

**Expenditure Elasticities and Growth Linkages
for Rural Households in Two Study Areas
of KwaZulu-Natal**

Sheryl Lee Hendriks

November 2002

In fulfilment of a PhD in Agriculture,
Discipline of Agricultural Economics,
School of Agricultural Sciences and Agribusiness,
Faculty of Science and Agriculture,
University of Natal,
Pietermaritzburg.

ABSTRACT

Expenditure patterns were investigated to determine the potential impact of a widespread income shock on household expenditure and to estimate the potential for growth linkages to spur agriculture-led growth in two communal areas of KwaZulu-Natal. Expenditure data were collected from 99 sample households at the rural areas of Swayimana and Umzumbe during 1997. District and wealth group expenditure analyses for commodity groups suggested expenditure elasticities of close to unity for food. Low expenditure elasticities were found for staple foods. Expenditure elasticities for meat, meat products, and poultry were close to unity, while horticultural products showed the greatest potential for demand growth within the food category. Of the statistically significant commodity categories, expenditure elasticities for durables, housing, and transport were more than double those estimated for the aggregate food category. There was little difference in the response of wealthier households (the top expenditure decile) and that of poorer households. However, wealthier households have a greater propensity for increased expenditure on transport, while poorer households show a greater propensity for increased expenditure on housing and durables.

District and wealth group expenditure analyses for tradable versus non-tradable farm and non-farm goods and services suggest a less than proportional increase in the demand for tradable farm commodities, and a more than proportional increase in demand for non-tradable farm commodities, following a one percent increase in household expenditure. Expenditure on non-farm tradables (imported consumer durables) showed the greatest potential for demand growth, with expenditure elasticities ranging from 1.75 to 2.59. A one Rand increase in household income is predicted to add an additional 28 cents (multiplier of 1.28) to the local economy. However, even relatively weak growth linkages could lead to much needed new income and

employment opportunities within the local farm and non-farm sectors if the constraints inhibiting agriculture, and hence broad-based growth in rural incomes are alleviated. Agriculture-led growth in South Africa requires public investment in both physical and institutional infrastructure to reduce transaction costs and risks in all markets, encouraging greater participation by local entrepreneurs and private sector investors. In addition, the roles, functions and services offered by extension agents should be extended to promote collective marketing, facilitate land rental contracts, provide training, and technical and business support for farm and non-farm entrepreneurs.

DECLARATIONS

I hereby declare that this is my own work. Where other sources have been used, these are duly acknowledged in the text.

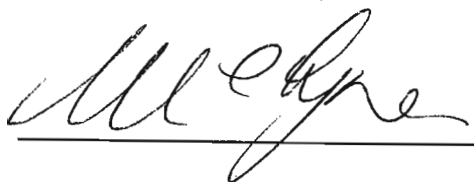


Sheryl L Hendriks

18/11/02

Date

As Research Supervisor, I agree/do not agree to submission of this thesis for examination.



Professor Michael C Lyne

20/11/02

Date

DEDICATION

To the Lord, my treasured helper,
and in memory of my Mother,

Rosanne Spalding

(7 March 1944 - 26 July 2000)

*Even in your absence,
your admirable courage and absolute belief in me
spurred this work to completion.*

ACKNOWLEDGEMENTS

The contributions of the following people and organisations to this study are most gratefully acknowledged:

- Professor Mike Lyne, Research Supervisor, for his most valued and excellent guidance, patient mentoring and continual encouragement;
- The Land and Agriculture Policy Centre for funding the surveys;
- Christopher Delgado, Paula Despins, Dr Bettina Hedden-Badenhorst, Professor Johan Kirsten, Dr Moraka Makhura, and Dr Simphiwe Nqgangweni for input in the questionnaire development;
- Duncan Stewart and David Mpisane of LIMA for overseeing the fieldwork, and Charles Ngwenya (also of LIMA) for conducting the fieldwork;
- John and Trisha Klug for digitising the orthophoto maps;
- The Tribal Ward Chiefs, *indunas*, councillors, court secretaries, sample households and field interviewers from Gcabane, KwaHlongwa and Swayimana for their cooperation and assistance in data collection;
- Harvey Dicks for assistance with the estimation of the t-statistics;
- Beulah John for proof reading the final thesis;
- Roelie, and my very little sons, Kevin and Aidan, for their immeasurable sacrifices, endurance, support and understanding through my endless cycles of hope and despair.
- Dad, Petra, Carol, and Steve for their continual encouragement.
- Janet, Gavyn, Stephen, and Kate Wirth for babysitting and taking my family on numerous camping 'retreats'.

- My colleagues in the School of Agricultural Sciences and Agribusiness for their encouragement in this endeavour.

TABLE OF CONTENTS

ABSTRACT	ii
DECLARATIONS	iv
DEDICATION	v
ACKNOWLEDGEMENTS	vi
TABLE OF CONTENTS	viii
LIST OF FIGURES	xi
LIST OF TABLES	xii
CHAPTER 1: THE PROBLEM AND ITS SETTING	1
1.1 Importance of the study	1
1.2 Statement of the research problem	4
1.3 Research hypothesis	4
1.4 Study Design	4
1.5 Organisation of sections of the thesis	5
CHAPTER 2: REVIEW OF RELATED LITERATURE	6
2.1 What induces a Green Revolution?	8
2.2 The contribution of agriculture to livelihoods in rural South Africa	9
2.3 Rural household consumption patterns in South Africa	10
2.4 Growth linkages	12
2.5 Growth linkages and rural employment opportunities	13
2.6 Growth linkage benefits for the rural non-farm economy	14
2.7 The role of agriculture in the new global order	16
2.8 Growth multiplier models	17

2.9	Asian agricultural growth linkage studies	19
2.10	Comparative studies of Asian versus African growth linkages	23
2.11	Early African growth linkage studies	26
2.12	More recent African growth linkage studies	27
2.13	Which are the most efficient shocks for stimulating agricultural production?	31
2.14	Application of agricultural growth multipliers to small scale farmers	34
2.15	What is the potential for economic growth in rural South Africa?	35
2.16	Constraints to agricultural growth in South Africa	38

CHAPTER 3: SAMPLE AND SURVEY DESIGN AND CHARACTERISTICS OF

THE STUDY AREAS

41

3.1	Overview of the study districts	41
3.2	Sample selection	43
3.3	Interviewer training and questionnaire trial	46
3.4	Questionnaire design and data collection	47
3.5	Estimation of annual household expenditure	48
3.6	Descriptive statistics	51

CHAPTER 4: EXPENDITURE ELASTICITIES AND GROWTH MULTIPLIER

METHODOLOGY

55

4.1	Estimation of expenditure elasticities	55
4.2	Reliability of the estimated model, expenditure shares and elasticities	59
4.3	Estimation of growth multipliers	63

CHAPTER 5: DISTRICT AND WEALTH GROUP EXPENDITURE ELASTICITIES

66

5.1	Expenditure elasticities for districts	66
5.2	Expenditure elasticities for wealth groups	73

CHAPTER 6: EXPENDITURE ELASTICITIES FOR TRADABLE AND NON-TRADABLE GOODS AND SERVICES, AND LOCAL GROWTH MULTIPLIERS	76
6.1 Tradable and non-tradable expenditure elasticities for districts	76
6.2 Tradable and non-tradable expenditure elasticities for wealth groups	78
6.3 Growth multipliers	79
CHAPTER 7: POLICY IMPLICATIONS AND CONCLUSIONS	82
7.1 Policy implications	84
7.2 Conclusions	89
SUMMARY	93
REFERENCES	98
Appendix A: Survey questionnaire for round one	
Appendix B: Survey questionnaire for round two	
Appendix C: Survey questionnaire for round three	
Appendix D: Coding list and data set	
Appendix E: Table indicating variance inflation indexes	
Appendix F: Expenditure elasticities for aggregate commodity groups in Swayimana and Umzumbe, 1997 (n = 93)	
Appendix G: Expenditure elasticities for food commodity groups in Swayimana and Umzumbe, 1997 (n = 93)	
Appendix H: Expenditure elasticities for aggregate commodity groups by wealth group in Swayimana and Umzumbe, 1997 (n = 93)	
Appendix I: Expenditure elasticities for food commodity groups b wealth group in Swayimana and Umzumbe, 1997 (n = 93)	

LIST OF FIGURES

Figure 2.1	Increases in agriculture and reduction in percentage poverty as a result of additional government expenditure (after Fan <i>et al</i> , 1999, p2)	32
Figure 2.2	Number of people moved out of poverty as a result of additional government spending of one million Rupees (after Fan <i>et al</i> , 1999, p 2)	33
Figure 3.1	Location of Swayimana and Umzumbe (after Braby, 1997)	42
Figure 3.2	Map of Swayimana (after KwaZulu Department of Interior, 1982)	43
Figure 3.3	Map of Umzumbe wards (after KwaZulu Department of Interior, 1979)	45
Figure 3.4	Agronomic potential of Swayimana and Umzumbe (after Guy and Smith, 1998, p8)	54
Figure 4.1	Percentage difference in predicted ABS and actual ABS in Swayimana and Umzumbe, 1997 (n=93).	60
Figure 5.1	Comparison of predicted average budget shares predicted for Swayimana and Umzumbe, 1997 (n = 93).	68

LIST OF TABLES

Table 2.1	Multipliers estimated for regional economies in Asian countries	20
Table 2.2	Comparative country multipliers estimated by Haggblade and Hazell (1989)	25
Table 2.3	Multipliers estimated for regional economies in African	30
Table 2.4	Local multipliers for African countries (Delgado <i>et al</i> , 1998)	31
Table 3.1	Classification of non-tradable goods and services for Swayimana and Umzumbe, 1997.	50
Table 3.2	Annual expenditure per capita and adult equivalent, Swayimana and Umzumbe, 1997, n = 93.	51
Table 4.1	Household characteristic variables included in the model	56
Table 4.2	Illustrative coefficients, sample means and standard errors for whole sample food category, Swayimana and Umzumbe, 1997 (n=93).	58
Table 5.1	Expenditure elasticities for significant aggregate commodity groups in Swayimana and Umzumbe, 1997 (n = 93)	67
Table 5.2	Expenditure elasticities for significant food commodity groups in Swayimana and Umzumbe, 1997 (n = 93)	69
Table 5.3	Expenditure elasticities for food commodity groups by wealth group in Swayimana and Umzumbe, 1997 (n = 93)	74
Table 6.1	Results of the district expenditure analysis for tradable/non-tradable commodity groups, Swayimana and Umzumbe, 1997 (n = 93)	77
Table 6.2	Results of wealth group expenditure analysis for tradables and non-tradables in Swayimana and Umzumbe, 1997 (n = 93)	78

Table 6.3	Growth multipliers for Swayimana and Umzumbe, 1997 (n = 93)
-----------	---

80

CHAPTER 1: THE PROBLEM AND ITS SETTING

This study investigates household expenditure patterns and estimates agricultural growth multipliers for sample households drawn from three tribal wards in two districts of KwaZulu-Natal. Panel data collected over four months in 1997 are used to estimate regional and wealth group expenditure shares and elasticities for commodity groups, and tradable and non-tradable goods and services; and growth multipliers. The estimates shed light on the potential for agriculture-led growth in rural KwaZulu-Natal, and the impact that policy, aimed at increasing agricultural production and incomes, could have on the rural economy.

