A DESCRIPTIVE ANALYSIS OF EMPLOYMENT TRENDS IN SOUTH AFRICAN AGRICULTURE

N. Vink and J.F. Kirsten[1]

The article discusses the trends in farm employment over time in South Africa. This is followed by the presentation of six case studies of specific commodities and regions with the view to establishing the potential employment effects of various changes in the policy environment. The article ends with an assessment of selected aspects of the wider environment within which the sector operates, to ascertain the extent to which such policy shifts are feasible, i.e. whether the measured effects in employment generation are likely to happen.

'N BESKRYWENDE ANALISE VAN TENDENSE IN INDIENSNAME IN DIE SUID-AFRIKAANSE LANDBOU

Die artikel bespreek die tendense in landbou-indiensname in Suid-Afrika oor tyd. Dit word gevolg deur die bespreking van ses gevallestudies van spesifieke kommoditiete en streke met die doel om die moontlike indiensname effekte van beleidsveranderings te bepaal. Die artikel eindig met 'n analise van die omgewing waarbinne die landbou opereer om te bepaal tot watter mate sulke beleidsveranderings moontlik is en daardeur vas te stel of die effek op werkskepping in die landbou wel sal plaasvind.

1.   INTRODUCTION

South Africa has adopted a macroeconomic strategy (GEAR) whose purpose, among others, is to increase the level of employment in the economy, and to move the economy to an export orientation. Agriculture, as a primary sector, has traditionally played an important role in South Africa despite the presence of a large mining sector. Even today, it plays a central role in growth, and it contributes more than 10% of formal employment opportunities. The sector has, by all measures, relatively large linkage effects with the rest of the economy, and is a major earner of foreign exchange. However, while agriculture has experienced relatively high rates of growth over the past century, fuelled mainly by healthy productivity growth in the past two decades (Thirtle *et al,* 1993), the sector has experienced a conventional secular decline, and today contributes less than 5% of GDP and a lower proportion of

---

[1] *Respectively Chair: Department of Agricultural Economics, University of Stellenbosch and Chair: Department of Agricultural Economics, Extension and Rural Development, University of Pretoria. Comments from two anonymous referees are acknowledged with thanks.*

employment than the average of other countries at a similar level of development (Lipton, 1996).

The resources used in agriculture, including natural, human and material resources, have an opportunity cost as they can potentially be deployed in more productive activities elsewhere. Any further investment in the sector also means that more resources are allocated away from activities that may be able to contribute even more to achieving the aims of GEAR. The purpose of this article is, therefore, to assess whether the employment benefits of increased investment in agriculture are potentially high enough to warrant further stimulation of the sector. This is a partial view only, as the focus here is on the numbers of employed, rather than on the quality of the jobs that are created.

The article is divided into three parts. First, the trends in farm employment over time are analysed. Second, case studies of specific commodities and regions are assessed with respect to the potential employment effects of various changes in the policy environment. Third, an assessment is made of the wider environment within which the sector operates, to ascertain the extent to which such policy shifts are feasible, i.e. whether the measured effects in employment generation are likely to happen.

2.   LONG TERM TRENDS IN FARM SECTOR EMPLOYMENT

Figures 1 and 2 below show the long term secular decline in farm employment in South Africa, while Table 1 shows the most recent macro level data. The data presented in the Table show that the sector shed about 150 000 regular employees between 1985 and 1993, and about 120 000 casual and seasonal workers between 1985 and 1992.

The most recent employment data available are those gleaned from the October Household Survey. These have been converted to 'full time equivalent' employment opportunities by Klasen and Woolard (1999)[1], and show agricultural employment to have increased 1 226 886 in 1994 to 1 229 514 in 1995. These data are not comparable with those in Table 1, as they include the forestry and fisheries sectors. Nevertheless, they do show that farm sector employment has at the least not continued to decline, and may even have increased in recent years.
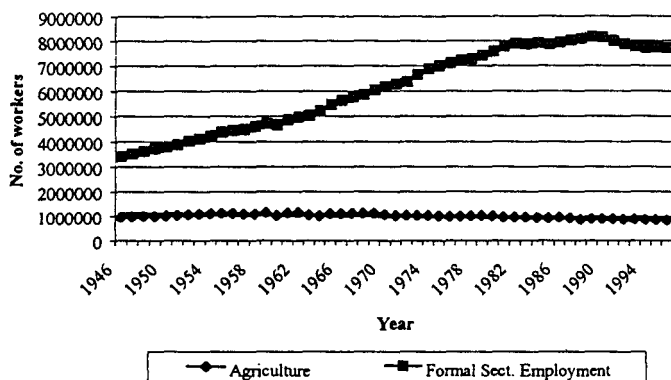
Figure 1:   **Formal sector employment in South Africa, 1946-1996**

Source: Development Bank of Southern Africa (Standardised Employment Series of South Africa)

Note: Forestry and fishery workers are included under 'agriculture', while domestic workers on farms are excluded.
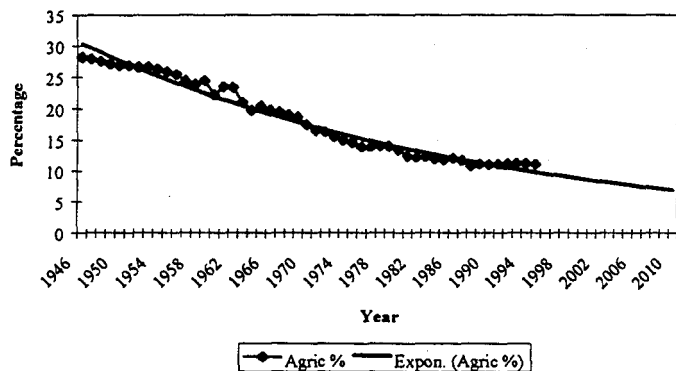

Figure 2:   **Agricultural sector employment as a percentage of formal sector employment, 1946-2010**

Source: Development Bank of Southern Africa (Standardised Employment Series of South Africa)

Notes: The trend line was estimated by regression analysis using ordinary least squares. The equation of the trend line was estimated by the function: $Y=31047e^{-0.0231x}$. The corresponding regression co-efficient of determination is $R^2 = 0.9227$.

