

Full Length Research Paper

The impact of land transfers in the different agricultural sectors of the North West Province

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Imbalances and inefficiency fostered by the policies of the previous South African government necessitate changes to reduce the imbalance of the past and enhance the inclusiveness and competitiveness of the agricultural industry. Against this background, the policy of land reform was initiated. In theory, the agricultural land reform policy might appear effective; given that agriculture is a major contributor to rural economic growth and development. Broadening the economic activities of previous disadvantaged individuals through the acquisition and cultivation of land will help to rebuild and strengthen the rural communities. However, the outcomes of this policy has to date not seen the desired results regarding rural economic development and poverty reduction. Many of the foreseen positive aspects of the land reform policy are also contributors to the potentially negative outcomes of the policy. This makes this specific policy controversial and subject of heated debate. Transfers of land in the various agricultural sectors will impact differently on social- and economic factors. Unless a proper understanding of the impact of transferring land in the different agricultural sectors is established, the controversy around the potential impact of land reform will continue. To obtain a better understanding of this impact, the study employed a Social Accounting Matrix (SAM) based partial equilibrium model. Results from the model revealed that the negative impact of the land reform policy largely overshadows the positive effects. Moreover, transfers within the larger agricultural sub-sectors will result in more significant social and economic impacts. Thus, the implementation of the agricultural land reform policy needs to be radical and calculative; otherwise it will result in false expectations, hardship and poverty.

Key words: Land reform, partial equilibrium model, economic and social impacts.

INTRODUCTION

After the first democratic elections in 1994, South Africa's government policy- and development objectives shifted and included the establishment and support of new and inclusive agricultural (economic) activities. This involves, amongst others, the establishment of small-scale/new commercial farmers. Government furthermore aims at a highly efficient and economically viable market-directed farming sector (Awosola, 2006). In order to achieve this goal, the South African government has embraced

agricultural-led Growth, Empowerment and Redistribution (GEAR) strategies. One of these strategies includes the Land Reform for Agricultural Development (LRAD) policy, which states that 30% of commercial farmland should be transferred to previously disadvantage individuals by 2025. In theory, the land reform policy might appear to be effective; given that agriculture is a major accelerator of rural economic growth and development. Broadening the economic activities of previous disadvantaged individuals through the acquisition and cultivation of land will help to rebuild and strengthen the impoverished rural communities.

These benefits of land reform gained particular momentum after the publication of "The Mystery of Capital" by

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Table 1. Contribution towards agricultural GDP in the North West Province (2006).

Agricultural sub-sector	Contribution (%)
Cereal- and grain sector	51.3
Livestock sector	21.8
Other agriculture sector	19.9
Vegetable sector	2.3
Dairy sector	3.6
Citrus fruit sector	0.6
Sub-tropical fruit sector	0.1

Source: Own calculations.

De Soto in 2000. In this publication, De Soto argues that secure property rights through legal reforms will help to include the poor in formal legal- and economic systems and increase the poor's ability to access credit and contribute to economic growth and poverty reduction. Meizen-Dick et al. (2009) are of the same view, suggesting that land reform holds significant social- and economic benefits which includes the eradication of food insecurity and alleviation of poverty in, especially developing countries. Many of the anticipated positive aspects of land reform that is the contribution towards food security, economic growth, poverty alleviation etc. can be at the same regarded as the negative outcomes of land reform. This makes this policy controversial. Bezuidenhout (2000), Ortmann and Machethe (2003) and Awosola (2006) all argue that land reform in South Africa has raised, amongst other issues, the uncertainty of property rights, insecure land tenure, free rider problems, land invasion, and crime in the farming communities. Additional arguments suggest that ineffective land reform may cause further hardship and conflict (Bourbeau, 2001; Nyamu, 2007). Drimie (2002) and Varley (2007) are of the same view, arguing that if land reform is improperly or inadequately implemented, such reforms may further disadvantage marginalised groups. Moreover, the authors also argue that radical reforms, such as large-scale redistribution of land as suggested by the land reform policy of South Africa, may result in land being unproductive which could lead to economic decline and increased food insecurity.

Similarly, Awosola (2006) suggests that the land reform policy of South Africa may affect agricultural output potentials and consequently regional and national food self-sufficiency in the short- and long-run. A recent statement by government which suggested that the current success rate of agricultural land reform projects in South Africa is a mere 10%, exacerbated the concern that the outcome of the land reform policy will be negative. The transfers of farm land in each of the various agricultural sectors of South Africa will have a different effect on social- and economic factors. Unless a proper understanding of the impact of transferring land in

each of the different agricultural sectors is established, the controversy around the effects of land reform will continue.

This study attempts to quantify the impact of land transfers in each of the different agricultural sectors and assumes a direct relationship between unsuccessful land reform and a decline in total agricultural output. The North West Province (NWP) of South Africa is used as a case study. Hence, the study measures the overall impact of transferring 30% of commercial farmland to previously disadvantaged communities or individuals in seven different agricultural sub-sectors of this province at different rates of success. The NWP was selected as the agricultural sector is very important in the context of its contribution towards the regional economy and the high level of labour it absorbs. The agricultural sector in the NWP is also important in the overall South African agricultural economy as a whole.

A Social Accounting Matrix (SAM) based partial equilibrium model is used to simulate the impact of transferring 30% of agricultural land at different levels of success. Results from the simulations are reported in terms of the potential impact of the land reform in its current state on Gross Domestic Product (GDP), on employment, on household spending and the fiscal impact. In order to get a better understanding of the impact of land reform in the agricultural sector of the NWP, subsequently we will provide an overview on the contribution of each sub-sector towards agricultural GDP in the province. Also, the data, the theoretical framework, and the scenarios used in the model are discussed. This is followed by the results, concluding remarks and recommendations.

