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COMMERCIAL AGRICULTURE IN THE WESTERN CAPE: MACROECONOMIC ANALYSIS WITH A SOCIAL ACCOUNTING MATRIX

J.B. Eckert[1], G.F. Liebenberg[2] and D.P. Troskie[3]

A social accounting matrix was developed for the Western Cape to meet growing needs for quantitative analysis of the agricultural sector. Twenty-five farm commodities and seven agribusinesses are explicitly included in the model. The coloured and black populations dominate provincial expenditure on fresh and processed farm commodities, suggesting that future demand growth depends on income increases among these household groups. In the aggregate, agriculture's contributions to job creation, value added and government revenue significantly exceed those of the nonagricultural sectors; agribusiness exceeds other nonagricultural sectors because of their backward links to production agriculture. Within agriculture, horticulture and livestock subsectors make the most significant contributions to the macro economy. Similar patterns are found with respect to generating household incomes, and in the equality with which such incomes are distributed. Household economic behaviour is explicit. Spending by the poor is found to be more labour intensive than spending by the rich, and generates greater impacts on value added (GGP), gross operating surplus and the demand for most farm and non-farm commodities. A composite ranking of macroeconomic contributions to development is constructed. Nine horticultural enterprises and broilers comprise the ten top sectors.

KOMMERSIËLE LANDBOU IN DIE WES-KAAP : MAKRO-EKONOMIESE ANALISE MET 'N SOSIALE REKENING MATRIKS

'n Sosiale Rekening Matriks is vir die Wes-Kaap ontwikkel ten einde aan 'n groeiende behoefte vir kwantitatiewe analise in die landbousektor te voldoen. Vyf-en-twintig landbou kommoditiete en sewe agri-nywerhede is eksplisiet in die model ingesluit. Die kleurling en swart bevolking domineer provinsiale besteding op vars en geprosesseerde landbou kommoditeite, en dit dui daarop dat toekomstige groei in vraag afhanklik is van groei in inkome onder die betrokke huishoudings. In die geheel oorskry landbou se bydrae tot werkskepping, waarde toevoeging en staatsinkomste die bydrae van agri-nywerhede wat op hul beurt, as gevolg van hul rugwaartse bindings met die landbou sektor, die nie-landbou sektore se bydrae oorskry. Die tuinbou en veeteelt subsektore binne die landbou maak die beduidendste bydrae tot die makro ekonomie. Soortgelyke patrone word gevind ten opsigte van houshoudelike inkome gegenereer en in die

[1] *Visiting professor, Department of Agricultural Economics, University of Stellenbosch and Professor, Department of Agricultural and Resource Economics, Colorado State University.*

[2] *Senior Researcher, Development Impact Analysis Unit: Agricultural Research Council, Pretoria.*

[3] *Deputy Director, Subdirectorate: Agricultural Economics, Department of Agriculture, Western Cape.*

gelyke verdeling van sodanige inkome. Die ekonomiese gedrag van huishoudings is eksplisiet. Dit is bevind dat die besteding van die arm huishoudings meer arbeidsintensief is as besteding deur die rykes en dat dit 'n groter impak op toegevoegde waarde (BGP), bruto bedryfsurplus en die vraag na die meeste landbou kommoditeite tot gevolg het. 'n Saamgestelde rangorde van makro ekonomiese bydraes tot ontwikkeling is gekonstrueer. Nege tuinbou kommoditeite en braaikuikens behels die tien top sektore.

1. A NEW ENVIRONMENT FOR AGRICULTURAL POLICY AND PROGRAMS

1.1 The need for quantitative policy analysis in agriculture

South Africa's agriculture is in the midst of long term fundamental change. Beginning in the 1980s, major policy reforms were launched leading toward sharply reduced levels of protection for the farming sector (Vink, 1993). Most subsidies were removed. The inquiry into the Agricultural Marketing Act (Kassier, et al., 1992) led to voluntary and statutory responses across the country that removed most major institutional imperfections in marketing channels, linking consumers, producers and the rest of the world more directly. New marketing legislation is now being implemented. Full accession to the Uruguay Round of GATT has set in motion a longer-term movement toward full, relatively unprotected integration into world commodity markets. Depreciation of the Rand, halving its value in the last decade, has affected South Africa's comparative advantage, restructured domestic price relations and emphasized the importance of world commodity prices, themselves in a state of flux, on domestic farm incentives. Labour legislation was extended to agriculture. Land reforms are in progress with continued uncertainty as to their ultimate extent and nature. Drought in the early 1990s exacerbated a financial crisis in commercial agriculture and accelerated its restructuring. Democratic elections in 1994 vastly broadened and diversified the number of enfranchised stakeholders in the agriculture's constituency. For the first time, the poor became a dominant voice in government policy, and their needs for food security and low cost food rose to prominence on the agricultural agenda. Finally, the Constitution of 1996 makes agriculture a shared responsibility, thus increasing substantially the responsibilities and prerogatives of the provinces in administering this sector while, at the same time, passing these responsibilities to new and often inexperienced provincial bureaucracies.

