliers. These buyers purchase directly from the farmers on the basis of live weight.

The main activity in this system is indigenous Nkone breeding on leased state land under the project development strategy. The particular case study is a 1060 ha unit accommodating a 275 animal unit herd under suitable climatic conditions for Nkone rearing. The farming practice in this farming unit is characterised by semi-intensive monitoring of cattle performance to breed an environmentally suitable Nkone breed. Marginal cattle are culled every year. Production runs over a 22-month cycle from calving to sale of long yearlings/weaners and employs both family and hired labour. Owing to the Nkone's hardiness and ease of calving (92 percent calving percentage),

minimum intervention is required in terms of supplementary feeding and disease control. Despite the Nkone's hardiness and environmental adaptation, its production activity in the sample farm is run under semi-intensive conditions employing fairly sophisticated infrastructure. These facilities include a scale, neck clamp, and a high quality handling pen. A decision to invest in these facilities was made primarily in preparation for an anticipated privatisation in the near future. From a production efficiency point of view they were arguably not required.

Family labour accounts for about a quarter of the total number of production hours under this activity. The rest of the labour hours are filled by hired workers from surrounding villages where farm production is mainly to supplement household consumption (Siyoko, 1997).

Exotic cattle

The exotic cattle activity is subjected to the same market conditions as its indigenous counterpart. This study selected a Simmentaler (dual purpose breed) breeding unit as a case study for estimating private and social costs for exotic cattle enterprise in the Eastern Cape. This is located in Mpofu/Seymour district in the former Ciskei and is managed by lessees. The 277 ha holding accommodates 115 animal units bred for both milk and beef. The production activity, stretching for a period of 11 months, employs both hired and family labour. The marketing activity is co-ordinated by the former homeland parastatal. The animals are sold as long yearlings on regular basis to local buyers.

Dairy

Emerging dairy production in the former Ciskei and Transkei is limited to the development projects and irrigation schemes established by the former homeland authorities in the 1970s. This development strategy entailed huge modern capital investment in the form of dairy parlours and irrigation infrastructure for pastures estimated at R8.86 million between 1976 and 1979 (Van Averbeke, 1995). Through an

arrangement with the parastatal Ulimocor the farmers currently settled in the scheme will gradually be granted private ownership of the land. Milk in these schemes is sold locally, and because of high costs (perishability, distance, and transport costs) is considered as a non-tradable commodity.

One of these is a 1730 ha land area in the district of Keiskammahoek in the former Ciskei. This farming system supports 12 ha dairy units relying principally on cultivated pasture. For the purposes of this study, a 27 AU case study unit was selected. This unit is run on a 17 ha area accommodating 6 ha of kikuyu permanent pasture and 6 ha of winter ryegrass. The farm employs both hired and family labour. On average, milk production per cow per day is 5.5 litres marketed locally at R1.50 per litre. The decreasing level of parastatal support has had a negative impact on the milk yields and therefore incomes.

Citrus

The Kat River citrus farming system located in the Mpofu/Seymour district was selected for the purposes of this analysis. A 17 ha navel orange holding along the Kat River valley was studied for the estimation of private and social costs for perennial citrus in this area. Orchards accommodate 600 trees per hectare. Production on these farms employs only hired labour in a highly mechanised process aimed at producing the highest possible exportable produce percentage. Currently, about 60 percent of a 35-ton per hectare yield are exported. Over 30 percent of the produce are sold on the local market and the remainder to the factory.

These farmers lease their land from the state on an annual basis and manage their own operations. They belong to the Kat River Citrus Co-operative (KATCO) through which they market their produce and buy production inputs. KATCO is a member of the Outspan citrus export company. All the export produce is sold through Outspan in a non-regulated marketing environment. In the absence of any protection in the output market export price in Port Elizabeth is used as the reference price in the budgets.

Cabbage

The 50 hectare irrigated vegetable farming area of Horseshoe situated about 10 km north of King William's Town in the Zwelitsha district of the Eastern Cape was selected as a case study area for the analysis of irrigated cabbage production. Also part of the agricultural schemes in the former homelands, this farming system is managed by 25 fully independent farmers, each on 2 hectares leased from the state. The parastatal responsible for this scheme is Ulimocor who took over its running in 1985 from the former Ciskei Department of Agriculture.

The market for cabbage is readily available in the urban area of King William's Town-Bisho. Some of the produce is sold on the farm to retailers. Any surplus - which is rarely experienced - is sold in the East London market. For the purpose of this study the King William's Town market is taken as the reference market.

The climate and soils are generally suitable for production of irrigated vegetables and water is readily accessible from the nearby Buffalo river. Sprinkler is the main system of irrigation used on these plots. Services provided to the farmers by Ulimocor included, a 50 percent subsidy on water charges, a 25 percent subsidy on mechanical operations, maintenance of infrastructure, security, timely training and extension services.

Irrigated Maize

The selected case study activity for the analysis of irrigated maize budgets is located in the district of Keiskammahoek in the former Ciskei. Planning in this area was done in the context of the former homeland irrigation schemes strategy of the 1970s. About 22 ha of land is allocated to cultivation of irrigated field crops and vegetables in 0.25 hectare plots. More than 60 percent of this arable cropland is allocated to and managed by independent, semi-commercial maize producers employing family labour. In the particular case study plot, about 75 percent of the maize produced is marketed locally at the prevailing local price in Keiskammahoek. This price is used as the reference price for

the market. As in the case of dairy, irrigated maize in this area is considered as a non-tradable commodity owing to transaction costs associated with transportation.

Dryland Maize

The dryland maize farming system located in the Herschel district in the former Transkei was selected for the study of private and social prices for dryland maize. The case study under consideration is a 1-hectare holding managed by smallholders and employing family labor. A combination of semi-arid climate and unreliable rainfall in this area significantly affects the yields. The Transkei Agricultural Corporation (Tracor) provided contractor services at subsidised prices. Only 30 percent of the total output is sold locally with the rest used as fodder. Dryland maize is also taken as non-tradable as it faces the same transaction cost constraints as irrigated maize and dairy.

4.2.5 The Policy Analysis Matrix as Applied in this Study

The study of comparative advantage required construction of Policy Analysis Matrices (PAMs) for each of the selected activities. A PAM is an accounting technique that organises data on costs of production and marketing, for specific rural activities, technologies and market channels. PAMs contrast observed ("financial") data to data valued at hypothesised social ("economic") costs in an internally consistent manner, leading to calculation of economic indicators used to assess economic efficiency and the competitiveness of specific activities in specific markets (Monke and Pearson, 1989).

Production of the basic indicators in a Policy Analysis Matrix (PAM) involved collection of production and marketing cost data through focus group interviews, farmer recall, and interviews with organisations involved in smallholder extension and marketing. The objective was to derive in each case study area farm budgets for principal crop and livestock activities, on a per unit basis, using prevailing technologies. This budget data could then be associated with secondary data on transportation costs, prices, and shadow prices, to assess partial equilibrium indicators of comparative advantage and distribution

for the major activities in each area. The next sub-section elaborates on the process of budget preparation.

4.2.5.1 Construction of Farm-Level Budgets for the PAM

Policy makers need farm-level data to make policy decisions regarding farm-level issues. Apart from the COMBUD's[24] prepared periodically by the government, South Africa has lacked such data in the smallholder sector up to now. It is thus one of the implicit objects of this study to contribute to laying of a foundation and starting of a tradition of more intensive farm-level data gathering in the smallholder farming areas. Hence the Appendix section of this thesis could be an invaluable resource for anyone involved in smallholder research and policy making. A more formal publication by Ngqangweni, *et al.* (1998) containing smallholder budget information for the Eastern Cape, KwaZulu-Natal and the Northern Province is in circulation - a direct outcome of this study.

After selecting activities to be analysed, the next step in this study was to prepare farm-level budgets for each of the case studies. The primary objectives of enterprise budgets were:

- To present data that contrasts private and social profits;
- To allow quantification of transfers induced by policy or market failures through construction of PAM ratios; and
- To determine comparative advantage of smallholders in the selected activities.

In line with the methodology applied in this study, a number of key respondents and respondent groups were identified. The agricultural and extension offices in the case study districts as well as the (former) regional offices of the Ciskei and Transkei agricultural corporations served as main reference and verification points during the process of budget preparation.

[24] "*Com*mercial *Bud*gets" covering traditionally white commercial farming areas.

They helped with identification farmers whose production records were kept up-to-date. This proved to be invaluable in facilitating gathering of accurate and relevant data. These farmers were then visited a number of times individually and sometimes in groups to gather and verify cost and revenue data on their farming practices. Data gathering was approached in a systematic manner using the approach suggested by Monke and Pearson (1989).

For the crop enterprises namely, citrus, cabbage and maize activity calendars were first drawn up to identify various tasks in crop production, such as land clearing and preparation, planting, fertilisation, pest control and weeding, and harvesting. The next step was to specify quantities of inputs and outputs associated with each calendar task. Inputs were classified into fixed (capital equipment), direct (hired and family) labour, and intermediate inputs. A standard unit of measurement (per hectare in this case) was then specified and was used consistently in the analysis and interpretation of results. For valuation of these data items, prices were collected from secondary sources, such as farm input firms, co-operatives and retail outlets.

A special challenge in the preparation of crop budgets arose with citrus, a perennial crop. In this case the activity budget prepared represented the observed costs and returns of the activity in a year of full production (year 7). Profitability figures from the first to the sixth year were compounded to give a net present value in year 7. The present values were added up and taken as an investment cost, and the useful life of the investment as the remaining term of the production cycle. The citrus budget used in the analysis is presented in Table 4.1 as an illustrative example (see also Appendix 4). The rest of the detailed activity budgets are presented in Appendices 1 to 7.

Preparation of livestock (dairy, beef and dual-purpose cattle) budgets involved almost the same procedure as that of the crop activities (see Appendix 1). These employed the Animal Unit as the standard unit of measurement in the analysis. After the observed cost and income items were priced and presented, their shadow prices were determined. The shadow prices, which represent the social costs, were then presented in a "social budget".

Table 4.2: Budget for Irrigated Citrus in Mpofu District, Eastern Cape

The farming system

Location	Mpofu, Eastern Cape
Practice	Irrigated citrus production
Citrus area (ha)	17.00
Expected lifespan (yrs)	40.00
Full production attained in	eighth year
Working hours	8.00
Hired wage ®	30.00
Discount rate (%)	5.00

Activities

Activity	Fixed input	Adult labour (man-days)	Intermediate input
Land preparation		contractor	
Irrigation equipment installation	Irrigation lines and equipment	contractor	
Planting	spades	90.00	600 trees, 100 windbreaks
Fertilising	knapsack	1.00	0.5 ton fertiliser;480 L fertiliser
Pest and disease control	boom sprayer, tractor	377.00	73 L pesticide; 0.1 ton pesticide
Weed control	herbicide sprayer	55.00	9 L weedicide
Soil and leaf sampling		contractor	
Maintenance	slasher, hand-saw	2.00	
Harvesting	picking shears, storage shed, bin trailer	696.00	1 picking bags
Marketing		contractor	

Table 4.2: Continued

List of fixed costs items and their Net Initial Costs

Fixed input	Initial cost (R)	Useful life (yrs)	Salvage value (SV) (R)	Present value of SV (R)	Net initial cost (R)
Tractor	58208.50	10.00	5820.85	3573.50	54657.69
Boom sprayer	47880.00	10.00	4788.00	2920.68	44959.32
Herbicide sprayer	4000.00	10.00	400.00	244.00	3756.00
Storage shed	15000.00	10.00	1500.00	915.00	14085.00
Bin trailer	14800.00	10.00	1480.00	902.80	14348.60
Knapsack	250.00	5.00	0.00	0.00	250.00
Slasher	80.00	5.00	0.00	0.00	80.00
Picking shear	25.00	5.00	0.00	0.00	25.00
Hand-saw	9.00	5.00	0.00	0.00	9.00
Spades	32.00	5.00	0.00	0.00	32.00
Irrigation lines and equipment	102000.00	10.00	10200.00	6261.92	95738.08

Calculation of annual fixed costs (R/ha)

Fixed input	Days/ha	Days/ year	Per ha share of annual use
Tractor	25.50	1087.00	0.19
Boom sprayer	22.40	378.00	0.17
Herbicide sprayer	3.20	55.00	0.02
Slasher	0.06	1.00	0.00
Hand-saw	0.06	1.00	0.00
Knapsack	1.00	1.00	0.01
Picking shear	38.50	654.00	0.29
Bin trailer	38.50	654.00	0.29
Loading shed	2.50	42.00	0.02

Table 4.2: Continued

Fixed input	Net initial cost (R)	Capital recovery factor	Share of annual use	Annual capital cost
Tractor	54657.69	0.13	0.47	3326.70
Boom sprayer	44959.32	0.13	0.42	2445.30
Herbicide sprayer	3756.00	0.13	0.06	29.20
Slasher	80.00	0.23	0.00	0.01
Hand-saw	9.00	0.23	0.00	0.00
Knapsack	250.00	0.23	0.02	1.20
Picking shear	25.00	0.23	0.29	1.67
Bin trailer	14348.60	0.13	0.29	538.86
Loading shed	14085.00	0.13	0.02	36.48

Calculation of annual private costs (R/ha)

ITEM	QUANTITY	RANDS PER UNIT	TOTAL (R)
Fixed inputs			
Tractor	2.00	3326.70	6653.40
Boom sprayer	1.00	2445.30	2445.30
Herbicide sprayer	1.00	29.20	29.20
Slasher	2.00	0.01	0.02
Hand-saw	6.00	0.00	0.01
Knapsack	2.00	1.20	2.40
Picking shear	25.00	1.67	41.75
Bin trailer	1.00	538.86	538.86
Loading shed	1.00	36.48	36.48
Investment cost	1.00	19657.61	1260.50
TOTAL FIXED INPUT COST			11007.92
Direct labour (days)			
Unskilled adult	109.00	20.00	2180.00
Intermediate inputs			
Fertiliser (ton)	0.50	2161.43	1080.72
Fertiliser (L)	480.00	1.55	744.00
Pesticide (ton)	0.10	29.79	2.98
Pesticide (L)	73.00	52.66	3844.18

Table 4.2: Continued

ITEM	QUANTITY	RANDS PER UNIT	TOTAL (R)
Weedicide (l)	85.00	18.74	1592.90
Picking bags (units)	1.00	9.00	9.00
Contractor-leaf and soil sampling (ha)	1.00	175.00	175.00
Water (ha)	1.00	120.00	120.00
Electricity (ha)	1.00	555.00	555.00
Repair and maintenance (ha)	1.00	939.00	939.00
Fuel and lubricants (ha)	1.00	240.00	240.00
Packing (ha)	1.00	5007.10	5007.10
Transport (ton)	35.00	31.20	1092.00
TOTAL INTERMEDIATE COSTS			15401.87
Land (ha)	1.00	2000.00	2000.00
TOTAL PRIVATE COSTS (R)			30589.79
Annual Revenue			
Sales:			
Export (ton)	22.75	1340.00	30485.00
Local (ton)	9.25	450.00	4162.50
Factory (ton)	3.00	200.00	600.00
TOTAL			35247.50
ANNUAL PROFIT PER HA			4657.71

Calculation of annual investment cost (amortised over 40 years)	
TOTAL AMOUNT (R)	21628.37
AMMORTIZATION FACTOR	0.06
ANNUAL COST (R)	1260.50

Table 4.2: Continued

Decomposition of annual private costs (R/ha)

ITEM	QUANTITY	TRADABLE INPUT (R/ha)	LABOUR (R/ha)	LAND (R/ha)	CAPITAL (R/ha)	TOTAL
Fixed inputs						
Implements (ha)	1.00				9747.41	9747.41
Investment cost (ha)	1.00				1260.50	1260.50
Total					11007.92	
Direct labour						
Unskilled adult (days)	109.00		2180.00			2180.00
Intermediate inputs						
Fertiliser (ton)	0.50	1080.72				1080.72
Fertiliser (L)	480.00	744.00				744.00
Pesticide (ton)	0.10	2.98				2.98
Pesticide (L)	73.00	3844.18				3844.18
Weedicide (L)	85.00	1592.90				1592.90
Picking bags (units)	1.00	9.00				9.00
Packing (ha)	1.00	5007.10				5007.10
Water (ha)	1.00	120.00				120.00
Electricity (ha)	1.00	555.00				555.00
Repair and maintenance (ha)	1.00	939.00				939.00
Fuel and lubricants (ha)	1.00	240.00				240.00
Contractors						
Contractor-leaf and soil sampling (ha)	1.00	175.00				175.00
Transport (ton)	35.00	1092.00				1092.00
Total		15401.87				
Land	1.00			2000.00		2000.00
TOTAL ANNUAL COSTS (R)						30589.79
TOTAL ANNUAL REVENUE (R)						35247.50
TOTAL ANNUAL PROFIT (R)						4657.71

Table 4.2: Continued

Decomposition of annual social costs (R/ha)

ITEM	QUANTITY	TRADABLE INPUT	LABOUR	LAND	CAPITAL	TOTAL
Fixed inputs						
Implements (ha)	1.00				8550.36	8550.36
Investment cost (ha)	1.00				1260.50	1260.50
Total					9810.86	
Direct labour						
Unskilled adult (days)	109.00		2180.00			2180.00
Intermediate inputs						
Fertiliser (ton)	0.50	948.00				948.00
Fertiliser (L)	480.00	652.63				652.63
Pesticide (ton)	0.10	2.61				2.61
Pesticide (L)	73.00	3372.09				3372.09
Weedicide (L)	85.00	1397.28				1397.28
Picking bags (units)	1.00	7.89				7.89
Packing (ha)	1.00	4392.19				4392.19
Water (ha)	1.00	105.26				105.26
Electricity (ha)	1.00	486.84				486.84
Repair and maintenance (ha)	1.00	823.68				823.68
Fuel and lubricants (ha)	1.00	210.53				210.53
Contractors						
Contractor-leaf and soil sampling (ha)	1.00	175.00				175.00
Transport (ton)	35.00	1092.00				1092.00
Total		13666.01				
Land	1.00			2000.00		2000.00
TOTAL ANNUAL COSTS (R)						27656.88
TOTAL ANNUAL REVENUE (R)						35247.50
TOTAL ANNUAL PROFIT (R)						7590.62

4.2.5.2 The Construction of the PAM

Table 4.3 provides a stylised example of a PAM. The letters A through L represent groupings of data that reflect the associated row and column headings. For example, the data in category A would be revenues from a farming activity measured using the actual, observed prices paid by the private smallholder. Category E includes those same revenues calculated using an economic price, with taxes, subsidies, and price distortions removed. Category I is the net of associated values in A and E, which measures the divergence between private and social revenues. The two columns for costs allow separation between the inputs that are traded in export markets and those that are non-tradable domestic goods, such as land and labour.

Table 4.3: A Policy Analysis Matrix

Basis of analysis		Costs		
	Revenues	Tradable inputs	Domestic inputs	Profits
Private prices	A	B	C	D
Social prices	E	F	G	H
Divergence	I	J	K	L

Source: *Adapted from Monke and Pearson (1989)*

The actual entries in the PAM allow direct comparisons of revenues, costs, and profitability among agricultural systems that produce identical outputs, either within a single country, or across countries. This is made possible by six indicator ratios derived from the PAM. These ratios measure the competitiveness of different agricultural activities given current technology and government policies within and between regions. They rank the comparative advantage of various smallholder enterprises and identify possible areas of investment to increase the growth of national income.

The first indicator derived from the PAMs is the domestic resource cost (DRC). The DRC is a measurement specific to a given technology, a given end market, and a given

location of production. It condenses into a single ratio the relationship between true cost of producing one unit of the item in question and the return to selling it. DRCs less than one are usually thought to indicate efficient production based on the existence of comparative advantage. More specifically, the DRC for a particular smallholder activity is equal to the value of domestic inputs used, priced using social prices, divided by product revenues at social prices less the cost of tradable inputs priced at social prices (DRC=G/(E-F)). A DRC value less than unity therefore indicates that the opportunity cost (meaning the cost of production as valued by the foregone most profitable alternative uses of the inputs) of the domestic resources used is less than the value-added earned from the sale of those resources. Put simply, it indicates how well the activity uses resources to earn value. Comparing across activities, the one with the lowest DRC is the one that earns the most value with the least value of inputs.