1.1 Importance of the study

Although agriculture has played a major role in stimulating growth in the non-farm sectors of countries in Asia following the 'Green Revolution' (Delgado, 1997b), Delgado *et al* (1998), Hazell and Haggblade (1991), and Mellor (1976, p187) propose that growth linkages can generate employment opportunities and broaden rural incomes through expanded and diversified production of farm *and* non-farm goods and services. Strong growth linkages require increased demand for local demand-constrained products in order to stimulate a supply response from farm and non-farm production. For example, Hazell and Haggblade (1990, cited by Delgado *et al*, 1998) found that an increase of 100 Rupees in Indian farm incomes would, on average, generate an additional 64 Rupees in agricultural and non-agricultural income. This implies a growth multiplier of 1.64. The multiplier increased to 1.93 in areas of high agricultural potential and dropped to 1.46 in areas of lower potential. Infrastructure was also a significant determinant of the strength of these growth multipliers.

Delgado *et al* (1994) argue that widespread increases in spending on the types of non-tradables¹ that rural people consume (eg. dairy, fruits, vegetables, some starches, services, and building materials), could mobilise rural resources (land, labour and capital) for growth. High rates of unemployment and low productivity indicate under-utilisation of local resources which could be tapped through agricultural development that raises the incomes and spending power of large numbers of poor rural households.

This may be true for Asia, but the contribution of agriculture to black rural household income is low in South Africa (de Klerk, 1996; Lipton *et al*, 1996). According to Taylor and Cairns (2001), farm incomes in the former homelands are low due to labour shortages at critical times because inputs are unavailable or expensive, traction for ploughing is difficult to access, uncontrolled grazing by livestock threatens crops, local markets are easily saturated, emerging farmers find it difficult to compete with large commercial farmers, and because disease and weather risks are pervasive. In fact, for most rural households in South Africa, income from agriculture is much lower than income from wage remittances and social welfare (Hanekom, 1999). Even with substantial exogenous investment to improve infrastructure and overcome the constraints farmers face, the magnitude of impoverishment has led to “palpable pessimism about what small-scale agriculture can do for rural areas” (Ngqangweni *et al*, 1998, p1) and widespread scepticism regarding the future role of agriculture in these communities (Lipton *et al*, 1996). Nevertheless, Kepe *et al* (2001) contend that faster economic growth is often correlated with higher incomes amongst poor, isolated communities and in the agricultural and

¹ For the purpose of this study, non-tradables are goods which are neither exported outside of the region of study, nor imported into this region, and for which there are no close substitutes. Services are by nature non-tradable.

small-scale service sectors. This view is supported by four recent studies in African countries (Delgado *et al*, 1998) where estimated multipliers ranged from 2.69 to 3.96. Optimism about such multipliers should be tempered by the results of South African studies by Belete *et al* (1999) and Ngqangweni (2000) who estimate weaker multipliers of 1.35 and 1.98 respectively for rural communities in the Eastern Cape province. No such studies have been conducted in KwaZulu-Natal to estimate the potential for agriculture-led economic growth in the poor communal areas of the province.

At the national level, South African policy asserts that agriculture must contribute to national economic growth objectives, reducing income inequalities and eliminating poverty through increased agricultural production, increasing incomes for the poorest groups, creating additional employment opportunities and improving household food security (National Ministry of Provincial and Local Government, 2000; Ministry of Agriculture and Land Affairs, 1998). While studies in Asia predicted that such objectives could be met through increased farm earnings that stimulate production and the consumption of local goods and services, studies of farm economies in African countries have not illustrated the same potential for agriculture-driven economic reform (Delgado *et al*, 1998). The assumptions made by national and KwaZulu-Natal public policy therefore need to be more closely examined.

The development of appropriate policy focussed on agricultural growth rests on knowing what effect increased rural household income would have on demand for the commodities (particularly locally produced commodities) that these households consume, and clarification of the agricultural growth linkage potential of South Africa's communal areas. The objective of this study is to investigate the potential for agriculture-led growth linkages in two communal areas of KwaZulu-

Natal. The study examines the expenditure behaviour of sample households in these areas and questions whether widespread growth in smallholder farm incomes could effectively raise rural incomes through income re-spent on local non-farm goods and services for which there may otherwise not be a market.

1.2 Statement of the research problem

South Africa's Sustainable Integrated Rural Development Strategy builds on the assumption that rural economies are "potential engines for growth" (National Ministry of Provincial and Local Government, 2000, p25). However, the potential for agriculture-led growth in South Africa's rural economies is unclear (Delgado *et al*, 1997b), and no attempt has been made to estimate the agriculture-led growth potential of communal areas in KwaZulu-Natal. This study sets out to estimate budget shares for commodity groups and tradable and non-tradable goods and services, expenditure elasticities and agricultural growth multipliers for sample households in two communal regions (Swayimana and Umzumbe) in KwaZulu-Natal in order to verify the potential strength for agriculture-led growth in the communal areas of the province.

1.3 Research hypothesis

Changes in local consumption resulting from an initial exogenous income shock in the two communal districts of Swayimana and Umzumbe could stimulate consumption and production, increasing rural incomes and employment opportunities.

1.4 Study design

Expenditure data were collected from 99 households in Swayimana and Umzumbe, KwaZulu-Natal in 1997, using three structured rounds of interviews to record household composition,

income sources, savings, assets, agricultural enterprises, inputs, harvests, and sales. A multi-stage sampling process was used. Since savings rates were negligible, household expenditure was used as a proxy for income. Expenditure elasticities were estimated for commodity groups in each district and in two wealth groups (the wealthier top decile of households and the remaining 90 percent of poor households) using a variant of the Working-Leser model. The tradable farm and non-farm goods and services, and elasticities were estimated for each of these four expenditure categories. These results were substituted into Hazell's (1984) simplified semi-input-output model to compute local growth multipliers.

1.5 Organisation of sections of the thesis

Chapter 2 reviews the literature relating to expenditure and growth linkages and summarises the findings of growth linkage studies in Asia, Africa and South Africa. The later part of the chapter outlines the constraints inhibiting agricultural development in South Africa's communal areas including insecure land tenure, poor infrastructure, and a weak legal-regulatory environment that combine to raise transaction costs, reduce access to markets, and diminish incentives to invest in agriculture.

The characteristics of the study districts and sample households are presented in Chapter 3. Chapter 4 outlines the study methodology and Chapter 5 presents and discusses the results of expenditure analyses disaggregated by district and wealth groups. Chapter 6 aggregates the results by tradable and non-tradable goods and services and uses them to estimate growth multipliers. Finally, policy implications and study conclusions are presented in Chapter 7.

CHAPTER 2: REVIEW OF RELATED LITERATURE

Estimates of the effect of the Green Revolution in India in the 1970's indicated substantial economic development from increased local employment and rural purchasing power (Delgado *et al*, 1998). However, African countries have not experienced the levels of agriculture-led growth such as those achieved by Asian countries. Production in Africa is subject to less favourable agro-climatic conditions, economic instability and poor access to markets (Hazell and Haggblade, 1993). Early African growth linkage studies showed very weak linkages compared to those estimated for Asian countries (Delgado *et al*, 1998). However, more recent studies by Delgado *et al* (1998) suggest that African growth linkages may be stronger than previously predicted.

The South African government has proclaimed rural agricultural development a priority (National Ministry of Provincial and Local Government, 2000; National Department of Agriculture (NDA), 2001; NDA, 1999; NDA, 1995; African National Congress, 1994) despite ongoing debate over agriculture's potential as an engine of growth and economic development in African countries (Delgado *et al*, 1998; Haggblade *et al*, 1991), and lack of convincing evidence of growth linkage potential in South Africa. The benefits of growth linkages, namely raised rural incomes, increased non-farm activity and improved employment rates (Hazell and Haggblade 1993, Hazell and Röell 1983) are urgently needed to transform the South African rural economy and provide livelihood opportunities for millions of poor households. In other words, South Africa needs its own 'Green Revolution'.

However, South African economic transformation faces a number of unique situations and circumstances which complicate and constrain rural economic development and the advancement of rural livelihoods. As Delgado (1998, p146) has pointed out: "The issues involved in incorporating disadvantaged people into economic growth processes are separate from those of incorporating lower-potential areas - in effect, disadvantaged places." Not only are most of South Africa's rural populations disadvantaged people, they also occupy disadvantaged places with limited resources, poor infrastructure, weak institutions and high transaction costs.

This means that widespread increments to rural incomes have the potential to mobilise underused resources through creating enterprise and employment opportunities in non-tradable farm and non-farm sectors. The effect of widespread increases in spending on the sorts of non-tradables that rural people consume, for example: dairy, fruits, vegetables, some starches, services, local agricultural implements, and building materials - can mobilise rural resources for growth (Delgado *et al*, 1994). Empirical estimation of the potential for South African agriculture to drive much needed increases in rural income and employment is urgently needed. If strong potential exists, it is important to know which households contribute most to local economic growth, ie, which rural households spend larger shares of incremental income on labour-intensive goods and services produced in these areas. Appropriate policy choice rests on knowing how much increased employment can be supported by food supplies, the types of employment possible from alternative production structures, and the efficiency of various policies, strategies, investment and support to stimulate production of tradable commodities and increase the elasticity of non-tradable output supply (de Janvry, 1994; Mellor, 1976, p171).

This chapter therefore outlines the requirements for a 'Green Revolution' and reviews growth linkage studies in terms of their aims, methodologies, major findings and conclusions. The findings of South African rural household income and consumption surveys are summarised as evidence of the potential for increased income to drive local economic growth. Finally, obstacles to agricultural development which may dampen growth linkages are highlighted and discussed.

2.1 What induces a Green Revolution?

India's Green Revolution in the 1970's ushered in an increase in world food supplies. Growth in agricultural production was the result of many complex and interacting technical and economic factors, coupled with the political determination of the Indian government (Wiggins *et al*, 2000; Technical Centre for Agricultural and Rural Cooperation (CTA), 1998). 'Green Revolutions' are founded on increased and intensified agricultural production which drive favourable and supportive changes in consumption behaviour (Wiggins *et al*, 2000). Faster economic growth leads to more employment and higher wages, while greater agricultural output leads to lower food prices; both of which are beneficial to the poor (Fan and Hazell, 2000).

In Asia, increased and intensified production of cereals was achieved by increasing yields (primarily through the use of high-yield seed varieties and irrigation), increasing farm profitability, reducing associated risks for farmers, ensuring sufficient market demand for products, and supportive political will (CTA, 1998). Use of high-yield seed varieties usually requires recourse to inputs such as fertiliser, pesticides, water, and mechanisation, which are often not available to small scale farmers (CTA, 1998). Unpredictable rainfall, climate change, and soil degradation in many parts of the world preclude the use of such seed varieties. The majority of African countries are subject to less than favourable agro-climatic conditions, economic instability, poor access to

markets, and weak institutions (including insecure land tenure) (Delgado *et al*, 1998), constraining agro-economic development.

While the Indian Green Revolution was supply-led, many production and consumption changes in the rapidly globalising economy are demand-driven (Delgado *et al*, 1999). For example the 'Livestock Revolution' has been driven by increasing demand from developing countries for meat and fish (Cohen, 2001; Delgado *et al*, 1999). While rapid globalisation and information communication technology advancement pose many threats for widening the gap between developed and developing nations, without the same political commitment shown by Asian governments, it is questionable whether African countries can experience their own Green or Livestock Revolutions. South African public policy supports agricultural growth, but can agriculture-led growth bring about economic transformation in South African rural communities?