These changes, when taken together, comprise a fundamentally new environment for agriculture, an environment offering both challenges and opportunities for agricultural economists and policy analysts. Challenges lie in the clear need for more and better analysis to support, direct and ease the major

adjustments now underway in the sector. In this changing environment, it is essential that policy makers, producers, consumers and the market be better informed of the issues before them and of the consequences of alternative policy decisions. This is nowhere more important than in the Western Cape province where agriculture is extremely diverse and remains a strong source of economic growth, export earnings, jobs and incomes for the poor (Viljoen & Eckert, 1995).

The opportunity for agricultural economists lies in what might be called "the commercialization of commercial agriculture." Without the subsidies and distortions of previous policies, farmers are more likely to respond normally to market determined price signals and to behave in ways more consistent with economic rationality. Thus, a new research environment is emerging, one in which existing theory and methods can be more thoroughly applied, stronger conclusions drawn and aggregate economic behaviour better predicted. In this environment, the level of quantitative analysis can be increased significantly, and should be, given the mandate for better policy support in a time of rapid adjustment and change.

1.2 The Western Cape Provincial response

To address this need for better information and analytical inputs to the agricultural policy function, the Western Cape Department of Agriculture (WCDOA) followed a two-pronged approach. The first of these, the Agrifutura project, is "an environmental scanning activity aimed at nurturing insight into, and understanding of, the strategic environment that affects the agricultural sector. The main goal of the project is to provide strategic information and insights to decision makers in agriculture in the public, private and non-governmental sectors" (Agrifutura, 1996:1). This project concentrates on environmental scanning, qualitative development of futures scenarios, and stakeholder contact.

To compliment the qualitative dimension, the Development Impact Analysis Unit of the Agricultural Research Council and the WCDOA began the Strategic Micro and Macro Modelling (SM3) project in 1996. This effort developed micro (farm level) models and a macroeconomic model in order to quantify, to the extent possible, the costs and benefits of alternative policy choices. For micro modelling, a provincial linear programming approach was chosen. Macro modelling concentrated on developing a Western Cape social accounting matrix (the WCAGRSAM) emphasizing a detailed analysis of agricultural production and agribusiness sectors as well as roles of households within the broader economy. This paper briefly describes the WCAGRSAM in the following section and then discusses several analytical conclusions drawn from this model. The

WCAGRSAM was announced and made publicly available in Eckert et. al. (1997a). Comprehensive details of the process used to construct the model, data sources, assumptions made and other information can be found in Eckert, et al. (1997b).

2. THE WESTERN CAPE AGRICULTURAL SAM (WCAGRSAM)

2.1 Precedents and data sources

The framework developed here, a social accounting matrix highlighting agriculture, benefited significantly from prior work done by a number of researchers. The most directly antecedent model was an extended, multi-regional input-output model developed by Eckert & van Seventer (1995). The 1995 framework was "extended" in the sense that households were endogenized and "multi-regional" in that Western Cape provincial accounts were separated from those of the rest of the country and both appeared explicitly. Agriculture was disaggregated in that framework and several major agribusinesses kept explicit among the manufacturing sectors. Developing the 1995 I-O framework confirmed the usefulness of separately modelling both agricultural commodities and agricultural businesses and thus provided an initial structure for agriculture and agribusiness sectors in the WCAGRSAM. It also established the futility of attempting to quantify inter-regional transactions flows very accurately with currently available data. An alternative approach was used in WCAGRSAM with the result that it is best seen as a provincial framework only as opposed to the multi-regional framework attempted earlier.

In addition, in 1996, before they were disbanded, the former Central Economic Advisory Service was attempting to construct a series of provincial SAMs. As part of their collaboration with the SM3 project, a preliminary, unbalanced framework for the Western Cape was released to the Western Cape research team. This preliminary provincial SAM, with 23 production sectors, provided many control totals and some internal structures for the WCAGRSAM. Structural data were also drawn from the 93 sector national SAM prepared by the DBSA (van der Merwe & van Seventer, 1995) and the 1993 national input-output table prepared by the Central Statistical Service.

The present paper builds on the CEAS preliminary Western Cape SAM and the 1995 I-O framework by adding the remaining components of a fairly complete set of provincial accounts, updating the internal structure of all accounts to reflect the early 1990s (approximately 1993), and adding considerable additional, new and more accurate information on agricultural production relations and on household behaviour.

2.2 Distinguishing features of the WCAGRSAM

The present model contains some new or unique features relative to either South African or world practice. These are:

- The agricultural sector is disaggregated into 25 commodity groups, perhaps the most complete intra-sectoral detail yet available in any SAM. Commodity accounts are derived from extensive published and unpublished data available from the Western Cape and national Departments of Agriculture, supplemented by unpublished data and qualitative inputs from most of the major commodity organizations operating in the Western Cape. These production accounts represent a source of information not previously tapped for macro-modelling purposes. Because primary data were used from farmers, field operatives and commodity specialists, analytical results will differ somewhat from those in the 1995 I-O model which used secondary data and academic estimates. The list of commodity groups appears in Appendix 1 along with detailed results. Compositions of each commodity group can be found in Eckert et al., 1997b.

- Key forward and backward linked agricultural industries are kept explicit in order to quantify their transactions with production agriculture. "Agribusinesses" include backward linked input suppliers (agricultural chemicals, fertilizers and agricultural machinery), five forward linked food manufacturing industries, and the animal feeds sector - a forward linkage for some farmers and a backward linkage for others. A full listing is given in Appendix 2.