Although DRCs are usually employed in the context of international trade, and refer to the saving or earning of foreign exchange, the methodology also applies to regions within a country, provided the commodity in question is tradable. This condition does not hold for all the enterprises considered in this study as some commodities studied are not imported or exported from each particular region (although they probably could be if their prices justified it).

Non-tradables are commodities (or resources) whose equilibrium local market price is too high to permit profitable export to "outside" (non-local) markets, but too low to justify transporting the good into the local area, given prices "outside." Furthermore, true non-tradables are not good economic substitutes for other tradables (their prices are not correlated with tradables). DRC measurements can only be interpreted as showing comparative advantage in the cases of tradables, although they are computed for all goods. Low DRC (less than 1) for a tradable suggests that it would be profitable to concentrate more resources in that activity, but the same cannot be said of the DRCs for non-tradables. There, increased local production will lead to falling local prices as the local market is saturated, and the computed DRC will rise quickly.

The second indicator is the nominal protection coefficient on outputs (NPCO). The NPCO indicates the extent to which the market price differs from the social price (NPCO=A/E). By definition of social prices, an NPCO above unity indicates that producers of that good enjoy a price premium that represents a financial transfer from consumers of the good to its producers. An NCPO below unity would indicate a transfer from producers to consumers. These transfers occur either because of government policy or market imperfections that cause the market price to differ from the economic price.

The third indicator is the nominal protection coefficient on inputs (NPCI). The NPCI is the ratio of the private price of inputs to their social price (NPCI=B/F). Like the NPCO, the NPCI measures financial transfers caused by government policies or market imperfection. The NPCI measures the extent to which the market price of tradable inputs exceeds their social price. An NPCI above unity indicates that smallholders undertaking that activity pay a premium for their tradable inputs.

The fourth indicator is the effective protection coefficient (EPC). The EPC measures the effects of policies and market imperfections affecting the markets for outputs and tradable inputs. It measures the divergence between the value added by domestic inputs as measured with private prices and that measured with social prices (EPC=(A-B)/(E-F)). Value added by domestic inputs is product revenue minus costs paid for tradable inputs. An EPC greater than unity indicates that the profitability of activity given current policy and market conditions exceeds what it would be if subsidies or other such distortions were removed. The EPC indicates whether policy and market conditions for both outputs and purchased inputs have created an incentive or disincentive to undertake an activity.

The fifth indicator is the profitability coefficient (PC). The PC is the ratio of the profit from an activity measured with private prices to that measured with social prices (PC=D/H). Like the EPC, the PC measures the extent to which policy or market conditions have created an incentive or disincentive to undertake an activity. Unlike the EPC, the PC includes variation between private and social prices of non-tradable inputs.

The last indicator used in this report is the subsidy ratio to producers (SRP). The SRP measures the premium producers receive by undertaking a certain activity in relation to the social price or value of a good (SRP=L/E=(D-H)/E). It is a measurement of the profits derived from a financial transfer from consumers of a good to its producers.

4.2.6 Data Requirements for the Policy Analysis Matrix

An important aspect in determining many of the PAM ratios is the estimation of social values for revenues and costs. This is the most difficult part of the research, since if this is done incorrectly, the indicators would also be misleading. It is especially in relation to the social valuation of revenues and costs that a number of assumptions had to be made.

These assumptions are an essential part of the analysis from the first phase of this study. They determine what values of land, labour and capital are the closest proxy of their opportunity costs for each activity. These opportunity costs in turn largely condition the outcome on whether or not an activity makes efficient use of resources. The next part of the chapter discusses this process in more detail.

4.2.6.1 Financial (Private) Valuation of Domestic Factors and Tradable Inputs

Factors of production are generally taken as land, labour and capital. Assumptions and methodology underlying valuation of each of these factors for budget preparation will be discussed next. Some useful guides on valuation of resources for project analysis have been published in the past (see for example Gittinger, 1972; Squire and Van der Tak, 1975; and Brown, 1979). This sub-section will draw heavily on these sources along with the appreciation of unique circumstances in the study area.

Land

In both financial and economic analysis, land is valued based on the form of tenure and whether or not transfer of ownership is involved (Brown, 1979). In general, actual prices

paid by farmers for their land are recorded directly in private budgets. In the valuation of land for private budgets, these principles were followed in this particular exercise.

In execution of this particular exercise, *i.e.* measuring efficiency of resource use, the basic premise is that all figures included in the private/financial budgets reflect the opportunity cost to individual farmers for the use of resources. This opportunity cost refers to a quantifiable measure of the cost to a farmer for putting the resource, in this case land, in a given use rather than in its next best alternative use. The survey identified nominal rates charged by the state for its land leased to the farmers in the study area - R12/ha for indigenous beef farmland and R15/ha for dual-purpose farmland. For citrus, the lease rate was R2900/ha. Dairy, cabbage and maize farmers did not pay for the land, and hence a figure of zero in their private budgets.

Labour

It was an observed tendency for maize and cabbage sample farmers to employ both hired and family labour in production activity. For small farms, the use of family labour is a common phenomenon. Employment of hired labour by smallholders also occurs in the study area, which suggests that it is profitable to do so. This is probably because it still pays many rural people in the Eastern Cape to leave their land fallow and seek wage employment elsewhere. It would therefore be important to explain the source of hired labour for indigenous beef, dual-purpose cattle, dairy, citrus and cabbage activities.

The major source of hired labour for the smallholders in the study area is the surrounding villages. This is a homogeneous group of local Xhosa villagers residing mostly within walking distance from the farms studied. The contracting arrangements with the farm operators were such that they are full-time workers walking to and from home to work daily, and paid 'regular' market wages.

Valuation of hired labour for private budgets was relatively straightforward. Farmers in the study area paid a market wage as observed in the farming industry in the area. This

price was recorded directly in the private budgets and varies between activities. Citrus farmers paid R30 per adult working day compared to R10 paid by livestock, dairy, cabbage and maize farmers in the study area. The only explanation for the difference in wages between the two groups could be that the citrus arguably required relatively more skilled labour than cattle, cabbage and maize. There were no observations of additional benefits to the labour force. This approach was employed with an observation that influences of imperfect competition such as minimum wage laws (Brown, 1979) are non-existent in the study area.

Valuation of family labour required a different approach. The opportunity cost of family labour is defined as the income from the next best alternative that is forgone by participating in the farming activity (Brown, 1979). The next best alternative for family members working on the farm in the Eastern Cape would be wage employment elsewhere in the country. Given the unemployment rate, the opportunity cost of family labour was taken as their expected wage. This was calculated as follows:

Expected Wage = *Market Wage * (1 - unemployment rate)*

Capital

Since capital goods have a longer productive life than one production period, their value has to be annualised in private budgets. Monke and Pearson (1989) provide useful guidelines for this annualisation process. They advocate the use of the 'capital recovery cost' as the annual equivalent value for a capital item, *i.e.* the annual payment that will repay the cost of a capital item and provide an economic rate of return. This measure discounts the initial purchase price of a capital item to an annual equivalent, using a capital recovery factor derived by employing the following formula:

$$\frac{(1 + i)^n i}{(1 + i)^n - 1}$$

Where i is the investment-earning rate of return, and n is the useful life of the capital item.

Working out a proper proxy for an investment-earning rate of return for the study area was particularly tricky. This figure had to reasonably mirror the true opportunity cost of capital as it applied to the farmers in the area. In West Africa this has conventionally been valued at 20%, which represents the rate of return to livestock (Delgado, 1989). This would arguably be a good proxy for the Eastern Cape if one takes into consideration the same value and role of livestock among black farmers.

Another alternative was to use a figure of 5% representing the real cost of borrowing capital in South Africa. The latter figure was opted for because all the cases studied were strictly commercial. A general assumption that their capital wealth is tied up in livestock would not necessarily apply to them. Their opportunity cost of capital would be affected more by market interest rates.

A question that arises in the construction of PAMs is how to determine cost of the operator or manager in the production system. According to Monke and Pearson (1989:20), the cost of capital, which is defined as the pre-tax return that owners of capital require to maintain their investment in the system, is included in the domestic costs (see category "C" in Table 4.3). Category D (private profits) (Table 4.3) then represents "excess profits" to the operators of the activity. If D is negative, then operators are earning a subnormal rate of return and can be expected to exit from the activity. If private profits are more than zero (or above the "normal level"), then the manager is earning "super-normal" returns.

Tradable inputs were relatively simple to deal with. The price paid by the farmer was directly included in his private budget.

4.2.6.2 Economic Valuation of Domestic Factors and Tradable Inputs

Factors of production were also valued at their economic prices for construction of 'social' budgets. Social budgets measure profitability of enterprises from society's point of view. They organise data useful for an analysis of enterprises' level of efficiency in use of society's resources. To determine economic or social values for factors of production, financial prices were converted into 'shadow prices.' These represent opportunity cost to society of engaging in production of an activity (Bannock, *et al.*, 1992).

This study takes a deliberate step in valuation of domestic factors for black smallholder farmers in the Eastern Cape. In general, it assumes opportunity costs that are comparable to those of their white commercial counterparts. Given the history of smallholder repression and inequality of opportunity discussed in Chapter 1, it would probably not be fair to compare the two groups of farmers in this way. However, it was considered proper to determine how smallholder production would fare in terms of efficiency if it were to be subjected to the same cost assumptions as those faced by similar commercial farm activity. This would then expose the smallholders in an even more unambiguous fashion.

Land

According to Brown (1979), if the market for land were perfect, the market price for land would be taken as its true economic cost or the net value of production forgone. But other factors tend to have a stronger influence on the market price than the land's net contribution to production. These include speculative expectations and considerations such as social prestige and personal security.

In the study area, production takes place on land leased from the state in the case of indigenous beef, dual-purpose cattle, cabbage and citrus farms studied. Farmers in the project area pay a nominal annual amount as rent for the land to the state. If this price

were a good indication of the productive value of land in the area, it would normally be expected to be representative of the opportunity cost to society for the use of the land. But, since this was only a nominal price, which does not necessarily reflect this productive value, it could not be used in the social budgets.

For indigenous and exotic cattle activities it was assumed that R30/ha was a reasonable indication of the opportunity cost of land, based as observed on adjacent commercial farms. In the case of dairy cattle, cabbage, irrigated and dryland maize activities, figures of R600, R450, R600, and R100 per hectare respectively, were taken as shadow land prices. Based on a study conducted by the University of Fort Hare (1997) in the study areas, these figures represent what the farmers would rent their land out for. This was accepted as the closest indication of the shadow price for land in these areas. Opportunity costs for citrus lands were assumed at R2000/ha also based on what the farmers in the area would be willing to accept for their land. These costs are comparable to those faced by commercial farmers.

Labour

For social budgets, both hired and family labour need to be valued at their opportunity cost to society. Computation of shadow wage rates for both labour forms would entail taking care of distortions in the labour market. In the absence of a minimum wage requirement, the shadow wage rate remained the same as the private wage rate for both hired and family labour. Since the farmers do not adhere to Unemployment Insurance Fund, worker compensation and services council levies, their budgets were not affected by such adjustments.

Capital

None of the capital items included in the budgets were subjected to any distortions in their trade. The smallholder farmers are not registered for the national sales tax, the Value Added Tax (VAT), and can therefore not claim it back. This is the only distortion

taken care of in this analysis. However, some of the input items are not subject to VAT. All these adjustments are reflected in the social budgets.

Tradable Inputs

Since all the smallholder farmers included in the survey area are not registered for VAT, they still incur tax on certain inputs. But many of the inputs used by the farmers are zero-rated, for example, animal feeds and remedies, fertiliser, pesticide and seed. The effect of VAT is therefore very small

4.2.6.3 Methodological Approach to Valuing Outputs

The ultimate goal of this analysis was to measure the individual activities' profitability from the viewpoint of society as a whole. In this context, profitability refers to the capacity of these activities to maximise the efficient use of the nation's resources in producing national income. In valuing outputs, it is important to separate tradable items from non-tradable ones. Treatment of those items that earn foreign exchange differs from that of those consumed locally.

Non-tradable outputs

In this study dairy, cabbage, irrigated and dryland maize outputs were considered non-tradable. Dairy is non-tradable by virtue of its highly perishable nature and therefore high transaction costs involved in marketing. Maize (local traditional varieties) and cabbage are produced on such a small scale that trading them would not make economic sense because of transaction costs of selling small quantities of a bulky product over large distances. These products are also not imported into the area at any scale.

For dairy and irrigated maize produced and sold in Keiskammahoek, and dryland maize produced and sold in Herschel, local retail prices in their respective towns were used as

reference prices. These retail prices were then converted into farm-gate prices by simply deducting all marketing costs.

The social value of outputs is defined as the value of output after adjustments for transfer payments and distortions in the prices of foreign exchange and outputs. By definition, non-traded activities' "foreign exchange earnings" equal zero. In the absence of transfer payments in the output prices for dairy, cabbage and maize, the social output value remains zero for comparative advantage calculations with respect to the rest of the country and the same as their private value from the standpoint of assessing relative profitability within the Eastern Cape.

Tradable outputs

In valuing outputs in private budgets, the same principles applied for non-traded commodities were applied in the valuation of indigenous beef, dual-purpose cattle and citrus outputs. Deducting marketing, transport and handling charges from the border price to obtain an "export parity price" derived the foreign exchange earnings for exported outputs. Since beef is an importable in the study area and also subject to a 40% import tariff, its import parity price in East London harbour was used as reference in the valuation of indigenous beef and dual-purpose cattle outputs. The Port Elizabeth price was used as reference for citrus output. The East London and Port Elizabeth citrus export prices were observed to be free of market distortions as total deregulation has been fully realised. This has made social valuation of outputs citrus outputs relatively easy. Its resulting social output value did not differ from the private values.

4.3 Indicators of Smallholder Comparative Advantage

4.3.1 A Summary of the Results

As a framework for any analysis of comparative advantage, assumptions relating to relevant opportunity costs, as they apply to inputs and outputs, are essential and therefore

need to be clearly stated. These are used in the process of converting financial (private or observed) prices into economic (social or shadow) prices. In the previous sections, a number of assumptions relating to this central aspect of opportunity costs for inputs and outputs were laid out and explained. This section of the chapter presents results showing indicators of comparative advantage within the context of these assumptions as discussed in the previous sections. The findings emanating from this analysis are summarised in Table 4.4. These figures indicate the various aspects of efficiency of smallholders in their employment of resources in seven selected farming activities in four districts of the Eastern Cape.

The DRC column is particularly important in the interpretation of the results in general, and is therefore highlighted in bold. In the Policy Analysis Matrix (PAM) methodology, the DRC (domestic resource cost) ratio is the principal indicator of efficiency of resource use and therefore of the existence of comparative advantage in a farming activity. Simply put, the rest of the ratios only serve to explain the degree of protection in the market for inputs, outputs and resources associated with the activity in question. The Policy Analysis Matrices for each of the selected farming activities were extracted from more bulky data on enterprise budgets that were created as the initial survey exercise. The process of budget construction and accompanying details are presented in Appendices 1 to 7.

Table 4.4: Summary of Indicators of Comparative Advantage, Eastern Cape

Commodity and district	NPCO	NPCI	EPC	SRP	**DRC**	PC
Indigenous Beef: Mpofu	1.05	1.00	1.06	0.04	**0.62**	1.13
Exotic dual purpose: Mpofu	1.00	1.06	0.93	-0.04	**1.17**	1.50
Dairy: Keiskammahoek	1.00	1.01	0.99	0.18	**1.04**	-11.15
Irrigated Citrus: Mpofu	1.00	1.13	0.92	-0.08	**0.65**	0.61
Irrigated Cabbage: Zwelitsha	1.00	1.03	0.92	0.19	**1.01**	-42.15
Irrigated Maize: Keiskammahoek	1.00	1.04	0.97	0.11	**0.37**	1.30
Dryland Maize: Herschel	1.00	1.03	0.99	0.03	**0.36**	1.05

A number of important caveats must be borne in mind before any meaningful interpretation of Table 4.4 and subsequent tables can be made. Dairy, cabbage and the

two maize activities selected for analysis are non-tradable within the context of the study area, as is milk. Their case was explained in Section 4.2.4. The level of economic efficiency of resource use in these activities can only be interpreted as it applies to the 'local' village market. This then leaves us with only three genuinely tradable activities in the study area, namely, indigenous beef (Nkone) cattle, the exotic (Simmentaler) dual-purpose cattle, and the irrigated citrus activity.

However this does not mean that the rest of the figures, i.e. those relating to activities that are not 'genuine' tradables, will be totally discarded in the interpretation of results. They will only be interpreted with due qualifications. Although the DRC methodology does not necessarily apply to activities that are not tradable outside national boundaries, its application has been stretched in this study to include activities that are at least partly commercially exchanged.

A general overview of the results presented in Table 4.4 suggests that, under the given set of assumptions relating to opportunity costs, and bearing in mind the caveats mentioned above, smallholders in the Eastern Cape produce certain commodities both profitably and efficiently. Although no intensive effort was taken to compare these farmers' efficiency with that of commercial farmers, these results do expose very important findings in this regard. Using land and labour opportunity cost assumptions which apply to commercial farmers, smallholder farmers showed good comparative advantage in two of the activities selected for study namely, indigenous beef and citrus. With a DRC ratio of 0.62 the indigenous beef activity boasts the best indicator of efficiency, followed by citrus at 0.65.

Not to be ignored are irrigated and dryland maize activities. With DRC's of less than 1 these two activities do possess 'comparative advantage'. However, as explained above, their comparative advantage only applies to the 'local' level (i.e. the surrounding village area) market. At the bottom of the range are dairy, irrigated cabbage and exotic cattle activities, with each recording a DRC ratio exceeding 1, suggesting a lack of comparative advantage. This informs us that the cost of employing domestic resources to raise exotic cattle or dairy or to grow cabbage exceeds the resulting value-added from such an

exercise. The direct message from these results is that, *ceteris paribus,* it is probably not worthwhile to society for smallholders to continue raising exotic dual-purpose or dairy cattle or produce irrigated cabbage in the Eastern Cape.

These assertions could not be considered conclusive without subjecting the data to further tests. Thus for the purpose of expanding the scope of discussion, it was deemed appropriate to conduct a sensitivity analysis. It would only be interesting to determine how sensitive the above results are to the assumptions about opportunity costs. The next section presents the results emanating from this investigation.

4.3.2 Interpretation of Results Including the Outcome of Sensitivity Analysis

Although the main concern of this section is to report the sensitive nature of the original results to changes in opportunity costs, it is not the only one. As shown in Tables 4.6 through 4.11, other changes such as that of the 'off-take' rate in the cattle activities and the citrus export percentage were also tested. An extract of these results is presented in Table 4.5.

Table 4.5 contrasts outcomes from two scenarios namely, the "most relaxed" estimate of opportunity cost (comparable to smallholder private costs) versus the "strictest" social cost (comparable to white commercial costs) (Lyne, 2000; see also Ohene-Anyang, 1997). The "most relaxed" columns show data on land and labour costs, which approximate those reported or observed from the farmer's point of view, i.e. his private costs. They also show a resultant 'DRC' when using these more lenient assumptions. Under the most conservative scenario, the opportunity costs of land and labour approximating commercial rates are recorded with their resultant DRC and other PAM indicator ratios. The rest of the scenarios (see Table 4.6 to 4.11) indicate how the comparative advantage situation is likely to change if the assumptions regarding the opportunity costs of labour and land, as well as other factors change. These are discussed in more detail below as they apply to each of the chosen smallholder activities.