2.2 The contribution of agriculture to livelihoods in rural South Africa

Approximately 240 000 small farmers (36 percent of rural households) supply South Africa's local and regional markets, including large numbers of informal traders (NDA, 2001; May *et al*, 1995). These farmers support more than one million family members and provide occasional employment to another 500 000 people. However, it is estimated that three million farmers, mostly in the communal areas of the former homelands, produce food primarily for subsistence (NDA, 2001), often producing less than their consumption needs (National Ministry of Provincial and Local Government, 2000; Nattrass and Nattrass, 1990; Lyne, 1989; Nieuwoudt and Vink, 1989; Nattrass and May, 1986). Although forty percent of the country's population is primarily dependent on agriculture and related industries, agriculture is only the third most important livelihood strategy for rural households, producing relatively low (10% - 20%) contributions to

rural household income (van Zyl and Kirsten, 1997; Sender and Johnston, 1996). Local non-farm employment contributes 25 - 50 percent to rural cash incomes (Makhura *et al*, 1999), while 50 - 70 percent of household income typically comes from pensions and wage remittances by migrant workers (Nattrass and Nattrass, 1990). Typical livelihood strategies in rural South Africa comprise diverse income sources (May, 1998), including agriculture, fishing; self-employment in informal small and micro-enterprises, wage labour and social support (state pensions, disability and child maintenance grants) (Aliber, 2001; NDA, 1999; May, 1998). Migrant remittances frequently finance farm investments, raising crop yields for farm families with migrant members, despite the reduction in agricultural labour lost to urban migration (Heron, 1991; Van Zyl *et al*, 1991; Nieuwoudt and Vink, 1989; Bembridge, 1986).

Poverty is a major stumbling block to rural agricultural development in South Africa (National Ministry of Provincial and Local Government, 2000). Seventy-two percent of rural dwellers live below the national poverty line, i.e. have a monthly household expenditure of less than R352 per adult equivalent (May *et al*, 2000, cited by Aliber, 2001). The poorest 40 percent of rural households (equivalent to 50 percent of South Africa's population) receive only 11 percent of total income. Bonti-Ankomah (2001) reports that 50 percent of South Africa's households have incomes less than R2 500 per month, while 30 percent of all households earn less than R1 000 per month.

2.3 Rural household consumption patterns in South Africa

Agricultural growth leads to changes in household income and, consequently to changes in household expenditure or consumption patterns. Sustained growth depends on the demand created in rural areas for non-tradable commodities (Delgado *et al*, 1998). Van Seventer's (1987)

study of income redistribution to black South Africans suggests that, as for other African countries, an increase in income usually leads to an increase in demand for food and semi-durables. Other local studies of small farm households (Belete *et al*, 1999; van Zyl *et al*, 1991; Nieuwoudt and Vink, 1989) have found the demand for food less responsive to changes in income than demand for other products. Van Zyl *et al* (1991) and Nieuwoudt and Vink (1989) found that increases in rural incomes are roughly twice as likely to be spent on vegetables, fruit and meat, household durables and semi-durables (e.g. clothing) as on maize, the staple food in many rural areas. Van Rooyen and van Zyl (1990) report that grain and grain products (e.g. bread) have lower income elasticities than other food commodities, while meat and vegetable products have greater potential for increased consumption amongst black consumers (van Rooyen and van Zyl, 1990). Van Rooyen and van Zyl (1990) estimate that increases of ten percent in expendable incomes of black consumers could result in consumption increases of 11.9 and 14.6 percent for meat and vegetables respectively.

Increased real incomes could alter rural consumption patterns, but demand for food (especially staples) would increase less than demand for more luxury goods such as clothing (Belete *et al*, 1999; van Zyl *et al*, 1991; Nieuwoudt and Vink, 1989). Evidently rural households display a preference for purchased goods (van Zyl *et al*, 1991). Nevertheless, since demand for locally produced food, goods and services is *relatively* income elastic, and as most rural households have access to farmland (Thompson and Lyne, 1993), increased agricultural incomes could stimulate rural economic growth. However, incentives for increased production are lacking in the South African rural economy (Lyne, 1989; Nieuwoudt and Vink, 1989; Nattrass and May, 1986).

2.4 Growth linkages

Following the tradition of Hirschman's (1958, cited by Delgado *et al*, 1998) work in Latin America, early linkage studies showed that agricultural growth stimulated little new effective demand for intermediate inputs or new induced investments in downstream activities. It was concluded that agriculture was not a high priority for fostering growth in developing countries (Delgado *et al*, 1998). Non-agricultural sectors were thought to have stronger linkages to the economy, resulting in higher multiplier effects (Hazell and Röell, 1983). Consequently, public investment was directed towards non-agricultural sectors (Hazell and Röell, 1983). Although production linkages from the agriculture sector (especially subsistence agriculture) were shown to be weak, with little effect on growth outside agriculture (Hazell and Röell, 1983), the results of the Green Revolution in Asia, clearly showed that consumption linkages from agriculture had beneficial indirect effects on the rest of the economy (Mellor, 1976, p161). Mellor (1976, cited by Hazell and Röell, 1983) therefore concluded that, since development strategies generally ignored consumption linkages, the importance of agricultural growth had previously been underestimated. Moreover, agricultural growth offers broad-based increases in incomes because most rural households in South Africa have farming skills and resources.

Growth multipliers are usually estimated from a regional model of typical household demands and intermediate demands between farm and non-farm tradable and non-tradable sectors (Hazell and Röell, 1983). Economic growth is generated through an initial income shock when the supply of tradables increases due to factors such as technological change or improved infrastructure (Delgado *et al*, 1998). Agricultural growth multipliers measure the result of such an exogenous income shock on extra income derived from stimulated regional demand, and hence production, in the local non-tradable sector (Delgado *et al*, 1998). Growth therefore results from a direct or

indirect shift (to the right) of the regional supply curve. Direct growth is attained by stimulating the tradables sector through widespread adoption of new technologies that improve production of exportable goods, or by lowering the unit cost of marketing these goods. Indirectly, growth usually occurs when a non-tradable produced by many households becomes tradable, leading to increased opportunities for export production, while still meeting local demand. The strength of growth linkages is dependent on the consumption patterns of those benefiting from an increase in agricultural income. If households spend most of the increased income on tradables, demand for locally produced non-tradables will not grow much.

2.5 Growth linkages and rural employment opportunities

South African rural unemployment (27 percent) is rife (Statistics South Africa, 1998). High transaction costs in sub-Saharan Africa greatly increase the chance that significant rural resources are underemployed as large shares of rural production and consumption involve goods that are largely non-tradable outside local areas (Delgado *et al*, 1998). Production and marketing costs for non-tradable goods outside the local area are higher than returns, while import cost often surpasses their local value (Taylor and Cairns, 2001; Delgado, 1997b).

Growth linkages (the indirect effect of agricultural commercialisation) provide two important reasons for promoting efficient markets. First, where households are faced with high transaction costs and much of their production mix is non-tradable, resources are likely to be underutilised. People may want to work but there is nothing for them to do, short of leaving the area (Delgado, 1997b). Second, indirect linkages with the non-farm economy may provide opportunities for non-farm enterprises, further increasing local employment opportunities. Moreover, policies that effectively promote exports from the local area promote increased employment not only directly

but possibly also indirectly, by creating local purchasing power for demand-constrained items (Delgado, 1997b).

In South Africa agriculture generates more jobs (both farm and non-farm) per Rand invested than any other major sector (van Zyl and Vink, 1992). The production and marketing of inputs and the processing and marketing of outputs create jobs in a more employment-intensive way than typical urban and industrial sources of growth (van Zyl and Kirsten, 1998). Yet the question is whether increases in rural incomes will lead to changes in rural consumption patterns in support of local enterprise. Considering the consumption patterns discussed in section 2.3, South African rural consumer preferences may not support strong growth in local economies.

2.6 Growth linkage benefits for the rural non-farm economy

Increases in agricultural production are important for their own sake, but non-farm activities are important for immediate and long-term household food security. Hazell and Haddad (2001) explain that sustained increases in per capita incomes hinge on diversification into higher-value agricultural products and non-farm activities. Agro-industry and post-harvest systems can raise rural incomes and absorb excess labour through local manufacturing, trade, construction, transportation, communications, value-adding, institutions, and services (Markets and Structural Studies Division, 2002; Islam, 1997). Survey evidence from many countries, including South Africa as indicated earlier (section 2.2), shows that farm families obtain substantial income shares from non-agricultural sources (Makhura *et al*, 1999; Hazell and Röell, 1983).

As incomes rise in the farm sector, farm households demand more goods from the non-farm sector including: seed, water, fertiliser, and farm implements (Islam, 1997). Strong household

links to the rural non-farm economy reduce poverty and malnutrition as non-farm income provides money to buy food, and liquidity for inputs and investment to increase production (Hazell and Röell 1983). In the aggregate, non-farm enterprise spurs farm profitability by providing markets for agricultural production and liquidity for farm inputs (Reardon *et al*, 1994a, cited by Machethe *et al*, 1997; Reardon *et al*, 1994).

In turn, increased farm income has spin-offs for the non-farm economy. First, a growing agricultural sector raises agricultural wages, in turn raising the opportunity cost of labour in non-farm activities (Hazell and Haggblade, 1993). Second, an increase in the opportunity cost of labour induces a shift in the composition of non-farm activity out of very labour-intensive, low return activities to more skilled, higher-investment, high return activities (Hazell and Haggblade, 1993). Third, income and employment generated by agricultural linkages are predominantly concentrated in rural areas and stem urban migration (Delgado *et al*, 1998). Fourth, because most rural households are poor, they consume relatively more labour-intensive commodities like basic, starchy staples, whereas higher income households consume relatively more capital intensive and imported goods (Delgado *et al*, 1998; Machete *et al*, 1997). Finally, the kinds of non-farm goods and services demanded as a result of increased rural incomes are typically products produced by small, labour intensive enterprises, focussed on such sectors as transportation, hospitality and catering, entertainment, personal services, health, housing and residential construction, all of which lend opportunities for local employment (Hazell and Röell 1983).

It is evident that agriculture-led growth could have widespread benefits for local economies by stimulating backward and forward linkages, raising agricultural incomes, encouraging enterprise

development in farm service and non-farm sectors, and generating employment opportunities with widespread benefits for rural development.

2.7 The role of agriculture in the new global order

“As the world prepares for the new millennium, all countries are trying quickly to adjust to changing needs within the increasingly mobile global market place” (Bathrick, 1998, p1). Bathrick (1998) asserts that agriculture is re-emerging as a leading economic sector in many developing countries, but the benefits of agriculture may not be as broadly based as they could be. Although many opportunities exist in growing urban and export markets, the majority of rural families are poorly prepared either to gain the broader benefits of the changes in agriculture or respond to previously unknown competitors (NDA, 2001; Bathrick, 1998). Small farmers face a growing number of challenges regarding compliance with storage, quality, convenience, certification and safety characteristics of food products that are exported or consumed in growing formal urban food markets (Markets and Structural Studies Division, 2002).

To participate in the growing formal urban and export markets, producers need access to well-organised post-harvest chains capable of providing quality processing and efficient marketing (Markets and Structural Studies Division, 2002). Delgado *et al* (2001) explain that rather than trading raw commodities across national borders, there is an increasing trend for multinational companies to procure, process, package and distribute food commodities across many borders, with more direct activity in developing countries. However, urban consumers and multinational contractors demand timely delivery, consistency, quality and safety of purchased foods (Delgado *et al*, 2001). Meeting these demands not only commands compliance with requirements but also certification. Increasingly, small scale farmers require access to specialised information,

technology, professional knowledge, institutions, infrastructure and liquidity (Delgado *et al*, 2001). Vertical coordination (eg. contract farming), producer marketing cooperatives and traders' associations can address these problems by reducing non-compliance among farmers (Markets and Structural Studies Division, 2002; Delgado *et al*, 2001). Informed policies and a conducive regulatory environment can also help to ensure the product attributes demanded by agro-processors.