- In another departure, at least from prior South African practice, farm households are separated from non-farm households in order to capture consumption linkages that might flow from changes in farm incomes. Farm owner and farm worker households are distinguished and unique consumption patterns developed for both. Ethnic identification was used as a proxy for nature of involvement. Thus, white farm owners and employed white managers appear as one group while black and coloured farm workers appear as the second. These groupings were motivated by presumed similarities between household spending patterns within each group as well as the absence of some key data in the disaggregations needed for more specificity.

- Non-farm households are classified by population group and per capita incomes within households, following methods used in South Africa's first national SAM (CEAS, 1986). Income classes reflect specific Western Cape

patterns developed from the 1991 population census. For simplicity and following international practice, income classes represent the poorest 40 percent, middle 40 percent and the richest 20 percent, as measured separately within each population group. Household per capita incomes were used for classification because this measure most accurately reflects the principal determinant of household consumption patterns. In a demand driven SAM, consumption pattern differentials are crucial to final results. Income distributions contained in this model may be less equal than distributions measured from either total household incomes or incomes of earners alone. Lower income households, even with multiple income sources, also show the largest family sizes in all groups except whites. This generally lowers calculated per capita incomes in these households and increases measured inequality.

- Due to their limited numbers, especially in agriculture (the 1991 census identified only 27 persons of Asian descent living in households engaged in farming in the Western Cape), Asian households were combined with whites in all household accounts. Again, this was based on presumed similarity of spending patterns due to the almost universal urbanization of the provincial Asian population and the structure of their employment which is indistinguishable from that of whites in many respects.

- The framework represents 1993, the most recent year possible with data available in mid-1996. Distributions of occupations, salaries and wages received, and relationships between occupation of employees and their home households classified by income levels were calculated specifically for the Western Cape subset from the 1991 population census (CSS, 1992) data tapes, adjusted for inflation to 1993.

- Spending patterns were drawn from 1990 estimates of the Bureau of Market Research (1994), adjusted for inflation to 1993 values, and assumed to represent median income levels. Population group average patterns were adjusted again for upper and lower income groups using income elasticities of demand from the BMR (1990). For the first time, actual expenditure patterns of farm worker households were available from field research (Karaan and Tregurtha, 1996) and were incorporated into this framework.

- The WCAGRSAM focuses exclusively on the Western Cape using current boundaries. Interregional imports and exports were combined with residuals and adjusted to balance the model. Important as transactions with the rest of the nation may be, current data do not include sources and destinations for major transaction flows except for national imports and exports. A rural-

urban split, while desirable for a model of this type, also proved impossible because of the lack of a statistical definition of "rural".

- Because the structure of government was in flux when this model was constructed, constitutional devolution of many central responsibilities to provinces had yet to be fully implemented. With new structures of government revenue collection and dispersion yet to be fully determined and implemented, all transactions with government are combined in the WCAGRSAM. Therefore, no distinction is made between national, provincial or local authorities in the model nor can any be made in analyses based on this model.

3. STRUCTURAL RELATIONS IN THE WESTERN CAPE AGRICULTURAL ECONOMY

3.1 Relative economic contributions from different sectors

Table 1 presents aggregated structural relations between different sectors of the Western Cape economy as captured in the WCAGRSAM model. Some of these observations differ from conventional expectations based on earlier national-level models. This article reports results occurring only within the provincial economy with the exception noted above of transactions with government. Agriculture in this model contributes just over four percent of total value added (GGP) in the province. This rather low result was perhaps indicated earlier when the 1995 I-O model (Eckert & van Seventer, 1995) suggested that as much as half of some key multipliers from Western Cape agriculture occur outside the province. The sector is employment intensive, contributing nearly 13 percent of total formal sector jobs but low paying with only 2½ percent of total provincial salary and wage payments being derived from farm employment.

Two caveats are important here. First, it must be remembered that a significant portion of farm worker remuneration is received in kind, including not only consumables (food, clothing) but also housing, children's schooling and other infrastructure and family support amenities. Official statistics show that in-kind remuneration raises farm workers' incomes by 22.9 percent over their cash wage. It has been suggested elsewhere that, at least in the Western Cape, this figure probably underestimates the full economic impact of on-farm residence significantly (Viljoen and Eckert, 1995). Second, households included in this economic model are, per force, largely limited to those attached to the formal economy. Many thousand Western Cape households, enmeshed in the informal economy in low-income residential areas, lie outside the official data collection net and are inaccessible to models built on official statistics. Thus, while Table 1

clearly indicates that farm workers are poorly paid relative to other formal sector occupations, one must admit that significant portions of the Western Cape poverty problem are not captured in this SAM framework. Among the statistically invisible households, poverty can be substantially worse than among farm workers.

Table 1: Structural relations in the Western Cape Economy (direct spending as percent of provincial totals

	Value added	S & W Payments	Employment[a]
All Agriculture	4.16%	2.56%	12.79%
Cereals	0.27%	0.15%	0.17%
Other Crops[b]	0.52%	0.38%	1.02%
Horticulture	2.22%	1.46%	6.99%
Livestock	1.14%	0.56%	4.61%
Agribusiness	4.20%	4.10%	2.40%
Non-Agriculture	72.02%	69.09%	62.49%
Government	18.58%	22.48%	22.32%
Households	1.04%	1.77%	

a) Domestic employees of households excluded from this column for lack of data

b) "Other crops" is a mixed collections including all cropping except cereals and horticulture. This group includes hay, other field crops, potatoes and field scale vegetables, each of which is an explicit sector in the model.