Table 4.5: Contrasting Outcomes from Strictest (Private Level) Versus Most Relaxed (Commercial Level) Assumptions

Activity	"Most Relaxed" Opportunity Cost Estimates			"Strictest" Opportunity Cost Estimates							
	Land (R/ha)	Labour (R/day)	DRC	Land (R/ha)	Labour (R/day)	**DRC**	NPCO	NPCI	EPC	SRP	PC
Indigenous Cattle[a]	12	10	0.37	30	20	**0.62**	1.05	1.00	1.06	0.04	1.13
Exotic Cattle[b]	15	10	0.96	30	10	**1.17**	1.00	1.06	0.93	-0.04	1.50
Dairy Cattle[c]	0	10	0.77	600	10	**1.04**	1.00	1.01	0.99	0.18	-11.15
Irrigated Citrus[d]	2900	30	0.79	2000	20	**0.65**	1.00	1.06	0.96	-0.06	0.61
Irrigated Cabbage[e]	0	10	0.86	450	10	**1.01**	1.00	1.03	0.92	0.19	-42.15
Irrigated Maize[f]	0	10	0.15	600	10	**0.37**	1.00	1.04	0.97	0.11	1.30
Dryland Maize[g]	0	10	0.32	100	10	**0.36**	1.00	1.03	0.99	0.03	1.05

Notes:

a (1) The DRC of 0.62 is a result of use of infrastructure coefficient comparable to that of exotic cattle farm. Keeping real economic land and labour costs constant and using reported infrastructure costs pushes DRC up more than one and half times; (2) a most likely off-take rate of 16% was used as opposed to a rate of 14% reported in the survey.

b An additional assumption in the DRC calculation was that the 14 % off-take rate reported in the survey reflects the likely scenario in exotic cattle activity.

c Land was valued at its assumed real economic cost of R600 as opposed to a zero cost as reported in the survey.

d Land was valued at almost three times lower than it's reported value. An export percentage of 65% was also assumed instead of 60% reported in the survey. This makes citrus more profitable than was reported in the survey.

e Land was valued at its assumed real economic cost of R450 as opposed to a zero cost as reported in the survey.

f Land was valued at its assumed real economic cost of R600 as opposed to a zero cost as reported in the survey. Real opportunity cost of family labour was assumed to be R10 a day, which is comparable to a commercial wage rate elsewhere in the survey area.

g The opportunity cost of land was assumed to be R100 as opposed to a reported value of zero.

4.3.2.1 Indigenous Beef

Indigenous beef (Nkone) cattle farmers in the study area leased land from the state at a nominal rate of R12 per hectare. This is land transferred from the then 'republic' of South Africa to the former homelands, which subsequently became property of the South African Native Trust as stipulated by the Natives Trust and Land Act of 1936 (see Section 3.3.2.1 for a detailed background discussion).

The hired labour employed was paid a wage of R10 a day, which was considered as the market-related rate in the study area. In the Nkone farming system studied, the smallholder farmer had made some physical capital investments in preparation for an envisaged privatisation of the farm. This decision by the farmer was taken to be of special significance as it turned out that it would have some bearing on the results pertaining to smallholder comparative advantage on indigenous beef. This is discussed in more detail below.

In the sensitivity analysis exercise, the "relaxed" level resource costs borne by the Nkone smallholder were taken as the first possible opportunity costs scenario (see Table 4.6). An additional factor was recorded as part of the first scenario, that is, an off-take rate of 16 percent was assumed. Using this scenario the smallholder farmers would enjoy superior comparative advantage as seen in a DRC of 0.37. If higher opportunity costs (double the relaxed level costs) are applied, the efficiency ratio rises to a less efficient but still impressive 0.44, even after a higher and more likely[25] off-take rate of 16 percent is used. This ratio is still safely lower than the threshold 1 above which comparative advantage is considered non-existent.

Although the opportunity costs of land and labour play a role in determining smallholder comparative advantage in the Eastern Cape, such a role seems to be miniature. It should also be pointed out, however, that land and labour opportunity costs seem to still play a relatively more important role than the quantity of output.

[25] A higher off-take rate would make more sense for the Nkone considering its physical advantages.

The rest of the sensitivity analysis results show that smallholders will enjoy comparative advantage only up to a certain level of opportunity costs of land and labour. Even though no threshold level was measured, it seems that if land and labour opportunity costs were to increase up to R60 a hectare and R20 per day respectively, society would no longer gain from smallholder use of resources in raising indigenous beef.

Another important factor in determining comparative advantage was considered to be the fact that the Nkone cattle have become adapted to the Eastern Cape environment over more than a thousand years (Hundleby, *et al.*, 1986). Characteristics such as low mortality rates, favourable off-take rates, disease resistance and general hardiness, add to the advantages of these indigenous breeds.

In this analysis, it was assumed that the Nkone's natural hardiness as a breed could potentially play a role in determining their comparative advantage. Based on evidence of Nkone's 'extensive' nature, and comparable observations from other livestock activities, namely exotic cattle, 'real fixed' costs for Nkone were assumed to be no higher than those observed for the farm keeping exotic cattle. The results of an analysis done in the activity budgets using these lower fixed costs showed that the Nkone activity had a substantial comparative advantage. This comparative advantage disappears rapidly when 'intensive' type infrastructure is added to the Nkone activity. The real economic land and labour costs were kept constant and private/reported/observed infrastructure costs were used. This adjustment pushed the DRC up by more than one-and-half times. This suggests that success using indigenous cattle will require avoiding capital intensive technologies.

Together with scientific findings on Nkone's physical performance (Hundleby, *et. al.*, 1986), these comparative advantage results clearly demonstrate the Nkone cattle activity's potential as a leading livestock enterprise for smallholders in the Eastern Cape. Among the seven activities tested in this analysis, indigenous cattle have the third lowest DRC ratio after the two maize activities. However, as explained above the maize results only apply under 'local market' conditions and are therefore relatively less relevant to the study

area. Indigenous cattle are in effect the most potentially profitable cattle enterprise for smallholder producers in the Eastern Cape.

Table 4.6 Sensitivity Analysis: Indigenous Cattle

Scenario						DRC
#	Description		Opportunity cost		Off-take rate (%)	
	Land price level	Labour price level	Land (R/ha)	Labour (R/day)		
1	Low	Low	12	10	16	0.37
2	Low	Low	12	10	14	0.44
3	Low	High	12	20	16	0.46
4	Low	High	12	20	14	0.46
5	Medium	Low	30	10	16	0.59
6	Medium	Low	30	10	14	0.59
7	Medium	High	30	20	16	0.62
8	Medium	High	30	20	14	0.61
9	High	Low	60	10	16	0.84
10	High	Low	60	10	14	0.84
11	High	High	60	20	16	0.86
12	High	High	60	20	14	1.90

According to the NPCI ratios reported in Table 4.5, tradable input markets affecting indigenous beef are free of intervention. However, the EPC ratio exceeding 1 indicates incentives to the farmers through institutional arrangements affecting tradable inputs and increasing private profitability. The NPCO ratio also shows a transfer to the producers as a result of an import tariff in the beef market. The PC ratio shows a more complete picture regarding government intervention in input and output markets since it also includes non-tradable inputs. Such an intervention has acted as a minor disincentive for Eastern Cape smallholders undertaking the indigenous beef activity. This could be explained in imperfections in mainly in the land market. The positive SRP figure also alludes to small transfers to the Eastern Cape beef smallholders. However, these transfers

are almost too negligible to be taken up as major policy indicators. At best, they are only a pointer or warning that better institutional arrangements should be in place if smallholders are to be encouraged to invest in indigenous beef production.

4.3.2.2 Exotic Dual-Purpose Cattle

The survey recorded almost similar private land and labour costs for the exotic (Simmentaler) cattle as their indigenous counterparts, except for a slightly higher land price for the exotic cattle enterprise at R15 per hectare. According to Table 4.5, if these private prices were used as the lower limit opportunity costs, the Simmentaler activity would just manage a modest level of efficiency as measured by a DRC ratio of 0.96. However, a look at the adjacent columns reveals that if commercial-level opportunity costs (more than double the smallholder private costs) are used, such efficiency worsens to an unacceptable level with a DRC of 1.17. It appears that the main factor responsible for such deterioration is the doubling of the land price to represent commercial level opportunity costs in the study area. The sensitivity analysis results in Table 4.7 reveal that beyond land and labour costs of R15 per hectare and R20 a day respectively, the exotic cattle enterprise becomes socially non-profitable (see scenario #5, Table 4.7). It is also revealed in the table that the quantity of meat/milk output plays only a secondary role in shaping smallholder comparative advantage in exotic dual-purpose cattle in the study area. A more primary role is taken up by the opportunity costs faced by smallholder farmers, especially those of land.

The NPCO ratio of 1 (see Table 4.5) indicates zero intervention in output markets affecting exotic cattle products, i.e. meat and milk. Since all the smallholder farmers included in the survey area are not registered for value added tax (VAT), they still incur tax on certain inputs. Many of the inputs used by the farmers are zero-rated, for example, animal feeds and remedies, fertiliser, pesticide and seed. The effect of VAT is therefore very small, hence the NPCI ratio of just over 1. As in all the smallholder activities studied, the EPC ratio for exotic cattle has remained just less than 1, which indicates a minor disincentive in the tradable input market for these activities. The farmers, it seems,

could easily avoid this disincentive by registering for VAT exemption. The interpretation of the EPC is the same for all activities studied and will therefore not be carried on to the rest of the activity subsections. The effect of the minor tax disincentive in tradable input markets for exotic cattle are easily offset by a generous incentive in non-tradable input markets. This is indicated by a PC ratio of 1.50, which incorporates the effects of intervention in non-tradable input markets.

An important finding from the sensitivity analysis results is that only through increased subsidisation of land prices could the Simmentaler activity boost its social profitability. Sadly, however, exotic cattle cannot be expected to survive with the need for relatively more intensive management than their indigenous counterparts, poor local milk market and poor prospects for lower land prices. Any remnant exotic cattle farmers would likely disappear in the near future as policy encourages indigenous cattle production instead, by making more investments in an enabling institutional environment for this activity.

Table 4.7 Sensitivity Analysis: Exotic Cattle

Scenario						DRC
#	Description		Opportunity cost		Off-take rate (%)	
	Land price level	Labour price level	Land (R/ha)	Labour (R/day)		
1	Low	Low	15	10	16	0.96
2	Low	Low	15	10	14	0.96
3	Low	High	15	20	16	0.99
4	Low	High	15	20	14	0.99
5	Medium	Low	30	10	16	1.10
6	Medium	Low	30	10	14	1.17
7	Medium	High	30	20	16	1.14
8	Medium	High	30	20	14	1.14
9	High	Low	60	10	16	1.39
10	High	Low	60	10	14	1.39
11	High	High	60	20	16	1.42
12	High	High	60	20	14	1.42

4.3.2.3 Dairy

Based on an initial arrangement within the context of the agricultural schemes, the smallholder dairy farmers studied did not pay for land. They only paid the market-wage rate of R10 per day for hired labour and the relevant amounts for tradable inputs. Taking this as the lower limit scenario in the sensitivity analysis, the results show that smallholder dairy farmers in the study area would manage a fair level of comparative advantage. Previous surveys conducted in the study area estimated opportunity costs for land under dairy, including irrigated pasture, at R600 per hectare. Taking this commercial rate and a labour price of R10 per day immediately exposed the dairy smallholders' poor efficiency in the use of resources as seen in the DRC of 1.04. Again the role played by the opportunity cost of land takes special prominence.

It seems that dairy is prone to the same challenges of intensive management demands and low local milk prices as is the dual-purpose activity. A study conducted by Sonandi and Van Averbeke (1995) among the Keiskammahoek dairy farmers emphasise the important role that management plays in dairy farming. They found that negligent management was to blame for decreasing milk yields in the Keiskammahoek irrigation scheme. However, as would be expected in any farming activity, management was by no means the sole determinant of profitability among the smallholder dairy farmers studied. Even the relatively superior management observed among these farmers was not enough to get the dairy enterprise to an acceptable level of social profitability.

A closer look at some of the figures presented in Tables 4.5 and 4.8 reveals other interesting observations about the smallholder dairy activity. Of particular interest are the SRP and PC figures in Table 4.5. An SRP figure of 0.18 reveals a subsidy to smallholder dairy producers. A quick glance in the next column magnifies this view. The PC ratio applying to dairy producers is -11.15. The negative in the figure is a reflection of a negative social profit denominator, which consequently affected the sign of the ratio. The sign should therefore not be incorrectly interpreted to show a disincentive towards smallholder dairy producers. Instead the three indicators together namely, the positive

SRP ratio, the negative in the PC ratio, and the PC ratio itself (regardless of the sign), all confirm a significant amount of subsidisation of smallholder dairy producers in the study area. This could be explained by a notably high degree of investment in physical infrastructure in these farms set up during the establishment of the irrigation schemes in the area.

Table 4.8 Sensitivity Analysis: Dairy

Scenario					DRC
#	Description		Opportunity cost		
	Land price level	Labour price level	Land (R/ha)	Labour (R/day)	
1	High	Low	600	10	1.04
2	Low	Low	250	10	0.88
3	Low	High	250	20	1.10
4	Medium	Low	375	10	0.94
5	Medium	High	375	20	1.16
6	High	High	600	20	1.26
7	Zero	Low	0	10	0.77

Prospects for smallholder dairy in the Eastern Cape are not particularly good. A look at the detailed sensitivity analysis results in Table 4.8 supports this assertion. Of the seven scenarios considered only three record a DRC ratio of less than 1. One of these is the smallholder's private level scenario already discussed above which sets the opportunity cost of land at zero. The other two scenarios set the opportunity cost of land at a little more than 60 percent of the commercial level (R375/ha) with the labour opportunity cost at commercial rate. Keeping the opportunity cost of land at 63 percent of the commercial value and doubling the opportunity cost of labour immediately renders dairy socially unprofitable. The result is the same if one holds the labour opportunity cost at double its commercial value and taking that of land even lower at 42 percent of its commercial value (R250/ha). What is reflected here is the equal role that land and labour opportunity cost play in determining the comparative advantage of smallholder dairy in the study

area. It could therefore be concluded that smallholder dairy's social profitability in the study area rests heavily on the unlikely prospect of low land and labour opportunity costs.

4.3.2.4 Irrigated Citrus

The citrus case study (the Kat River scheme) has experienced probably the smoothest process of transfer of ownership and running of production activities from parastatal to individual smallholder farmers in the Eastern Cape than any other former parastatal project activity. It has also continued to be the only exported and therefore real tradable smallholder farming activity. Farmers directly incur a cost of R2900 (rental from the state) per hectare for their land. The labour was observed to be 200% more expensive than all the other activities chosen for analysis at R30 per day. Taking these observed conditions as the first (lower limit) scenario in the sensitivity analysis (see Tables 4.5 and 4.9), reveals that smallholder citrus in the study area would still enjoy a relatively comfortable level of comparative advantage. This is manifested in the DRC of 0.79 under this scenario. Further investigation revealed that opportunity costs of land and labour for smallholder citrus in the study area were R2000 per hectare and R20 per day respectively. This scenario significantly improves the activity's social profitability by close to 20 percent. The DRC of 0.65 for smallholder citrus makes it the second best after that of indigenous cattle.

According to Table 4.9, none of the twelve scenarios considered for the sensitivity analysis tests showed lack of comparative advantage for smallholder citrus. These results also show that none of the factors applied in the sensitivity analysis namely, land and labour opportunity costs, as well as export quantity, played a more dominant role than the other in shaping social profitability. However, one cannot underestimate the impact of a good citrus harvest and therefore a high export percentage. It is shown in Table 4.9 that, keeping the opportunity costs of land and labour constant, and adjusting export percentage up or down by 5 percent, tended to have at least an equal effect on the DRC. This is a pointer towards the danger of ignoring the output side and only concentrating on

the input side. The only major threat to the output side is the incidences of hail that have been reported over the years, which have negatively affected export percentage.

After factoring in the observed generous subsidies in the form of initial investments in start-up infrastructure (irrigation lines, etc), the remaining 'incentives' were minor. The SRP of -0.06 in Table 4.5 instead shows some form of taxation to the smallholder citrus farmers in the area. That could probably be traced back to the relatively higher private land and labour costs that these farmers incur. Otherwise, *ceteris paribus*, it appears that citrus carries tremendous prospects for smallholders in the Eastern Cape.

Table 4.9 Sensitivity Analysis: Citrus

Scenario						DRC
#	Description		Opportunity cost		Export (%)	
	Land price level	Labour price level	Land (R/ha)	Labour (R/day)		
1	High	High	2900	30	60	0.79
2	High	High	2900	30	65	0.74
3	High	Low	2900	20	60	0.74
4	High	Low	2900	20	65	0.69
5	Medium	High	2000	30	60	0.75
6	Medium	High	2000	30	65	0.69
7	Medium	Low	2000	20	60	0.69
8	Medium	Low	2000	20	65	0.65
9	Low	High	1000	30	60	0.70
10	Low	High	1000	30	65	0.65
11	Low	Low	1000	20	60	0.64
12	Low	Low	1000	20	65	0.60

An important question to be raised when arguing the citrus case is that of high debt levels of the sample citrus farmers. Is this likely to affect the farmers apparent efficiency? This is a rather thorny issue which is easier to avoid than to tackle. The methodology applied in this study, which uses the DRC as an indicator of comparative advantage, only reveals the extent to which domestic resources earn revenue under a given technology. The data

used to arrive at the indicator ratio is derived from enterprise budgets, which do not account for debt repayment. However, the results should be interpreted with a caution given about the long-term prospects of smallholder citrus if the debt issue is not solved.

4.3.2.5 Irrigated Cabbage

According to the irrigation scheme set-up, the smallholder cabbage farmers surveyed did not pay directly for the land, but paid a market-related wage of R10 per day for hired labour. If this is taken as one of the likely scenarios, these farmers struggle to show any respectable level of comparative advantage judging from a DRC of 0.86. Their efficiency situation worsens when opportunity costs of land and labour are pushed higher. Using commercial level assumptions about opportunity costs, smallholder cabbage shows no comparative advantage.

Both the SRP ratio shows a fair amount of producer subsidisation. The PC ratio particularly looks exaggerated. This is, however, a fair indication of the situation on the ground. Despite the favourable marketing environment for cabbage in the sample area of Zwelitsha, and fairly good yields, this activity has evidently been dependent upon capital and water subsidies for irrigation as well as on full-time extension and training services from the parastatal. The only variable that was factored in this analysis was capital investment. The rest of the variables were not accounted for. These findings suggest that, in a normal uncontrolled environment, smallholder cabbage's comparative advantage in the Eastern Cape is potentially non-existent. The only opportunity for success rests on a particular set of institutional arrangements. If commercial smallholder cabbage is to survive in this province, it would be only under an innovative institutional model whereby technical, human resource and marketing support services to the smallholders would be key. And since cabbage is considered a non-tradable in the study area, all the conclusions only apply to the local market.

Table 4.10 Sensitivity Analysis: Cabbage

Scenario					
#	Description		Opportunity cost		DRC
	Land price level	Labour price level	Land (R/ha)	Labour (R/day)	
1	Low	Low	450	10	1.01
2	High	High	450	20	1.31
3	Medium	Low	300	10	0.96
4	Medium	High	300	20	1.26
5	Low	Low	250	10	0.95
6	Low	High	250	20	1.24
7	Zero	Low	0	10	0.86

4.3.2.6 Irrigated and Dryland Maize

It was observed that from the farmer's point of view, land used in both dryland and maize production was free owing to the afore-mentioned irrigation scheme arrangement. As in the case of other irrigation scheme activities, maize farmers in the study area paid R10 per day for hired labour. The sensitivity analysis results show that among all the activities studied, the two maize activities boast the best social profitability potential under all possible scenarios considered. Taking commercial level opportunity costs for land and labour, irrigated and dryland maize had virtually the same DRC's: 0.37 and 0.36 respectively. A fair amount of subsidisation is observed in both the SRP and the PC ratios.

For reasons already discussed, smallholder maize's potential is only limited to the local level market. A closer look into the local market reveals that high transaction costs associated with maize marketing threaten even the local market for this crop. Over-saturation of the market during good harvests would put downward pressure on the price, making it futile to pursue maize production in the area. Such considerations lead one to conclude that maize would at best remain a subsistence crop among smallholders in the Eastern Cape.