The agricultural sectors of the North West Province

It is hypothesised that the relative importance of the respective agricultural sub-sectors will influence the level of impact of land-reform. Therefore, here we provide some background on the relevance of the different agricultural sub-sectors in the NWP, which will guide the interpretation of the results. Approximately 54% of the province's surface area has been transformed by agriculture. The fertile areas in the northern parts of the province allow for extensive mixed-crop farming, which include crops such as tobacco, citrus, paprika, wheat, peppers, cotton, groundnuts and sunflower. Agriculture towards the eastern, wetter parts of the province comprises of livestock and crop farming, while the semi-arid central and western parts support livestock and wildlife farming. Table 1 reflects the contribution of the different sub-sectors towards the total agricultural GDP of the province.

From Table 1, it is evident that the cereal and grain sector is the largest sub-sector in the NWP, accounting for 51.3%. Maize and sunflower are the main contributors

of total physical output (that is quantities produced) with a 91.7% share in the total field and fodder crop production in the province. Other field and fodder crops that make a meaningful contribution include wheat (3.9%), groundnuts (1.3%) and lucerne (2%). Most arable crops within the NWP are extensively produced under dry-land conditions. Only 1% of the total area planted with maize for grain is irrigated. However, this accounts for 7% of the total provincial maize yield. Sunflower and groundnut production show a similar situation, with only 0.8 and 11% of the total area planted under irrigation. However, other major grain crops, including wheat (56%) and lucerne (64%), are predominantly produced under irrigation. Livestock is the second largest contributor towards provincial agricultural GDP with a share of 21.8%. Cattle farming is the foremost contributor towards the total physical output of livestock production in the province with a share of 60.6%, followed by pigs (28.4%) and sheep (9.2%). Cattle, pigs and sheep combined account for almost 98.2% of the province total physical livestock output.

The other agricultural sector cluster comprises of poultry farming, game farming and viticulture contributes 19.9% towards provincial agricultural GDP. Poultry farming is the largest contributor in this sub-sector, with the production of eggs that accounts for 45% of the total value of livestock products sold in the NWP. The dairy sector, contributes 3.7% towards the agricultural GDP of the province. Dairy cattle only accounts for 1.4% of live animals sold, with fresh milk and cream accounting for 52% of the total value of livestock products sold. The production of horticultural crops (that is citrus, fruits and vegetables) is mainly concentrated in the north eastern parts of the province along the Crocodile, Harts and Vaal Rivers. Intensive cultivation, adequate water and suitable climate limit the production of horticultural crops, with the sub-sector contributing a mere 3% towards the agricultural GDP of the NWP. The vegetable sector is the foremost contributor in the horticultural cluster with a share of 2.3% followed by citrus and sub-tropical fruit. The major horticultural crops produced in the NWP are potatoes (20%) followed by oranges (17%), onions (17%), carrots (14%) and cabbages with 13%.

DATA AND THEORETICAL FRAMEWORK

Here, the data and methodology used in this study are discussed. Particular attention is given to the data-set, input structure, theoretical framework and the scenarios.

Model description and data sources

The study applies the most recent provincial SAM which is developed by Conningarth Economist (2009). This SAM, with 2006 as base year, was compiled by making

use of various sources including: the population census, household expenditure survey, labour force survey, industrial census and other sectoral census, as well as supply and use (SU) tables published by StatsSA. The SU-Tables were used to identify the disaggregated accounts to be included in the SAM. In total, the SAM consists of over 34 activities and 34 commodities. The 34 commodities are classified into 26 production sectors (that is one agricultural and mining, one electricity, one water, one building, one construction account, and 21 manufacturing accounts) and 8 service accounts. These commodities correspond to the goods and services produced by the various activities in the SAM. The factor payments in the SAM consist of a labour and a capital account. The labour account is sub-divided into four ethnic categories (African, Coloured, Asian and White) and three educational levels (skilled, semi-skilled and unskilled). The capital account of the SAM consists of public enterprises, private business enterprises, combi-taxi enterprises and informal enterprises. The sub-divisions help to ascertain the proportion of payments from the production sector to each of the factor inputs. Payments to factors of production go to the households and institutions. Three institutions are identified; enterprises, households and government. Households in the SAM are divided in four distinctive groups each separated into 12 different occupations. The household distinction reflects the differences in the sources of levels of income. In addition, other accounts include investment and the rest of the world account.

Input structure of the model

The SAM database for the NWP as compiled by Conningarth Economists (2009) is selected because it is the most recent SAM available. Unfortunately, the underlying SAM does not include disaggregated detail for the different agricultural sectors in the province. The process of disaggregating the agricultural sectors presented various problems, of which limited data was the foremost. Data for the agricultural sector of the NWP is often missing, unreliable or outdated. This is especially true for data on the input composition of the agricultural sector in the NWP. This composition of the agricultural sector refers to the inputs required for successful farming. The SAM database captures this input data through:

- 1) Its commodities account, which reflects 34 different industries from which the agricultural sector sources its production inputs;
- 2) Its human resources requirements, number, skill levels and salaries of personnel;
- 3) In Gross Operating Service (GOS), which includes capital to public and private business enterprises, tax and informal enterprises; and
- 4) General capital investments, which include

investments made to acquire machinery, equipment, buildings, civil constructions, etc.

To overcome the scarcity of data, the agricultural sector of the NWP was disaggregated, making use of the input composition of the different agricultural sectors as depicted in the SAM databases of the Mpumalanga and the Northern Cape Province. This approach assumes that production activities in the corresponding agricultural sectors of these three provinces are conducted in a comparable manner. An input structure was compiled from the input composition of the different provincial agricultural sectors by estimating a proxy, or percentage, of each input in relation to the total value of production. This input structure was then used to determine the input composition for the different agricultural sectors of the NWP by multiplying the respective percentages of each input with the total production reported by the different agricultural sectors of the NWP. The data derived from this process (input composition) was then used to quantify the impact of land redistribution on the respective agricultural sectors of the NWP through the SAM-based partial equilibrium model.