Within agriculture, interesting relationships occur. Horticultural enterprises dominate agriculture's contributions to provincial value added, employment and employee remuneration. In descending order, viticulture, deciduous fruit, field scale vegetables and table grapes lead in this regard. Economic contributions from the livestock subsector, which receives little attention in the popular press, are relatively high, both in terms of value added and employment. As a generator of jobs, broiler production outclasses all but some of the horticultural enterprises. Salary and wage payments to farm workers are particularly low in livestock enterprises relative to other subsectors.

3.3 Aggregate economic roles of household groups

Table 2 explores the structure of household spending in the Western Cape as depicted in the WCAGRSAM framework. Spending patterns clearly reflect differences that might be expected between households at different income

levels. While white households overall spend the largest total amount of money, the Coloured population dominates provincial spending on raw farm commodities as

Table 2: Distribution of direct household spending by population groups

	Non-Farm Whites	Non-Farm Coloureds	Non-Farm Blacks	On-Farm Whites	On-Farm Labour	Total
Total H.H. spending	R20272	R16194	R3020	R1550	R868	R41905
%	48.4%	38.6%	7.2%	3.7%	2.1%	100.0%
Spending on unprocessed agricultural products	R298	R716	R54	R24	R99	R1190
%	25.0%	60.2%	4.5%	2.0%	8.3%	100.0%
Spending on processed food commodities	R1122	R1997	R374	R89	R215	R3797
%	29.6%	52.6%	9.8%	2.4%	5.7%	100.0%
Spending on trade margins	R2892	R3468	R707	R225	R225	R7516
%	38.5%	46.1%	9.4%	3.0%	3.0%	100.0%
Direct (income) taxes	R3915	R805	R102	R287	R29	R5139
%	76.2%	15.7%	2.0%	5.6%	0.6%	100.0%
Indirect (VA) Taxes	R1218	R1450	R287	R95	R96	R3144
%	38.7%	46.1%	9.1%	3.0%	3.0%	100.0%
Payments to Gov't Rev.	R4961	R2058	R351	R370	R112	R7852
%	63.2%	26.2%	4.5%	4.7%	1.4%	100.0%

well as processed food. The non-white population (non-farm Coloureds and blacks plus farm workers of both races) account for 73.0% and 68.1% of household spending on unprocessed and processed agricultural commodities respectively. Furthermore, due to their lower income levels, income elasticities of demand for foods of all types will be substantially higher among these groups. The policy implication of this observation is clear and important. Future growth of domestic demand for agriculture's output is heavily dependent on future patterns of change in aggregate incomes of the non-white population.

Low income households save less and spend a greater proportion of their income on consumption goods and services. For this reason, Coloured spending accounts for the largest portion of payments for trade margins, an important source of local rural incomes.

The burden of direct income taxes falls predominately (more than three-quarters) on the white population. However, the burden of indirect taxes, largely value added taxes on consumption spending, falls primarily on the non-white population groups. Thus, the Western Cape mirrors RSA and international patterns with a progressive structure for income (direct) taxes and a regressive structure for indirect taxes. Added together and including the much smaller effects of transfers to government (largely fines and forfeits) and receipt of subsidies by households, 67.7% of net household contributions to government revenue is drawn from whites.

4. FIXED PRICE MULTIPLIER RESULTS[4]

4.1 Macroeconomic implications of sectoral change

Table 3 presents selected fixed price multipliers for aggregated agricultural and economic sectors. Specific figures for individual commodities or economic sectors are listed in Appendices 1 and 2. The agricultural sector, particularly horticultural crops and livestock, has very strong contributions to make to the provincial economy in terms of employment and value added. Numbers in the

[4] *The term "fixed price" indicates that the estimated multipliers assume that supply is perfectly elastic. Obviously, in reality, this condition rarely occurs. This is especially true in agriculture where fixed natural resource stocks of land an water limit farm supply responses, even in the long run. The fixed price assumption that is build into linear Input-Output of SAM models tends to overstate the impact of exogenous change in the economy in question. Linear multiplier analysis is thus most accurate as a guide to policy when the simulated changes represent only modest deviations from the base.*

individual columns of Table 3 reflect two different definitions. Employment figures indicate the number of person years of employment created from R1 million of additional final demand. In the other three columns, figures indicate the ratio of the expected change in the particular measure for a given change in the value of final demand. Thus, R1.00 of additional demand for the cereal sector's output will increase provincial value added by R1.02, require R0.27 of additional international imports and contribute R0.27 to government revenue. Note that interregional imports from the rest of South Africa are not included here.