Table 1:   Farm employment in South Africa

	1985	1986	1987	1988	1990	1991	1992	1993
Regular employees	807341	816660	795283	724439	728414	702323	656772	647839
Casual and seasonal employees	516411	534781	559230	495209	456262	413239	394425	491588
Total paid employees	1323694	1351558	1354624	1219648	1184676	1115562	1051197	1139427

Figures 3 and 4 show trends in the employment of regular vs. casual and seasonal employees. The data show the successive structural shifts in the employment trends over this period (see also Van Zyl *et al*, 1987). Employment (both permanent and seasonal) increased with the introduction of tractors in the period after the Second World War, then declined with the introduction of mechanised harvesting of grain crops from the late 1960s. This latter trend can be seen in the sharper drop in seasonal employment during this period. Thereafter, both categories show a decline.

Regular employment seems to have shifted to a different trend line in the period after deregulation started having an effect on the sector, namely the mid-1980s. Table 1 shows an increase to 1986, after which it dropped sharply to 1991, and then less sharply thereafter. In all likelihood these trends are the result of the severe drought of the early 1990s, and the beginning of the current period of more sustained economic growth.
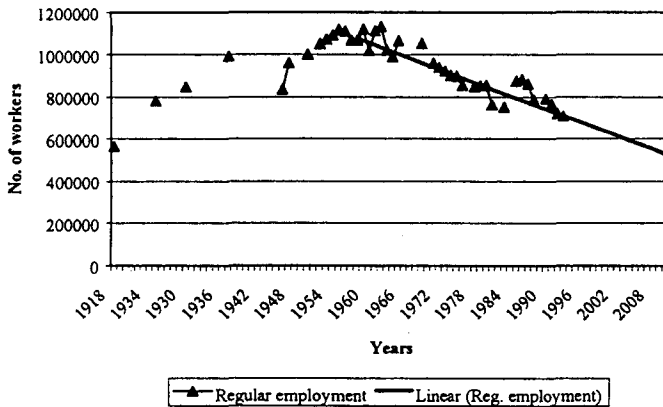

Figure 3:   The trend in regular employment in agriculture, 1918-2010

Source: CSS, various years

Notes: Regular employment includes: Regular workers + Domestic workers on farms + Working owners (working owners are assumed to equal the number of farms, while family members are not included). Regular employment was forecast by fitting a linear trend line. This was calculated by regression using ordinary least squares method for the period 1958-2010. The following function was applied: $Y = -10501x + 1000000$. The corresponding regression co-efficient of determination is $R^2 = 0.8574$.
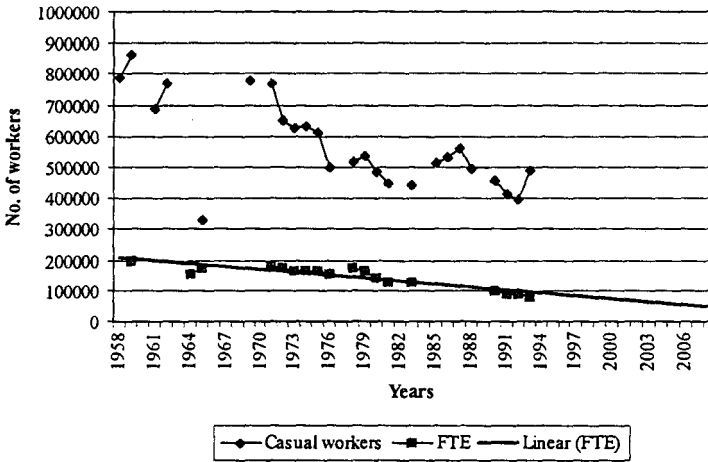
Figure 4:   **Casual employment in agriculture: 1958 – 2010**

Source: Agricultural Census/ Agricultural Survey

Notes: Data on casual employment in the agricultural sector was too variable to fit any trend line. When casual employment was converted into full time equivalent units (for the years it was possible) the variability was reduced. The FTE was calculated as follows: FTE = total casual cash labour income/ cash income per regular worker. The FTE series trend was forecast by regression analysis using ordinary least squares. The function used was: $Y = -322.2x + 212361$. The corresponding regression co-efficient of determination is $R^2 = 0.8271$. This trend should be considered with circumspection given the limited number of actual data points available.

Seasonal employment increased to 1987, then dropped sharply to 1992, and then showed an increase in 1993 which was sufficiently large to cause an increase in overall employment in the sector. The category of casual and seasonal employees is notoriously difficult to estimate, so that this increase may be no more than a measurement error. On the other hand, the large increase in exports of fruit (the sector that is the largest user of casual and seasonal labour) that was experienced during this period may have resulted in an increase in jobs.