According to Diao et al. (2004), a macro model can be approached in two ways: 1) full linkages, that is embedding the input structure in the partial equilibrium model, or 2) top-down (stand-alone) linkages. Due to the nature and scope of this study as well as data limitations, the top-down (stand-alone) approach was the most appropriate. Shocks (that is redistributing 30% of productive agricultural land at different levels of success) are introduced through the input structure, resulting in changes in outputs and therefore different structures. The changes in outputs are then used together with economic multipliers calculated from the SAM to determine the backward economic linkages of the specific sub-sectors (the theoretical description of the model is also discussed subsequently). The change in output is used to determine the potential impact of land reform on employment, income levels and taxes by making use of the different multipliers embedded in the model. The agricultural sector of the SAM database of the NWP was disaggregated into seven different sectors, including cereals, citrus, other fruits, vegetables, livestock, dairy, and other farming sectors. The cereal farming sector represents all the grains and oilseeds (that is maize, wheat, sunflower, etc.) produced in the NWP, the other fruits sector includes both the production of deciduous fruit and sub-tropical fruits. The other farming sector comprises mainly data from poultry, game and viticulture production.

The theoretical framework

A partial equilibrium model is applied to present a

counterfactual picture of the impact of transferring land in the different agricultural sub-sectors of the NWP. The study adopts the partial equilibrium framework developed by Conningarth Economist (2009). This framework uses technical coefficients and the Leontief inverse to transform the SAM's into a model. A technical coefficient is defined as the quantity of intermediate inputs that a particular sector requires from another sector in order to supply a unit of output, that is the quantity of intermediate inputs from sector i that is required by sector j to supply a unit of output from sector j . This can be formulated as follows:

$$a_{ij} = \frac{X_{ij}}{X_j} \quad (i=1, \dots, n) \text{ and } (j=1, \dots, n) \quad (1)$$

Where:

a_{ij} is a technical production coefficient indicating the amount of products from sector i needed to produce one unit of product in sector j (technical coefficient);
 X_{ij} is the delivery of intermediate goods from sectors i to j ;
 X_j is total gross input (output) of sector j .

The following holds for specific elements in a transaction table:

$$a_{11} = \frac{X_{11}}{X_1}; a_{12} = \frac{X_{12}}{X_2}; \dots \text{and } a_n = \frac{X_{1n}}{X_n} \quad (2)$$

The technical coefficients matrix is a collection of technical coefficients and is often indicated by a capital letter 'A':

$$A_{ij} = \begin{bmatrix} a_{11} & a_{12} & \dots & a_{1n} \\ a_{21} & a_{22} & & a_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ a_{n1} & a_{n2} & & a_{nn} \end{bmatrix} \quad \text{where } (i=1, \dots, n) \text{ and } (j=1, \dots, n) \quad (3)$$

With the application of Equation 1, a system of output equations for different agricultural sectors in the NWP can be calculated. For example:

$$\begin{aligned} x_{11} + x_{12} + \dots + x_{1n} + F_1 &= X_1 \\ x_{21} + x_{22} + \dots + x_{2n} + F_2 &= X_2 \\ (i=1, \dots, n) \text{ and } (j=1, \dots, n) \\ x_{n1} + x_{n2} + \dots + x_{nn} + F_n &= X_n \end{aligned} \quad (4)$$

Where:

F_n is the final demand of a specific sector.
 This can also be illustrated as:

$$F_1 = X_1 - x_{11} - x_{12} - \dots - x_{1n}$$

$$F_2 = X_2 - x_{21} - x_{22} - \dots - x_{2n}$$

$$(i=1\dots n) \text{ and } (j=1\dots n) \quad (5)$$

$$F_n = X_n - x_{n1} - x_{n2} - \dots - x_{nn}$$

After the elements in the transaction table are converted to technical coefficients, then:

$$\frac{X_{ij}}{X} = a_{ij} \quad (6)$$

Then, let all x_{ij} in Equation 5 be:

$$F_1 = X_1 - a_{11}X_1 - a_{12}X_2 - \dots - a_{1n}X_n$$

$$F_2 = X_2 - a_{21}X_1 - a_{22}X_2 - \dots - a_{2n}X_n$$

$$(i=1\dots n) \text{ and } (j=1\dots n) \quad (7)$$

$$F_n = X_n - a_{n1}X_1 - a_{n2}X_2 - \dots - a_{nn}X_n$$

By grouping similar terms:

$$F_1 = (1 - a_{11})X_1 - a_{12}X_2 - \dots - a_{1n}X_n$$

$$F_2 = -a_{21}X_1 + (1 - a_{22})X_2 - \dots - a_{2n}X_n$$

$$(i=1\dots n) \text{ and } (j=1\dots n) \quad (8)$$

$$F_n = -a_{n1}X_1 - a_{n2}X_2 - \dots + (1 - a_{nn})X_n$$

This can be written in a matrix-format as:

$$F = (I - A) X \quad (9)$$

By multiplying Equation 6 on both sides with the inverse $(I-A)^{-1}$, the result will be:

$$(I-A)^{-1}F = (I-A)^{-1}(I-A)X \quad (10)$$

And

$$X = (I-A)^{-1}F \quad (11)$$

As is:

$$\Delta F = (I-A)^{-1}\Delta F \quad (12)$$

Where:

ΔF reflects the change in final demand; and

ΔX reflects the change in output/production.

The inverse of $(I-A)^{-1}$ is known as the Leontief

inverse. In summary, the model is concerned with solving for the sectoral output levels (X) that satisfy final demand for those outputs (F) given the inter-industry structure of production. The model is used to determine a production plan that is consistent with a desired final demand vector, given the inter-sectoral transaction matrix (A). The key assumptions made for a typical SAM-Leontief multiplier model also hold for the Conningarth model. These assumptions include:

- 1) Fixed relative prices;
- 2) Perfect elastic conditions, that is, excess production capacity in all sectors;
- 3) Sectoral production is completely demand driven and the underlying production function assumes constant returns to scale and no substitution among the different inputs.