Table 3: Fixed price multipliers for commodity and sector groupings

	Employment[a]	Value Added[b]	Imports[b]	Government Revenue[b]
All Agriculture	82.8	1.29	0.21	0.26
Cereals	26.1	1.02	0.27	0.27
Other Crops[c]	70.8	1.36	0.19	0.25
Horticulture	92.8	1.40	0.20	0.24
Livestock	88.4	1.25	0.20	0.27
Agribusiness	39.7	1.02	0.26	0.20
Non-Agriculture	29.4	1.10	0.25	0.22

[a] Number of person-years employment created per extra R1.0 million final demand.
[b] Rand value per additional R1.00 of additional final demand.
[c] See footnote (b) for Table 1

Several generalizable patterns are evident in Table 3 Agriculture's potential to contribute to employment and value added in the provincial economy significantly exceeds those of the non-agricultural sectors. Within the latter category, agribusiness has substantially higher employment multipliers than other non-agricultural sectors. Within agriculture itself, the high fliers are the horticultural sub-sector, livestock and field scale vegetables. Household gardens are not included in statistics on vegetable production and thus are not in this model. Although such gardens may be very important to the nutritional security of many individual households, they are inconsequential in terms of aggregate production or employment. Cereal production does not compete well with other options in Table 3. Current cereals technologies cause that subsector to be the least labour intensive, with the lowest value added multiplier and with the highest dependence on imported goods as inputs to production.

4.4 Effects of sectoral growth on household incomes

Each sector of the economy will generate incomes received by households in a

unique multiplier pattern. Sectoral differences appear in the amount of such incomes generated and in the equity or inequity of their distribution. Table 4 illustrates some of these differentials for selected key Western Cape economic sectors. Figures for "household income multipliers" reflect the amount of additional household incomes resulting from R1.00 of additional sales in each sector. The Gini coefficients reflect the level of inequality in the distribution of incomes generated. The overall provincial average in the model is 0.509. Lower Gini coefficients indicate multiplier patterns that will lead to more equal income distributions whereas growth in sectors with higher Gini ratios will worsen overall provincial income distribution.

Table 4: Income multipliers and gini coefficients for selected economic sectors

Sector	Household Income Multiplier	Gini	Sector	Household Income Multiplier	Gini
Agricultural Production Sectors			Agribusiness Sectors		
Field vegetables	0.905	0.384	Horticultural canning	0.792	0.482
Grapes	0.924	0.404	Dairy products	0.566	0.492
Deciduous fruit	0.871	0.413	Distilleries/wine	0.772	0.493
Viticulture	0.740	0.429	Meat processing	0.301	0.497
Flowers + bulbs	0.898	0.384	Grain products	0.721	0.503
Lucerne	0.590	0.481	Animal feeds	0.675	0.512
Potatoes	0.658	0.517	Agribusinesses	0.641	0.500
Wheat	0.600	0.502	**Selected Other Economic Sectors**		
Beef	0.657	0.486	Construction	0.794	0.438
Small stock	0.603	0.487	Textiles	0.837	0.450
Dairy	0.722	0.534	Metal mfg.	0.353	0.519
Pigs	0.877	0.373	Transportation	0.708	0.523
Broilers	0.729	0.498	Non-metal mfg.	0.427	0.546
Layers	0.679	0.551	Trade	0.952	0.562
Ostriches	0.775	0.532	Commercial services	0.861	0.628
All Agriculture	**0.758**	**0.464**	**Non-Agriculture**	**0.703**	**0.540**

Significant differences exist in various sectors' ability to contribute to household incomes and in the distributions of those incomes. However, these are not necessarily directly correlated. Among agricultural commodities, those with the

highest household income multipliers also tend to be those with the most equitable distributions. Elsewhere, a mixed pattern appears. Wholesale and retail trade, for example, is very income intensive (multiplier of 0.952) but those incomes are poorly distributed with a Gini coefficient of 0.562. In general, agricultural production tends to make greater contributions to household incomes and in a more egalitarian fashion than other sectors. The agribusinesses, through their backward links to agricultural suppliers, show more egalitarian multiplier patterns than other non-agricultural sectors.

4.5 Effects of changes in household incomes

Household spending is a major determinant of economic processes. Spending patterns are primarily determined by levels of per capita incomes within the household. The WCAGRSAM contains five broad household groups defined by race and involvement in agriculture. Each of these is further disaggregated by per capita incomes. Thus the model can simulate the direct and indirect multiplier effects of changes in household incomes on the economy as a whole. Such simulations can be used to assess the possible impacts of income redistribution policies, or different income growth histories between population groups in the Western Cape.

4.6 Effects on production sectors

Table 5 presents fixed price expenditure multipliers for selected agricultural and economic sectors that occur as a result of spending by different non-farm household groups. Five household classes are highlighted, arrayed by median household per capita income for each group. Interracial comparisons are shown by comparing columns 1, 3 and 4, the middle income levels for each ethnic group. However, one must be clear that the different patterns shown undoubtedly reflect differences in income level, perhaps more so than cultural tastes and preferences. All three income groups are given for the Coloured population, the most numerous group in the province and therefore a mainstay in the provincial economy. Comparing columns 2, 3 and 5 provides a picture of economic relationships occurring within the Coloured population strictly as a result of income differentials. Before turning to a discussion of the implication of these estimated multipliers, we must note the severe income inequality that remains within the Western Cape, both within and between population groups. It would appear that redistributive economic growth policies must be of high priority in this province, as elsewhere in the nation.