Table 2: The provincial composition of the farm labour force, 1993

Province	Regular employees[1]	%	Seasonal and casual labour	%	Value added, 1991	%	Value added per ha arable land, 1991
Western Cape	104615	16,15	98334	20,00	2489913	18,27	217,14
Northern Cape	29721	4,59	46248	9,41	598421	4,39	20,57
Free State	93499	14,43	68500	13,93	2051167	15,05	175,69
Eastern Cape	46476	7,17	58107	11,82	1280211	9,39	88,18
KwaZulu Natal	122103	18,85	43402	8,83	2456458	18,03	342,66
Mpumalanga	96260	14,86	48214	9,81	1994793	14,64	356,49
Northern Province	62720	9,68	60396	12,29	1033394	7,58	114,61
Gauteng	27286	4,21	7016	1,43	589204	4,32	760,98
North West	65159	10,06	61371	12,48	1133418	8,32	117,71
Total	**647839**	**100,00**	**491588**	**100,00**	**13626978**	**100,00**	**137,73**

Note: [1] Excludes proprietors, tenants and family members involved in the farming operation (these categories made up about 10% of regular employees)

Source: CSS, 1993; DBSA data files.

Table 2 shows the provincial distribution of the farm labour force. KwaZulu Natal, Mpumalanga and the Western Cape are the largest employers of regular workers, and the Western Cape, KwaZulu Natal and the Free State the largest employers of regular and seasonal labour. As expected, Gauteng records the highest value added per hectare, followed by Mpumalanga, KwaZulu Natal and the Western Cape.

Table 3 in turn shows the average employment intensities of the main branches of farming in the country.

Table 3: The employment intensity of agriculture

Sector	Hectares under production per permanent employee
Horticulture	12,97
Field crops	33,64
Mixed farming	98,15
Animal production	188,77

Finally, an econometric study by Townsend (1997) confirms the trends discussed above. He shows a remarkably close relationship between the ratio of machinery to labour and the price of labour relative to the price of machinery after 1950. In the first few years after the end of the Second World War, the arable area was being extended, which led to increased use of labour (especially since harvesting was not mechanised) as well as machinery. Then for three decades, the price of machinery fell relative to the price of labour, and the machinery labour ratio rose. After the abolition of favourable credit and tax policies labour use increased as it was substituted for expensive capital.

This study also measured the effects of policy distortions on employment in agriculture, including factor price ratios and those variables that affect the factor-saving biases, such as farm size, real interest rates and tax concessions. Through a number of tests it was determined that average farm size, research and extension expenditures, favourable tax and interest rate policies as well as other non-price factors such as public goods and macro-economic policies contributed to the strong machinery-using bias of technological change. The results show that government policies skewed the allocation of R&D expenditure towards labour saving technical change, which was hardly appropriate for a labour-surplus economy. The processes described here were largely responsible for the shedding of labour from agriculture and the increasing reliance on capital equipment in the production process during the

three decades up to the middle eighties. In a later section we show how current labour policies could again make labour more expensive, leading to a further increase in the capital labour ratio.

3.   THE EMPLOYMENT RESPONSE TO POLICY SHIFTS IN SOUTH AFRICAN AGRICULTURE

Michael Lipton (1996) argues from the international evidence on the farm size-efficiency relationship that an increase in physical output per hectare (yield) resulting from smaller farms will lead to an increase in farm and off-farm labour use per hectare. The extent of this greater labour intensity on these more efficient small farms will depend on the supply elasticity of labour, as the more inelastic the labour supply, the higher wages need to be to induce workers into that sector.

If agriculture is reformed by means of the establishment of small family farm operators, for example, the farm labour force will increase because of the larger number of farm operators as well as the larger number of workers that they require. How many more jobs are created will then depend on the supply elasticity of wages. If labour supply is inelastic, the remaining large farms will bid up wages, making hired work more profitable to small part-time family farmers who allocate a part of household labour to wage work. This will make the small farms relatively less efficient, and negate the benefits from the increased labour use intensity of small farms.

Technical change that benefits small farmers could counter this trend by inducing small farmers to use more labour, if these new technologies bring economic benefits. However, unless technical change also induces large-scale farmers to follow more labour using practices, there may be no employment growth. Large-scale farmers will only replace machinery with additional workers if the unit cost of labour decreases. This cannot be accomplished by lowering wages, as it will lead to adverse selection problems (they will not be able to bargain for the better-skilled workers). Therefore, unless profitable labour-using technologies are simultaneously available to large-scale farmers, they will become more capital-intensive.

What this implies is that land reform on its own may have adverse consequences for the creation of rural livelihoods. Land reform must be accompanied by the availability of labour using technologies for both small family farmers and for large scale commercial farmers; by efforts to improve the skills of farm workers and small family farmers; and by access to markets,

i.e. by Lipton's 'four reforms,' if it is to be accompanied by greater employment.

Most of these reforms are being planned and implemented in South Africa. In the case studies below, evidence of their effect on farm employment is drawn from individual case studies for different commodities, different modes of production and different regions of the country. To the extent that this is feasible, this evidence is extrapolated to the country as a whole to provide some idea of the likely direction of employment trends in the future.

Case study 1:   Policy shifts and farm employment in the Western Cape

During the late 1980s Van Zyl modelled the South African maize industry in order to ascertain the welfare effects of a range of macro and micro policy shifts (Van Zyl, 1989a; 1989b). The effects of changes in the structure of production and of changes in the marketing regime on employment in the sector were also modelled. The results showed that, under the then controlled marketing system, total employment in the sector would decrease if land were shifted from commercial production to small farms, even under a successful farmer support programme. However, total employment would increase if the marketing system were liberalised. This increase in employment consisted of a decrease in employment in the commercial farming sector that was, however, overshadowed by an increase in employment in the small farm sector.