2.8 Growth multiplier models

Most multiplier estimates to date have been Keynesian demand-driven multipliers computed from input-output models, economic base models or semi-input-output models (Delgado *et al*, 1998). All assume fixed-coefficient Leontief technology and a perfectly elastic supply of rural non-tradables; hence their constant price (Hazell and Haggblade, 1993). Many Asian and African studies (reported below) are based on Hazell's 1984 (cited by Hazell and Haggblade, 1993) simplified semi-input-output model. The model estimates the increase in regional value added that would occur if, through development of new technology or investment in agriculture, governments were able to relax supply constraints limiting outputs of major agricultural tradables. Hazell's model is based on three basic parameters (two production and one consumption parameter), derived from consumption, farm management and rural non-farm enterprise surveys (Haggblade *et al*, 1987).

Given a one-unit increase in value added from a region's major tradable agricultural output, the model estimates the resulting total increase in regional value added as a function of consumers' marginal budget share spent on non-tradables, producers' demand for non-tradable intermediate inputs (as a ratio of gross regional output) and the ratio of value added to gross regional output

(Haggblade *et al*,1987). Although simple, the model allows assessment of three important features of farm/non-farm linkages:

- differences in African and Asian growth multipliers;
- the implications of alternative types of agricultural growth on the ensuing non-farm linkages; and
- breakdown of the total multiplier into its production and consumption-based components.

Hazell's model assumes a perfectly elastic non-tradable supply, and is therefore a fixed-price model. Agricultural income multipliers generated by this model range from 1.27 to 3.96 (Tables 2.1 - 2.4). That is, a \$1 increase in agricultural income generates an additional \$0.27 to \$2.96 of income in the regional economy.

Recognising the limitations of these models, Haggblade *et al* (1991) developed a price endogenous model that allows for input substitution as well as for a less than perfectly elastic supply of rural non-tradables. Both semi-input-output and price endogenous models incorporate intermediate and consumption demands. Both allow upward-sloping supply curves in tradable sectors and treat the price of internationally traded goods as fixed. Therefore any increase in demand for tradables leaves price, and hence domestic production, unchanged. Demand increase only decreases net exports (Dorosh and Haggblade,1993). The two models differ only in their assumptions about output supply elasticity in non-tradables. The semi-input-output model assumes perfect elasticity of supply of non-tradables, while the more realistic price endogenous models do not assume perfect elasticity. Price endogenous models include upward-sloping supply curves for non-tradables. Therefore, an exogenous shock which increases incomes and demand will lead to price inflation in non-tradables, lowering income multipliers (Dorosh and Haggblade

1993). Empirical results suggest that the price endogenous model leads to lower multiplier estimates (70 to 90 percent of the levels predicted by the fixed-price models).

The choice of multiplier model therefore hinges on the supply elasticity of non-tradables. However, researchers tend to favour the semi-input-output model partly for its computational advantages and partly because the model and its variants have produced plausible and consistent estimates. For example Hazell's 1984 (cited by Hazell and Haggblade, 1991) simplified semi-input-output model generated a multiplier of 1.82 for the Muda region of Malaysia. This estimate is very close to Bell *et al*'s 1982 (cited by Haggblade *et al*, 1987) multiplier of 1.83 for the same region. Consequently, Hazell's 1984 model has since been widely used in consumption studies in both Asia and Africa.

2.9 Asian agricultural growth linkage studies

Following Asia's Green Revolution, a number of studies attempted to isolate the effect of increased agricultural production in Asia on other sectors of the economy, and to determine whether, in fact, agricultural growth had improved conditions for poor households. Many earlier studies showed that larger households benefited disproportionately from the results of agriculture-led growth (Hazell *et al*, 1991). Growth multipliers estimated in these studies are summarised in Table 2.1.

Bell and Hazell (1980) investigated the indirect effects of an agricultural project on the region surrounding the Muda River in north west Malaysia. The regional downstream effects of agricultural intensification were estimated using a social accounting matrix (Pyatt *et al*, 1977, cited by Bell and Hazell, 1980) and a variant of Tinbergen's (1966, cited by Bell and Hazell, 1980)

semi-input-output model. The downstream and direct effects of the project were similar: each additional dollar of value in paddy production added about 75 cents to the value of downstream activities. Moreover, each dollar of downstream value added was supported by just over a dollar of additional investment in inputs and equipment. The direct effects of the project did not worsen income distribution among farm households, but downstream added value accrued mainly to non-farm households involved in paddy milling and production of non-tradables. The spread of income amongst non-farm households was broad, but better-off households received greater shares of the benefits.

Table 2.1 Multipliers estimated for regional economies in Asian countries

Study	Location	Multiplier
Bell and Hazell (1980)	India, all	1.75
Bell <i>et al.</i> (1982)	Malaysia, Muda River region	1.83
Hazell (1984, cited by Haggblade <i>et al.</i> , 1991)	Malaysia, Muda River region	1.82
Hazell and Haggblade (1990, cited by Delgado <i>et al.</i> , 1998)	India, all	1.64
	India, Punjab and Haryana regions	1.93
	India, Madhya Pradesh and Bihar regions	1.46
Hazell and Haggblade (1991)	India	1.37 - 1.54
Hazell <i>et al.</i> (1991)	India, North Arcot and Tamil Nadu regions	1.83

Rangarajan (1982) used 12 years of historical data to quantify relationships between agriculture and industry in India. Two of his five simulation models indicated that a one percent growth in agricultural output increased industrial production by about 0.5 percent, increasing national income by a little more than 0.7 percent. Although the study showed that a rise in food grain trade had negligible impact on the national economy, agriculture could have an important impact on the economy.

Hazell and Haggblade (1990, cited by Delgado *et al*, 1998) compared the results of a cross-sectional econometric analysis based on data from local states and districts in India with the results of a semi-input-output model fitted to national data to examine rural-urban growth linkages. The results indicated that an increase of 100 Rupees would, on average, generate an additional 64 Rupees in agricultural and non-agricultural income. An additional 93 Rupees would be generated in high productivity areas, compared to an increase of 46 Rupees for an equivalent increase in agriculture in lower productivity areas. Infrastructure was also a significant determinant of the strength of the agricultural growth multipliers. The larger multipliers estimated for areas of high agricultural growth potential were associated with stronger consumption linkages.

The same Indian data were used by Hazell and Haggblade (1991) to estimate indirect rural employment and income benefits generated by agricultural growth. This model assumed that agricultural output is constrained by technology, land and agro-climate, but that rural non-farm activity is constrained by demand. Improved agricultural technology increases farm income and hence increases demand for non-farm inputs and consumer goods. The model used was:

$$AGY = \alpha + \beta RNFY + \gamma_i X \quad (2.1)$$

where, AGY = agricultural income and RNFY = rural non-farm income. The model was then adjusted to include feedback from the agricultural sector.

The multiplier estimated for India was 1.37, and 1.54 when adjusted for feedback. For each Rupee increase in agricultural income, between 37 and 54 additional Rupees in rural non-farm income could be generated. The difference in estimates is explained by the strength of the feedback effect of rural non-farm activity on farm income. The multiplier was two thirds stronger for rural areas than for rural towns where a greater share of increased income was spent on 'imported' goods.

Better infrastructure also strengthened the growth multiplier. However, irrigated and medium sized farms stood to benefit most from agricultural growth. The importance of downstream benefits was emphasised by proportionally faster growth in non-farm employment.

The impact of increases in paddy and groundnut production on the Indian economy, driven by subsidised inputs or infrastructure changes, was investigated by Hazell *et al* (1991). An extended input-output model was developed using the 1982/1983 Indian Social Accounting Matrix. Value-added gross multipliers were estimated to determine the cross-sector influence of increased demand on the output of corresponding sectors. The agricultural sectors showed relatively large multipliers (1.8 to 2.2 Rupees). Large multipliers were estimated for agro-processing, especially agricultural trading, local financial services, commercial banks and various personal services. Manufacturing multipliers were lower, especially where manufacturing depended on costly imported inputs (such as silk). The importance of household expenditure linkages was shown by much smaller multipliers (0.93 Rupees) when incomes were fixed exogenously. Therefore, production linkages were as important as household consumption linkages in generating indirect benefits from increased agricultural output. This finding was contrary to Bell *et al's* (1982) findings for the Muda valley, where consumption linkages were approximately twice as strong as production linkages.

In summary, the Asian studies show that growth multipliers are stronger in rural areas where households are poor, and in areas where agricultural potential and infrastructure are better. The magnitude of the multipliers ($\approx 1.6 - 1.8$) suggests strong potential for increasing farm and (especially) non-farm employment and hence rural incomes through agricultural growth.

2.10 Comparative studies of Asian versus African growth linkages

Following the positive results of the Asian studies, research attention turned to the potential for similar agricultural growth in Africa and the potential for poor countries to bring about their own 'Green Revolutions'. Comparable in-depth empirical studies in sub-Saharan Africa are few, but existing evidence suggests that growth linkages in Africa may be half as powerful as Asian linkages for four main reasons (Hazell and Hojjati, 1995): African countries typically have lower per capita incomes that constrain consumption expenditure on non-foods; Africans use more traditional agricultural practices with fewer purchased inputs; poor African infrastructure development weakens links between villages and rural towns; and low population densities lead to seasonal labour bottlenecks and inadequate market concentration, which retard the emergence and growth of small, labour-intensive firms.

Hazell and Röell (1983) compared income and consumption for different commodities to establish how household expenditure changed with income and household characteristics in the Muda River irrigation project (northwest Malaysia) and the Gusau agricultural project (northern Nigeria). Although growth multipliers were not calculated, the study gives valuable insight into consumption expenditure variations between households in the two study areas in Asia and Africa. It was found that food, alcohol and tobacco were the most important commodity groups in the total budget of average households in each region. As would be expected, the share of total household expenditure allocated to food grains was lower for higher income households compared to lower income households. However, the share of incremental expenditure allocated to local non-tradables was greater for wealthier households. In Muda, additional expenditure on non-tradables went mostly to non-food goods and services, particularly those associated with housing, education, health, transport, personal services, entertainment, social obligations, and festivities.

By contrast, in Gusau, additional expenditure on non-tradables was spent on higher quality foods, particularly vegetables, fruit, meat and dairy products.

In both areas, aggregate income relied on production of agricultural crops, especially food grains, the greater part of which were exported outside of the region. Linkages to the local non-farm economy were stronger in Muda, and weaker in Gusau where agriculture was less labour intensive. The researchers concede that it was tempting to conclude that differences in results for the two areas could be attributed to labour-intensive agricultural systems in Asia and high land-to-manpower ratios in Africa. However, the differences were attributed to more poorly developed infrastructure and poor communication links between villages and towns in Gusau. Poor communication and remoteness impedes access to non-food goods and services and increases their cost relative to the price of foods. Consequently, even richer households were discouraged from diversifying their expenditure into non-foods.

Hazell and Röells' (1983) analysis suggests that households on larger farms in both regions had more desirable expenditure patterns for stimulating secondary rounds of growth in local economies, and are consequently more suitable targets for technology or public investments to increase agricultural output. The study highlights a trade-off between growth and equity in rural areas. Targeting technologies or public investment on small farms leads to immediate equity in production of grains. However, the secondary growth in income and employment generated may not be nearly as strong compared to targeting medium and large farms. Such trade-offs between growth and equity are accentuated by the fact that richer households probably benefit more from secondary income growth than do the poor.