Table 4.11 Sensitivity Analysis: Irrigated and Dryland Maize

Activity	Scenario					DRC
	#	Description		Opportunity cost		
		Land price level	Labour price level	Land (R/ha)	Labour (R/day)	
Irrigated maize	1	'Real'	Low	600	10	0.37
	2	High	Low	400	10	0.30
	3	High	High	400	20	0.43
	4	Medium	Low	300	10	0.26
	5	Medium	High	300	20	0.40
	6	Low	Low	200	10	0.23
	7	Low	High	200	20	0.36
	8	Zero	Low	0	10	0.15
Dryland maize	1	Low	Low	100	10	0.36
	2	High	Low	300	10	0.44
	3	High	High	300	20	0.75
	4	Medium	Low	200	10	0.40
	5	Medium	High	200	20	0.71
	6	Low	High	100	20	0.67
	7	Zero	Low	0	10	0.32

4.4 Concluding Remarks

During the best part of the 20th century black smallholder farming in South Africa was largely forgotten both in research and policy making circles. This neglect was determined mainly by the socio-political circumstances prevailing during the apartheid era in the former homeland areas where these farmers are based. These circumstances were such that black farming was actively discouraged in favour of the white large-scale farming sector. These factors have culminated in a situation whereby researchers and policy makers know little about the black smallholder sector.

An extreme notion that seems to dominate the perception of some scholars is that smallholder farming has no prospect of being rehabilitated to the level it used to achieve before it was deliberately suppressed. The present study takes up the challenge of providing evidence to the contrary, and of illustrating that at least for some black smallholders in some circumstances, smallholder farming can provide a viable way to increase rural livelihoods.

The previous section presented results of a survey of selected smallholder activities spread throughout the central region of the Eastern Cape province. Specifically it showed what activities black smallholders in this province can pursue profitably and with an acceptable level of efficiency. In other words, it reveals areas in which these farmers possess comparative advantage, which could be built upon. According to these results, two of the smallholder activities studied in particular are highlighted to have a comparative advantage. Indigenous beef cattle show a considerable potential under low fixed cost technologies. In general, the semi-arid climate, steep topography and cattle-favouring vegetation types found in much of the Eastern Cape, all combine to reinforce the potential for this breed in the province. The study also found that it would be particularly important, when investing in this type of activity, for smallholders to keep fixed costs low in order to draw advantage from the adaptation of the Nkone breed to the local physical conditions. It was shown that heavy infrastructure investment boosted per unit costs in a way that was not adequately compensated for by increased productivity. Better local beef marketing arrangements that would lower transaction costs would arguably in turn boost the returns to the farmer and to society as a whole.

In addition to indigenous beef cattle, citrus also presents special opportunities along river valleys where there is good soil and abundant water for irrigation. Physically, these valleys are deep and the occurrence of level land is generally limited and localised (Van Averbeke, 1995). Notwithstanding these limitations, citrus has maintained a good track record as possibly the only true foreign exchange earner available to smallholders in the Eastern Cape province.

To maintain this record, smallholder citrus needs to maintain a good export percentage as much of its profitability depends on export earnings (at least 60 percent of total output). The key holding observed was in the order of 20 hectares. It is questionable whether citrus holdings of smaller than 10 hectares in the Eastern Cape could support full-time agricultural production by an individual with the requisite skills for horticulture. It is also important that the actual degree of subsidy, mainly in the form of water drawn from the river, be adequately specified by policy. It was also observed that poor quality orchards could potentially harm profitability. There is a need for investment in new orchards which would also mean more and better quality output, more export percentage and therefore enhanced profitability. An important factor in these farmers' long-term performance is that of debt servicing. Their sustainable profitability will depend very much on their progressive ability to repay their debt and redeem themselves from their current reputation of bad debt servicing.

The rest of the activities studied are either not socially profitable under the specified opportunity cost assumptions, as in the case of exotic cattle, dairy, and irrigated cabbage, or their profitability only applies to the local market, as is the case with irrigated and dryland maize. These results only serve to indicate a need for increased attention from policy-oriented and technology-oriented researchers as well as increased agricultural support in the higher potential areas. The concluding chapter elaborates on this issue.

CHAPTER 5

RURAL GROWTH LINKAGES IN A SMALLHOLDER FARMING AREA IN THE EASTERN CAPE

5.1 Introduction

With the first phase of this research having established that smallholders do have a comparative advantage in some agricultural activities, the aim of the second phase was to address the issue of the impact of rising smallholder incomes on the local economy. The second phase consisted of a survey of household consumption and expenditure behaviour in the Middledrift district, from whose results growth linkages were then calculated. From these results it should be possible to identify areas of intervention necessary to sustain growth originating from a stimulus to tradable agriculture from economic reform.

The survey for the second phase was carried out in two Middledrift villages, namely Ann Shaw and KwaNdindwa[26]. The degree of contrast between these two villages made it possible to make certain comparisons between some factors of significant importance in the context of the findings of this research. The three rounds of interviews conducted were carefully scheduled around the major expenditure periods during the first quarter of the year. First, the mid- and end-month periods of February and March during which many of the professional, regular and casual wage earners get paid. Second, the month of March during which the second old age pension cheques for the year are handed out. Third, the major expenditure time of Easter during the first week of April at which time most food and consumer non-durables are purchased in the first quarter of the year.

[26] See Section 5.4 for a description of the survey method.

However, the results should be interpreted bearing in mind that this research excluded the important expenditure time of Christmas.

Each survey round lasted for a week on average. In order to fill any major data gaps, for example missed expenditure for items such as consumer durables, the recall period was extended to a maximum of one year in such cases. However, because of their sensitive nature, certain types of data were particularly challenging to probe. These include data on income earnings, formal savings, and alcohol and stimulants expenditure. Notwithstanding these challenges, data of major significance to the objectives of this research were adequately and satisfactorily captured. The surveys recorded information on household composition, decision making, household income and income sources, assets, agricultural production, and the household's consumption and expenditures on foods and non-food goods and services.

5.2 Origins of the Concept of Linkages

It was pointed out in the preceding chapter that the concept of comparative advantage was challenged by a number of studies by development economists beginning in the 1950s and 1960s. The thinking of that time was that the scope of economic growth through agricultural and other primary exports was limited (after Raul Prebisch and Hans Singer). Albert Hirschman was one of the most influential development economists of that era through his empirical work in Latin America. In his book, *The Strategy of Economic Development* (1958), he introduced the concept of (*production*) "linkages" between industries or sectors. These were classified as "forward" and "backward" linkages arising from an investment in any type of activity. Backward linkages on one hand were defined as the demand for inputs arising from the new investment. Forward linkages on the other hand were considered as the new productive activities arising from a new intermediate product on the market (Delgado, *et al.*, 1998; Staatz and Eicher, 1998).

Agriculture was generally considered to have no direct stimulus to the setting up of new activities through linkage effects, and manufacturing was seen as superior in this respect. It was therefore concluded that investment in industry would "create" a comparative advantage, generally leading to more rapid and more broad-based economic growth than would investment in agriculture.

According to Staatz and Eicher (1998:11) the distress about the lack of attention to agriculture prompted economists like Bruce Johnston, John Mellor and William H. Nicholls to emphasise the importance of agriculture in economic growth. Drawing on the insights from the Lewis' two-sector model, Johnston and Mellor (1961), argued that agriculture could make five important contributions to the structural transformation of developing countries. It could provide labour, capital, foreign exchange, and food to a growing industrial sector and also supply a market for domestically produced industrial goods.

Another development in the study of the role of agriculture in economic development was a shift from theory to empirical research. Based on experiences in industrialised countries, development programmes of the 1950 also emphasised the American model of agricultural extension as well as the "diffusion model" of agricultural development. The diffusion model came under scrutiny following the failure of extension and community development programmes to achieve the desired results. Consequently, Schultz (1964) influenced a major shift from agricultural extension towards investment in agricultural research and human capital.

The "high-payoff input" model subsequently took over as the dominant agricultural development model during the 1960s and the 1970s following the success of the Green Revolution technology in Asia. At the backdrop of this success, Mellor (1966) and Adelman and Morris (1973) argued a case for strong *consumption linkages* from agriculture. According to Delgado, *et al.* (1998:6), in a closed economy consumption linkages are generated as a result of new spending on tradable items which in turn creates new demand for items for which there was previously insufficient local demand. If there

are underused resources in the local economy as a result of insufficient demand for what they can produce, then the new consumption adds to total production of these previously demand-constrained items.

Based on findings from their Asian work, Mellor and Lele (1973) (cited by Haggblade, *et al.*, 1989), put emphasis on the significance of agricultural consumption linkages, concluding that middle-sized peasant farmers spend more of their incremental income on labour-intensive and rurally produced goods than their large-scale and urban counterparts. Such spending generates new demand "multipliers". These multipliers indicate how much extra net income could be generated in rural areas from new production of non-tradable goods and services arising from new household income gained from tradable sectors (Delgado, *et al.*, 1998:2).

5.3 Empirical Studies on Growth Linkages

Delgado, *et al.* (1998), provide a comprehensive review of the literature on empirical estimation of growth multipliers. This sub-section dwells heavily on their report on growth linkages work done mainly in Sub-Saharan Africa. They cite Peter Hazell and Steven Haggblade as the key contributors to the quantification and modelling of production and consumption multipliers (Haggblade, *et al.*, 1989 and Haggblade, *et al.*, 1991).

Rangarajan (1982) examined historical data and estimated both production and consumption linkages in India. He discovered that the 'agriculture-to-industry' production multipliers were weaker at 13 percent. Consumption linkages on the other hand were quite significant. Bell and Hazell (1980) and Bell, *et al.* (1982) use a semi-input-output model to estimate the effect of technological change on irrigation in Malaysia. Hazell (1984) (cited by Delgado, *et al.*, 1998), simplifies the analysis in his measurement of a multiplier effect on income of an exogenous shock to agriculture. Such a shock could come from a technological change or outside investment. Assuming that

the amount of intermediate inputs used per unit of tradable output does not change as a result of the initial increase in tradable output, the multiplier (M) is measured as:

$$M = \frac{1 - a_{nn} + a_{nt}\left(v_n / v_t\right)}{1 - a_{nn} - \beta_n v_n (1 - s)},$$

Where:

v_n = a constant with a value equal to $1-a_{tn}-a_{nn}$; the share of value added in gross output of the non-tradable sector;

v_t = similarly for tradables;

a_{nn}, a_{tn}, = respectively, the share of non-tradable intermediate inputs in non-tradable and tradable output (between 0 and 1);

$ß_n$ = marginal propensity to consume non-tradables;

s = leakage; a constant proportion of total income (savings and tax rate).

Assuming that $a_{nn} = a_{nt} = a_n$ (intermediate demand for non-tradables) and $v_n = v_t = v$, the multiplier becomes:

$$M = \frac{1}{1 - a_n - \beta_n v (1 - s)}.$$

Hazell's simplified multiplier can be easily measured using values for the marginal budget share (MBS) for non-tradables in household expenditure (β_n), the ratio of non-tradable intermediates to gross output in total production (a_n), and the ratio of value added to gross output in total production (v). By setting $\beta_n = 0$, the effect of production linkages alone can be easily derived. A vital feature of the model is the assumption that the supply of non-tradables is perfectly price elastic, with output constrained by effective demand.

5.4 Measurement of Growth Linkages in this Study

This study utilised data collected with the use of structured questionnaires over three rounds in 1998. A total of 100 randomly sampled households were interviewed in two villages of Middledrift district in the central Eastern Cape. The sample was subdivided such that 50 households were surveyed in each of the two chosen villages namely, rural KwaNdindwa and the relatively more 'urbanised' village of Ann Shaw. The survey had two immediate main objectives. The first objective was to examine how increased rural incomes would be spent on a mix of tradable and non-tradable farm and non-farm good/ service categories. The second goal was to assess the potential for these expenditure patterns to generate growth multipliers in the rural areas. The analysis estimated modified Working-Leser regressions (Hazell and Röell, 1983; Delgado *et al.*, 1998) to estimate marginal budget shares (MBS) for a typical rural household in each specified good/service category, based on mean values from the household survey. Growth multipliers were estimated expeditiously by ignoring the use of non-tradable inputs, leading to a very simple algorithm.

5.4.1 The Household Expenditure Model

Average budget shares (ABS) represent the percentage of total household expenditure that goes to a given commodity or expenditure group. Marginal budget shares (MBS) are the percentages of the last increment of income spent on a given good or expenditure group. Dividing MBS by ABS gives income elasticity, that is, the responsiveness of expenditure on a given good or group of goods to increments in income.

It is hypothesised that the MBS for non-tradable goods are the principal factors driving the estimates of growth multipliers (Haggblade, *et al.*, 1991). These marginal budget shares depend on the pattern of rural consumption, which may differ by location and by income category (Delgado, *et al.*, 1998). Marginal budget shares were obtained by employing the modified Working-Leser model (Hazell and Röell, 1983) for each good category, adapted to cross-sectional household level data. This model entails using total

expenditures as a proxy for income in order to estimate Engel functions. Marginal budget shares would then represent marginal propensities to consume, provided the total expenditures were a good proxy of household income (Delgado, *et al.*, 1998). A modified Working-Leser model of the following form was employed for estimation:

The linear Engel curve is:

$$E_i = \alpha_i + \beta_i E \qquad (1)$$

The function above, however, does not permit the marginal budget share (β_i) to vary at all. A modified Working-Leser model was thus chosen:

$$S_i = \beta_i + \alpha_i / E + \gamma \log E \qquad (2)$$

To allow comparison of expenditure behaviour of households with different incomes, allowance was made for differences in their other socio-economic characteristics. Engel functions of the following form were thus estimated:

$$E_i = \alpha_i + \beta_i E + \gamma_i E \log E + \Sigma_i (\mu_{ij} Z_j + \lambda_{ij} E.Z_j) \qquad (3)$$

Where E_i is expenditure on commodity i
E is total consumption expenditure
Z_j are household characteristic variables, and
$\alpha_i, \beta_i, \gamma_i, \mu_{ij}, \lambda_{ij}$ are constants

Instead of a restrictive linear Engel curve, this functional form allowed for non-linear relationships between consumption and income. It also controlled for household characteristics that may affect both the intercept and slope of the Engel function. The model was estimated in share form in order to mitigate potential heteroskedasticity problems (Hazell and Röell, 1983). Dividing equation (1) by E gives,

$$S_i = \beta_i + \alpha_i / E + \gamma \log E + \Sigma_i (\mu_{ij} Z_j / E + \lambda_{ij} Z_j) \quad (4)$$

Where $S_i = E_i/E$ is the share of commodity i in total expenditure.

The marginal budget share (MBS_i), average budget share (ABS_i) and expenditure elasticity (ξ_i) for the ith commodity is:

$$MBS_i = \partial E_i/\partial E = \beta_i + \gamma_i (1 + \log E) + \Sigma_j \lambda_{ij} Z_j \quad (5)$$

$$ABS_i = S_i \quad (6)$$

$$\xi_i = MBS_i / ABS_i \quad (7)$$

For the average household, these equation terms are evaluated at the sample mean values for E and Z_j. But across expenditure groups (say upper and lower expenditure halves, as done in this study), then E and Z_j are assigned their mean values for relevant halves. These share equations were estimated by ordinary least squares (OLS).

5.4.2 Choice of Explanatory Variables

Table 5.1 below summarises the independent variables selected for inclusion in the share equations for the two villages studied. The variables in Table 5.1 were included on the basis that they logically explain the relationship between income and consumption of individual commodities. All these are self-explanatory. Many household characteristic variables were included to prevent bias in the estimator arising from omission of significant sources of inter-household variability in expenditure behaviour.

Hazell and Röell (1983) noted some disadvantages to estimation of the above share equations. First, R^2 coefficients are typically smaller. Second, the inclusion of many explanatory variables in the equation for every commodity or expenditure group wastes

some degrees of freedom. This was particularly the case in the Middledrift regressions due to the small sample size. Third, the need to use the same functional form in each equation cancels out a common approach of fitting several different functions for each commodity, and then choosing the one that fits best.

Table 5.1: Independent Variables included in the Middledrift Regressions

Description	Name	Unit
Intercept	INTERCEPT	R
Reciprocal of total expenditure	1/E	R
Log of total expenditure	LOG_E	
Distance from nearest tar road	TARDIST	km
Distance from nearest tar road divided by total expenditure	TARDIST/E	
Size of household	HHSIZE	# of people
Size of household divided by total expenditure	HHSIZE/E	
Age of household head	AGEHEAD	years
Age of household head divided by total expenditure	AGEHEAD/E	
Value of household assets (e.g. TV, radio, refrigerator)	ASSETSR	R
Value of household assets divided by total expenditure	ASSETSR/E	
Number of babies (less that one year old) per capita	BABIES	# of people
Number of babies per capita divided by total expenditure	BABIES/E	
Number of children (one to five years old) per capita	CHILD	# of people
Number of children per capita divided by total expenditure	CHILD/E	
Number of youths (6 to 15 years old) per capita	YOUTH	# of people
Number of youths per capita divided by total expenditure	YOUTH/E	
Number of adult women per capita	WOMEN	# of people
Number of adult women per capita divided by total expenditure	WOMEN/E	

5.4.3 The Household Consumption and Expenditure Behaviour in Middledrift

Table 5.2 below summarises the consumption and expenditure behaviour of an average household in Middledrift, Eastern Cape. The sample is disaggregated into lower and upper expenditure halves, and rural and small town locations. These findings are a result

of evaluation of equations (5), (6) and (7) for MBS, ABS and expenditure elasticities (see Section 5.4.1). The disaggregated results were found to be statistically non-significant. However, this has little bearing in the interpretation of the 'whole sample' results.

Results in Table 5.2 in the "whole sample" columns reveal that households in Middledrift spend more on basic food than on any other good or service group. Up to a third of the total budget of the average household in Middledrift is spent on food. These include starches such as maize meal, samp (stamped maize) and rice and other grocery items such as fresh and sour milk, bread flour, vegetables, sugar, oils, and meat. Steyn (1988) found an even higher figure in the adjacent Peddie district. Along with transportation and other expenditure (church contributions, support for relatives, donations and pocket money), the expenditure elasticity of food in Middledrift is less than unity, suggesting that these items are necessities among Middledrift households.

Food remains a necessity in the rural half of the Middledrift sample at expenditure elasticity of 0.23. This is consistent with findings by Nieuwoudt and Vink (1989) in rural KwaZulu-Natal province. However, in the small town half of the sample, food staples are increasingly becoming inferior, judging from the negative elasticity. It seems that family and social obligations (family and social traditional festivities and ceremonies) occupy most of incremental incomes. Also, as incomes increase, this group becomes the most important in rural budgets.

The bottom section of Table 5.2 presents results on whether household income growth will stimulate production of farm or non-farm (demand-constrained) non-tradables. The results show that households in Middledrift allocate almost half of their budgets to non-tradable goods. Half of Middledrift incremental incomes are spent on non-tradables. The better part of these expenditures (64 percent) is on non-farm non-tradables. Non-farm non-tradables will become a more important part of their budgets as incomes increase. It appears that non-farm sectors such as transportation, liquor and tobacco, furniture, education, medical, communication, and family and social obligations will grow the most as rural incomes in Middledrift increase.

5.4.4 Treatment of Household Consumption and Expenditure Data

Characterisation of expenditure goods and services according to sector and tradability is central in the interpretation of growth linkage results. In their linkages study in Niger, Delgado, *et al.* (1998) elaborate on this assertion. For example, treating a non-tradable good as tradable inevitably leads to an underestimation of the amount of additional growth that can be derived through linkage effects. This is taking into account the fact that tradables, by definition, are imports or exports. Therefore their additional demand leads to leakage of income from the region of concern rather than to stimulation of new local production.

In this study, the survey data were first aggregated and categorised into sixteen groups, then further aggregated into "farm tradable", "farm non-tradable", and "non-farm non-tradable". This was done in order to allow calculation of average budget shares and marginal budget shares by expenditure group and by sector and tradability group. Growth multipliers of sector and tradability groups would then be readily derived.

The sixteen categories into which the data was aggregated are: food, household cleansing materials, fuel and lighting, clothing and footwear, furniture, housing, transportation, liquor and tobacco, medical, educational, entertainment, insurance and savings, communication, family and social obligations, agricultural and other/miscellaneous expenditure. These were further aggregated into farm tradable, farm non-tradable, non-farm tradable, and non-farm non-tradable.