A similar algorithm was used to model agriculture in the Western Cape (Vink *et al.*, 1996 and Van Zyl *et al.*, 1997). This model was based on the 1988 agricultural census data, the most recently available at the time[2]. Again, this serves as a handy test of the validity of the results, as the predicted outcome, namely an increase in employment, seems to have been realised after the (limited) deregulation of the wheat sector. The employment effect of all ten policy scenarios analysed was positive, as is shown in the Table 4 below.

The mechanism that explains these employment effects is the same for each of the scenarios. A shift in any of the policies mentioned will result in a decline in the price of the commodity with the most distorted price. In the case of the Western Province this will be the cereal crop, and principally wheat because of its dominance. Even where the assumption of a closed economy is made, internal market liberalisation will result in a pricing strategy that has to follow the world price more closely. The drop in the wheat price will lead to a decline in the production of wheat, and a (partial) reallocation of resources to sectors such as dairy and wool production. Increased output of these

commodities will lead to a decline in their output prices in a competitive environment. As these sectors are more labour-intensive than wheat production, total farm employment in the province increases. While the extent of the production effects varies widely according to whether imports are possible or not, the predicted employment effects fall within a relatively narrow range. These results are summarised in row 1 of Table 7 below.

Table 4:   Farm employment effects in the Western Cape

	Scenario	Employment effect (%)[1]
1	Internal market liberalisation with effective barriers to imports	7,5
2	As scenario 1, with a 20% reduction in transport costs (e.g. better infrastructure)	7,7
3	As scenario 1, with 'voluntary' land reform[2]	8,1
4	As scenario 1, with 'forced' land reform[3]	10,6
5	Internal market liberalisation, external trade liberalisation and 'voluntary' land reform	8,2
6	Internal market liberalisation, external trade liberalisation and 'forced' land reform	10,8
7	As scenario 1 with a 20% reduction in transport costs and a 5% increase in interest costs	8,1
8	As scenario 1 with a 20% reduction in transport costs and a 5% decrease in interest costs	7,5
9	Internal and external market liberalisation, with a 5% increase in interest costs	7,5
10	Internal and external market liberalisation, with a 5% decrease in interest costs	6,9

Notes: [1] As a percentage of current employment
          [2] Where small farms compete in the market for resources
          [3] Where 30% of the land under each commodity type is allocated to small farms.

The principle shortcoming with the version of the model used here was its rather rudimentary treatment of the horticultural sector, which of course is the main employer in Western Cape agriculture (see Case study 3 below). The principle strength is its realistic portrayal of what already seems to have happened, namely an increase in employment in the Western Cape resulting from deregulation of the internal market for wheat, red meat, eggs and dairy products.

Case study 2: Wheat systems in the Western Cape

The increase in farm employment predicted by this model is historical to the extent that it has resulted from internal market deregulation. The model also predicts an increase in employment resulting from land reform. Eckert (1996) synthesised a small farm option for the wheat industry in the Western Cape, and considered the net employment effects in primary production as well as in the related upstream and downstream industries.

In this calculation, land is taken out of commercial production on farms of 600-800 hectares using full input, continuous wheat technologies and reallocated to small farms of between 27 and 55 hectares. These small farms will provide livelihoods for between 18 and 28 households per 1000 hectares. However, around 10 livelihoods per 1000 hectares will be lost from the commercial farming sector. The resulting low input mode of production will have a negative effect on employment opportunities, with an estimated loss of 10,8 to 14,9 jobs per 1000 hectare allocated to the small farms. In addition, the lower farm incomes and possibly higher commodity prices could have negative income multiplier effects that could lead to a further loss of jobs in the wider economy. These results are, of course, not applicable to new land brought under wheat production. However, it is hardly likely that new plantings of wheat will be encouraged in the Western Cape.

The model of Van Zyl discussed above is not able to capture these multiplier effects, hence the more optimistic result in terms of employment creation. These results are captured in row 2 of Table 7 below.

Case study 3: Deciduous fruit in the Western Cape

De Klerk (1996) and Conradie *et al.* (1996) have analysed the prospects for small-scale farmers in pear and apple production respectively. Both come to the conclusion that small farm options are feasible, but that they will not contribute to the creation of new livelihoods, except to the extent that these represent the establishment of new orchards.

Nevertheless, job creation from small farm activities are likely to form only a small part of employment trends in the fruit industries of the Western Cape. Table 5 shows the results of an extrapolation of recent trends in these industries. A growth of 28% in employment is expected, given industry estimates of the effect of current trends in orchard and vineyard establishment. The results are extrapolated in row 3 of Table 7 below.

Table 5:   Employment trends in the fruit industry

	Employment[1]		
	1996 (Number)	2010 (Number)	Index
Fresh fruit	47223	70442	149
• Pome	19 650	22 408	114
• Stone	6 090	10 349	170
• Table grapes	17 500	30 165	172
• Citrus	3 983	7 500	188
Canning fruit	32 192	42 104	131
Wine grapes	43 186	44 068	102
Total:	122 601	156 594	(128)

Note: [1] Regular employees only. Assumes that labour use per hectare and yield per hectare remains constant.
Source: Kleynhans *et al*, 1997

Case study 4:   The effect of changes in water policy

Vink and Van Zyl (1997) used the model discussed in case study 1 above to predict the effects of different water allocation policies on agriculture in the Western Cape. An advantage of this model was the increased realism in the treatment of the deciduous fruit industry. The results are shown in Table 6 below.