Haggblade and Hazell (1989) estimated the impact of different technology changes in Asia, Africa and Latin America. Their study drew on various existing data sources and was based on the assumption that improved agricultural technologies increase agricultural output, and therefore demand, for regional non-tradables. Bell and Hazell's (1980, cited by Haggblade and Hazell 1989) three sector variant of the semi-input-output model was used to estimate growth multipliers. Refer to Table 2.2 for a summary of Haggblade and Hazell's (1989) multipliers. Growing high yield rice varieties under irrigation generated the largest multipliers (1.74), while traditional rain-fed smallholder agriculture in Africa and Latin America produced the smallest multipliers (1.25 and 1.26 respectively). Non-farm activities accounted for comparatively larger shares of total multipliers in Asia and Latin America than in Africa. This was attributed to larger marginal budget shares for non-tradable foods in Africa, possibly due to limited access to towns. Poor infrastructure development in Africa fragments markets for perishable foods, making many foods non-tradable in Africa. Haggblade and Hazell (1989) concluded that middle-sized farms (between five and 15 hectares) appeared to generate the greatest rural growth multipliers because of greater demand diversification into non-farm goods compared to small farms, and because of lower import content than estate farms.

Table 2.2 Comparative country multipliers estimated by Haggblade and Hazell (1989)

Study	Location	Multipliers
Haggblade and Hazell (1989)	Asia,	1.38 - 1.74
	Africa and	1.25 - 1.47
	Latin America	1.26 - 1.52

In summary, comparative studies suggest that linkages to the non-farm sector are stronger in Asia than in Africa. Asian agriculture also seemed more labour intensive than African agriculture. Households on middle and large-size farms were more likely to generate and benefit from

agricultural growth. Compared with Asian households, African households had larger marginal budget shares (MBSs²) for non-tradable foods. Consequently, farm activities accounted for larger shares of African growth multipliers, possibly due to the relative remoteness of African villages, impeding access to non-farm goods and services.

2.11 Early African growth linkage studies

Africa has not experienced agricultural growth parallel to Asian growth following its 'Green Revolution'. Early estimates of growth multipliers for Africa were therefore lower than for Asia (Haggblade *et al*, 1987). Rural growth potential appears relatively weak in Africa, with little likelihood that agriculture would automatically duplicate the multiplier effects seen in Asia. This lack of optimism is founded on the context in which African farmers exist. The nature of rainfall patterns and geology preclude irrigation and intensive agriculture on the scale observed in Asia, population density is lower in Africa, and distances between markets are greater in Africa. African consumption patterns are therefore less diversified into non-foods (Haggblade *et al*, 1987).

Rogers (1986, cited by Haggblade *et al*, 1987) used data from Mauritania to estimate multipliers under a range of conditions for Sahelian West Africa. Most multiplier estimates averaged 1.27. However, Haggblade *et al* (1989, p1190) explain that "this figure very likely paints an unduly pessimistic picture of agricultural growth multipliers throughout the rest of sub-Saharan Africa" given the harsh climate and sparse population of rural Mauritania (Table 2.3). Haggblade *et al* (1989) contended that their 1987 value added multiplier estimate of 1.5 for Sierra Leone and

² MBSs measure the direct impact of income changes on the consumption of a group of goods (Delgado *et al*, 1998)

Nigeria is probably more representative of most African data (Haggblade *et al*, 1989). Even so, this estimate places African growth multipliers below most Asian multipliers.

2.12 More recent African growth linkage studies

Studies in the 1990's (Dorosh and Haggblade, 1993; Delgado *et al*, 1994; Hazell and Hojjati, 1995; Delgado *et al*, 1998) have raised the hope that agricultural intensification and diversification, although often lower than for Asia, may still hold the key to economic development in the continent (Table 2.3). Dorosh and Haggblade (1993) estimated total growth multipliers of 2.0 to 2.7 using a semi-input-output model to compare the growth-generating power of food grains versus export crops in the Madagasy economy. Data from the national economy of Madagascar included both urban and rural areas. The study found that rice production had the greatest potential for stimulating growth in other sectors of the economy, than for example growing coffee for export. Since input costs for rice production were substantially lower than for other crops, investment in rice production would generate 40 - 100 percent more gross domestic product (GDP) than a comparable investment in export crops. Rice production generated more employment and resulted in more equitable income distribution. Consumption linkages accounted for 80 percent of the indirect growth propelled by agricultural investment. The result may be biased by the inclusion of urban households. The researchers suggest that future research should focus on consumption data to better understand the growth trade-offs of alternative agricultural development strategies.

Hazell and Hojjati (1995) estimated multipliers for Zambia's eastern province. Growth multipliers for nine agricultural districts were estimated using Hazell and Röell's (1983) semi-input-output model. It was assumed that households with larger farms would have more access to home grown

foods, and so household characteristics (in per capita form) were included in the model. In addition, two scenarios were defined: a base model and a variant in which fruits and vegetables were reclassified as tradables rather than non-tradables. The base model generated larger value added multipliers of 2.57 for the valley and 2.48 for the plateau. An additional kwacha of value added by tradable agriculture through technological change generated another 1.57 and 1.48 kwachas of value added in the regional economy (of the valley and plateau respectively). Most indirect income was generated in the non-tradable agricultural sector, whereas non-farm income increased by only 0.20 kwacha. The difference between the two sectors was attributed to large allocations of household income going to non-tradable foods (especially fruit and vegetables).

Hazell and Hojjatis' (1995) results affirm weak linkages between the farm and non-farm sectors in Africa. Additional farm income is spent mainly on food, especially horticultural and livestock products. The researchers concluded that, until per capita incomes increased substantially, agricultural growth would lead to only modest levels of diversification in the regional economy. However, farm and non-farm linkages would be strengthened by investment in rural infrastructure and transport and continual policy reforms to create an enabling environment for farm and non-farm entrepreneurs.

Delgado *et al* (1998) propose that the lower multipliers reported for African studies can be explained largely by differences in the classification of tradable and non-tradable goods and services across continents, postulating that the sensitivity of growth multipliers is found in choice of trading space. In a study to investigate the mix of farm and non-farm goods and services that rural Africans purchase, meticulous attention was paid to classification of goods and services as tradable or non-tradable. A four-sector variant of the Haggblade and Hazell (1989) semi-input-

output model was used by Delgado *et al* (1994) to estimate growth multipliers for Burkina Faso, Niger, Senegal and Zambia. The results (Table 2.3) suggest that African rural growth multipliers may be higher than previously thought, due to implicit assumptions about the tradability of different commodities. The study was based on the same assumption made for most Asian studies, that supply of non-tradables is perfectly elastic with respect to prices, and increments in demand would be fully met by new production at constant prices. Two different models were used to calculate value added multipliers for agriculture and non-agriculture. The agricultural multiplier estimation was based on Haggblade and Hazell (1989), while the non-agriculture multiplier was based on Hazell and Röells' (1983) share model. The reasons for using different models were not stated.

MBSs for food ranged from 75 percent in Burkina Faso to 47 percent in Senegal. Even so, demand for food was inelastic with respect to income because average budget shares (ABSs³) exceeded these MBSs. Demand for non-food commodities and services in all study zones was income elastic. Two-thirds of the increments to Zambian income went to non-tradables (primarily farm goods). The resultant national multipliers showed that for an additional \$1.00 increase in farm income, total income increases by \$1.88 for Burkina Faso; \$1.48 for Zambia; \$ 1.24 and \$1.48 in two locations in Senegal; and \$0.96 in Niger. It was reported that the multipliers could be 30 percent lower, due to possible rigidities in African production. These are more optimistic multipliers for Africa than previously estimated. Delgado *et al*,(1998) attribute this to the improved quality of data collected from weekly and biweekly repeat interviews and the underlying assumptions about tradeability which, they assert, follow African conditions more closely.

³ ABSs measure the percentage of household expenditure going to a group of goods (Delgado *et al*, 1998)

Table 2.3 Multipliers estimated for regional* economies in African countries

Study	Location	Multiplier
Rogers (1986, cited by Haggblade <i>et al</i> , 1989)	Mauritania	1.27
Haggblade <i>et al</i> (1987 cited by Delgado <i>et al</i> , 1998) assuming millet, sorghum and maize are non-tradables	Gusau, Nigeria	2.81
Haggblade <i>et al</i> (1987)	Sierra Leone and Gusau, Nigeria	1.50
Dorosh and Haggblade (1993)	Madagascar	2.0 - 2.7
Simler (1994, cited by Delgado <i>et al</i> , 1998)	Malawi	1.66 (range of 1.41 to 3.08 depending on assumptions).
Hazell and Hojjati (1995)	Eastern province of Zambia	2.48 - 2.57
Delgado <i>et al</i> (1998)	Burkina Faso	7.95
	Niger	5.81
	Senegal (Southeast Groundnut Basin)	3.83
	Senegal (Central Groundnut Basin)	4.23
	Zambia	n.a.

* These studies take the region of interest as the national economy and multipliers are estimated from national data.

Delgado *et al* (1998) report the same study as for Delgado *et al* (1994) but describe the methodology employed by the study in more detail. The tradable sector was reclassified into tradable agricultural goods and non-tradable agricultural and non-agricultural (manufactured and service) goods. Non-tradables were treated as perfectly elastic with respect to price (Delgado *et al*, 1998). The consequences of this meticulous reclassification are reflected in the study results. In Table 2.3, the multipliers are large because the number of non-tradables increases when the region of analysis expands to cover an entire country. Conversely, the multipliers in Table 2.4 are relatively small because the number of non-tradables decreases as the region of analysis shrinks.

These findings suggest that the earlier estimates of African growth multipliers may have been understated by mis-classifying non-tradables as tradables.

Table 2.4 Local* multipliers for African countries (Delgado *et al*, 1998)

Country	Tradables	Farm non-tradables	Non-farm tradables	Multiplier
Burkina Faso	1.00	0.31	0.40	1.71
Niger	1.00	0.77	0.84	2.61
Senegal (Southeast Groundnut Basin)	1.00	0.75	0.32	2.07
Senegal (Central Groundnut Basin)	1.00	1.03	0.39	2.42
Zambia	1.00	0.41	0.41	1.82

* Using a more stringent classification of tradables and taking the region to be 80 km - 180 km from a small town.

Fan and Hazell (2000) report that investment in high-potential areas (irrigated and high-potential rain-fed lands) generates more agricultural output and higher economic growth at lower cost than investment in less-favoured areas. Does this suggest that rural areas with less-than-ideal agro-climates are less likely to benefit from agriculture-led growth?

2.13 Which are the most efficient shocks for stimulating agricultural production?

Growth linkages are typically stimulated by an exogenous income shock attributed to technological change or improved infrastructure. Fan *et al* (1999) analysed state-level data from India to identify the efficiency of various public investments in promoting agricultural growth and alleviating poverty in India. Various econometric simulations included direct benefits to the poor (such as employment programmes), and indirect effects that arise when government invests in rural infrastructure, agricultural research, and the health and education of rural people. Different types of investment were ranked according to their impact on growth and poverty. Figures 2.1

and 2.2 respectively illustrate the impact of Indian public investment on poverty and agricultural production (based on spending an additional 100 billion Rupees in 1993 constant prices), and the number of people that each type of investment is likely to move out of poverty.