Normally, the marginal propensity to consume is inversely related to income levels. Further, Engel's Law states that the proportion of income spent on food varies inversely with income levels as well. Thus the poor consume greater

Table 5: Expenditure multipliers for agricultural and economic sectors (Demand increases from an additional R1000 of income received)

	Household Groups Receiving Additional Income				
	Middle 40% Whites + Asians	Upper 20% Coloureds	Middle 40% Coloureds	Middle 40% Blacks	Lower 40% Coloureds
Median Income F	17066	8240	3125	1990	1015
Wheat	2.60	5.30	7.47	8.86	9.65
Viticulture	9.16	11.42	13.95	15.32	13.58
Table Grapes	2.33	3.46	4.79	4.18	5.87
Citrus	0.31	0.45	0.60	0.49	0.67
Deciduous Fruit	8.67	11.57	16.10	13.87	19.74
Dried Fruit	0.35	0.49	0.57	0.45	0.49
Potato	2.40	3.24	4.84	4.00	6.71
Other Vegetables	6.79	9.30	13.82	11.16	18.85
Small Stock	4.59	6.45	9.83	7.55	13.63
Beef	5.48	7.66	11.45	9.15	15.50
Dairy	8.94	12.94	19.68	15.76	27.17
Pigs	1.98	2.73	4.01	3.25	5.37
Broilers	10.62	16.46	23.88	21.83	31.35
Layers (eggs)	5.68	8.00	12.03	10.60	16.47
Meat processing	50.58	68.62	84.17	74.00	80.83
Dairy products	21.88	29.59	37.20	25.89	37.85
Canning	17.94	25.13	29.49	22.97	24.76
Fish & Edible Oils	12.23	18.32	25.51	21.52	32.07
Grain products	9.31	27.46	38.35	55.08	46.65
Distilleries/wineries	29.37	29.92	35.91	54.64	34.97
Other Bev.&Tob.	24.44	37.81	49.86	45.31	55.22
Textiles	47.58	58.91	68.43	96.83	72.19
Wood products	67.71	79.03	89.49	97.15	86.01
Non-metal mfgrs.	157.34	166.38	186.48	212.51	187.10
Metal manufactures	162.60	147.37	144.00	125.51	135.23
Electricity/gas/water	75.34	83.98	106.47	91.81	108.22
Construction	17.77	19.92	23.32	23.09	25.03
Trade	326.47	377.55	435.97	470.28	478.57
Transport/commun.	131.87	165.15	181.25	210.11	173.71

portions of their incomes and save less. And their consumption expenditures are skewed more heavily toward food commodities, both raw and processed, and basic necessities. These expected consumption patterns (discussed in more detail below) relate to actual and relative direct spending. In general, a consistent pattern is seen wherein expenditure multipliers for food rise as median incomes decline across white and Coloured income classes. African households differ somewhat, reflecting cultural influences on diet. Multipliers from African spending for most food groups are lower than would be expected from patterns visible within the Coloured population. However, for grain and grain products (bread, flour, maize meal) and distillery products, African multipliers depart from the Coloured trends on the higher side. Similar observations can be made about non-food sectors. Expenditure multipliers rise with lower incomes in nearly all cases modelled, with some exceptions for the very poorest group in Table 5.

These observations lead to some important conclusions. First, the data suggest that white and Coloured populations share essentially the same consumer spending practices, distinguished only by their relative level of spending power. The second main conclusion is more important from the point of view of future economic growth. Most sectors of the Western Cape economy will benefit more from income growth among the poor than they will from new incomes received by the rich. In several categories, the difference is substantial. For example, R1000 received as income by the lowest income Coloured group will lead to a R19.74 increase in expenditure for unprocessed deciduous fruit. This seems small if expressed in percentage of the initial income received, but it is 2¼ times the R8.67 figure for middle income whites. A key conclusion: business growth in the Western Cape depends on reducing poverty and bringing the marginalised into the mainstream as economic participants.

4.7 Effects on macroeconomic parameters

The Western Cape economy displays many of the economic behaviour differences normally found between rich and poor and the results of these behaviours influence macroeconomic outcomes. In this regard, the Cape mirrors many patterns found earlier for South Africa as a whole (Dreyer & Brand, 1986; Eckert & Mullins, 1989). Spending patterns by the poor differ from those of the rich in several ways. Spending by the poor has the following characteristics:

- A higher proportion spent on immediate consumption, and very low savings rates,

- A higher proportion of consumer spending allocated to food, as per Engel's Law.

- A higher labour content in the mix of goods and services purchased.

- A lower import content.

- Goods consumed by the poor will likely be produced by lower income workers, especially because of the concentration of their spending on raw and processed agricultural products.

- To minimize transactions costs, consumer items purchased by the poor are more likely to be retailed and even manufactured very close to home. This is particularly true with personal and household services. In the case of food in particular, this is largely a function of 1) the lack of spending power for bulk purchases and 2) the lack of storage and refrigeration facilities.

  Food is therefore purchased daily if not separately for each meal (Myburgh, 1996). Therefore, spending by the poor tends to stimulate very localized economic activity, much more so than spending by higher income groups.