Table 6:   Farm employment effects in the Western Cape

	Scenario	Employment effect (%)[1]
1	A 10% decrease in the amount of water available for irrigation.	-3,56
2	A 30% decrease in the amount of water available for irrigation.	-13,40
3	A 50% decrease in the amount of water available for irrigation.	-31,20
4	All water tariffs brought to the highest existing tariff, then doubled.	0
5	All water tariffs brought to the highest existing tariff, then tripled.	4,3

Source: Vink and van Zyl, 1997

The sequence of the argument starts with the availability of water. In the first three scenarios, the stock of water is decreased. The first reaction of the model is to reallocate water to its highest and best use. However, because water is less

available, some amounts of other resources such as land are left idle. So, for example, one would expect that water will be reallocated from wheat under irrigation to higher value fruit. The land that was being used for the less valued irrigation crops will be left idle, as there is not enough water for it to be kept under irrigation. It is then reallocated to uses that do not require water, such as dryland field crop production and extensive livestock production.

The effect on welfare and employment are fairly predictable, and disastrous. Further, as production shifts from intensive to extensive industries, the labour intensity of agriculture also declines, as can be seen by the decline in employment.

Changes in water tariffs, however, have a very different effect than limitations in total water availability. When all water throughout the province is priced at the level of the highest existing tariff, and all tariffs are then doubled, there is little economy-wide effect on output, prices, welfare or employment. There is, however, some evidence of a reaction by farmers when this procedure is repeated with a tripling of the highest tariff. The changes are also not quite the same as in the case of the lower availability of water. In this case, field crop production and extensive livestock production also increases, while vegetable and intensive livestock output decreases. However, fruit production, and specifically apple and pear production, increases.

The reasoning for these changes starts with the effect of the higher tariff. Water is switched from lower to higher value irrigation crops (in this case apples and pears), while some land is taken out of irrigation production because the higher tariff increases the cost of irrigation to the extent that it is no longer profitable. There is an increase in employment, most of which can be ascribed to the increased apple and pear production, as it is more labour intensive than the other sectors that show output increases.

However, the model assumes that farmers will not change their production practices, i.e. they will continue to use the same amount of water, which is clearly unrealistic. In line 4, Table 7, the net employment effect of changes in water prices is, therefore, given as zero.

Case study 5: Commercial agriculture in KwaZulu-Natal.

Lyne & Ortmann (1996) investigated the effects of a change in the distribution of farm size on the potential of commercial farm land in KwaZulu-Natal to create additional livelihoods. Farm household models were constructed for representative farms in each homogenous farming region.

The study presents estimates of aggregate farm employment in commercial agriculture in response to the proposed reforms. The estimates suggest major growth in the number of farms and the use of family labour as more land transfers from large to small farmers. However, this gain is achieved largely at the expense of hired workers and supervisors. The net result is a modest increase (6,8%) in the level of employment on farms. To compound their unfavourable prediction, job opportunities in related sectors may be adversely affected by an overall decline in the volume of farm products and non-labour inputs traded. They conclude that the implication is that land redistribution is unlikely to produce a significant net increase in the number of employment opportunities. The result is shown in line 5 of Table 7.

Case study 6:   *Dryland maize production and extensive animal production in a semi-arid region (Northern Province)*

A similar study by Kirsten (1996) estimated the employment potential of rural reform in the semi-arid region of the Northern Province. One particular magisterial district was selected as case study area and it was found that once again there is a modest potential gain of 10,8% in the number of livelihoods. However, when the current number of hired work years are taken into account, net livelihoods created through a process of rural restructuring would only increase by 1,1% if the quality of the livelihoods created is compromised. However, if it is accepted that households will have other sources of income, the estimate remains valid. When higher household income is assumed (to partly account for agricultural risk) the livelihoods created drop considerably. Raising the household income target to R20 000, for example, results in a loss of 6.5% of current livelihoods.

The results of this study confirm the limited capacity of semi-arid regions to create additional livelihoods through agricultural intensification. According to the results it seems that land reform will only benefit or displace current farm workers and that the majority of potential beneficiaries will still be deprived of a sustainable livelihood in agriculture. When risk, which is a reality in semi-arid regions, is included in these models the potential for employment creation in agriculture through rural reform is much lower and in most cases negative.

Table 7 below summarises the results of these case studies. Table 7 is a somewhat simplified and heroic summary of the case studies presented in this section. What the case studies confirm is that, in the absence of the 'four reforms', there is little scope for increasing employment in

Table 7:   Summary of the employment effects in agriculture

Case	Region	Commodity	Micro employment effect (%)[1]	Macro employment effect (%)[2]	Cumulative effect (%)[3]
1	Western Cape	All	+ 6 to 11	<1[4]	<1
2	Western Cape	Wheat systems	Negative	Negative	0
3		Fruit	28	7[5]	7
4	Western Cape	All	0 to -31,2%	0	7
5	KwaZulu-Natal	Cattle Timber Sugar-cane Bananas	+6,8%	Negative	6
6	Northern Province	Cattle Maize Oilseeds	+1-10.8	<1	6

Notes: [1]   The measured effect in the region or for the commodity under discussion
   [2]   The micro effect extrapolated to the national level
   [3]   A heroic attempt to add up the macro effects. Reflected as a once-off increase, but likely to occur over some 20 years
   [4]   The model 'predicted' an increase in employment which has, at least partly, already taken place (see text). Some allowance is made for further increases in employment resulting from land reform.
   [5]   Based on the 25% contribution of horticulture to the gross value of agricultural production.

agriculture. The bulk of the measured increase illustrated in the Table comes from the fruit export industries, mainly focused on the Western Cape. For the rest, there seems to be little prospect for increasing agricultural employment in the rural areas of South Africa unless the pattern of farm production is changed radically.