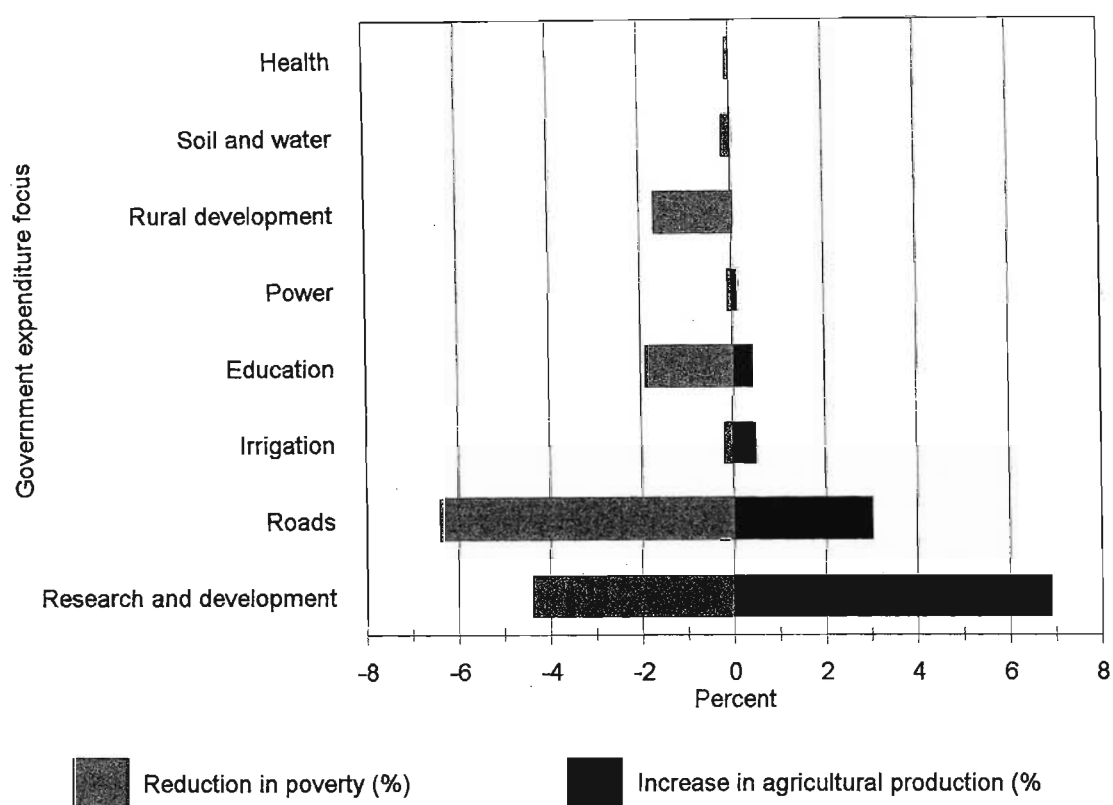


Figure 2.1 Increases in agriculture and reduction in percentage poverty as a result of additional government expenditure (after Fan *et al*, 1999, p2)

In order of greatest benefit, the following government expenditures would increase agricultural production and reduce poverty in India: roads, research and development, education, rural development, irrigation, and power (electrification). By making rural areas more accessible, roads bring off-farm employment and increased market access to farmers (Fan *et al*, 1999). Each kilometre of road built in irrigated, high-potential rain-fed, and low-potential rain-fed areas of India are estimated to lift 1.57, 3.5 and 9.5 people out of poverty respectively. Contrary to

conventional wisdom, this evidence strongly suggests that more investment should be channelled to low potential areas of India (Fan and Hazell, 2000).

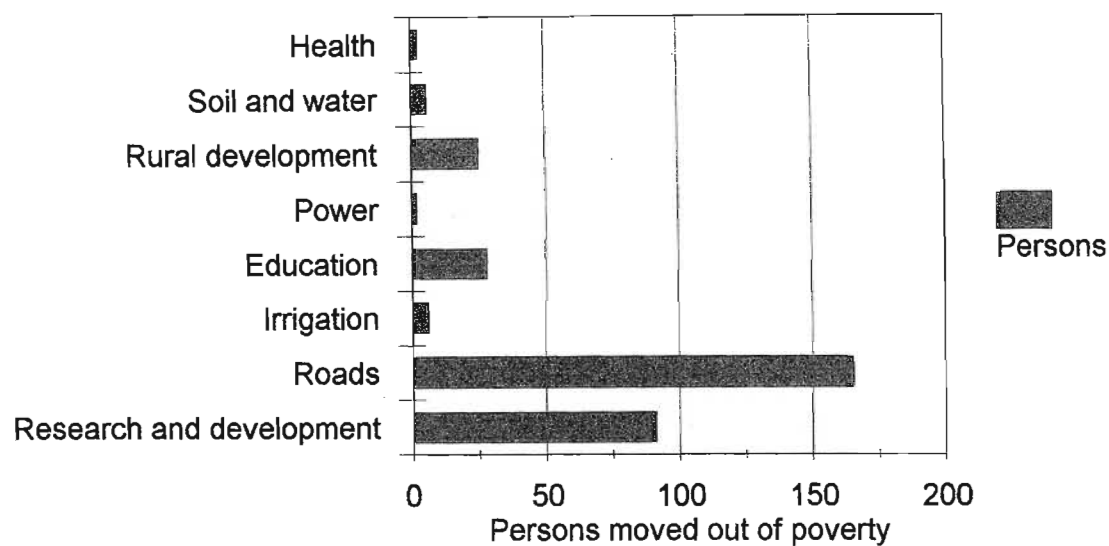


Figure 2.2 Number of people moved out of poverty as a result of additional government spending of one million Rupees (after Fan *et al*, 1999, p 2)

The results indicate no trade-offs between poverty alleviation and agricultural growth in India. Sizable improvements in both productivity and poverty are obtained from incremental investment. For example, a one million Rupees investment in roads will lift 165 people out of poverty (Fan *et al*, 1999). Rosegrant *et al* (2001, p 150) report that the construction of rural roads in sub-Saharan Africa to support crop yield growth and area expansion could account for 35 percent of total projected investment in the region.

A similar study in China (Fan and Hazell, 2000) shows that investments in three regions of differing agricultural potential had the biggest poverty impact in the low-potential western region and their second biggest impact on the mid-potential central region. Highest returns were estimated for the central region, suggesting the existence of trade-offs between growth and equity goals in allocating resources between mid- and low-potential areas in China. Similar studies have

not been carried out in Africa. Fan and Hazell (2000, p2) warn that it would be “dangerous to extrapolate these results beyond Asia, since many poorer countries, especially in Africa, have not yet invested sufficiently in their high-potential areas to have reached the point of diminishing production returns”. Such studies are crucial to direct policy, investment and strategies.

2.14 Application of agricultural growth multipliers to small scale farmers

Growth multipliers could be significant in Africa. Non-tradables, including non-farm non-tradables, could benefit from relatively strong consumption linkages in African economies. As world attention turns increasingly to sub-Saharan Africa, government leaders and donors alike view small farmer agriculture as the necessary centrepiece of development efforts. Equity, malnutrition and poverty considerations argue persuasively for such a focus. In addition, many believe that a small farmer strategy will generate maximum growth rates, Asia-style, through linkage multipliers with the rural economy (Haggblade *et al*, 1987). Delgado *et al*, (1998) propose that growth linkages may play a role in stimulating economic growth if agriculture plays a large role in the economy; the benefits of agricultural growth are widely spread; large shares of beneficiaries’ incomes are spent on labour-intensive local goods and services; and if local resources are under-utilised. However, Machethe *et al* (1997) have cautioned that the prospects of agricultural-led growth are affected by the following factors:

- technologies used in agriculture, which affect the demand for capital goods and services and inputs;
- farm sizes, which affect the scale of activities;
- level and distribution of rural incomes, which affect local expenditure linkages;
- competition from non-local, non-farm businesses;
- input costs;

- supply elasticity of the local factor market (financial and physical capital, labour and land);
and
- high transaction costs.

Many rural households in Africa are subsistence producers, whose incomes are low and who consequently spend a large share of their income on food. In addition, they use limited agricultural technology for small scale operations. The small scale farmers that characterise agriculture in the former homelands may not be capable of providing the initial income shocks that fuel local economic growth.

2.15 What is the potential for economic growth in rural South Africa?

The studies outlined in sections 2.9 to 2.12 illustrate the potential power of growth linkages for Asian and African countries. They conclude that middle-sized peasant farmers - and to a much greater extent than their larger scale and urban counterparts - spend incremental income on labour-intensive rurally produced goods, thereby generating important second-round demand growth. What is the potential for agricultural growth multipliers to drive economic development amongst small scale and emerging farmers in South Africa?

The agricultural sector accounts for 40 percent or more of the gross domestic products (GDP) in a third of all sub-Saharan countries, 34 percent in low-income African countries, and eight percent in middle-income African countries (World Bank, 1996, cited by Delgado *et al*, 1998). By contrast, agriculture contributed only 3,2 percent to South Africa's GDP in 2000, with input and agro-processing sectors contributing a higher percentage than agriculture *per se* - an additional ten percent (NDA, 2002; NDA, 2001). Amidst strong backward and forward linkages

within the commercial agriculture sector, links to upstream (input firms) and downstream (food and fibre processing) industries in communal areas are stunted (NDA, 2002). Van Zyl and Kirsten (1997) propose that small scale farmers could contribute more to national economic growth through mobilisation of inter-sectoral growth linkages, and predict that the contribution of agriculture to household income (currently 15 - 20 percent) in rural areas of South Africa's former homelands could "double or triple, thereby reducing dependency on declining levels of remittances and pensions" (van Zyl and Kirsten 1997, p191). Like Delgado (1997b), they believe that agriculture is key to growth through mobilisation of underutilised labour and land.

South Africa's Integrated Rural Development Strategy⁴ builds on the assumption that rural economies are "potential engines of growth"(National Ministry of Provincial and Local Government, 2000, p25). Although the National Ministry of Provincial and Local Government (2000, p26) acknowledges that "Agriculture need not be the only source of growth, and in many areas it will not be the most important", the potential for agriculture-led growth in South Africa's rural economies is unclear. Ngqangweni's (2000) and Belete *et al's* (1999) studies of communities in the Eastern Cape province estimate local multipliers of 1.98 and 1.35 respectively, indicating that a R1.00 increase in household income is predicted to add an additional 98 and 35 cents respectively to the local economy.

⁴ A strategy designed to realise a vision that will "attain socially cohesive and stable rural communities with viable institutions, sustainable economies and universal access to social amenities, able to attract and retain skilled and knowledgeable people, who are equipped to contribute to growth and development." (National Ministry of Provincial and Local Government, 2000, p25).

Belete *et al* (1999) estimated a total local multiplier of 1.35 using cross sectional data collected from 156 small food plot farmers at an irrigation scheme in the Eastern Cape province of South Africa. This multiplier is significantly lower than the results of African studies reported in Table 2.3, but closest to estimates for Mauritania (Rogers, 1986, cited by Haggblade *et al*, 1989), Sierra Leone and Nigeria (Haggblade *et al*, 1987) and Simler's (1994, cited by Delgado *et al* 1998) lowest estimate for Malawi. Belete *et al* (1999, p201) concluded that: "For as long as food plot holders in the poverty stricken rural environment such as Tyefu continue to spend all of their meagre resources on food and other very basic necessities, rural development cannot be expected to yield results that will be beneficial to rural populations".

Ngqangweni (2000) estimated a local multiplier of 1.98 for Middledrift in the Eastern Cape, with 0.35 cents of additional income generated from farm tradables and 0.63 cents from non-farm non-tradables for each additional Rand earned by households. Multipliers for rural households were almost a third higher than for urban households in the small towns of Middledrift, emphasising agriculture's potential as an engine for growth. Ngqangweni's (2000) estimates are comparable to other African multipliers, and he concludes that "any growth in agriculture, as meagre as it may be, will certainly result in multiplied growth in non-agricultural sectors" (Ngqangweni, 2000, p141).

Ngqangweni's (2000) more optimistic multiplier falls within Simler's (1994, cited by Delgado *et al*, 1998) range of estimates for Malawi, and is close to Dorosh and Haggblade's (1993) lowest estimate for Madagascar. Both Ngqangweni's (2000) and Belete *et al*'s (1999) local multipliers are at least one unit less than national multipliers estimated for other African countries. However,

Ngqangweni's (2000) local multiplier compares favourably with other local economy estimates for Burkina Faso, Zambia, and the Southeast Groundnut Basin in Senegal (Table 2.4).