The simulations

The aim of the model is to simulate different possible outcomes of agricultural land-reform. Therefore, a number of scenarios are designed to reflect the current assumptions on land transfers. The literature on land reform as a mechanism of development in South Africa reveals little about the current rate of success of agricultural land reform projects in the NWP or elsewhere. Following their investigation into the success rate of projects funded by the Comprehensive Agricultural Support Programme (CASP) in the Free State Province, Idsardi et al. (2009) identified that approximately one in every five projects (20%) could be regarded as successful and sustainable. The authors define success as "the ability of a project/farming operation to uplift rural households in a successful and sustainable manner". This definition of success was adopted to formulate the scenarios for the impact analysis. Moreover, a recent official statement by government suggests that the success rate of land reform is a mere 10%. Therefore, it seems adequate to assume that the success of land reform in its current form ranges between 10 and 20%. Thus, between 10 and 20% of the transferred farmland is used productively and commercially. Based on this, the simulation will reflect on three different scenarios, which are as follows:

Scenario 1 (SC1): redistributing 30% of the commercial agricultural land in the NWP with a 10% rate of success, Scenario 2 (SC2): redistributing 30% of the commercial agricultural land in the NWP with a 20% rate of success, Scenario 3(SC3): redistributing 30% of the commercial agricultural land in the NWP with a 30% success rate.

The following assumptions are made for each of the three scenarios:

- 1) Commercial farmland excludes state land;
- 2) The elasticity between unsuccessful land transfer and agricultural output is very close to 1 (that is the percentage of land being transferred and the success rate directly correlated with the decline in production);
- 3) Land that has been transferred successfully implies that production levels are similar to his/her predecessor;
- 4) Farm income on successful land transfers will be similar to that of predecessors;
- 5) Labour force of successful transfers will remain the same; and
- 6) Wages on successfully transferred land will be similar to that of predecessors.

SIMULATING THE IMPACT OF LAND TRANSFERS IN THE DIFFERENT AGRICULTURAL SECTORS OF THE NORTH WEST PROVINCE

Subsequently, we provide the results obtained from the partial equilibrium model. The results from the model are specified for the seven different agricultural sectors, as disaggregated in the SAM of the NWP. These sectors include: the cereal and grain sector, citrus sector, other fruit sector, vegetable sector, the livestock sector, the dairy sector and the other agricultural sectors. As mentioned, the cereal and grain sector encompasses all grains and oilseeds and the other fruit sector includes both deciduous and subtropical fruits produced in the NWP. The other agricultural sector is primarily compiled from data from the poultry, game and viticulture industries in the NWP. The simulation results for these different sectors are specified in four different aspects namely the impact on GDP, the impact on employment, the impact on household income/spending or social impact and the fiscal (that is government) impact. Note that these results are subject to the previously mentioned assumptions and that they reflect a snap-shot of redistributing 30% of agricultural land at once.

The results will indicate the direct, indirect and induce impact on the four different aspects, provided that the impact of a particular sector on the entire economy cannot be isolated. The direct impact refers to the initial immediate effects caused by a specific activity, which will subsequently initiate a series of iterative rounds of income creation, spending and re-spending, resulting in what are termed indirect and induce effects (Hussain et al., 2003). Indirect impacts refer to the changes in production, employment and income as a result of the direct effects on the industry sector that may be directly or indirectly related to the initial impacted sector. The third level of impact, namely induced effects, refers to general changes in household sector's earnings and spending patterns because of the direct and indirect effects. Together, these three effects or impacts make up the total effect or impact of a change in a particular

industry or economy (Hussain et al., 2003).

Impact on Gross Domestic Product

The economy of the NWP is relatively small, with its GDP valued at R 103 billion in 2006, thus making the province the third smallest contributor towards national GDP with 6.4%, that is 2006 reflect the base year of the database used for the analysis and therefore the focus on the specific year (StatsSA, 2007a). The agricultural sector of the NWP made a modest contribution to the total provincial GDP in 2006 (16.8% or R 17.3 billion). Despite the relatively small contribution of the agricultural sector towards the North West GDP, the sector is still regarded as a major player in ensuring economic growth and development in the province. According to the simulation results for the partial equilibrium model, the outcome of Scenario 1 (that is transferring 30% of the productive agricultural land in the NWP with a 10% success rate) reflects a 0.21% decrease in national GDP. In other words, in this scenario, the national agricultural production will decrease by almost a fifth of a percent should government proceed in implementing their land reform policy in the NWP (*ceteris paribus*). Results from Scenarios 2 and 3 show a decline of 0.19 and 0.17% in national GDP, respectively.

The decline in the national GDP resulted partly from a direct decrease in agricultural production activities in the NWP (that is the direct effect), and secondly from a decrease in the demand for inputs from other industries and the decline in consumer spending power. These effects refer to the indirect and induced impacts of the scenarios under review. For example, results from Scenario 1 indicate that the indirect- and induced effects have contributed 28.7 and 36.9%, respectively, towards the expected 0.21% decline in national GDP. The induced effects of Scenario 1 seem to be higher than the indirect effect which suggests that a reduction in agricultural production will have a significant impact on consumers' spending power. This is most likely a result of lower profits hampering new entrants or beneficiaries of the sector to remain sustainable as well as a reduction in the number of workers employed by the sector. A similar situation accounts for the impact that the land reform policy will have on the contribution made by the agricultural industry towards the provincial GDP. Results from Scenario 1 suggest that the contribution of the agricultural industry is likely to decline with 20.2% or R 3.5 billion. The impact in the case of the other two scenarios is slightly less with 18.5 and 16.1% respectively.