4.   POTENTIAL SHIFTS IN PRODUCTION PATTERNS

There exists a range of factors that could potentially change the pattern of production in South African agriculture radically. Three of these are discussed here, namely the way in which the resource base of the country is exploited; policy influences that revolve around the implementation of GEAR; and the influence of global market trends.

4.1   The resource base determines possibilities

South Africa's natural potential for agricultural production, and the extent to which this is being exploited, can be illustrated by means of comparison with some of our neighbours in Southern Africa.

First, South Africa has a relatively poor natural resource base for crop and horticultural production. In terms of physical size, for example, South Africa is second only to Angola in Southern Africa, while Angola, Mozambique, Tanzania and Zambia have more arable land than South Africa. Furthermore, less than 20% of South Africa's total agricultural land is potentially arable, compared to Angola (25%), Mozambique (52%), Tanzania (51%) and Zambia (34%).

Second, the potential for expansion in crop and horticultural production is relatively limited compared to other parts of the SADC region. South Africa already uses some 80% of its arable agricultural land, compared to Angola, Mozambique, Tanzania and Zambia (who all have more arable land than South Africa). These countries all use less than 20% of their potentially arable land at present.

Third, the arable resources of South Africa are relatively poor. Half our arable resource is of medium potential, and 78% of medium to low potential. Further, the prime arable land is geographically concentrated, with 90% of the high potential arable land found in two regions, roughly coinciding with the Mpumalanga and KwaZulu Natal provinces. The medium potential land is more evenly distributed, with the Free State, Mpumalanga and North West provinces jointly making up 62% of this category.

Fourth, although there is limited scope for horizontal expansion of crop and horticultural production in South Africa, some provinces use relatively fewer of their resources than others. At the one extreme, the Western Cape seems to have reached the limits of its horizontal expansion potential, while the Northern Province uses less than 50% of its available arable land. The growth potential for crops and horticultural products, however, depends on vertical as well as horizontal expansion. Clearly there is considerable scope for vertical expansion in the commercial farming areas as well as the former homeland areas. This is especially relevant for horticultural products, which are relatively less land using than either crop or livestock production.

Finally, South Africa is a net importer of red meat, despite the relatively abundant grazing resources at our disposal.

This analysis of the agricultural resource base shows that there is a limited potential for horizontal expansion in crop and horticultural production in South Africa, and some potential for vertical expansion through cropping pattern, area or yield effects. The latter includes a relatively large potential for increased production in the former homeland areas, as well as some of the commercial farming areas, especially if export markets can be penetrated. This aspect is especially true for those areas with the highest natural potential, namely KwaZulu-Natal and Mpumalanga. A greater export orientation in these provinces will lead to an increase in employment opportunities in agriculture.

4.2   Domestic policy changes

Macroeconomic policy

The distortions in the cost of capital caused by macroeconomic policies of the past have had a negative impact on job creation in agriculture. However, most of these negative influences have been neutralised over the past years, as the sector has become more deregulated. This includes a return to positive real interest rates and the abolition of many of the tax concessions that farmers received. Taken together with the high real rates of interest in the economy, it is clear that the cost of capital has increased considerably. This lack of bias against the use of more labour intensive technologies has a potentially positive impact on farm employment.

Further, the aims of South Africa's macroeconomic policy, as enunciated in the GEAR, include a strong emphasis on an export oriented strategy. A range of supply side measures in support of existing and new exports have been implemented to ensure that this happens. Although the emphasis is on the export

of manufactured goods, the underlying aim is to capture the benefits of any value adding activities, including those in agriculture. This will have a positive influence on employment in agriculture.

Agricultural marketing policy

The new Marketing of Agricultural Products Act, No 47 of 1997 has resulted in the deregulation of the agricultural sector. The case for a liberalised system rests on the argument that farmers will be rewarded according to the contribution they make to the national economy, and that it is not possible to raise their income above this level through intervention in the forces of supply and demand for any sustained period. Further, it is argued that the forces of competition will sort out any inefficiencies in the marketing chain. As far as export markets go, it is accepted that collusion can increase the price received by farmers, but that this will be at the expense of the volume of sales, and will lead to market inefficiencies. In the South African circumstances, it is also clear that a greater export orientation could lead to an increase in employment in agriculture, and that a deregulated sector could provide greater export opportunities.

Labour policies

A recent publication by the IDC (IDC, 1997) shows that the South African manufacturing sector has not yet been able to recover from almost two decades of declining employment despite the positive real rate of economic growth of the past four years. Some commentators have attributed this to rigid labour laws such as the Labour Relations Act (and the possibility of extending certain clauses to small business) and the Basic Conditions of Employment Act.

It is clear that, with poor labour productivity, limitations on the flexibility of labour use can have a negative effect on the labour absorption capacity of the economy, and especially in the SME and farming sectors. In addition to the existing labour legislation, there is also anecdotal evidence that legislation such as the Land Reform (Labour Tenants) Act and the Extension of Security of Tenure Act could have a negative effect on employment levels in agriculture.

Adherence to the stipulations of labour legislation, labour tenant issues, deteriorating security conditions and several other labour and land reform related issues have in many ways increased the costs of farm labour. Whether

this has been at the expense of employment opportunities is, however, less clear, especially as the cost of capital has also increased during this period.

4.3   The influence of the global trading environment

Under the General Agreement on Tariffs and Trade (GATT), member countries embarked on a series of 'rounds' of trade negotiations that ended with the final agreements of the Uruguay Round, signed in Marrakech in 1994. At this point, the World Trade Organisation (WTO) was created in a delayed recognition of the important contribution that international trade makes to global prosperity. The agreements reached under the Uruguay Round were the first real advances in reaching agreement on the need to liberalise global agricultural trade.