Table 5.2: Consumption and Expenditure Behaviour of an Average Household in Middledrift, Eastern Cape

Group	Whole sample		
	ABS	MBS	Elasticity
By commodity			
Food	0.36	0.33	0.94
Cleansing materials	0.07	-0.06	-0.85
Fuel and lighting	0.08	0.09	1.12
Clothing and footwear	0.04	-0.01	-0.40
Furniture	0.06	0.12	2.03
Housing and construction	0.02	0.05	2.18
Transportation	0.08	0.07	0.92
Liquor and tobacco	0.01	0.04	2.88
Medical	0.05	0.07	1.39
Educational	0.04	0.10	2.35
Entertainment	0.002	-0.01	-3.61
Communication	0.05	0.08	1.71
Family/social obligations	0.04	0.05	1.36
Agricultural	0.01	0.02	3.27
Other expenditure	0.09	0.05	0.50
By sector & tradability			
Farm tradable	0.19	0.18	0.94
Farm non-tradable	0.16	0.18	1.09
Non-farm tradable	0.35	0.32	0.92
Non-farm non-tradable	0.29	0.32	1.09

"Farm" goods were relatively simple to classify as these include those originating on farm, for example, horticultural, crop, and livestock items produced on the household land. "Non-farm" goods on the other hand include all the items originating off-farm and all consumption durables and non-durables.

Tradability was observed on the basis of local boundaries. The definition by Delgado, *et al.* (1998) of 'local' as radius of 100km around the household was adopted. Non-tradables were defined as those goods freely traded within the local area, but not outside it. Such factors as perishability and bulkiness were incorporated in determining whether or not a good was tradable in the local context. Derivation of marginal budget shares from household expenditure models requires the above classification exercise. Table 5.3

classifies goods/services according to whether they are tradable or non-tradable and whether they are farm or non-farm.

Table 5.3: Classification of Good and Services into Farm and Non-Farm Tradable and Non-Tradable Categories in the Middledrift 'Local' Boundary Area

Item	Classification
Farm goods	
Home-grown vegetables	Non-tradable
Home-consumed livestock and livestock products	Non-tradable
Non-farm goods and services	
Fuel (Batteries, candles, paraffin, electricity, matches)	Tradable
Household cleaning, laundry, toiletries, cosmetics, medicines	Tradable
Liquor and tobacco	Tradable
Magazines, newspapers, gambling	Tradable
Clothing	Tradable
Medical services	Non-tradable
Education (school fees, tuition, books and other expenses)	Non-tradable
Transport	
Service	Non-tradable
Fuel & repair expenses	Tradable
Communication services (telephone calls, postage)	Non-tradable
Other services (church contributions, donations)	Non-tradable
Housing expenses (building materials)	Tradable
Consumer durables	
Household furniture	Tradable
Jewelry	Tradable
Household appliances (TV, Radios, fridges, stoves)	Tradable
Blankets	Tradable
Dishes, containers	Tradable
Vehicle purchases	Tradable
Food	
Dairy products	
Fresh milk, sour milk, cheese, creamers, sterilized milk	Non-tradable
Maize and maize products	
Maize meal, samp, mealie-rice	Tradable
Cereals and cereal products	
Rice, flour, pasta, oats, breakfast cereals	Tradable
Prepared foods	
Potato chips, fried fish, fat cakes	Non-tradable
Fresh fruits and vegetables	Non-tradable

Item	Classification
Canned fruits and vegetables	Tradable
Legumes	Tradable
Dry beans, peanuts, soya products, peanut butter	
Meat	
Pork, mutton, chicken, sausages, cooked meat	Non-tradable
Fresh fish	Non-tradable
Canned fish	Tradable
Fats and oils	
Margarine, cooking fat, butter	Non-tradable
Cooking oil	Tradable
Eggs	Non-tradable
Sugar	Tradable
Food seasoning items	Tradable
Sweets and chocolates	Tradable
Dessert items	Tradable
Canned food	Tradable
Jam, syrup	Tradable
Soft drinks and beverages (tea, coffee, fizzy drinks)	Tradable
Home-made beverages (traditional beers)	Non-tradable
Baby foods	Tradable
Other food items	
Soups, sauces, vinegar, yeast	Tradable
Agricultural items purchased	
Fertiliser, veterinary supplies, seed, chemicals, equipment, implements	Tradable

5.4.5 The Growth Multiplier Model

Growth multipliers are a measure of how much extra net income growth can be derived in the rural areas from stimulating production in the non-tradable sectors through new effective demand from a unit of new income from the tradable sectors. A multiplier is a numerical derivation from a regional model that typically incorporates household demands and intermediate demands between sectors. Conceptually, computing a multiplier requires a definition of what is inside the region of interest and what is outside, and spin-off effects are limited to those inside the zone. In Middledrift, the region of interest was restricted to local administrative boundaries. Definition of a region of interest makes possible the identification of consumption items that are tradables and non-tradables with respect to the region of interest.

For present purposes, a non-tradable is a good whose current local price is determined by local supply and demand, regardless of modest price movements outside the region of interest. Such goods are typically not traded with points outside the region of interest, and are not close substitutes in consumption with items that are. By definition, all services are non-tradables. Perishable prepared foods are often non-tradables in rural areas, though not in all places. Tradability or lack of it is a characteristic of the local market for a given item and not of the good. Tradables are goods whose local free market price is determined primarily by factors outside the region of interest.

An important difference between tradables and non-tradables thus defined is that an increase in local consumer demand for tradables does not add further to local incomes. This is because the increased consumption is either imported to the region of interest, or local production destined for export is now diverted to local consumption. However, an increase in local consumer demand for non-tradables increases the demand for an item that cannot be imported and is not being exported (by definition). Provided that local resources are not fully employed and available for work, the new demand for non-tradables creates net additions to local employment and incomes. This illustrates a major assumption of linkage analysis, that the elasticity of supply of non-tradable items consumed locally is elastic (Delgado *et al.*, 1998). Failing this, increased demand for non-tradable consumer items stemming from increased incomes in the area of interest will just lead to inflation.

After subjective classification of local consumer items into tradables and non-tradables, this study aggregated the goods and services identified into four main categories: farm tradables, non-farm tradables, farm non-tradables and non-farm non-tradables (see Table 5.3 for a detailed classification).

Estimating the full regional multiplier requires including new demands for non-tradable inputs, in addition to new demands for non-tradable final goods. However, this greatly complicates the calculations. For simplicity, this study ignore non-tradable intermediate inputs, which will bias the results downwards by about 5 – 10 percent, based on

simulations in other African countries (Delgado *et al.*, 1998). It also ignores the fact that the simple formulation in fact assumes that all additional demand for non-tradables goes fully into increased production (and none of it into increased relative prices for non-tradables, implying a perfectly elastic supply of non-tradables). This has been shown elsewhere to bias multiplier estimates upwards by 20 – 30 percent, which more than offsets the downward bias. On balance, the simple methodology may slightly overestimate true multipliers, but by no more than 20 percent.

The simple multiplier is easy to see if we start with the amount of spending left over from an income injection after spending on tradables (which, recall, do not add to net local employment) and savings are netted out: *(1 – MBS tradables – s)*, where "s" is the share of income saved. This is then repeated multiplicatively "t" times, where t is the number of times the income is re-spent in the local community. MBS-tradables and savings are leakages from the re-spending cycle and they would therefore reduce the multiplier. Since the parameters are both positive and less than unity, the multiplier is the solution to an infinite series:

$$Multiplier = (1 - MBStradables - s)^{t}$$

$$Multiplier = \frac{1}{(1-MBSnontratables)}$$

remembering that: *1 - MBS tradables = MBS nontradables*

The above formula is only true if one ignores the fact that even tradables use non-tradable inputs. It therefore assumes that the value added ratio is one resulting in an underestimate of the true multiplier.

5.4.6 The Growth Multipliers in Middledrift

Table 5.4 summarises the growth multipliers calculated for the Middledrift household analysis.

Table 5.4: Estimated Total Extra Income for R1 in Extra Income from Production of Tradables (In R)

Country/Region	Tradable sector	Farm non-tradable	Non-farm non-tradable	Total Multiplier
Middledrift, RSA	1.00	0.35	0.63	1.98

The figures in Table 5.4 show the total net additions to average household income in South African Rands that result from an initial shock of 1.00 in the local tradable farm or non-farm sectors. The sources of growth were decomposed into new spending on farm and non-farm demand constrained non-tradable goods. The sum of the three components makes up the total multiplier. The table shows a R1.00 increase in household incomes through an outside positive effect (for example, a policy change) affecting local tradables. It also shows that such an increase will lead to R0.35 of additional income from spending on farm non-tradables, and to R0.63 of additional income from spending on non-farm non-tradables. This means a total multiplier of R1.98, of which R0.98 is the net extra growth from spending on demand-constrained items.

An important assumption underlying these results is that increased demand for non-tradable goods and services will be met by new production of these items. In other words, the supply response of non-tradables is assumed to be elastic. This is because, by definition, new demand for these items cannot be met from imports.

Table 5.4 illustrates two important facts. First, 'local' level linkages in South Africa seem to be generally comparable with those reported for Africa. This is consistent with previous studies done in Sub-Saharan Africa by Haggblade, *et al.* (1989), particularly in Zambia (Hazell and Hojjati, 1995), Nigeria (Hazell and Röell, 1983), and Burkina Faso

(Reardon, *et al.*, 1992). To illustrate the comparison, Table 5.5 shows agricultural growth linkages reported for selected African and Asian countries.

Table 5.5 Agricultural Growth Multipliers in Africa and Asia

Country	Total Multiplier
Niger	1.77
Malawi	1.66
Nigeria	2.81
India	1.70
Malaysia	1.83

Source: Delgado, et al. (1998)

Second, overall multipliers from the non-farm sector in Middledrift are higher than those from the farm sector. In fact the farm sector multipliers constitute only 18 percent of the composition of the total multiplier compared to 32 percent of the non-farm sector. This is consistent with findings from work done elsewhere in Africa, which confirmed the notion that linkages were primarily the way in which agricultural growth stimulated non-agricultural growth. In other words, any amount of growth in agriculture, as meagre as it may be, will certainly result in multiplied growth in non-agricultural sectors.

Table 5.6 demonstrates how much the rural economy will grow if policy supports smallholder tradable sectors. In the previous chapter it was shown that candidates for beneficial support should be indigenous beef cattle and irrigated citrus in the Eastern Cape, as these demonstrate the highest social profitability. The next section takes indigenous beef and citrus farming areas as case studies to demonstrate how much income would likely be gained in their economy if policies that enhance productivity are implemented.

5.5 Likely Multiplier Effects of Policy Support in Indigenous Cattle and Citrus Areas

Indigenous beef cattle selected for the study area were shown to have a comparative advantage under the normal physically tough environment to which they are well

adapted. This study also showed that the level of intensity of technology applied drives such comparative advantage. High fixed input technologies tended to worsen the comparative advantage situation. Investment in more and better handling facilities was deemed superfluous as the indigenous cattle were more profitable under low fixed cost technologies. It was argued that better marketing infrastructure would boost both private and social returns by up to 50 percent (based on returns on adjacent commercial farms), and are therefore recommended for indigenous beef.

Citrus was also shown to have a comparative advantage under the given opportunity cost assumptions. Table 4.9 shows that better quality of output and therefore higher export percentage means better comparative advantage for citrus. A major need identified in the citrus system was that of investment in new orchards to replace ageing ones which make up about half of the total orchards. This would potentially enhance the export percentage and therefore profitability.

Table 5.6 shows indigenous cattle and citrus as case studies to hypothesise multiplier effect of profitability-enhancing policies on the rural economy based on multiplier figures presented in Table 5.4. This is a straightforward illustration which isolates the two case studies, and shows in monetary terms how much income would be gained in the surrounding rural economy if profits increase by an assumed level. The multipliers in Table 5.4 are by themselves enough to show the likely benefits of alleviation of structural constraints in the local economy directed towards profitable tradable smallholder items. Table 5.6 only serves to replace the multiplier coefficients by money values. The table takes a 17-hectare navel orange farm and a 275 Nkone Animal Units as case studies. Based on the above-mentioned facts, it is assumed that policy support would result in 50 percent improvement in profit in both cases. It also assumes a multiplier of 1.98 based on the 'overall multiplier' in Table 5.4.

Table 5.6 shows that in both the indigenous cattle and citrus cases after policy change, e.g. removal of structural constraints, the profit increased by over half. In both cases this will result in overall income increasing by 98 percent. The bottom line is that there is a

need for demand-led growth policies in the rural areas of South Africa. In other words, there is tremendous extra growth potential through boosting rural incomes, which in turn would stimulate demand for non-tradable goods and services. Under-employed resources would then be brought into production.

Table 5.6: Hypothesised Multiplier Effects of Policy Support to Indigenous Beef and Citrus in the Surrounding Rural Economy (R)

Activity	Before Policy Change		After Policy Change	Multiplied Income Effect in Local Economy
	Annual Profit Per Unit	Total Annual Profit	Annual Profit Per Unit	
Indigenous Beef	179.66	49,406.50	74,109.75	146,737.31
Irrigated Citrus	4,657.71	79,181.07	118,771.61	235,167.79

5.6 Summary

Following up on the previous chapter's findings, this chapter's main purpose was to address the issue of the impact of rising smallholder incomes on the local economy. It reports on the second phase of this research, which consisted of a survey of household consumption and expenditure behaviour in the Middledrift district in the Eastern Cape, from whose results "growth linkages" were then calculated. Two villages in Middledrift namely, the more remote rural KwaNdindwa and the more urbanised Ann Shaw location were chosen for carrying out the structured survey. Three survey rounds were conducted to record information on household composition, decision making, household income and income sources, assets, agricultural production, and the household's consumption and expenditures on foods and non-food goods and services.

Albert Hirschmann first introduced the concept of "linkages" in the 1950s. His idea was to measure *production* linkages between industries or sectors. He classified them as "forward" and "backward" linkages arising from an investment in any type of activity. Backward linkages on one hand were defined as the demand for inputs arising from the

new investment. Forward linkages on the other hand were considered as the new productive activities arising from a new intermediate product on the market.

During this era agriculture was generally considered not to have strong linkage effects, and manufacturing was seen as superior in this respect. However, against the backdrop of the success of the Green Revolution, a case could be made for strong *consumption linkages* from agriculture.

The concept of agricultural consumption linkages was promoted based on the notion that incremental agricultural income spending on rurally produced goods and services generated new demand "multipliers". These multipliers indicate how much extra net income could be generated in rural areas from new production of non-tradable goods and services arising from new household income gained from tradable sectors as a result of a technological change or outside investment. Growth multipliers have since then been quantified in a series of empirical studies mainly in Asia and Africa.

In this study, a total of 100 randomly sampled households, equally divided between the two selected villages, were interviewed. The first objective was to examine how increased rural incomes would be spent on a mix of tradable and non-tradable farm and non-farm good service categories. The second goal was to assess the potential for these expenditure patterns to generate growth multipliers in the rural areas. The analysis estimated modified Working-Leser regressions to estimate marginal budget shares (MBS) for a typical rural household in each specified good/service category, based on mean values from the household survey. Growth multipliers were then estimated expeditiously by ignoring the use of non-tradable inputs, leading to a very simple formula.

Conceptually, computing a multiplier requires a definition of what is inside the region of interest and what is outside, and the spin-off effects are limited to those inside the zone. In Middledrift, the region of interest was restricted to local administrative boundaries. Definition of a region of interest makes possible the identification of consumption items that are tradables and non-tradables with respect to the region of interest.

An important difference between tradables and non-tradables is that an increase in local consumer demand for tradables does not add further to local incomes. This is because the increased consumption is either imported to the region of interest, or local production that was exported is now diverted to local consumption. However, an increase in local consumer demand for non-tradables increases the demand for an item that cannot be imported and is not being exported (by definition). Provided that local resources are not fully employed and are available for work, the new demand for non-tradables creates net additions to local employment and incomes. This illustrates a major assumption of linkage analysis that the elasticity of supply of non-tradable items consumed locally is elastic.

In this study, the survey data were first aggregated and categorised into sixteen groups, then further aggregated into "farm tradable", "farm non-tradable", and "non-farm non-tradable". This was done to allow calculation of average budget shares and marginal budget shares by expenditure group and by sector and tradability group. Growth multipliers of sector and tradability groups were then derived.

It was found that 'local' level linkages in South Africa appear to be generally comparable with those reported for the rest of Africa. It was further found that most growth was derived from spending on non-farm non-tradable items especially services such as health, education and transport. These results generally confirmed a need for demand-led growth policies in the rural areas of South Africa.

CHAPTER 6
DISCUSSION AND CONCLUSIONS

6.1 Introduction

> "Agriculture in South Africa has a central role to play in building a strong economy and, in the process, reducing inequalities by increasing incomes and employment opportunities for the poor, while nurturing our inheritance of natural resources" (Ministry for Agriculture and Land Affairs, 1998).

Since the early 1990s an active debate in South Africa has intensified in a quest to formulate policy options to restructure the agricultural sector in line with the advent of the wider socio-political changes sweeping the country at the time. Notably, the government has been actively involved in partnerships with the private sector, NGOs, universities and other interested parties in search of agricultural policy solutions for a new democratic order. As a result, good progress has been made in the formulation of a number of policies in agriculture during the 1990s decade[27].

The opening quotation above comes from the latest discussion document on agricultural and land policy and is a reflection of what the government perceives should be the main goal of agricultural policy. It is a commonly accepted fact that South African agricultural policy currently faces two broad challenges namely, maximisation of general efficiency, economic growth and resource sustainability in farming on the one hand, and promotion of equity within the rural population on the other. The latter also involves tackling the related extremely challenging problem of rural poverty.

[27] See Kirsten and Vink (1999) for a review of economic and agricultural policy changes in South Africa during the 1990s.

In a recent presentation, Duncan (1999) put the South African policy agenda into perspective. He professed that there is enough scope for win-win situations between the

The effectiveness of 'truth' on the other hand has been constrained by the lack of empirical base, especially affecting the goal of promoting smallholder farming. Because of previous lack of demand for data on smallholder farming, such data has been scarce. Only recently has significant headway been made in smallholder empirical data gathering, mainly in response to the new administration's new focus to integrate smallholders into the mainstream agriculture.

The progressive expansion in smallholder data capacity in recent times is a positive sign if a sound base for policy making is to be established. This study contributes to the essential and challenging requirement of providing empirical evidence to inform policy making, for the effective integration of smallholders into the mainstream economy. It aims to inform policy of avenues of support for economically competitive smallholders, as well as the likely impact of such support on rural incomes and employment. This final chapter particularly aims to review and expand on the main messages created in the previous chapters, and in conclusion, to come up with policy recommendations for achieving the main goals of growth and equity in South African agriculture.

6.2 Black Empowerment: Undoing the Legacy of the Past

Historical developments played a significant role in the demise of a once competitive black smallholder farming sector since the late nineteenth and early twentieth century. These were mainly in the form of dispossession of blacks of their land in order to promote white farming. Through this, blacks were effectively proletarianised. More successive support measures were put in place by the authorities of the time to boost large-scale white-run farming, while in the process ignoring the needs of black small-scale farmers. The latter group of farmers was restricted in tiny and mostly poor-quality land portions in the former homeland areas. These areas are poor, degraded and lack proper support services for productive farming ventures. From the national perspective, the rate of poverty and unemployment seems to be worst among blacks living in the former homeland areas. So is the effect (though not exclusively) of past policies. This was the subject of most of the introductory chapter.

Since the 1970s, a series of events have gradually taken place in South Africa to characterise a process of transformation in ideology, politics and the economy and a move away from the haunting past. Politically, the 1990s saw radical progress as power peacefully shifted from whites to blacks. However, there is still a long way to go in the economic arena. No transformation will be complete without a deliberate re-inclusion of the previously excluded blacks into productive economic activity, i.e. the so-called system of 'democratic capitalism'. Such a process will involve efforts to empower black farmers and to create equal opportunities for their participation in the wider economy. 'Affirmative action', 'black advancement', 'black economic empowerment' or 'agricultural democratisation' - whatever name the process is called - must have as its goal, the levelling of the playing field for equal participation of all types of farmers in the market. International evidence over the past few decades has served to strengthen the argument for promotion of smallholder agriculture in countries seeking economic reform in order to promote equity.