One aggregate result of these patterns is that spending by the poor tends to provide a much greater stimulus to the province's agricultural and manufacturing industries than does spending by the rich. The poor devote a higher portion of their incomes to consumption spending, directly consume fewer imports, and their spending tends to hire more people who are also poor, especially the agricultural labour force and persons involved in the informal sector. Multipliers from their spending tend to remain in the country, among people with similar spending patterns. Table 6 explores the impact of these differentials. An inverse relationship is found between incomes and several key parameters. Aggregate corporate and farm profits (gross operating surplus) are higher for spending of the poor, as is GGP (value added). The strong increase in domestic business activity caused by spending of the poor requires additional imports of intermediate goods, sufficient to offset the lower direct import content inherent in their consumption mix. Thus new spending by the poor, on balance, requires an increase in imports.

Upper income groups, as expected, have higher direct (income) tax multipliers. However, because of higher spending on consumption and lower import content of the consumption mix, indirect (VAT) tax multipliers are higher for spending by the poor. Government revenue multipliers from household

incomes mainly reflect these two types of taxes but also include household transfers to government, subsidies received by households and government property incomes (largely rents) paid by households, all of which are negatively related to income. All told, white incomes have the highest government revenue multipliers, although not in the same ratio as that for direct taxes alone.

Table 6. Comparative household income effects on macroeconomic variables (Increases from an additional R1000 of income received)

	Middle 40% Whites + Asians	Upper 20% Coloureds	Middle 40% Coloureds	Middle 40% Blacks	Lower 40% Coloureds
Gross Operating Surplus	320.32	349.93	390.42	394.03	414.94
Direct Taxes	256.58	166.56	131.72	127.80	132.47
Indirect Taxes	139.49	157.94	180.80	186.59	194.51
Government Revenue	387.59	310.41	296.42	297.24	312.11
Total Savings	137.08	194.61	189.03	179.15	176.48
Total Imports	398.98	433.83	456.16	465.06	449.94
Value Added	988.46	928.73	979.53	994.10	1022.91
Jobs Created/R1 million	29.86	29.89	33.84	34.26	35.87

In summary, the arguments supporting redistributive growth policies rest, in part, on the higher GGP, Gross Operating Surplus and employment growth to be attained from new incomes received by the poor as opposed to new incomes of the rich. To this must be added the redistributive factors that the jobs created are 1) more likely to be among other low income earners and 2) physically closer to their own communities. Thus, for example, increasing farm worker incomes (returns to labour) is likely to have a more direct impact on local town and rural development than strategies based on enhancing returns to other production factors in the rural economy such as land, capital or management.

4.8 Prioritizing development interventions

The central commitment of Government to economic transformation has been well established as policy. High on the agenda are employment and improved income distributions. To sustain such policies, strong economic growth is essential. For long run economic strength, policy management of such growth must emphasize those sectors whose growth is "balance of payments friendly." The present model permits a quantification of these concerns. It is possible using simple fixed price multipliers to construct a prioritization of farm commodities and economic sectors based on their respective contributions to each of these objectives.

In this exercise, a composite ranking is constructed for each commodity or sector. An ordinal ranking (first through last) results which flags those sectors most strongly suggested as growth points within the economy. The method is simple. Each of the 48 commodities and sectors is ranked from best to worst

relative to each other based on their multipliers for 1) value added (GGP), 2) employment creation per million Rand of extra output, 3) Gini coefficients, and 4) import dependency. "Best" values were assumed to be the highest multipliers for value added and employment creation and the lowest estimates for Gini coefficients and import dependency. The composite ranking was calculated as a simple sum of the rank scores of the four individual components. Table 7 summarizes the results, presenting the best and worst sectors for the individual components and the overall composite ranking. Complete details for each sector in the WCAGRSAM as well as individual Gini measurements can be found in Eckert, et al.(1997c).

Table 7. Ten best and five worst commodities or sectors for developmental impacts[a]

Rank	Employment	Value Added	Import Content	Gini Coefficient	Composite Rank
1	Dried fruit	Other horticulture	Indigenous teas	Other horticulture	Deciduous fruit
2	Citrus	Trade	Comm'l services	Other field crops	Other horticulture
3	Broilers	Deciduous fruit	Broilers	Pigs	Flowers + bulbs
4	Deciduous fruit	Fynbos	Ostrich	Flowers + bulbs	Other vegetables[b]
5	Flowers + bulbs	Other vegetables[b]	Fynbos	Other vegetables[b]	Dried fruit
6	Table grapes	Flowers + bulbs	Animal fibres	Dried fruit	Citrus
7	Other horticulture	Table grapes	Viticulture	Table grapes	Table grapes
8	Other vegetables[b]	Comm'l services	Trade	Citrus	Broilers
9	Small stock	Other field crops	Deciduous fruit	Deciduous fruit	Fynbos
10	Animal fibres	Citrus	Other vegetables[b]	Other livestock	Viticulture
42	Ele-Ga-Wa[c]	Non-metal mfgrs.	Non-metal mfgrs.	Fertilizer	Agric. machinery
43	Non-metal mfgrs.	Metal mfgrs.	Metal mfgrs.	Mining	Metal mfgrs.
44	Metal mfgrs.	Meat processing	Meat processing	Trade	Fertilizer
45	Mining	Agric. Machinery	Mining	Ele-Ga-Wa[c]	Non-metal mfgrs.
46	Agric. machinery	Mining	Agric. machinery	Comm'l services	Mining

a Excluding government services and the "not otherwise classified" sector.
b Field scale vegetables other than potatoes.
c Electricity, gas and water production and delivery.