The signing of the Marrakech Agreement resulted in a considerable advance in the liberalisation of world trade, but not in a free trade regime. South Africa's farmers and food processors, therefore, face competition in a world where the rules favour their competitors, although this bias is expected to decrease over time. In addition, the South African government has revealed its own priorities by successfully applying for membership of the Cairns Group. The original aim of this group was to lobby for the maximum degree of liberalisation under the Uruguay Round negotiations. It is safe to conclude that the outcome of those negotiations would have been even less favourable for the member countries if they had not joined forces in this manner. Further, the Group aims to push for an even greater degree of liberalisation of trade in farm and farm based commodities (i.e. including processed goods) in the forthcoming round of negotiations under the WTO, although it has stated explicitly that member countries will continue unilaterally to deregulate their domestic industries, remove subsidies and lower tariff protection at a pace that is not necessarily connected to a new round of agreements.

The second important influence on global trade is the increasing trend towards the creation of regional trading blocs. The best known of these include the European Union, the North American Free Trade Area, Mercosur, the Association of South East Asian Nations, and closer to home, the Southern African Development Community and the Southern African Customs Union, the oldest surviving customs union in the world. More recently, initiatives such as the Free Trade Area of the Americas and the Asia Pacific Economic Co-operation Forum have made rapid progress in fostering regional integration.

These new experiences with the feasibility of different types of regional arrangements bode well for Southern Africa. Sceptics have argued that, because South Africa dominates the economies of both SACU and SADC, it is impossible to deepen ties while simultaneously broadening membership. Their argument is strengthened by the failure of numerous attempts at regional integration in different parts of Africa. However, experience from elsewhere shows that there is no reason why SADC, for example, cannot succeed given the necessary political commitment.

Given the necessary political commitment, SADC stands a good chance of succeeding in creating a more liberal trading regime between its member countries. This will include freer trade in farm products. Some countries in the SADC region have more and better quality natural resources than does South Africa. South Africa has, in turn, substantially decreased the level of protection of its agricultural sector. This has resulted in a relative decline in the production of field crops (at least to the extent that there are fewer, and smaller, surpluses available for export). Hence, there is a possibility that South Africa will, over time, become an importer of farm products such as grain staples.

These changes will not take place overnight, nor do they necessarily imply that South Africa, or the region as a whole, will become a net importer of these commodities. In the maize industry, for example, it is possible that yellow maize will be imported, and used to add value through livestock production. In the shorter term, the main activity will probably be in trade between adjacent regions and in investment in the agro-processing sector in the region by South African firms. This could lead to greater trade in processed foods, i.e. in greater South African imports of processed foods. In the longer term trade will be influenced by political stability in individual countries, and the degree of investment in the infrastructure required to bring the vast unused potential of the region into production.

These changes will have a material effect on South African agriculture. However, it is not clear what will happen to the 'surplus' natural, human and physical resources that are left behind in South Africa. Conventionally, these resources will move out of agriculture as part of the natural secular decline in the sector that takes place as a country develops. However, South Africa does have a revealed comparative advantage in farm exports, and can build its competitive advantage in this arena. The extent to which human skills (managerial, technical, etc.) are transferred out of wasteful or relatively uncompetitive activities, and to the export sector, will depend on a range of factors.

5.   SUMMARY AND CONCLUDING COMMENTS

We have argued in this paper that the decline in the number of jobs provided by the South African agricultural sector over the past decades has been exacerbated by bad policies that inhibited export opportunities, discouraged the development of labour saving technology, and actively encouraged the adoption of capital intensive farming practices.

Two phases of reform have changed the way in which the agricultural labour market works. During the 1980s a process of deregulation was put in motion which has the potential of at least arresting the decline in employment in the sector. This has been followed by a number of reforms in the land and labour market that have been aimed at creating a more equitable agricultural sector. We have shown that, in the absence of the concomitant 'four reforms', these will not lead to an increase in employment opportunities. They may, in fact, lead to a net loss of rural jobs through the multiplier effects of agriculture.

In this respect, our analysis follows Mellor (1986) who argues that there is a strong case for neglecting the role of agriculture in economic development unless the following three questions can be answered positively:

- Can agricultural production be increased by means of advances in resource productivity?
- Can effective demand for agricultural commodities expand apace with accelerated agricultural growth?
- Can a dynamic agriculture provide an effective demand 'pull' for growth in other sectors?

In the South African case the evidence (Thirtle *et al.*, 1993) is positive with respect to the first question. However, we have also shown (Townsend, 1997) that productivity growth was gained by the adoption of labour-saving techniques, with the result that the second question cannot be answered positively at present. As the elasticity of demand for food is low, food prices will fall with production increases unless total demand can be increased. This is only possible if consumer prices fall and if employment increases. In South Africa consumer prices of food have not decreased along with the real decline in producer prices, and the country has had little success in creating jobs in either the agricultural sector or the economy at large over the past few decades.

The third question is more difficult to answer for the South African case. Numerous studies (e.g. Van Zyl and Vink, 1988; Townsend, 1997; Eckert *et al,*

1997) have shown that agriculture has relatively large linkage effects in the South African economy. However, the exploitation of these linkages is largely dependant on the extent to which demand for agricultural products will outpace increases in production (i.e. on a positive answer to the second question above), or, alternatively, to the extent to which export demand can pull the sector along.