6.3 International Evidence: A Strong Case for Smallholder Agriculture

One of the fiercest debates in economic scholarship has been that of the relationship between farm size and productivity. Formerly it was thought that large-scale farms were more superior to small-scale farms. Such factors as subsistence-mindedness, tradition and lack of innovativeness were associated with the perceived inferiority of small farms. The issue of presence of economies of scale in agriculture, under the influence of Karl Marx and some of his counterparts, reinforced this view during the early twentieth century. The 1950s saw investment in research to determine whether there existed increasing or decreasing returns to scale in agriculture. Spearheaded in India, this research, which was later deemed too subjective, showed an inverse relationship between farm size and agricultural productivity. Major research in other developing countries, however, has tended to confirm the Indian results rather than oppose them. It is now generally accepted that there is a decline in output per unit area as the total area of a farm increases.

In general, countries that followed a smallholder-based development path often achieved impressive growth in their economies. The period of independence was a turning point in most of colonial Africa as a strong drive towards agricultural commercialisation was carried out. A number of African agricultural success stories were recorded since this process was initiated. Kenya, Ivory Coast, Malawi and Swaziland are some of the prime examples of such success. These countries consistently kept an impressive growth record from the 1960s up to 1980s. Zimbabwe then took over during the 1980s as the new smallholder-based miracle. Across the Indian Ocean, Indonesia, Taiwan and other East-Asian countries provide further examples of nations that successfully put (smallholder) agriculture at the centre of development strategies. The most important lesson from these success stories is that an enabling environment needs to be created for smallholder growth to result in effective economic development.

Historical factors marginalised research and policy in smallholder farming in South Africa to some extent. As a consequence, little is known about the potential of this sector to act as an engine of growth and thus contribute to the general economic advancement in the country. It is therefore an absolute and pressing need to invest in new research ventures to close this information gap. Any available output in this regard will form part of a solid foundation for policy makers to make informed decisions especially during this period of transformation. The next section will elaborate more on this.

6.4 Smallholder Agriculture has Strong Potential: Lessons from South Africa

Two seminal volumes on rural livelihoods in South Africa were launched recently under the leadership of Michael and Merle Lipton of Sussex University. The publishing of these documents in 1996 was a welcome relief from a desperate drought of research output relevant to smallholder agriculture in South Africa. They set out to explore the potential for creating livelihoods in agriculture and the rural non-farm sector in the Western Cape and KwaZulu-Natal provinces. At a launching conference of these two books in 1997, there was a noted general pessimism about what smallholder agriculture

can do for black rural communities. Some of the book chapters also at least allude to the fact that smallholder agriculture will at best create a few additional rural livelihoods.

The debate on the role of smallholder agriculture in South Africa is arguably still at a controversial stage. One of the factors responsible for the apparent uncertainty about what smallholder agriculture is capable of achieving is the lack of an acceptable definition of "small-scale" or "smallholder" in the South African context (see for example Kirsten and Van Zyl, 1998). Clearly, more research is needed in this area for consensus to be reached. This study, based in the Eastern Cape province, is a contribution to this important debate. It seeks to establish whether or not smallholder farming is profitable and worth investing in. Similar research was recently conducted in Northern Province and KwaZulu-Natal (Ngqangweni, *et al.*, 1999). A clear message from these research findings is that smallholders in South Africa are efficient in producing at least some of the agricultural activities they are currently involved in. There exist special opportunities to exploit comparative advantage enjoyed by smallholder farmers in these areas. These opportunities were not previously exposed.

Ngqangweni, *et al.* (1999) revealed that smallholders in KwaZulu-Natal have a comparative advantage in the two contract activities timber and sugar cane. Convenient contractual relationships have been built up over the years in the province between processors and smallholder timber and sugar cane outgrowers. These arrangements, coupled with a relatively good agricultural potential, form a strong foundation for a thriving smallholder sector in the province. More research needs to go into linkage effects of growth in these activities in the overall rural economy.

Ngqangweni, *et al.* (1999) showed that smallholder agriculture appears to offer opportunities for efficient use of land, labour and capital in the Northern Province. However, small-scale agriculture is barely commercial in the areas studied. The main instances of smallholder cropping observed were primarily for home use. Hence the efficiency indicators observed were primarily for non-tradable activities, and thus did not really indicate comparative advantage for commercial purposes. Further work in the

competitiveness area needs to focus on marketing costs for other activities which are visibly beginning to pick up such as poultry and horticultural products produced under small-scale irrigation.

This study presented more elaborate results on the efficiency of smallholders in the Eastern Cape province. In general, profit opportunities seem to be open in indigenous beef and citrus activities for smallholders to exploit. Of the seven activities investigated, these two activities have the best comparative advantage. In the analysis of indigenous beef opportunities it was discovered that this activity's physical adaptability to the Eastern Cape conditions can be exploited as an additional advantage to the smallholders in the province. Citrus was found to be another impressive prospect for smallholders especially with its good record in the export market.

This study has also shown that the competitiveness of smallholders is influenced in a small way by the level of opportunity costs of land and labour, and to some extent by the level of output. The degree of competitiveness as shown by the indicator ratios is positively related to the level of opportunity costs for land and labour and to the level of output. Thus smallholder potential could be enhanced through lower economic costs for factors of production and through higher output levels.

After exposing the potential of some smallholder enterprises in South Africa, the next research task undertaken by this study was to investigate if such potential could benefit overall rural growth. Studies conducted in Asia and Africa have demonstrated that policy-induced increases in rural income through smallholder agriculture produce strong linkage effects with the rest of the rural economy. A recent study in Zimbabwe by Bautista and Thomas (1999), using the GDP-multiplier method, revealed that agricultural growth linkages were relatively stronger than labour-intensive industrial growth. Of special note was that emphasis on smallholder agriculture investment yielded the largest increase in overall income. In areas or regions where phenomena like poverty, inequality and unemployment are rife such opportunities could hardly be ignored.

This study went on to measure the consumption- or demand-side linkages that would be derived from a policy-boosted tradable smallholder agricultural sector in the Eastern Cape province. These linkages were found to match those recorded from similar African and Asian studies. They were evidently strengthened by cash inflow in the form of remittances and pensions from towns and cities into the rural areas. This phenomenon presents special opportunities for tradable smallholder agriculture, with its now proven potential, to take over as a significant source of required initial income injection. Sale of local agricultural tradables would also serve to lessen dependency on transfer payments from the cities.

Most extra growth appears to spring from spending on non-farm goods and services (health, transport and education). Boosting the supply-responsiveness of such items would only result in short-term benefits if the importance of income growth from a tradable source is not appreciated. Such a source would arguably be derived from tradable agricultural activities with comparative advantage. In this case citrus and indigenous livestock have a potential to act as the initial stimulus for the non-tradable non-farm sector.

But how can policy help build a thriving tradable smallholder sector? As this study draws near to conclusion, the next section will elaborate, *inter alia*, on some of the specific policy recommendations pertaining to ways in which smallholder agriculture could be induced to drive rural income and employment growth. It covers a topical issue of how to bring previously disadvantaged rural South Africans into the mainstream economy through informed policy decisions. Research needs to identify possible avenues through which such decisions could be effectively turned into sustainable programmes to enhance rural welfare. An environment of pessimism about the potential for smallholder agriculture to drive such a rural economic recovery process still exists. This pessimism has overlooked the role of deliberate and purposeful policy focus on this sector.

6.5 Conclusions and Recommendations

"Limitations of the government do not absolve [it] from [its] duties and responsibilities. Governments are elected to do the best they can do for the population" (Groenewald, 1998:532).

6.5.1 Policy Recommendations

6.5.1.1 Acknowledgement of Smallholder Agricultural Potential

Black smallholder or former homeland farming was historically marginalised. At best, policy has tended to treat this sector as a separate entity and not a part of the broader national agricultural sector. Efforts to rehabilitate former homeland agriculture in the past failed. Since the failure of these programmes no coherent policy on former homeland agriculture has existed. Apart from the Farmer Support Programmes (FSPs) led by the Development Bank of Southern Africa (DBSA), some private sector-small farmer innovative partnerships, notably in KwaZulu-Natal, some parts of Mpumalanga and the Northern Province, smallholder agriculture has largely been ignored.

In line with the government's new vision, commercial smallholder agriculture in South Africa needs to be supported to establish itself alongside a thriving large-scale sector. However, debate on the future of agriculture in South Africa has been laden with a sense of uncertainty and unease about how much smallholder agriculture can really contribute towards sustainable creation of income and employment opportunities. Pioneer research on this subject has gone a long way to clear some of this uncertainty. This study in particular has demonstrated that smallholders can certainly contribute positively to the cause of the poverty-stricken rural areas. International evidence has also done its bit to reinforce the view of an efficient smallholder sector whose potential, once unearthed, could act as an engine of rural growth. A general conclusion from such research was that small farmers are constrained by lack of opportunities to which they can show their potential. The time is now ripe to put such potential to the test in South Africa. The

broader socio-political reforms taking place in the country present special opportunities for government to rethink strategies to bring smallholder farming back into the economic mainstream.

6.5.1.2 Establishment of a Clear Policy towards Smallholder Agriculture

The latest agricultural policy discussion document lays a sound basis and vision for a more diversified agricultural sector based on three main goals namely: building a competitive and efficient agriculture (growth); supporting smallholder agriculture (equity); and conserving natural resources (sustainability). The achievement of the objective of supporting smallholder agriculture will depend on the existence of a clear framework for a comprehensive support system. In order to achieve equity in agriculture, smallholder farmers need to be empowered. Empowerment should go farther than entitlement through market-assisted land redistribution. Within a broader context of "agrarian reform" suggested by Ngqangweni (1996), further support measures are needed to assist in the establishment of new emerging farmers. Much has been written on the topic of support services for smallholders. It appears to be a commonly accepted view that support services are a pressing need for smallholders, and therefore should be urgently set up. This study does not dwell much on this topic lest it becomes an unnecessary repetition of what has already been said and written. Instead it will identify some of the key issues to be taken into account by policy. The following main elements are hence recommended as major aspects of a framework for a new policy on smallholder agricultural support:

- **Role of different stakeholders:** A policy framework on smallholder support should clearly define the role of all stakeholders including the private sector, the NGOs and other interested parties. It has been a rather hotly debated issue what role the state should play in the provision of support services to the farmers. Should the state necessarily be directly providing the services through parastatal institutions? Or

should it rather play the role of a facilitator whilst contracting the services out to other organisations - the so-called "New Public Management" (NPM) approach[28]?

In South Africa, parastatal-run service provision has had a questionable track record. The NPM approach, on the other hand, has not been sufficiently explored in the South African system of service provision in agriculture. It offers some advantages that need to be tested. Such advantages include efficiency gains resulting from a diversity of service providers instead of a monopoly. The introduction of an NPM approach, however, will come with its own inherent risks. For instance, it would be risky to fragment research, training and extension services, as these need to be closely linked. However, there is still scope to systematically explore some aspects of the NPM approach as part of a new policy on smallholder support.

- **Identification of key areas of support needed:** In a recent workshop organised by the DBSA on FSPs (Stilwell, 1997), one of the conclusions was that primary support services (inputs, mechanisation, on-farm infrastructure and marketing) were adequately available from the private sector in South Africa. Instead, the secondary services that support production and marketing were lacking, as manifested in poor roads, inadequate communication facilities, poor extension services and inaccessible credit facilities. Policy ought to clearly identify these gaps so as to appropriately direct focus for farmer support. It is thus recommended that the state invests on systematic research ventures specifically aimed at identifying areas needing attention regarding support services.

- **Identification of 'priority' smallholder activities:** Recent studies including the present one, have exposed areas where smallholders in South Africa have comparative advantage. It is through the exploitation of these potential areas that strong growth linkages could enhance the promotion of the needed income and employment growth in the rural areas. Future studies should be commissioned in other parts of the country to identify more of such potential among smallholders. It is

[28] Duncan (1999) provides more background discussion on NPM.

recommended that these comparative advantage activities be targeted as priority for support. This should, however, be done in conjunction with other wider grounds for identification of agricultural potential, for example, physical and agronomic grounds.

6.5.1.3 Institutional Considerations

In this chapter so far, the public sector has been identified as the one to play a facilitative role in the development of smallholder agriculture and promotion of general rural development. A major role of the public sector is expected to be establishment and strengthening of the various institutions required for supporting growth and replication of efficient smallholder activities. Research in smallholder farming area has established that the FSP approach has brought about a considerable degree of institutional innovation in these areas (Thomas and Tyobeka, 1995:178). A number of valuable lessons could therefore be learnt from this approach. Other studies have suggested that establishment of rental markets and strengthening of tenure security in communal farming areas (Lyne, 1991; Lyne, *et al.*, 1991; Lyne and Thomson, 1998), for example, could go a long way to create and promote opportunities for growth of efficient African smallholder activities.

6.6 Conclusions

The purpose of this study was to assist policy makers in finding an economic motivation to explain why it is beneficial for South Africa to support black commercial farming (albeit on a small scale). Enough evidence was provided to show the benefits. The challenge now is to clarify a strategy to empower commercial smallholders and to bring them up to the level of their large-scale counterparts. A number of lessons have been learnt in the first few years of the new democratic dispensation. It could be argued that enough elements of a basic framework for such a strategy do exist. The next big task is to fill the gap that so evidently exists in the implementation of programmes and projects. Different role players are currently involved in some rural upliftment projects - research, food security projects, infrastructure construction and other basic needs projects. However, there is very little institutional co-ordination between these different parties.

The time is ripe for the government, as the party with the responsibility to ensure the welfare of all citizens, to fine-tune the institutional arrangements to ascertain that public investments are correctly channelled and that they reach the intended beneficiaries. It should also guarantee that each tier in the institutional network is held accountable for investment to yield maximum returns.

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7. Appendices

Appendix 1: Budget for Indigenous Beef (Nkone) in Mpofu District, Eastern Cape

The farming system

Location	Mpofu/Seymour district, Eastern Cape
Practice	Indigenous Nkone breeding
Production cycle	22 months
Working hours	8.00
Total area (ha)	1060.00
Total AU	275.40
Stocking rate (ha/AU)	4.00
Hired wage (R/day)	10.00
Family labour (R/day)	6.00
Offtake rate (%)	14.00
Social price for beef per ton	4874.36
Social price for beef per AU kept	545.38
Discount rate (%)	5.00

Activity calendar per cycle

Activity	Time	Fixed input	Adult labour (man-days)	Family labour (man-days)
Calving	Sep - Nov	Cattle scale	90.00	45.00
Castration & Dehorning	Dec	Burdizzo, Disbudding iron, Neck clamp, pen	3.00	1.00
Condition scoring & mating	Dec - Feb		90.00	45.00
Vaccination	Mar	Handling pen	4.00	2.00
Weaning	Apr/May	handling pen	3.00	1.00
Pregnancy diagnosis	May	handling pen	5.00	2.00
Long weaners	Jan/May	Cattle scale	2.00	1.00
Cull cows (sale)	Jun		1.00	1.00

Appendix 1: Continued

Calculation of fixed costs per cycle

Fixed input	Initial cost (whole farm) (R)	Useful life (yrs)	Salvage value (SV) (R)	Present value of SV (R)	Net initial cost (whole farm) (R)
Handling facilities	7000.00	10.00	0.00	0.00	7000.00
Disbudding iron	450.00	5.00	0.00	0.00	450.00
Burdizzo	350.00	5.00	0.00	0.00	350.00
Neck clamp	350.00	5.00	0.00	0.00	350.00
Cattle scale	750.00	5.00	0.00	0.00	750.00

Fixed input	Days/AU	Days / cycle	Per AU share of cycle hours
Handling facilities	0.08	21.00	0.64
Disbudding iron	0.01	2.50	0.08
Burdizzo	0.01	2.50	0.08
Neck clamp	0.01	4.00	0.12
Cattle scale	0.01	3.00	0.09

Fixed input	Net initial cost (whole farm) (R)	Capital recovery factor	Per AU share of cycle hours	Fixed cost per cycle
Handling facilities	7000.00	0.13	0.64	576.86
Disbudding iron	450.00	0.23	0.08	7.87
Burdizzo	350.00	0.23	0.08	6.12
Neck clamp	350.00	0.23	0.12	9.80
Cattle scale	750.00	0.23	0.09	15.74

Appendix 1: Continued

Private Costs and Revenues per AU per cycle

ITEM	QUANTITY (AU)	RANDS PER AU	TOTAL PER AU PER CYCLE (R)
Fixed inputs			
Handling facilities	1.00	5.77	5.77
Disbudding iron	1.00	7.48	7.48
Burdizzo	1.00	5.82	5.82
Neck clamp	1.00	9.31	9.31
Cattle scale	1.00	14.96	14.21
Capital amortisation	1.00	116.28	116.28
TOTAL FIXED COSTS			158.86
Direct labour (days)			
Unskilled hired:			
Year 1	0.72	20.00	14.40
Year 2	0.00	20.00	0.08
TOTAL UNSKILLED HIRED LAB			14.48
Unskilled family:			
Year 1	0.35	12.00	4.20
Year 2	0.00	12.00	0.05
TOTAL UNSKILLED FAMILY LAB			4.25
TOTAL DIRECT LABOUR COST			18.73

Appendix 1: Continued

ITEM	QUANTITY (AU)	RANDS PER AU	TOTAL PER AU PER CYCLE (R)
Intermediate inputs			
Ear tags (units)	0.51	0.80	0.41
Dips (ml)	145.24	0.49	71.17
Penicillin (ml)	0.73	0.58	0.42
Terramycin (ml)	1.45	0.97	1.41
Workers' gear (AU)	1.00	0.01	0.01
TOTAL INTERMEDIATE COSTS			73.42
Land (per AU)	4.00	30.00	120.00
TOTAL PRIVATE COSTS (R)			371.00
Annual Revenue			
Long weaners sale (AU)	1.00	2325.58	2325.58
Cull cows sale (AU)	1.00	1260.00	1260.00
TOTAL REVENUE PER AU SOLD PER CYCLE(R)			3585.58
TOTAL REVENUE PER AU KEPT PER CYCLE (R)			573.69
PROFIT PER AU KEPT PER CYCLE (R)			202.69

Appendix 1: Continued

Decomposition of per AU private costs and revenues (R)

INPUTS	QUANTITY	LAND	DIRECT LABOUR	CAPITAL	TRADABLE INPUTS	TOTAL
Fixed inputs						
Tools				42.58		42.58
Capital amortisation				116.28		116.28
Total				158.86		
Direct labour						
Unskilled hired	0.72		14.48			14.48
Unskilled family	0.35		4.25			4.25
Total			18.73			
Intermediate inputs						
Ear tags	0.51				0.41	0.41
Dips	145.24				71.17	71.17
Penicillin	0.73				0.42	0.42
Terramycin	1.45				1.41	1.41
Workers' gear	1.00				0.01	0.01
Total					73.42	
Land						
Land rental (AU)	4.00	120.00				120.00
TOTAL COST PER AU PER CYCLE (R)						371.00
TOTAL REVENUE PER AU KEPT PER CYCLE (R)						573.69
PROFIT PER AU KEPT PER CYCLE (R)						202.69

Appendix 1: Continued

Decomposition of per AU social costs and revenues (R)

ITEM	QUANTITY	LAND	DIRECT LABOUR	CAPITAL	TRADABLE INPUTS	TOTAL
Fixed inputs						
Tools				37.35		37.35
Capital amortisation				116.28		116.28
Total				153.63		
Direct labour						
Unskilled hired	0.72		7.24			14.48
Unskilled family	0.35		2.12			4.25
Intermediate inputs						
Ear tags	0.51				0.36	0.36
Dips	145.24				71.17	71.17
Penicillin	0.73				0.42	0.42
Terramycin	1.45				1.41	1.41
Workers' gear	27.00				0.01	0.01
Total					73.36	
Land						
Land rental (AU)	4.00	120.00				120.00
TOTAL COST PER AU PER CYCLE (R)						365.72
TOTAL REVENUE PER AU KEPT PER CYCLE (R) (TARIFF-ADJUSTED)						545.38
PROFIT PER AU KEPT PER CYCLE (R)						179.66