According to the composite rank, the top ten sectors in the Western Cape economy with respect to their potential broad-based contributions to development and reconstruction are all agricultural. More specifically, with the inclusion of the broiler industry, these sectors basically comprise a full listing of the province's horticultural and vegetable products. Heavy manufacturing and mining are among those sectors that contribute the least. They generally employ few people for each R1 million of extra demand, contribute marginally to value

added, are heavily import dependent and the incomes generated do not effectively reach the poor.

5. CONCLUSIONS AND IMPLICATIONS

This analysis has demonstrated the importance of the Western Cape's commercial agriculture to the provincial economy as a whole, and more particularly to several specific policy goals of the reconstruction and economic transformation now under way. Commercial agriculture, taken in the aggregate, is the strongest provider of jobs and of value added (GGP) in the province. The sector excels in generating incomes for households and is particularly notable for the high share of those incomes that accrue to the provinces's poor. Because of their backward linkages to production agriculture, the agribusinesses outperform the rest of the non-agricultural sectors in terms of these goals as well. Within the mix of farm commodities, the horticultural crops and broilers have particularly high contributions to these various economic objectives. Growth in almost any agricultural commodity (potatoes, dairy, layers and ostriches being the exceptions) will contribute to improving aggregate income distributions.

A number of comparisons are developed between the economic behaviour of household classes at different income levels. These analyses emphasize the critical role of spending of the lower income groups in general and the Coloured population in particular on future growth and distribution in the Western Cape economy. Commercial agriculture and the poor are tightly bound in a circle of mutual dependence. The poor depend heavily of farm employment for incomes and farmers depend heavily on spending of the lower income groups for future demand expansion. Several related conclusions are worth reinforcing here:

- The data make a strong case for redistributive development policies, particularly for reducing income inequality and poverty.

- The economic contributions of agriculture as currently structured in this province argue for extreme caution with respect to land reform initiatives.

- Future growth in the demand for farm output will depend heavily on future growth in real incomes among the non-white population.

- Future employment generation and improved income distributions will depend heavily on continued strength of the agricultural sector.

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Appendix 1: Fixed Price Multipliers for Each Agricultural Sector

Sector	Employment	Value Added	Imports	Government Revenue
Wheat	26.1	0.988	0.488	0.271
Cereals	26.3	1.147	0.425	0.267
Canola	23.9	0.946	0.517	0.232
Hay	41.5	1.049	0.467	0.244
Other field crops	29.1	1.375	0.453	0.243
Viticulture	69.1	1.264	0.391	0.278
Grapes	113.9	1.435	0.454	0.225
Citrus	120.2	1.360	0.425	0.256
Deciduous fruit	115.7	1.487	0.392	0.217
Dry fruit	123.3	1.353	0.400	0.266
Potatoes	50.0	1.149	0.433	0.260
Field vegetables	82.2	1.464	0.394	0.253
Fynbos	44.8	1.477	0.385	0.211
Flowers & bulbs	114.4	1.452	0.399	0.251
Indigenous teas	65.6	1.344	0.281	0.258
Other horticulture	100.0	1.490	0.424	0.259
Animal fibres	77.7	1.251	0.385	0.294
Small stock	81.4	0.997	0.453	0.302
Beef	48.9	1.161	0.418	0.265
Dairy	72.7	1.197	0.449	0.257
Ostriches	66.9	1.284	0.373	0.299
Pigs	72.1	1.311	0.496	0.233
Broilers	116.5	1.325	0.355	0.270
Layers	71.2	1.227	0.401	0.258
Other livestock	69.4	1.237	0.469	0.219

Appendix 2. Fixed Price Multipliers for Each Non-agricultural Sector

	Employment	Value Added	Imports	Government Revenue
Forestry & fishing	55.9	1.082	0.527	0.182
Mining	12.4	0.166	0.932	0.030
Meat processing	21.4	0.465	0.811	0.088
Dairy products	41.1	0.901	0.638	0.153
Fruit & vegetable canning	54.7	1.247	0.474	0.242
Fish & oil canning	45.9	1.229	0.489	0.215
Grain products	41.8	1.139	0.511	0.230
Animal feeds	41.9	1.085	0.528	0.219
Distilleries/wineries	46.5	1.254	0.455	0.244
Other beverages, tobacco	46.3	1.204	0.488	0.215
Textiles	39.8	1.227	0.521	0.233
Wood products	29.9	1.148	0.545	0.211
Non-metal manufactures	18.3	0.668	0.722	0.133
Fertilizer, agr. chemicals	21.3	0.754	0.673	0.168
Metal manufactures	13.5	0.533	0.792	0.097
Agricultural machinery	5.5	0.191	0.936	0.034
Electricity, gas, water	20.7	1.075	0.518	0.200
Construction, engineering	45.0	1.122	0.579	0.216
Wholesale and retail trade	38.6	1.489	0.391	0.282
Transport, communications	30.6	1.256	0.463	0.247
Commercial services	29.8	1.429	0.316	0.341
Government services	191.0	1.348	0.411	0.269
Not otherwise classified	98.0	1.336	0.481	0.254