Disaggregated simulation results from the partial equilibrium model for the different agricultural sectors in the NWP, which suggest that land transfers in the cereal- and grain sector will have the largest impact on the

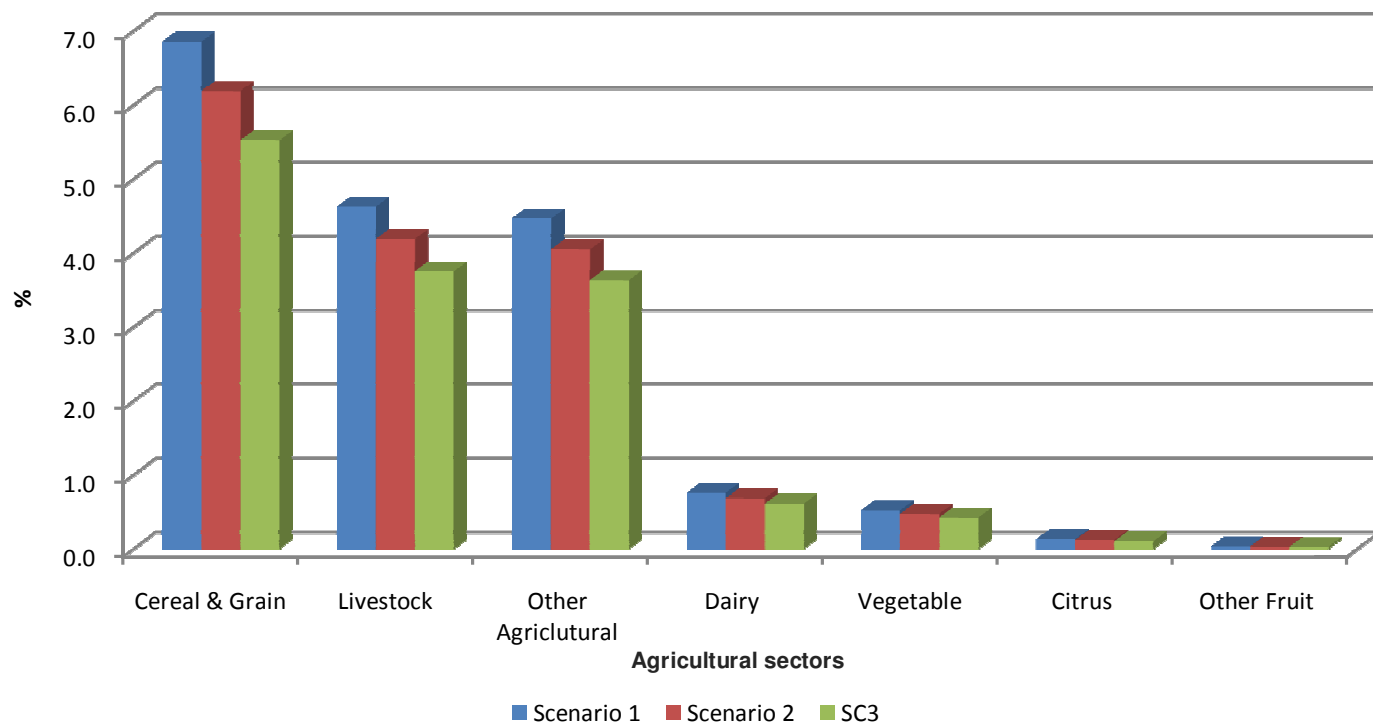


Figure 1. Impact of the different agricultural sectors on agricultural contribution towards provincial GDP.

contribution of the agricultural industry towards provincial GDP, and subsequently national GDP as is shown in Figure 1. Under the assumption of Scenario 1, the cereal- and grain sector reports a 6.9% or R 1.1 billion decline in agricultural contribution towards provincial GDP. The relatively large impact of the cereal- and grain sector is mainly due to the size of the sector in relation to total agricultural production. Hence, the cereal- and grain sector accounts for 51.3% of total agricultural production in the NWP. Land transfers in the livestock sector will have the second largest impact on agricultural contribution towards provincial GDP with 4.6%. This is also in relation to the size of the sub-sector, with the livestock sub-sector being the second largest contributor towards provincial agricultural GDP. Comparing results from Scenario 1 with that of Scenario 3 for the cereal- and grain sector, the reported impact is slightly lower. For example, Scenario 1 reports a 6.9% decline in the contribution of the agricultural sector towards GDP compared to a decline of 5.3% in Scenario 3. This suggests that if a success rate of 30% is achieved, the direct impact of land transfers in the cereal- and grain sector may be reduced with 1.3% or R 231 million.

Land transfers in the cluster defined as 'other agricultural sector' will also have a significant impact on provincial GDP. According to the results, Scenario 1 will lead to a 4.5% or R 776 million decline in agricultural contribution towards provincial GDP. This is followed by the dairy and vegetable sector with a decline in

contribution of 0.8 and 0.5% in provincial GDP respectively. The total impact of the different scenarios per agricultural sector is depicted in Figure 1. The total impact consists of the direct, indirect and induced impact. Of these three types of impact, the direct impact is the largest for all three scenarios. However, the indirect and induced impacts also make meaningful contributions. For example, both indirect and induced impact, in the case of the CGS under the assumptions of SC1, are reported to contribute 36.5 and 13.4%, respectively, to the total decline of 6.9% in agricultural contribution towards provincial GDP. The reduction is accounted for by a decline in salaries paid to workers, jobs lost and a reduction in profits that are normally ploughed back into the economy.

Impact on employment

The agricultural sector plays an important role in employment in the NWP. The sector is the fourth largest employer with an estimated 8.7% of the total workforce in the province. The sector is renowned for providing employment opportunities, especially in the rural areas of the province. Hence, unsuccessful land reform will result in taking productive agricultural land out of production. This will ultimately lead to less demand for both skilled and unskilled labour in the primary agricultural production processes (e.g. land cultivation, harvesting, transport