Appendix 1: Continued

Policy Analysis Matrix for Indigenous Nkone beef **Mpofu, Eastern Cape (Per Animal Unit)**

	Revenue	Production costs					Profit
		Tradable inputs	Domestic factors			Total Domestic factors	
			Unskilled labour ; Family	Unskilled labour ; Hired	Land	Capital	
Private Prices	573.69	73.42	4.25	14.48	120.00	158.86	297.58	202.69
Social Prices	545.38	73.36	4.25	14.48	120.00	153.63	292.36	179.66
Divergences	28.31	0.05					5.23	23.03

NPCO	1.05
NPCI	1.00
EPC	1.06
SRP	0.04
DRC	0.62
PC	1.13

Appendix 2: Budget for Exotic (Simmentaler) Dual-Purpose Cattle in Mpofu District, Eastern Cape

The farming system

Location	Mpofu district, Eastern Cape
Practice	Dual purpose (Simmentaler) breeding
Production season	11 months
Herd size (AU)	115.10
Total extent (ha)	277
Stocking rate (ha/AU)	2.4
Working hours	8
Hired wage (R/day)	10
Family wage (R/day)	6
Discount rate (%)	5
Social revenue (Incl. milk)	389.59
Offtake rate (%)	14

Activity Calendar

Activity	Time	Fixed input	Hired lab (man-days)	Family labour (man-days)
Calving	Sep - Nov		45	23
Castration	Dec	Handling pen	3	2
Mating	Nov-Jan		23	12
Pregnancy diagnosis	Apr		1	1
Weaning	Jul	Handling pen	1	1
Weaners	Aug	Loading ramp	2	1

Appendix 2: Continued

Calculation of per AU fixed costs per cycle

Fixed input	Initial cost for whole farm (R)	Useful life (yrs)	Salvage value (SV) (R)	Present value of SV (R)	Net initial cost for whole farm (R)
Handling facilities	82	10	0	0	82
Loading ramp	430	10	0	0	430

Fixed input	Days/AU	Days/ season	Per AU share of use per cycle
Handling facilities	0.061	7	0.70
Loading ramp	0.026	3	0.30

Fixed input	Net initial cost (R)	Capital recovery factor	Per AU share of use per cycle	Fixed cost per AU per cycle
Handling facilities	82	0.1295	0.70	7.45
Loading ramp	430	0.1295	0.30	16.64

Appendix 2: Continued

Private Costs per AU per cycle (R)

Item	Quantity	Rands per unit	Total (R)
Fixed inputs			
Handling facilities	1	7.45	7.45
Loading ramp	1	16.64	16.64
Capital amortisation	1	138.62	138.62
TOTAL FIXED COST			162.71
Direct labour (days)			
Unskilled hired	0.65	10.00	6.50
Unskilled family	0.35	6.00	2.10
TOTAL LABOUR COSTS			8.60
Intermediate inputs			
Ear tags (units)	40	2.40	96.00
Dosing mixture (ml)	30	0.01	0.30
Black quarter vaccine (ml)	17	0.13	2.21
Terramycin (ml)	43	1.62	69.66
Placenta treatment tablets (units)	0.03	213.00	6.39
Syringes (units)	0.17	3.50	0.60
Lucerne feed (bales)	0.87	25.00	21.75
Mineral licks (blocks)	0.26	33.00	8.58
TOTAL INTERMEDIATE COSTS			205.49
Land (per AU)	2	30.00	60.00
TOTAL PRIVATE COSTS (R)			436.79
Total Revenue (R)			
Weaners sale (AU)	1	2759.89	2759.89
Milk consumption (AU)	1	12.60	12.60
TOTAL REVENUE/AU SOLD (R)			2772.49
TOTAL REVENUE/AU KEPT (R)			388.15
PROFIT PER AU KEPT PER CYCLE (R)			-48.64

Appendix 2: Continued

Decomposition of per AU private costs (R)

Item	Quantity	Land	Direct labour	Capital	Tradable inputs	Total
Fixed inputs						
Tools				24.09		24.09
Capital amortisation				138.62		138.62
Total				162.71		
Direct labour						
Unskilled hired	0.65		6.50			6.50
Unskilled family	0.35		2.10			2.10
Total			8.60			
Intermediate inputs						
Ear tags (units)	40				96.00	96.00
Dosing mixture (ml)	30				0.30	0.30
Black quarter vaccine (ml)	17				2.21	2.21
Terramycin (ml)	43				69.66	69.66
Placenta treatment tablets (units)	0.03				6.39	6.39
Syringes (units)	0.17				0.60	0.60
Lucerne feed (bales)	0.87				21.75	21.75
Mineral licks (blocks)	0.26				8.58	8.58
Total					205.49	
Land						
Land rental (AU)	2	60.00				60.00
TOTAL COST PER CYCLE (R)						436.79
TOTAL REVENUE PER AU KEPT PER CYCLE (R)						388.15
PROFIT PER AU KEPT PER CYCLE (R)						-48.64

Appendix 2: Continued

Decomposition of per AU social costs (R)

Item	Quantity	Land	Direct labour	Capital	Tradable	Total
Fixed inputs						
Tools				21.13		21.13
Capital amortisation				138.62		138.62
Total				159.75		
Direct labour						
Unskilled hired	0.65		6.50			
Unskilled family	0.35		2.10			6.50
Total			8.60			2.10
Intermediate inputs						
Ear tags (units)	40					
Dosing mixture (ml)	30				84.21	84.21
Black quarter vaccine (ml)	17				0.30	0.30
Terramycin (ml)	43				2.21	2.21
Placenta treatment tablets (units)	0.03				69.66	69.66
Syringes (units)	0.17				6.39	6.39
Lucerne feed (bales)	0.87				0.52	0.52
Mineral licks (blocks)	0.26				21.75	21.75
Total					8.58	8.58
Land						
Land rental (AU)	2	60.00				60
TOTAL COST PER CYCLE (R)						421.98
TOTAL REVENUE PER AU KEPT PER CYCLE (R) (TARRIF-ADJUSTED						389..59
PROFIT PER AU KEPT PER CYCLE (R)						-33.83

Appendix 2: Continued

Policy Analysis Matrix for dual purpose breeder - Mpofu, Eastern Cape (Animal Unit)

	Revenue	Production costs						Profit
		Tradable inputs	Domestic factors				Total Domestic factors	
			Unskilled labour ; Family	Unskilled labour ; Hired	Land	Capital		
Private Prices	388.15	205.49	2.10	6.50	60.00	162.71	231.31	-48.64
Social Prices	389.59	193.62	2.10	6.50	60.00	159.75	228.35	-33.38
Divergences	11.86	11.86					2.96	-16.26

NPCO	1.00
NPCI	1.06
EPC	0.93
SRP	-0.04
DRC	1.17
PC	1.50

Appendix 3: Budget for Dairy Cattle in Keiskammahoek District, Eastern Cape

The farming system	
Location	Keiskammahoek, Eastern Cape
Practice	Milk production
Working hours	10.00
Dairy unit area (ha)	17.00
Hired wage (R)	10.00
Family wage (R)	6.00
Total AU	27.00
Total pasture area (ha)	12.00
Kikuyu area (ha)	6.00
Ryegrass area (ha)	6.00
Pasture stocking rate (ha/AU)	0.44

Appendix 3: Continued

Activity calendar

Activity	Time	Fixed input	Hired lab (man-days)	Family lab (man-days)	Intermediate input
Soil preparation, planting and fertilising (kikuyu)	Sep-Oct		contractor		0.09 ton 2.3.2, 0.01 ton kikuyu seed
Calving	Sep-Nov	Electric fence boxes, watering troughs	90.00	45.00	dairy meal
Mating	Jan		90.00	45.00	
2nd fertilising (kikuyu)	Jan		contractor		1.5 ton LAN
Soil preparation, planting and fertilising (ryegrass)	Feb-Mar		contractor		0.09 ton 2.3.2; 0.01 ton ryegrass seed
3rd fertilising (kikuyu)	Mar		contractor		0.09 ton LAN
2nd fertilising (ryegrass)	Mar		contractor		0.09 ton LAN
3rd fertilising (ryegrass)	May		contractor		0.09 ton LAN
Weeding (pasture)		hand slasher	3.00	1.00	
Milking activity	daily		1056.00		

Appendix 3: Continued

Calculation of annual fixed costs

Fixed input	Initial cost (R)	Useful life (yrs)	Salvage value (SV) (R)	Net initial cost (R)
Electric fence box	876.00	5.00	0.00	876.00
Watering troughs	380.00	5.00	0.00	380.00
Hand slasher	80.00	5.00	0.00	80.00
Handling facilities	7000.00	10.00	0.00	7000.00

Fixed input	Days/AU	Days/ season	Per ha/AU share of seasonal use
Electric fence box	5.00	135.00	0.24
Watering troughs	15.00	405.00	0.72
Hand slasher	0.15	4.00	0.01
Handling facilities	0.78	21.00	0.04

Fixed input	Net initial cost (R)	Capital recovery factor	Share of seasonal use	Annual capital cost
Electric fence box	876.00	0.23	0.24	50.57
Watering troughs	380.00	0.23	0.72	64.93
Hand slasher	80.00	0.23	0.01	0.18
Handling facilities	7000.00	0.13	0.04	33.79

Appendix 3: Continued

Annual Private Costs

Item	Quantity	Rands/ unit	Total
Fixed inputs			
Electric fence box	1.00	50.57	50.57
Watering troughs	5.00	64.93	324.65
Hand slasher	3.00	0.18	0.55
Handling facilities	1.00	33.79	33.79
Capital amortisation	1.00	298.50	298.50
TOTAL			708.05
Direct labour			
Unskilled hired labour (man-days)	45.89	10.00	458.90
Unskilled family labour (man-days)	3.37	6.00	20.22
TOTAL			479.12
Intermediate inputs			
2.3.2 fertiliser (ton)	0.18	1245.00	224.10
LAN (ton)	1.77	1115.80	1974.97
Kikuyu seed (ton)	0.01	1440.00	14.40
Rye seed (ton)	0.01	5500.00	55.00
Supplementary feed (ton)	1.06	1134.60	1202.68
Terramycin (litres)	0.06	536.80	32.21
Deadline (litres)	0.63	150.80	95.00
Weedicide (litres)	0.63	13.22	8.33
Contractors	0.40	500.00	200.00
TOTAL			3806.68
Land (per ha)			600.00
TOTAL PRIVATE COSTS (R)			5593.86
Annual Revenue			
Milk sales (L)	2360.00	2.00	4720.00
Cull sales (per AU)	0.63	1984.13	1250.00
TOTAL REVENUE			5970.00
ANNUAL PROFIT			376.15

Appendix 3: Continued

Decomposition of per AU private costs (R)

ITEM	QUANTITY	LAND	DIRECT LABOUR	CAPITAL	TRADABLE	TOTAL
Fixed inputs						
Tools and facilities	1.00			409.55		409.55
Capital amortisation	1.00			298.50		298.50
Total				708.05		
Direct labour						
Unskilled hired	45.89		458.90			458.90
Unskilled family	3.37		20.22			20.22
Total			479.12			
Intermediate inputs						
2.3.2 fertiliser (ton)	0.18				224.10	224.10
LAN (ton)	1.77				1974.97	1974.97
Kikuyu seed (ton)	0.01				14.40	14.40
Rye seed (ton)	0.01				55.00	55.00
Supplementary feed (ton)	1.06				1202.68	1202.68
Terramycin (litres)	0.06				32.21	32.21
Deadline (litres)	0.63				95.00	95.00
Weedicide (litres)	0.63				8.33	8.33
Contractors (ha)	0.40				200.00	200.00
Total					3806.68	
Land						
Land rental						0.00
ANNUAL TOTAL COSTS (R)						4993.86
ANNUAL TOTAL REVENUE (R)						5970.00
AUUNAL PROFIT (R)						976.15

Appendix 3: Continued

Decomposition of per AU social costs (R)

ITEM	QUANTITY	LAND	DIRECT LABOUR	CAPITAL	TRADABLE	TOTAL
Fixed inputs						
Investment cost	1.00			538.54		538.54
Tools and facilities	1.00			359.26		359.26
Capital amortisation	1.00			298.50		298.50
Total				1196.30		
Direct labour						
Unskilled hired	45.89		458.90			458.90
Unskilled family	3.37		20.22			20.22
Total			479.12			
Intermediate inputs						
2.3.2 fertiliser (ton)	0.18				224.10	224.10
LAN (ton)	1.77				1974.97	1974.97
Grass seed (ton)	0.01				14.40	14.40
Seed (ton)	0.01				55.00	55.00
Supplementary feed (ton)	1.06				1202.68	1202.68
Terramycin (litres)	0.06				32.21	32.21
Deadline (litres)	0.63				95.00	95.00
Weedicide (litres)	0.63				8.33	8.33
Contractors (AU)	0.40				175.44	175.44
Total					3782.12	
Land						
Land rental	1.00			600.00		600.00
ANNUAL TOTAL COSTS (R)						5519.00
ANNUAL TOTAL REVENUE (R)						5970.00
ANNUAL PROFIT (R)						451.00

Appendix 3: Continued

Policy Analysis Matrix for small-scale dairy producer (Animal Unit) - Keiskammahoek, Eastern Cape

	Revenue	Production costs						Profit
		Tradable inputs	Domestic factors				Total Domestic factors	
			Unskilled labour ; Family	Unskilled labour ; Hired	Land	Capital		
Private Prices	5970.00	3806.68	20.22	458.90	0.00	708.05	1187.17	976.15
Social Prices	5970.00	3782.12	20.22	458.90	600.00	1196.30	2275.42	-87.54
Divergences	0.00	24.56					-1088.24	1063.68

NPCO	1.00
NPCI	1.01
EPC	0.99
SRP	0.18
DRC	1.04
PC	-11.15

Appendix 4: Budget for Irrigated Citrus in Mpofu District, Eastern Cape

The farming system	
Location	Mpofu, Eastern Cape
Practice	Irrigated citrus production
Citrus area (ha)	17.00
Expected lifespan (yrs)	40.00
Full production attained in	eighth year
Working hours	8.00
Hired wage (R)	30.00
Discount rate (%)	5.00

Appendix 4: Continued

Activities

Activity	Fixed input	Adult labour (man-days)	Intermediate input
Land preparation		contractor	
Irrigation equipment installation	Irrigation lines and equipment	contractor	
Planting	spades	90.00	600 trees, 100 windbreaks
Fertilising	knapsack	1.00	0.5 ton fertiliser;480 L fertiliser
Pest and disease control	boom sprayer, tractor	377.00	73 L pesticide; 0.1 ton pesticide
Weed control	herbicide sprayer	55.00	9 L weedicide
Soil and leaf sampling		contractor	
Maintenance	slasher, hand-saw	2.00	
Harvesting	picking shears, storage shed, bin trailer	696.00	1 picking bags
Marketing		contractor	

Appendix 4: Continued

List of fixed costs items and their Net Initial Costs

Fixed input	Initial cost (R)	Useful life (yrs)	Salvage value (SV) (R)	Present value of SV (R)	Net initial cost (R)
Tractor	58208.50	10.00	5820.85	3573.50	54657.69
Boom sprayer	47880.00	10.00	4788.00	2920.68	44959.32
Herbicide sprayer	4000.00	10.00	400.00	244.00	3756.00
Storage shed	15000.00	10.00	1500.00	915.00	14085.00
Bin trailer	14800.00	10.00	1480.00	902.80	14348.60
Knapsack	250.00	5.00	0.00	0.00	250.00
Slasher	80.00	5.00	0.00	0.00	80.00
Picking shear	25.00	5.00	0.00	0.00	25.00
Hand-saw	9.00	5.00	0.00	0.00	9.00
Spades	32.00	5.00	0.00	0.00	32.00
Irrigation lines and equipment	102000.00	10.00	10200.00	6261.92	95738.08

Appendix 4: Continued

Calculation of annual fixed costs (R/ha)

Fixed input	Days/ha	Days/ year	Per ha share of annual use
Tractor	25.50	1087.00	0.19
Boom sprayer	22.40	378.00	0.17
Herbicide sprayer	3.20	55.00	0.02
Slasher	0.06	1.00	0.00
Hand-saw	0.06	1.00	0.00
Knapsack	1.00	1.00	0.01
Picking shear	38.50	654.00	0.29
Bin trailer	38.50	654.00	0.29
Loading shed	2.50	42.00	0.02

Fixed input	Net initial cost (R)	Capital recovery factor	Share of annual use	Annual capital cost
Tractor	54657.69	0.13	0.47	3326.70
Boom sprayer	44959.32	0.13	0.42	2445.30
Herbicide sprayer	3756.00	0.13	0.06	29.20
Slasher	80.00	0.23	0.00	0.01
Hand-saw	9.00	0.23	0.00	0.00
Knapsack	250.00	0.23	0.02	1.20
Picking shear	25.00	0.23	0.29	1.67
Bin trailer	14348.60	0.13	0.29	538.86
Loading shed	14085.00	0.13	0.02	36.48

Appendix 4: Continued

Calculation of annual private costs (R/ha)

ITEM	QUANTITY	RANDS PER UNIT	TOTAL (R)
Fixed inputs			
Tractor	2.00	3326.70	6653.40
Boom sprayer	1.00	2445.30	2445.30
Herbicide sprayer	1.00	29.20	29.20
Slasher	2.00	0.01	0.02
Hand-saw	6.00	0.00	0.01
Knapsack	2.00	1.20	2.40
Picking shear	25.00	1.67	41.75
Bin trailer	1.00	538.86	538.86
Loading shed	1.00	36.48	36.48
Investment cost	1.00	19657.61	1260.50
TOTAL FIXED INPUT COST			11007.92
Direct labour (days)			
Unskilled adult	109.00	20.00	2180.00
Intermediate inputs			
Fertiliser (ton)	0.50	2161.43	1080.72
Fertiliser (L)	480.00	1.55	744.00
Pesticide (ton)	0.10	29.79	2.98
Pesticide (L)	73.00	52.66	3844.18
Weedicide (l)	85.00	18.74	1592.90
Picking bags (units)	1.00	9.00	9.00
Contractor-leaf and soil sampling (ha)	1.00	175.00	175.00
Water (ha)	1.00	120.00	120.00
Electricity (ha)	1.00	555.00	555.00
Repair and maintenance (ha)	1.00	939.00	939.00
Fuel and lubricants (ha)	1.00	240.00	240.00
Packing (ha)	1.00	5007.10	5007.10
Transport (ton)	35.00	31.20	1092.00
TOTAL INTERMEDIATE COSTS			15401.87

Appendix 4: Continued

ITEM	QUANTITY	RANDS PER UNIT	TOTAL (R)
Land (ha)	1.00	2000.00	2000.00
TOTAL PRIVATE COSTS (R)			30589.79
Annual Revenue			
Sales:			
Export (ton)	22.75	1340.00	30485.00
Local (ton)	9.25	450.00	4162.50
Factory (ton)	3.00	200.00	600.00
TOTAL			35247.50
ANNUAL PROFIT PER HA			4657.71

Calculation of annual investment cost (amortised over 40 years)

TOTAL AMOUNT (R)	21628.37
AMMORTIZATION FACTOR	0.06
ANNUAL COST (R)	1260.50

Appendix 4: Continued

Decomposition of annual private costs (R/ha)