To date no regional multipliers have been estimated for South Africa, making comparisons with other studies impossible. Evidence of strong growth linkages in South Africa is therefore comparatively weak and unconvincing. Given the consumption preferences of rural South Africans for imported goods (refer to evidence in section 2.3), there is insufficient evidence to suggest that sustained rural economic growth can be achieved through an income shock generated by increased agricultural production. Indeed, it is not clear that agriculture is capable of raising household incomes given the constraints facing farmers in the communal areas of South Africa's former homelands.

2.16 Constraints to agricultural growth in South Africa

Marginalisation of black farmers in South Africa through a host of discriminatory legislation prohibited land ownership by blacks outside of native reserves (Bundy, 1979; Beinart, 1983; Vink and van Zyl, 1989; Van Rooyen *et al*, 1987; all cited by van Zyl and Kirsten, 1997). Apartheid policies resulted in the concentration of about eight million rural black people on 13 percent of available agricultural land in so called "former homelands" (native reserves). Only 13 percent of South Africa's land can be used for crop production (NDA, 2002), and only 22 percent (four million hectares) of this land is considered high-potential agricultural land (NDA, 2002, May, 1998).

A number of constraints face farmers in South Africa's communal areas, including:

- low availability of water (NDA, 2002);

- inadequate tenure rights which stifle land rental markets in communal areas (Lyne and Thomson, 1993), deter investment in technology (World Bank, 2002, p 6; Cousins, 2001; Wiggins *et al*, 2000; Essa, 2002, p19, citing Feder *et al*, 1985), investment in high-value products (Kaiser, 2001; Underwood, 1999), prevent farm growth and limit profitability achieved by economies of scale (Taylor and Cairns, 2001);
- small farm sizes, usually less than two hectares per household (National Ministry of Provincial and Local Government, 2000; Nieuwoudt, 1990);
- high incidence of violence and crime which increases enterprise risks, lowers profit and impacts on enterprise development (Aliber, 2001; May *et al*, 1998, p 107);
- isolation from markets and market opportunities, exacerbated by poor infrastructure (eg. energy, water supply, sanitation, irrigation, transport and communications) and weak institutional support (legal and regulatory) (May 1998, van Zyl and Kirsten, 1998), and
- high transaction costs (Matungul *et al*, 2001), ie. the costs incurred in carrying out an exchange (Coase, 1960 cited by Delgado 1998).

These conditions have contributed to the virtual elimination of small-scale black agriculture and thus prevented the development of a viable, employment-intensive rural economy centred on agriculture (NDA, 2001). As a result, the range of informal business activities created through forward and backward linkages do not exist in South Africa's rural economy (NDA, 2002; van Zyl and Kirsten 1997). For example, Makhura *et al* (1998) found that most non-farm activities carried out in rural areas of the North West Province, had no direct relationship to agriculture. Farm products are generally marketed in their raw, unprocessed form. Very little income from non-farm activities is invested in agriculture (Makhura *et al*, 1998).

As Delgado (1997b, p146) has pointed out: “The issues involved in incorporating disadvantaged people into economic growth processes are separate from those of incorporating lower-potential areas - in effect, disadvantaged places”. According to May (1998, p 25), “The persistence of poverty in rural areas is due to ‘poverty traps’, ie. the lack of complementary services and assets resulting in ‘poverty of opportunity’, whereby individuals are unable to take full advantage of the few assets to which they have access. The contraction of the South African economy in recent years, and the erosion of the rural economic base through population expansion, lack of infrastructure, and outright dispossession, means that many households previously dependent upon cash income now find themselves with neither the income, nor the assets from which to generate an adequate income”.

However, Delgado (1997b) suggests that the presence of high transactions costs in developing countries greatly increases the chance that significant rural resources are underutilised as a large share of rural production and consumption involves goods and services that are largely non-tradable outside the local area or catchment region. Therefore, he insists that given rural poverty, a vigorous smallholder sector could have widespread positive effects on household income (1997a). Makhura *et al*, (1998) propose that this is only possible for rural South African households if they are granted access to opportunities and resources (namely land, credit, markets and information). Constraints and problems facing small farmers may limit the potential for agriculture to drive economic growth in South Africa’s rural areas. In addition, the extent of local economic growth generated by higher agricultural earnings needs to be clarified. Chapters 3 - 6 set out to quantify the magnitude of rural growth multipliers in two communal areas of KwaZulu-Natal.

CHAPTER 3:
SAMPLE AND SURVEY DESIGN AND
CHARACTERISTICS OF THE STUDY AREAS

3.1 Overview of the study districts

Sample households were drawn from the adjacent tribal wards of Gcabane and KwaHlongwa near Umzumbe and the inland ward of Swayimana (Figure 3.1). Gcabane and KwaHlongwa lie approximately 20 km from the south coast village of Umzumbe and 52 km from the larger town of Port Shepstone. Swayimana is a large tribal ward located approximately 43 km from the town of Wartburg and 79 km from the city of Pietermaritzburg. Gcabane and KwaHlongwa were treated as one district due to comparable political, environmental and sociological characteristics. The two survey districts (Swayimana and Umzumbe) differed in demographic profile, infrastructure, and agricultural production but were selected for the study as they both have high agricultural potential, albeit for different products.

The study districts are situated in the former KwaZulu homeland. The Group Areas Act of 1948 created strict residential segregation and compulsory removal of black people to separately managed 'homelands' (Ministry for Constitutional Affairs and Constitutional Development, 1998). The KwaZulu homeland consisted of tribal wards scattered throughout the former province of Natal on the east coast of South Africa. Within these homelands, local government was vested with tribal authorities headed by a local chief. Although this undemocratic situation is now changing with regard to the provision of certain public goods and services, tribal chiefs still wield considerable influence over local institutions in many of KwaZulu-Natal 'communal' areas, especially tribal courts, land tenure and the allocation of land rights.

Prior to the 1994 change of government in South Africa, tribal chiefs appointed community leaders or headmen (*indunas*) who performed specific tasks at the request of the chief. Since 1994, some *indunas* have been replaced by community elected councillors. These councillors represent the community at the next level of government, namely District Committees of District Councils (Ministry for Constitutional Affairs and Constitutional Development, 1998).

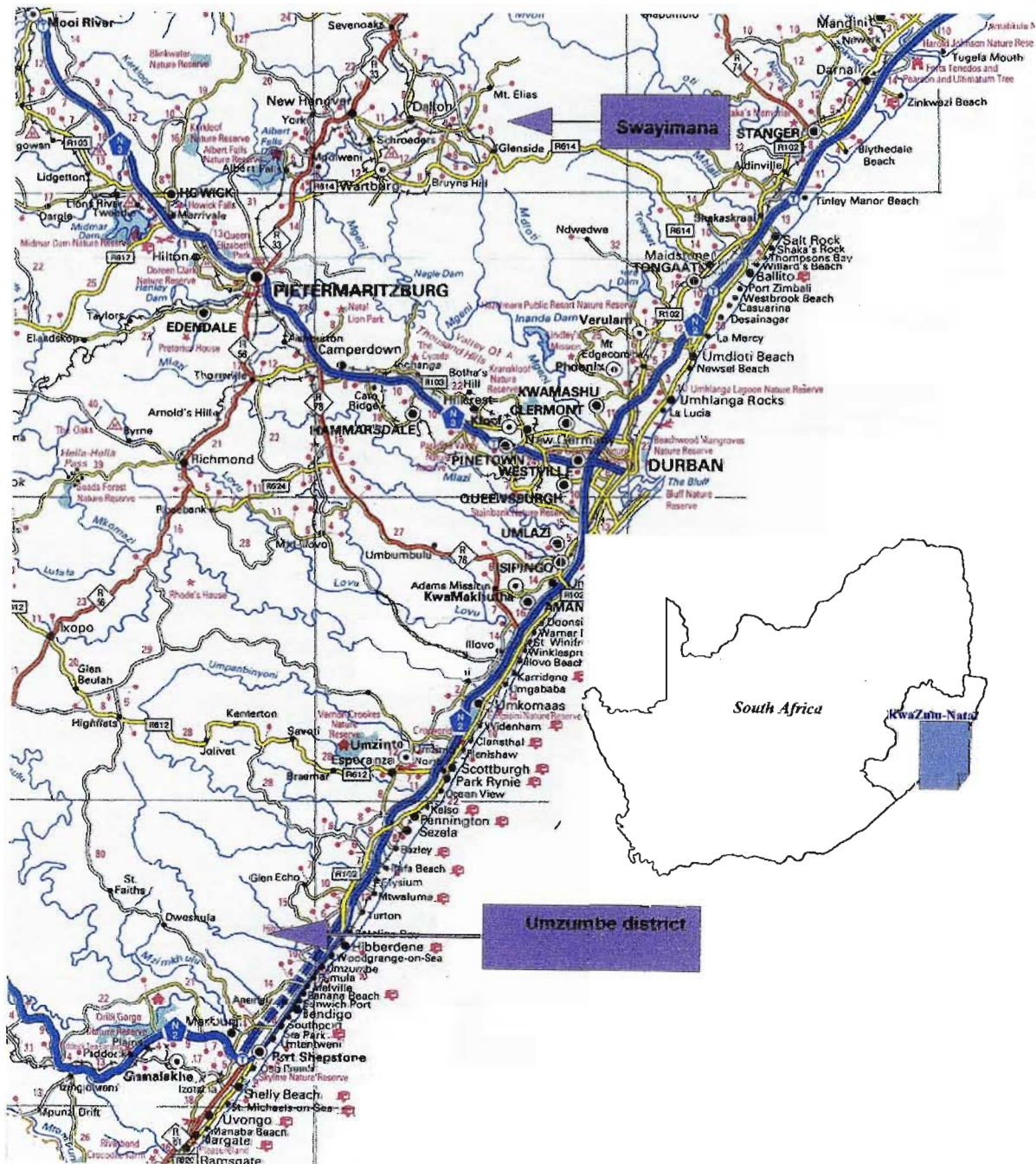


Figure 3.1 Location of Swayimana and Umzumbe (after Braby, 1997)

Politics plays an important role in local government. Rural communities tend to become strongholds (mostly determined by the political allegiance of the chief) of one of the two largest, predominantly black political parties. One of the marked differences between the two study districts is their political polarisation. Umzumbe wards are Inkatha Freedom Party strongholds while Swayimana is an African National Congress (ANC) stronghold, leading to distinct differences in governance structures. At the time of the survey, Umzumbe wards followed a more traditional practice of government, while Swayimana's *indunas* had already been replaced by community elected councillors. In addition, tribal dues were not paid by the inhabitants of Swayimana, while Umzumbe households still paid monthly and *ad hoc* tribal dues to the chiefs.

3.2 Sample selection

Ninety-nine rural households were surveyed during the latter half of 1997, 49 in Swayimana and 50 in the Umzumbe district. These two districts were purposively selected as both have high agricultural potential (Guy and Smith, 1998) but relatively low yields, making them prime areas for investigating the potential growth effects of mobilising under-utilised agricultural resources. A larger sample was not possible as repeat visits were necessary to elicit accurate consumption data and the research budget was limited. The study districts were defined by natural boundaries identified on orthophoto maps. A stratified, multi-stage sampling technique was used to draw a representative sample as sampling frames (eg. lists of households) were not available. The Swayimana plateau was treated as a single stratum, but the two tribal wards in Umzumbe were treated as separate strata. Each stratum was divided into homogenous primary sampling units (PSUs) using natural boundaries. The Swayimana stratum was divided into 42 PSUs. The Umzumbe strata, Gcabane and KwaHlongwa, were divided into nine and ten PSUs respectively (refer to Figures 3.1 and 3.2).