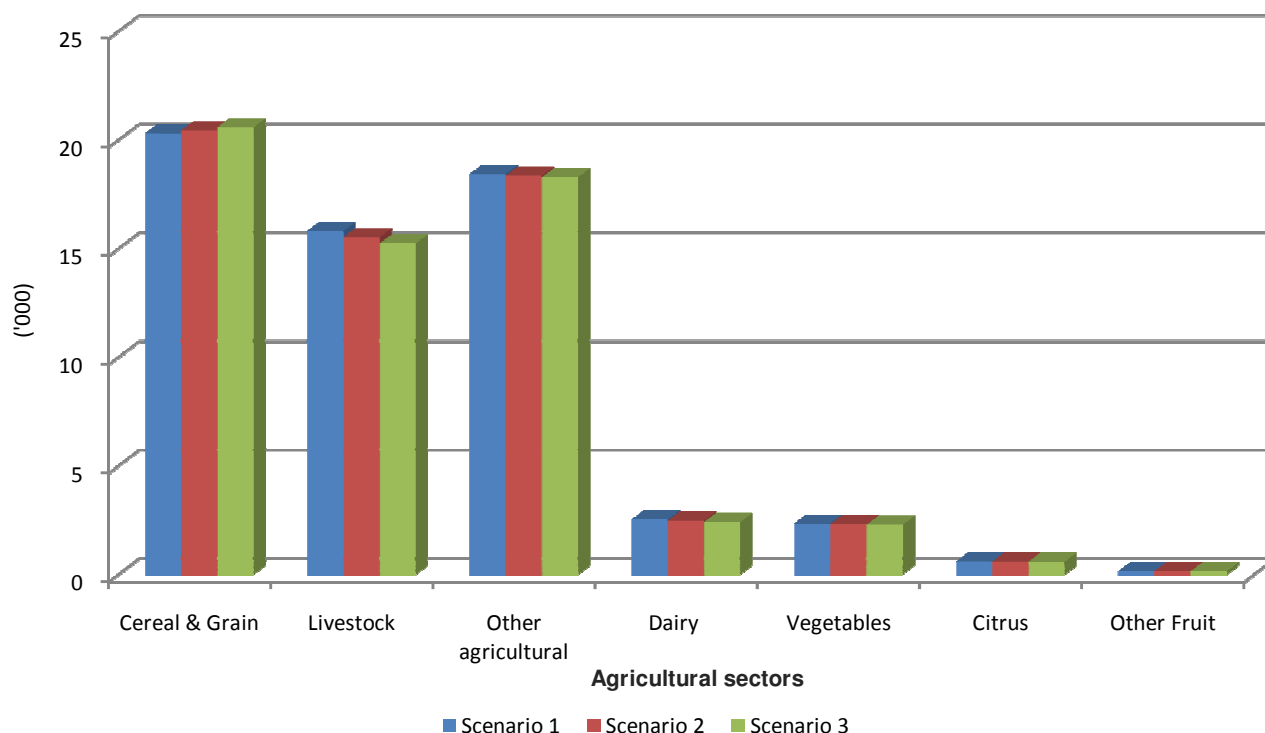


Figure 2. Number of job losses in the different agricultural sectors of the NWP.

etc.). Figure 2 shows the potential impact on employment once government transfers 30% of agricultural land in the NWP. Analogous to the impact on GDP, land redistribution in the cereal and grain sector results in the highest number of employment opportunities lost. This relates to the size of the sector, as the cereal- and grain sector accounts for 51.3% of total agricultural GDP in the province. Considering Scenario 1, an estimated 20 312 people could lose their jobs in the NWP. These include the direct jobs that will be lost in the agricultural sector itself, as well as the indirect and induced job losses. Simulated results from the partial macroeconomic equilibrium model reveal that the number of jobs lost in the cereal and grain sector will decrease by an estimated 0.6%, for every 10% increase in the success rate of land distribution projects. Thus, should the success rate increase from a mere 10%, as assumed in Scenario 1, to 30%, as used for Scenario 3, the number of employment opportunities lost will amount to 20 582 in total.

It is interesting to note that the other agricultural sector has the second largest impact on employment. As mentioned, this sector comprises mainly the poultry, game (wildlife) and viticulture industries. Considering the size of the industry or contribution to GDP, it is clearly more labour intensive than for instance, the cereal and grain sector or livestock sector. The same is the case for the fruit and vegetable industries. Although, the impact of land reform in these sectors appear to be small based on

these numbers alone, however these sectors are significantly more labour intensive. The labour/production ratio means that land transfers in these sectors lead to more people losing their jobs per R 1 of production than in the cereal- and grain sector and in the livestock sector if the scenarios become reality.

Impact on household spending

According to the National Accounting Matrix of the North-West Province, the total household expenditure in the NWP amounted to R 68.5 billion in 2006. Of this amount, 88% (R 60 billion) is attributed to private consumption expenditures, 11.2% (R 7.7 billion) to taxes, and the rest are savings and transfers to households in other provinces or countries. Results from the partial macroeconomic equilibrium model reveal that household spending in the NWP is likely to decline by 1.6% or R 1.1 billion under the assumptions of Scenario 1. The decline in household spending is mainly caused by the lost of employment opportunities, lower profits and income in the farming and related sectors. Results from Scenarios 2 and 3 reflect a slightly lower decline in household spending, R 1 billion and R 933 million respectively. Moreover, the impact of land transfers in the different agricultural sub-sectors on household spending is shown in Figure 3. Similar to the impact on GDP and