ITEM	QUANTITY	TRADABLE INPUT (R/ha)	LABOUR (R/ha)	LAND (R/ha)	CAPITAL (R/ha)	TOTAL
Fixed inputs						
Implements (ha)	1.00				9747.41	9747.41
Investment cost (ha)	1.00				1260.50	1260.50
Total					11007.92	
Direct labour						
Unskilled adult (days)	109.00		2180.00			2180.00
Intermediate inputs						
Fertiliser (ton)	0.50	1080.72				1080.72
Fertiliser (L)	480.00	744.00				744.00
Pesticide (ton)	0.10	2.98				2.98
Pesticide (L)	73.00	3844.18				3844.18
Weedicide (L)	85.00	1592.90				1592.90
Picking bags (units)	1.00	9.00				9.00
Packing (ha)	1.00	5007.10				5007.10
Water (ha)	1.00	120.00				120.00
Electricity (ha)	1.00	555.00				555.00
Repair and maintenance (ha)	1.00	939.00				939.00
Fuel and lubricants (ha)	1.00	240.00				240.00
Contractors						
Contractor-leaf and soil sampling (ha)	1.00	175.00				175.00
Transport (ton)	35.00	1092.00				1092.00
Total		15401.87				
Land	1.00			2000.00		2000.00
TOTAL ANNUAL COSTS (R)						30589.79
TOTAL ANNUAL REVENUE (R)						35247.50
TOTAL ANNUAL PROFIT (R)						4657.71

Appendix 4: Continued

Decomposition of annual social costs (R/ha)

ITEM	QUANTITY	TRADABLE INPUT	LABOUR	LAND	CAPITAL	TOTAL
Fixed inputs						
Implements (ha)	1.00				8550.36	8550.36
Investment cost (ha)	1.00				1260.50	1260.50
Total					9810.86	
Direct labour						
Unskilled adult (days)	109.00		2180.00			2180.00
Intermediate inputs						
Fertiliser (ton)	0.50	948.00				948.00
Fertiliser (L)	480.00	652.63				652.63
Pesticide (ton)	0.10	2.61				2.61
Pesticide (L)	73.00	3372.09				3372.09
Weedicide (L)	85.00	1397.28				1397.28
Picking bags (units)	1.00	7.89				7.89
Packing (ha)	1.00	4392.19				4392.19
Water (ha)	1.00	105.26				105.26
Electricity (ha)	1.00	486.84				486.84
Repair and maintenance (ha)	1.00	823.68				823.68
Fuel and lubricants (ha)	1.00	210.53				210.53
Contractors						
Contractor-leaf and soil sampling (ha)	1.00	175.00				175.00
Transport (ton)	35.00	1092.00				1092.00
Total		13666.01				
Land	1.00			2000.00		2000.00
TOTAL ANNUAL COSTS (R)						27656.88
TOTAL ANNUAL REVENUE (R)						35247.50
TOTAL ANNUAL PROFIT (R)						7590.62

Appendix 4: Continued

Policy Analysis Matrix for 1ha Irrigated Citrus (8th year - representative year)

	Revenue	Production costs						Profit
		Tradable inputs	Domestic factors				Total Domestic factors	
			Unskilled labour ; Family	Unskilled labour ; Hired	Land	Capital		
Private Prices	35247.50	15401.87		2180.00	2000.00	11007.92	15187.92	4657.71
Social Prices	35247.50	13666.01		2180.00	2000.00	9810.86	13990.86	7590.62
Divergences	0.00	1735.86					1197.05	-2932.91

NPCO	1.00
NPCI	1.13
EPC	0.92
SRP	-0.08
DRC	0.65
PC	0.61

Appendix 5: Budget for Irrigated Cabbage in Zwelitsha District, Eastern Cape

The farming system	
Location	Zwelitsha district, Eastern Cape
Practice	Irrigated cabbage production
Production cycle (months)	4
Crops/year	12
Working hours	8
Total annual cabbage area (ha)	4.8
Hired wage rate (R/day)	10
Family wage (R/day)	6

Appendix 5: Continued

Activity Calendar

Activity	Fixed input	Hired labour (man-days)	Family labour (man-days)	Intermediate input
Land preparation and weeding		contractor		2L herbicide
Planting	marker	96	48	25000 seedlings
Fertilisation		12	6	0.5 ton 2.3.4; 0.5 ton LAN
Pest and disease control		contractor		0.02 ton pesticide; 6L pesticide
Harvesting	slasher	216	108	1675pockets
Marketing		contractor		

Annual fixed input costs

Fixed input	Initial cost (R)	Useful life (yrs)	Salvage value (SV) (R)	Present value of SV (R)	Net initial cost (R)
marker	10	5	0	0	10
slasher	80	5	0	0	80

Fixed input	Days/ha	Days/ year	Per ha share of annual use
marker	20.8	100	0.24
slasher	67.5	324	0.76

Fixed input	Net initial cost (R)	Capital recovery factor	Share of annual use	Annual capital cost (R)
marker	10	0.2309	0.24	0.55
slasher	80	0.2309	0.76	14.04

Appendix 5: Continued

Annual Private Costs

ITEM	QUANTITY	RANDS PER UNIT	TOTAL (R)
Fixed inputs			
Marker	1	0.55	0.55
Slasher	1	14.04	14.04
TOTAL FIXED COSTS			14.59
Direct labour (days)			
Unskilled hired	67.5	10.00	675.00
Unskilled family	33.75	6.00	202.50
TOTAL LABOUR			877.50
Intermediate inputs			
Herbicide (L)	2	361.30	722.60
Seedlings (units)	25000	0.05	1250.00
Fertiliser 2.3.4 (ton)	0.5	1360.00	680.00
Fertiliser LAN (ton)	0.5	1040.00	520.00
Pesticide (ton)	0.02	31330.00	626.60
Pesticide (L)	6	258.72	1552.32
Pockets (units)	1675	0.85	1423.75
Land Preparation (L fuel)	30	6.50	195.00
Transport (ha)	1	200.00	200.00
Water, repair and maintenance (ha)	1	150.00	150.00
TOTAL INTERMEDIATE COSTS			7320.27
Land (per ha)	1	0.00	0.00
TOTAL PRIVATE COSTS (R)			8212.36

Appendix 5: Continued

ITEM	QUANTITY	RANDS PER UNIT	TOTAL (R)
Annual Income (R)			
Local sales (bags)	1050	6.00	6300.00
Urban market sales (bags)	625	6.00	3750.00
Home consumption (bags)	0.2	6.00	8.50
TOTAL GROSS INCOME (R)			10058.50
ANNUAL PROFIT (R/ha)			1846.14

Appendix 5: Continued

Decomposition of per ha private costs (R)

ITEM	QUANTITY	LAND	DIRECT LABOUR	CAPITAL	TRADABLE INPUT	TOTAL
Fixed inputs						
Implements	1			14.59		14.59
Direct labour						
Unskilled hired	67.5		675.00			675.00
Unskilled family	33.75		202.50			202.50
Total			877.50			
Intermediate inputs						
Herbicide (L)	2				722.60	722.60
Seedlings (units)	25000				1250.00	1250.00
Fertiliser 2.3.4 (ton)	0.5				680.00	680.00
Fertiliser LAN (ton)	0.5				520.00	520.00
Pesticide (ton)	0.02				626.60	626.60
Pesticide (L)	6				1552.32	1552.32
Pockets (units)	1675				1423.75	1423.75
Land preparation (L fuel)	30				195.00	195.00
Transport (ha)	1				200.00	200.00
Water, repair and maintenance (ha)	1				150.00	150.00
Total					7320.27	
Land						
Land rental(ha)	1	0.00				0.00
ANNUAL TOTAL COSTS (R)						8212.36
ANNUAL TOTAL REVENUE (R)						10058.50
ANNUAL PROFIT (R)						1846.14

Appendix 5: Continued

Decomposition of per ha social costs (R)

ITEM	QUANTITY	LAND	DIRECT LABOUR	CAPITAL	TRADABLE INPUT	TOTAL
Fixed inputs						
Implements				12.80		12.80
Investment cost				1683.50		1683.50
Total				1696.30		
Direct labour						
Unskilled hired	67.5		675.00			675.00
Unskilled family	33.75		202.50			202.50
Total						
Intermediate inputs						
Herbicide (L)	2				722.60	722.60
Seedlings (units)	25000				1250.00	1250.00
Fertiliser 2.3.4 (ton)	0.5				680.00	680.00
Fertiliser LAN (ton)	0.5				520.00	520.00
Pesticide (ton)	0.02				626.60	626.60
Pesticide (L)	6				1552.32	1552.32
Pockets (units)	1750				1248.90	1248.90
Land Preparation (L fuel)	30				171.05	171.05
Transport (ha)	1				175.44	175.44
Water, repair and maintenance (ha)	1				131.58	131.58
Total					7078.49	
Land						
Land rental(ha)	1	450.00				450.00
ANNUAL TOTAL COSTS (R)						10102.29
ANNUAL TOTAL REVENUE (R)						10058.50
ANNUAL PROFIT (R)						-43.79

Appendix 5: Continued

Policy Analysis Matrix for 1ha Cabbage : Zwelitsha District, Eastern Cape

	Revenue	Production costs						Profit
		Tradable inputs	Domestic factors				Total Domestic factors	
			Unskilled labour ; Family	Unskilled labour ; Hired	Land	Capital		
Private Prices	10058.50	7320.27	202.50	675.00	0.00	14.59	892.09	1846.14
Social Prices	10058.50	7078.49	202.50	675.00	450.00	1696.30	3023.80	-43.79
Divergences	0.00	241.78					-2131.71	1889.93

NPCO	1.00
NPCI	1.03
EPC	0.92
SRP	0.19
DRC	1.01
PC	-42.15

Appendix 6: Budget for Irrigated Maize in Keiskammahoek District, Eastern Cape

The farming system

Location	Keiskammahoek district, Eastern Cape
Practice	Irrigated maize production
Production cycle	12 months
Working hours	8.00
Total maize area (ha)	1.00
Family wage (R/day)	6.00

Activity Calendar

Activity	Time	Fixed input	Family labour (man-days)	Intermediate input
Soil preparation and planting	Aug	contractor		0.05 ton seed
First fertilisation	Oct/Nov	contractor		0.6 ton 2.3.2 fertiliser
Cut -worm control	Oct/Nov	Knapsack		0.005 ton Cutworm bait
Stalkborer control	Nov	Knapsack		0.002 ton Granules
Cultivation	Dec	contractor		
Hoeing	Dec	hoes	25.00	
Second fertilisation	Dec	contractor		0.3 ton LAN
Harvesting	Jun/July		25.00	80 bags
Shelling	July		25.00	

Appendix 6: Continued

Annual fixed input costs

Fixed input	Initial cost (R)	Useful life (Yrs)	Salvage value (R)	Net initial cost (R)
Hoe	25.00	5.00	0.00	25.00
Knapsack	250.00	5.00	0.00	250.00

Fixed input	Days/ha	Days/year	Per ha share of annual use
Hoe	25.00	25.00	0.68
Knapsack	12.00	12.00	0.32

Fixed input	Net initial cost (R)	Capital recovery factor	Share of annual use	Annual capital cost (R/ha)
Hoe	25.00	0.23	0.68	3.93
Knapsack	250.00	0.23	0.32	18.47

Appendix 6: Continued

Annual Total Private Costs

ITEM	QUANTITY	RANDS PER UNIT	TOTAL (R)
Fixed inputs			
Hoes	5.00	3.93	19.63
Knapsacks	2.00	18.47	36.94
TOTAL FIXED COSTS			56.57
Direct labour (days)			
Family labour	37.00	10.00	370.00
TOTAL DIRECT LABOUR COST			370.00
Intermediate inputs			
Seed (kg)	50.00	9.00	450.00
Fertiliser ; 2:3:4 (30) (kg)	600.00	1.23	738.00
LAN	300.00	0.83	249.00
Cutworm bait (ton)	0.01	5084.40	25.42
Stalkborer granules (ton)	0.00	4263.60	8.53
Bags (units)	80.00	2.00	160.00
Water	1.00	45.00	45.00
Contractors: Plough/plant (ha)	1.00	375.00	375.00
Contractor: Transport	1.00	80.00	80.00
TOTAL INTERMEDIATE COST			2130.95
Land (ha)	1.00	0.00	0.00
TOTAL PRIVATE COSTS (R)			2557.52
Annual Total Revenue			
Maize sales (bags)	60.00	60.00	3600.00
Maize consumed (bags)	20.00	60.00	1200.00
ANNUAL TOTAL INCOME (R)			4800.00
ANNUAL PROFIT (R)			2242.48

Appendix 6: Continued

Decomposition of per ha private costs (R)

ITEM	QUANTITY	LAND	DIRECT LABOUR	CAPITAL	TRADABLE INPUTS	TOTAL
Fixed inputs						
Hoes	5.00			19.63		19.63
Knapsack	2.00			36.94		36.94
Total				56.57		
Direct labour						
Family labour	37.00		370.00			370.00
Intermediate inputs						
Seed (kg)	50.00				450.00	450.00
Fertiliser ; 2:3:4 (30) (kg)	600.00				738.00	738.00
LAN	300.00				249.00	249.00
Cutworm bait (ton)	0.01				25.42	25.42
Stalkborer granules (ton)	0.00				8.53	8.53
Bags (units)	80.00				160.00	160.00
Water	1.00				45.00	45.00
Contractors: Plough/plant (ha)	1.00				375.00	375.00
Contractor: Transport	1.00				80.00	80.00
Total					2130.95	
Land						
Land rental	1.00	0.00				0.00
ANNUAL TOTAL COSTS (R)						2557.52
ANNUAL TOTAL INCOME (R)						4800.00
ANNUAL PROFIT (R)						2242.48

Appendix 6: Continued

Decomposition of per ha social costs (R)

ITEM	QUANTITY	LAND	DIRECT LABOUR	CAPITAL	TRADABLE INPUTS	TOTAL
Fixed inputs						
Hoes	5.00			17.22		17.22
Knapsack	2.00			32.41		32.41
Total				49.62		
Direct labour						
Family labour	37.00		370.00			370.00
Intermediate inputs						
Seed (kg)	50.00				450.00	450.00
Fertiliser ; 2:3:4 (30) (kg)	600.00				738.00	738.00
LAN	300.00				249.00	249.00
Cutworm bait (ton)	0.01				25.42	25.42
Stalkborer granules (ton)	0.00				8.53	8.53
Bags (units)	80.00				140.35	140.35
Water	1.00				39.47	39.47
Contractors: Plough/plant (ha)	1.00				328.95	328.95
Contractor: Transport	1.00				70.18	70.18
Total					2049.90	
Land						
Land rental	1.00	600.00				600.00
ANNUAL TOTAL COSTS (R)						3069.52
ANNUAL TOTAL INCOME (R)						4800.00
ANNUAL PROFIT (R)						1730.48

Appendix 6: Continued

Policy Analysis Matrix for 1ha Irrigated Maize, Emerging Farmer - Eastern Cape

	Revenue	Production costs					Profit
		Tradable inputs	Domestic factors			Total Domestic factors	
			Unskilled labour ; Family	Unskilled labour ; Hired	Land	Capital	
Private Prices	4800.00	2130.95	370.00		0.00	56.57	426.57	2242.48
Social Prices	4800.00	2049.90	370.00		600.00	49.62	1019.62	1730.48
Divergences	0.00	81.05					-593.05	512.00

NPCO	1.00
NPCI	1.04
EPC	0.97
SRP	0.11
DRC	0.37
PC	1.30

Appendix 7: Budget for Dryland Maize in Herschel District, Eastern Cape

The farming system	
Location	Herschel district, Eastern Cape
Practice	Irrigated maize production
Production cycle	12 months
Working hours	8.00
Total maize area (ha)	1.00
Family wage (R/day)	6.00

Appendix 7: Continued

Activity Calendar

Activity	Time	Fixed input	Family labour (man-days)	Intermediate input
Soil preparation and planting	Aug	contractor		0.012 ton seed
First fertilisation	Oct/Nov	contractor		0.012 ton 2.3.2 fertiliser
Herbicide application	Oct/Nov	contractor		1.75 L Herbicide
Cut -worm control	Oct/Nov	contractor		0.006 ton Cutworm bait
Stalkborer control	Nov	contractor		0.004 ton Granules
Cultivation	Dec	contractor		
Hoeing	Dec	hoes	25.00	
Second fertilisation	Dec	contractor		0.07 ton LAN, 0.05 ton Urea
Harvesting	Jun/July		25.00	50 bags
Transportation	July	contractor		
Shelling	July		25.00	

Appendix 7: Continued

Calculation of annual fixed costs

Fixed input	Initial cost (R)	Useful life (Yrs)	Salvage value (R)	Net initial cost (R)
Hoe	25.00	5.00	0.00	25.00

Fixed input	Days/ha	Days/year	Per ha share of annual use
Hoe	25.00	25.00	1.00

Fixed input	Net initial cost (R)	Capital recovery factor	Share of annual use	Annual capital cost (R/ha)
Hoe	25.00	0.23	1.00	5.77

Appendix 7: Continued

Calculation of annual private costs (R/ha)

Item	Quantity	Rands per unit	Total (R)
Fixed inputs			
Hoes	5.00	5.77	28.86
TOTAL FIXED COSTS			28.86
Direct labour (days)			
Family labour	75.00	10.00	750.00
TOTAL DIRECT LABOUR COST			750.00
Intermediate inputs			
Seed (ton)	0.01	9576.00	114.91
Fertiliser (ton)	0.13	1596.00	210.67
Herbicide (L)	1.75	32.39	56.68
Cutworm bait (ton)	0.01	5084.40	30.51
Stalkborer granules (ton)	0.00	4263.60	17.05
Bags (units)	50.00	2.00	100.00
Contractors (ha)	1.00	60.00	60.00
TOTAL INTERMEDIATE COSTS			589.83
Land (ha)	1.00	0.00	0.00
TOTAL PRIVATE COSTS (R)			1368.69
Annual Total Revenue			
Maize sales (bags)	35.00	60.00	2100.00
Fodder (bags)	15.00	60.00	900.00
ANNUAL TOTAL INCOME (R)			3000.00
ANNUAL PROFIT (R)			1631.31

Appendix 7: Continued

Decomposition of per ha private costs (R)

Item	Quantity	Land	Direct labour	Capital	Tradable inputs	Total
Fixed inputs						
Hoes	5.00			28.86		28.86
Direct labour						
Family labour	75.00		750.00			750.00
Intermediate inputs						
Seed (ton)	0.01				114.91	114.91
Fertiliser (ton)	0.13				210.67	210.67
Herbicide (L)	1.75				56.68	56.68
Cutworm bait (ton)	0.01				30.51	30.51
Stalkborer granules (ton)	0.00				17.05	17.05
Bags (units)	50.00				100.00	100.00
Contractor (ha)	1.00				60.00	60.00
Total					589.83	
Land						
Land rental	1.00	0.00				0.00
ANNUAL TOTAL COSTS (R)						1368.69
ANNUAL TOTAL INCOME (R)						3000.00
ANNUAL PROFIT (R)						1631.31

Appendix 7: Continued

Decomposition of per ha social costs (R)

Item	Quantity	Land	Direct labour	Capital	Tradable inputs	Total
Fixed inputs						
Hoes	5.00			25.32		25.32
Direct labour						
Family labour	75.00		750.00			750.00
Intermediate inputs						
Seed (ton)	0.01				114.91	114.91
Fertiliser (ton)	0.13				210.67	210.67
Herbicide (L)	1.75				56.68	56.68
Cutworm bait (ton)	0.01				30.51	30.51
Stalkborer granules (ton)	0.00				17.05	17.05
Bags (units)	50.00				87.72	87.72
Contractors (ha)	1.00				52.63	52.63
					570.18	
Land						
Land rental	1.00	100.00				100.00
ANNUAL TOTAL COSTS (R)						1445.50
ANNUAL TOTAL INCOME (R)						3000.00
ANNUAL PROFIT(R)						1554.50

Appendix 7: Continued

Policy Analysis Matrix for 1ha Dryland Maize, Emerging Farmer - Herschel, Eastern Cape

	Revenue	Production costs						Profit
		Tradable inputs	Domestic factors					
			Unskilled labour ; Family	Unskilled labour ; Hired	Land	Capital	Total Domestic factors	
Private Prices	3000.00	589.83	750.00		0.00	28.86	778.86	1631.31
Social Prices	3000.00	570.18	750.00		100.00	25.32	875.32	1554.50
Divergences	0.00	19.65					-96.46	76.81

NPCO	1.00
NPCI	1.03
EPC	0.99
SRP	0.03
DRC	0.36
PC	1.05