The only way in which agriculture can conceivably become a major creator of employment opportunities for the country as a whole would be through a wider and deeper export drive, i.e. through bringing large areas of KwaZulu Natal and Mpumalanga into export production. This would require a long term commitment of human, financial and natural resources to production processes that make optimal use of the nation's resource endowment, i.e. that are labour using rather than labour saving in the sense proposed by Lipton (1996).

NOTES

1. *A recent release by the Central Statistical Service (CSS, 1998) shows that total employment in agriculture, fisheries, and forestry dropped from 1421 000 in 1994 to 965 000 in 1995 to 606 000 in 1996 and to 637 000 in 1997. This has caused some problems, as it seems that part-time and seasonal opportunities were excluded from these data.*

2. *As late as 1997, only four pages of tables from the 1993 Agricultural Census were available.*

REFERENCES

CSS (1998). *Employment and Unemployment in South Africa: October household survey 1994-1997.* Statistical Release P0317.10. Central Statisctial Service, Pretoria, 13 August 1998.

CONRADIE, B J, ECKERT, J.B., KLEYNHANS, T.E. & GRIESSEL, H.M., (1996.) Apple production systems for small-scale farmers in the Western Cape. *Agrekon*, 35(1):1-11.

DE KLERK, M, (1996). The sustainable livelihood creation potential of small scale horticulture in the Western Cape.' In Lipton M, M De Klerk, and Merle Lipton (Eds.) *Land, labour and livelihoods in rural South Africa. Volume 1: Western Cape.* Durban: Indicator Press: 201-244.

ECKERT, J, (1996). Fifty hectares and freedom: field crop options for small-scale farmers in the Western Cape. In Lipton M, M De Klerk, and Merle Lipton (Eds.) *Land, labour and livelihoods in rural South Africa. Volume 1: Western Cape.* Durban: Indicator Press: 245-274

ECKERT, J B, LIEBENBERG, G.F. & TROSKIE, D.P. (1997). *Compiling an agricultural SAM for the Western Cape.* Elsenburg, Western Cape Department of Agriculture.

IDC. (1997). *Trade for growth: Overview of South African trade and industrial performance.* Sandton, Industrial Development Corporation.

KIRSTEN, J.F. (1996). The potential for creating additional rural livelihoods in agriculture and the rural non-farm sector in semi-arid areas: A case study in the Northern Province. In: Lipton, M, F Ellis and Merle Lipton (Eds.) *Land, Labour and Livelihoods in Rural South Africa. Volume 2: KwaZulu-Natal and Northern Province*, Durban, Indicator Press: 303-334.

KLASEN, S. & WOOLARD, I. (1999). Levels, trends and consistency of employment and unemployment figures for South Africa. *Development Southern Africa*, 16(1): 3-35.

KLEYNHANS, T E, LAUBSCHER, J., STREET, K. & HOBSON, L. (1997). *Vooruitskouing van prominente Wes-Kaapse landboubedrywe teen 2010.* Agrifutura Project, University of Stellenbosch.

LIPTON, MICHAEL. (1996). Rural reforms and rural livelihoods: the contexts of international experience. In Lipton M, M De Klerk, and Merle Lipton (Eds.) *Land, labour and livelihoods in rural South Africa. Volume 1: Western Cape.* Durban: Indicator Press: 1-48.

LYNE, M C & ORTMANN, G.F. (1996). Estimating the potential for creating additional livelihoods on commercial farmland in KwaZulu-Natal. In: Lipton, M, F Ellis and Merle Lipton (Eds.) *Land, Labour and Livelihoods in Rural South Africa. Volume 2: KwaZulu-Natal and Northern Province*, Durban, Indicator Press: 59-76.

MELLOR, J. (1986). Agriculture on the road to industrialisation. In Lewis, John P and Valeriana Kallab (Eds.) *Development strategies reconsidered.* New Brunswick, NJ, Transaction Books.

THIRTLE, C, SARTORIUS VON BACH, H.J. & VAN ZYL, J. (1993). Total factor productivity growth in South African agriculture, 1947-1991. *Development Southern Africa,* 10(3):301-318.

TOWNSEND, R.F. (1997). *Policy distortions and agricultural performance in the South African economy.* Unpublished PhD thesis, University of Pretoria, Pretoria.

VAN ZYL, J, VINK, N. FÉNYES, T.I. (1987). Labour-related structural trends in South African maize production. *Agricultural Economics,* 1(3):241-258.

VAN ZYL, J. (1989a). Interrelationships in the maize industry I: Production and price aspects. *Development Southern Africa,* 6(2):202-215.

VAN ZYL, J. (1989b). Interrelationships in the maize industry II: Welfare aspects. *Development Southern Africa,* 6(3):340-348.

VAN ZYL, J & VINK, N. (1988). Employment and growth in South Africa: an agricultural perspective. *Development Southern Africa,* 5(2):196-207.

VAN ZYL, J, VINK, N., TOWNSEND, R. & KIRSTEN, J. (1998). Economic effects of market and trade liberalisation on agriculture in the Western Cape province of South Africa. *Journal of International Development,* 10(1):75-84.

VINK, N., VAN ZYL, J., VAN SEVENTER, D. & ECKERT, J.B. (1996). The macroeconomics of rural livelihoods creation in the Western Cape province.' In Lipton M, M De Klerk, and Merle Lipton (Eds.) *Land, labour and livelihoods in rural South Africa. Volume 1: Western Cape.* Durban: Indicator Press: 51-70.

VINK, N. & VAN ZYL, J. (1997). The effects of water policies on the farm sector in the Western Cape. *Agrekon,* 36(4):573-584.