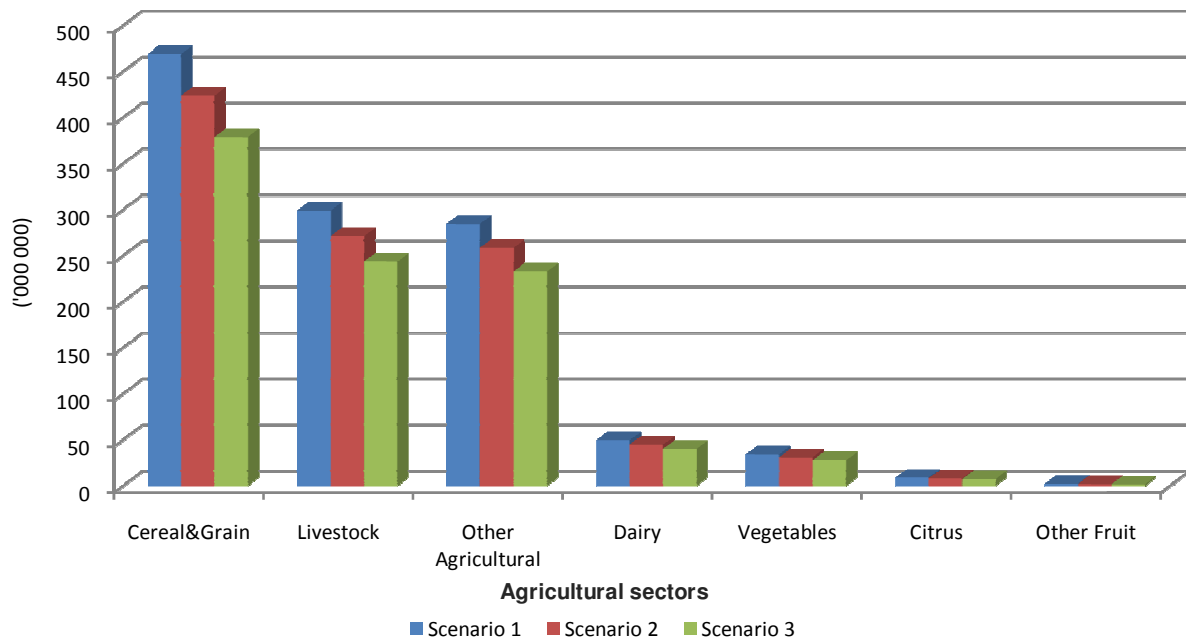


Figure 3. Disaggregation of the impact of land transfers in the different agricultural sub-sectors on household spending.

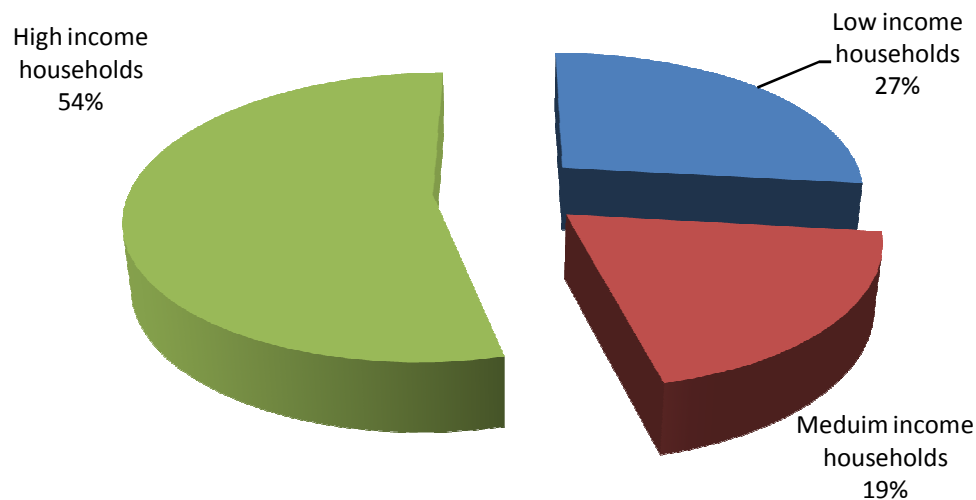


Figure 4. Disaggregation of the impact on household spending to three different household income levels.

employment, land transfers in the cereal and grain sector will have the largest impact. Again, the size of the sector in relation to the other agricultural sectors in the province directly relates to the size of the impact.

Under the assumptions of Scenario 1, land transfers in the cereal- and grain sector are likely to result in an R 469 million decline in consumer spending. This is followed by the livestock sector with a decline of R 299 million and other agricultural sectors with a decline R 284 million in consumer spending. The impact of Scenarios 2

and 3 on household spending remain considerable. For example, when comparing Scenario 1 with Scenario 2 for the cereal- and grain sector; the impact on household spending will be reduced by 9.5% or R 45 million, with the total impact that equates to R 424 million. Figure 4 reveals how these impacts for the different agricultural sectors will transpire to the different household income categories. Figure 4 shows the impact in the cereal and grain sector specifically. This can be used as a benchmark for the other agricultural sectors as the

distribution of the impact is similar across the different agricultural sub-sectors. The different household income categories were aggregated into high, medium, and low income households as a proxy of skill levels and associated wages. Skilled employees were therefore classified as high income households, semi-skilled under medium-income and unskilled under low-income households.

From Figure 4, it is evident that the spending of high-income households will be most affected by the transfer of agricultural land in the cereal- and grain sector of the NWP. This is followed by a reduction in the spending power of low-income households by 27% and medium-income households by 19%. Thus, it could be concluded that, out of the total decline of R 1.1 billion in household spending in Scenario 1, high-income households account for a decline of R 614 million, followed by low-income households with a decline in spending power of R 310 million and medium-income households with a decline in spending power of R 224 million. Moreover, of the R 614 million decline in spending by the high-income households, R 540 million (88%) is estimated to be of a private nature with the rest being taxes, transfers to other households and savings. The same applies to the medium and low income groups.

Fiscal impact

Government through its three spheres (national, provincial and local), bears the main responsibility for ensuring a better life for all citizens of South Africa. This was emphasised through the government's pro-poor programmes which are largely the functional responsibility of provincial and local government. These include social and municipal/public services which have a direct impact on the quality of life for all South Africans, especially the poor. However, a reduction in national government's revenue and tax income due to a decrease in agricultural production will lead to a smaller budget. Thus a reduction in spending in all three spheres of government. An understanding of the way in which funds are allocated at both national and local government levels is important to interpret the results. The paragraphs that follow touch briefly the allocation of government funding.

Income for provincial and local governments is mainly sourced from the national government, following a top-down approach in allocating funds. The main source of income for national government is tax, with the four main contributors being personal income tax, company tax, value added tax, and customs- and excise. As mentioned, provincial government is financed by transfers from the national government.

Normally, these transfers are in the form of equitable shares, which account for 90% of the transfers to the province, and conditional grants, which account for the

remaining 10%. The equitable shares are allocated "horizontally" among the different provinces of South Africa according to an equitable share formula. This formula takes into account the different economic profiles, demographic variations and socio-economic circumstances to allocate the funds. Conditional grants are normally earmarked to fund national priorities in the specific province (such as housing, HIV/AIDS and infrastructure) and are allocated accordingly (Idasa, 2006). Similarly, most local government funds are transferred from provincial and national government through equitable shares and conditional grants. A local government's equitable share is split between all the municipalities using a formula that takes into account the differences in revenue-raising capacity between municipalities, and the historical and geographic imbalances. Conditional grants are normally transferred from national departments and funded from the department's equitable share allocations (Idasa, 2006). Thus, the impact of land reform on GDP, labour and, consequently, income of both private- and commercial entities impacts on the income received by national government. Due to the top-down approach of transferring funds, the impact is likely to spiral down to local government level. As mentioned, the functioning and allocation of funds from national down to local government should be borne in mind when interpreting the results.

According to the simulation results from the partial macroeconomic equilibrium model, the total fiscal impact of Scenario 1 amounts to an estimated R 375 million. This reflects a 0.08% decline in the national budget (2006 base year). The impact is most visible in national government's income which is likely to decrease by an estimated R 338 million, followed by local government's income (municipalities of the NWP) decreasing by R 35 million, and the NW provincial government's income decreasing by a mere R 397 000. The low impact on the NWP government's budget is probably due to the equitable share formula which determines the amount of funds transferred from national to provincial governments as discussed earlier. Figure 5 illustrates the fiscal impact of the different agricultural sectors and scenarios used in the study. Results of Scenario 1 for the cereal- and grain sector suggest that national government's income will decrease by R 195 million. Taking into consideration Scenarios 2 and 3, the fiscal impact might decline to R 175 million or R 155 million respectively. In the case of the livestock sector, results for Scenario 1 suggest that national government's income will decrease by R 78.6 million compared to R 63.7 million under Scenario 3.

Although the decline in government's income is relatively small when compared to the total budget, it might hold severe implications for the province. This is especially true when one considers that a decline in government's income is likely to result in a decrease in the budget for the province (including, for example,

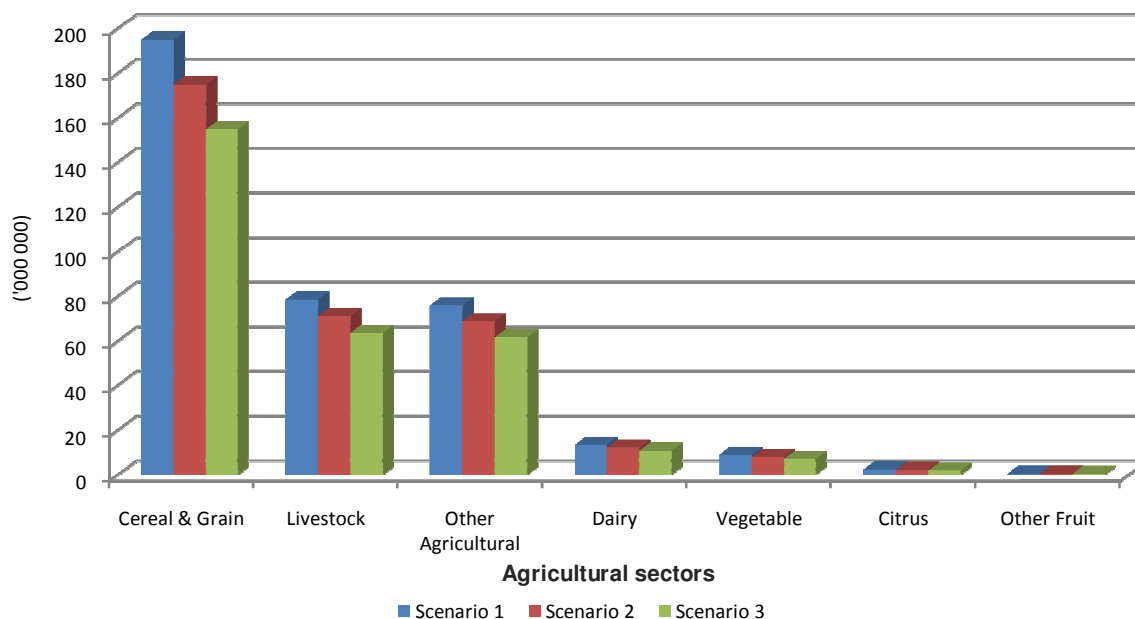


Figure 5. Disaggregated fiscal impact of transfer land in the different agricultural sectors of the NWP.

education, health, and safety). This will surely result in worse socio-economic conditions for the province, aggravating the economic hardship experienced by those living in rural regions in particular. Although it is impossible to prevent the impact that the land reform programmes will have on the province, negative effects could be significantly reduced by exploring alternative methods and systems of transfer (that is revitalization of former homelands). Alternatively, transfer land in sub-sectors that are playing a smaller role in the economy, and so will have a smaller negative impact on job creation and economic development.

CONCLUSIONS AND RECOMMENDATIONS

Imbalances and inefficiencies imposed by previous government policies necessitate changes in policy to reduce the inequalities and enhance competitiveness in the agricultural industry. Therefore, the policy of land reform is justified. However, implementing such policy should not be irrational and overlook the impact on the overall economy. From the results, it is evident that land reform policy as it is currently implemented has a negative impact that overshadows the possible positive effect by a significant degree. Moreover, government needs to consider the different impact of land redistribution on each of the individual agricultural sub-sectors. As expected, the results show that the redistribution of land within the larger agricultural sub-sectors will result in larger economic impacts. Therefore,

it might be advisable for government to firstly determine the impact of land transfers in each specific sub-sector before commencing with land transfers in that specific sector. For example, unsuccessful land reform in the cereal and grain-sector of the NWP will have a much larger impact on both the economic and socio-economic environment of the province when compared to reform in the fruit or vegetable sectors. However, this result will obviously differ per province.

The results of the study also provides motivation for considering alternative approaches to land transfer, for instance, it might be worthwhile for the NWP government to try and revitalize arable land in the former homelands instead of transferring productive arable land. Furthermore, a focus on implementing holistic support programs or structures that improve the success rate of agricultural land reform projects is recommended, instead of just transferring land with a single policy aim the achievement of set transformation targets. Conclusively, land reform needs to be economic and socially sustainable, and holistic; otherwise the outcomes will be negative, resulting in more economic hardship for the rural populations of South Africa.

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