Within each stratum (tribal ward), PSUs were selected with probability proportionate to an estimate of their size (the number of households counted within each PSU on the orthophoto maps) and sample households were drawn randomly from a list of all households located by field workers in each of the selected PSUs (Lyne, 1981). Ten PSUs were selected at Swayimana and three from each tribal ward at Umzumbe. Five households were drawn from each of the PSUs selected in Swayimana (50 in total). Approximately eight households were drawn from each of the PSUs selected in the strata at Umzumbe, yielding a further 50 households. Thus the total sample initially comprised of 100 households.

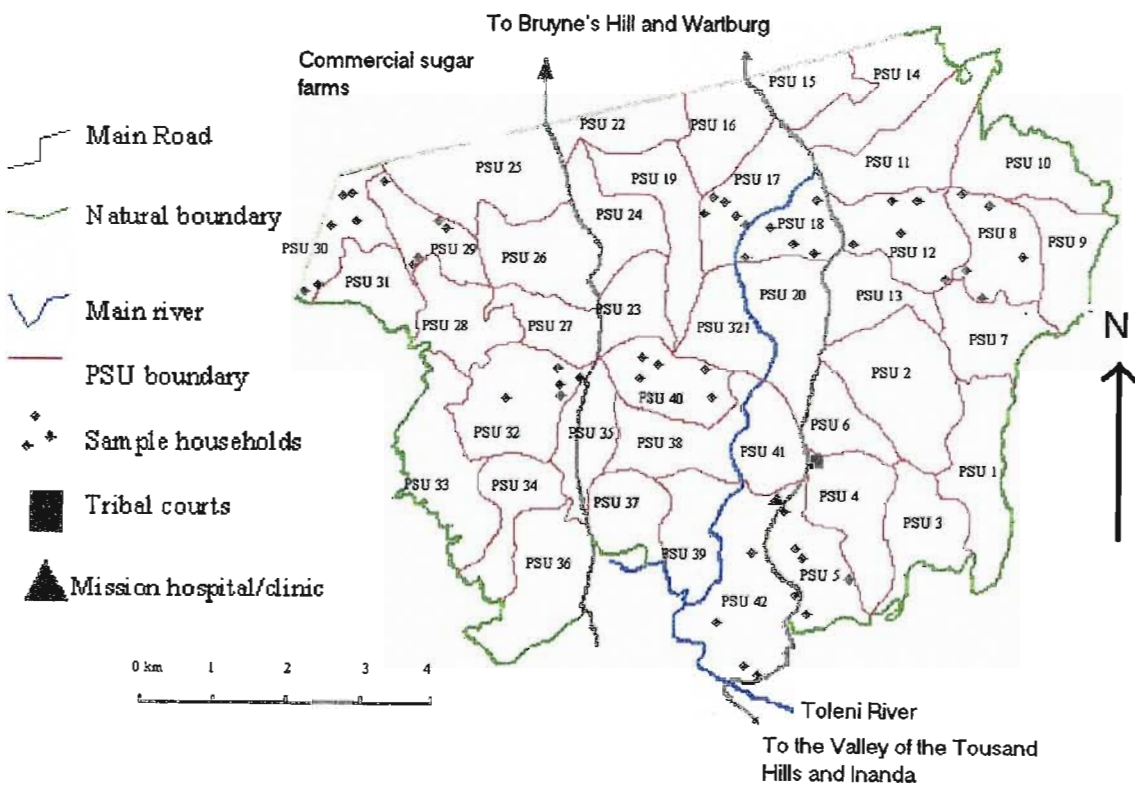


Figure 3.2 Map of Swayimana (after KwaZulu Department of Interior, 1982)

Each interviewer was allocated to specific PSUs. The interviewers accompanied the researcher, field supervisor, and a tribal *induna* (headman) or councillor hired to locate and identify the

sample homesteads. Questionnaires were numbered with the relevant random number and the family name of the household was recorded to facilitate future rounds of interviews. Interviewers were instructed that, in the event of the homestead being unoccupied on the first round of interviews, or if a suitable adult respondent could not be found, they were to substitute the next closest household.

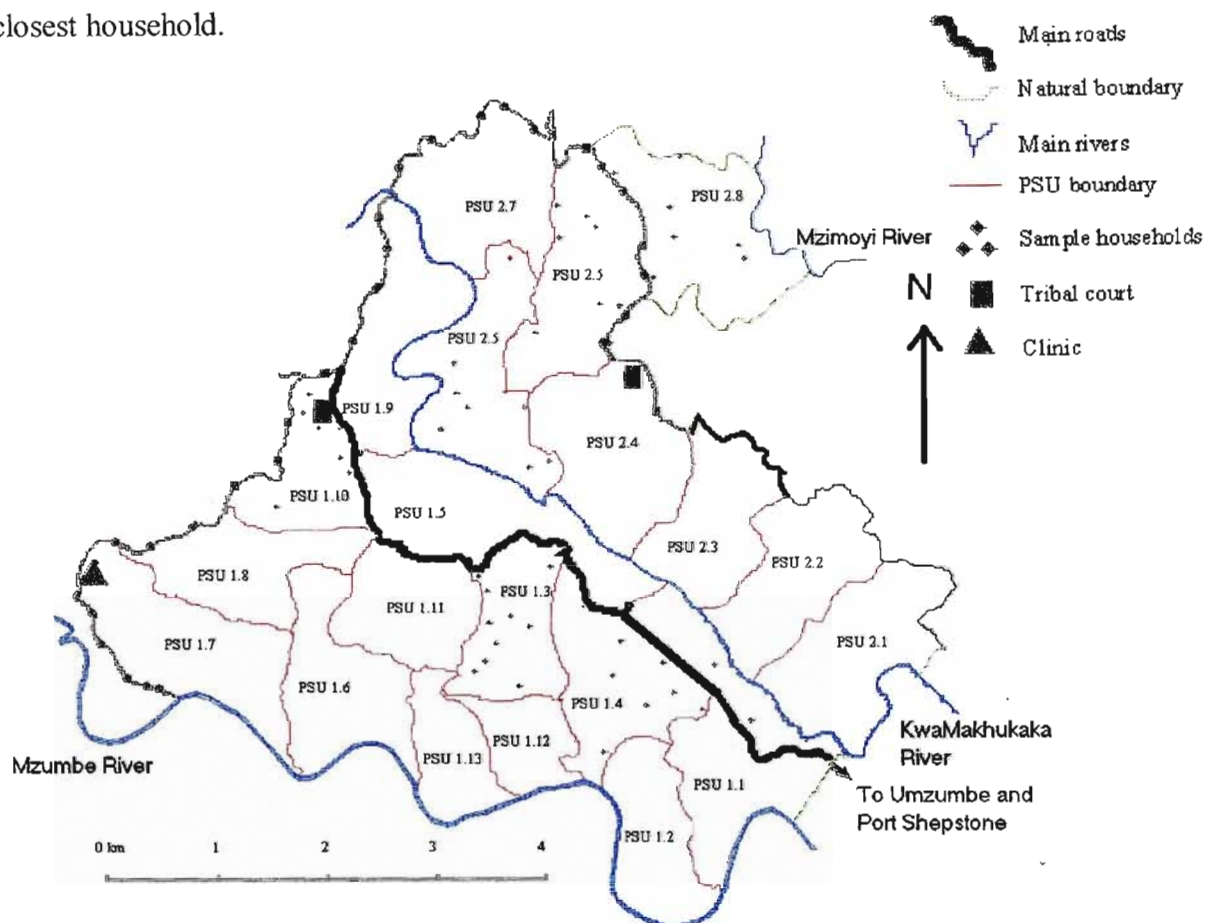


Figure 3.3 Map of Umzombe wards (after KwaZulu Department of Interior, 1979)

Due to an oversight, one household was not interviewed in the first round of surveys, reducing the sample size to 99. Two more households were dropped from the sample when suitable respondents were not available during the second and third rounds of interviews. Of the remaining 97 cases, four had substantial missing data relating to expenditure, and in most expenditure

analyses, these cases were excluded. The resultant effective sample size for the expenditure analyses was therefore 93 households.

3.3 Interviewer training and questionnaire trial

Interviewers at Umzumbe were trained in approaching households, phrasing questions and recording information on the interview schedules. The questionnaire was trialled after the training sessions. Three households from each district were randomly chosen from PSUs not included in the sample survey and were interviewed to identify flaws in the questionnaire and to determine interview duration.

The trial run allowed for post interview evaluations to appraise not only the questionnaire but also the performance of the interviewers. A post-trial discussion with field workers explored ways of winning the confidence of respondents in order to improve the amount of information rendered. The wording of some questions was altered. Since interviews were conducted in Zulu, the field supervisor and interviewers assisted in developing lists of Zulu terms for the goods and services consumed. These terms were used during training and subsequent interview rounds to standardise questions and prompt interviewee recall of purchases.

During the first round of interviews, a tribal *induna* or councillor, nominated by the local chiefs escorted the researcher, interviewers, and field supervisor and introduced the research team to sample households. Although this threatened interviewee honesty, it was considered necessary to promote cooperation. During subsequent interview rounds, the tribal *induna* accompanied the teams in each stratum but did not sit in on household interviews. Sensitive information regarding tribal dues was therefore collected only during the final round of interviews

3.4 Questionnaire design and data collection

Structured interview schedules were developed for each of the three rounds of interviews. The surveys were conducted over four months to account for seasonal availability of home grown produce. The questionnaire format, categorisation of goods and services, and list of possible household expenditures were informed by studies of growth linkages (Hazell and Röell, 1983; Delgado *et al*, 1998), household consumption surveys (Alderman, 1993; Low, 1993; Malik, 1993; Puetz, 1993; Grootaert and Cheung, 1985), the living standards measurement survey (Deaton and Case, 1988), and expenditure studies conducted in communal areas of South Africa (Vivier *et al*, 1993; Geerats *et al*, 1990; Martins, 1985; May and Peters, 1984; Gandar and Bromberger, 1981; Stopforth, 1974). In addition, the questionnaires were designed to collect information on household composition, income sources, savings, assets, agricultural enterprises, inputs, harvests, and sales.

Different recall periods were used for foods, non-food items, and services to minimise non-responses, memory errors, and misreporting of information. Weekly recall was used for food items as they are purchased more frequently and are more numerous than non-food items and services. Each interview round was scheduled for a different week of the month in order to gain a more representative picture of monthly consumption. The questionnaire was trialled on three households randomly chosen from PSUs not included in the survey.

There were three interview rounds. The first interview round collected household demographic, income and farm information, details of food consumed during the calendar week prior to the survey, and information on non-food items consumed during the calendar month prior to the

survey (refer to Appendix A for a sample questionnaire). The much shorter second round interviews were conducted three weeks after the initial surveys (refer to the sample questionnaire in Appendix B). This gathered information about food consumed over the calendar week prior to the survey and of non-food items consumed since the last survey. Questions relating to household income sources and savings were also repeated. The same three aspects (food and non-food consumption, income and savings) were recorded in the third interview round, together with expenditure on durables and seasonal and annual expenditures (refer to Appendix C for a sample questionnaire). The third round of interviews was conducted five weeks after the second round. The survey periods ran from late July to early October 1997 for Umzumbe, and from September to November 1997 for Swayimana. Consumption data were therefore gathered from harvest through to planting. Farm inputs and yields were recorded for the previous season (1996/1997). Farm inputs were excluded from total household expenditure to avoid double counting (Devereux,1993) because own consumption of household produce (crops, livestock, and processed products) was treated as part of consumption expenditure. The opportunity costs of these products were estimated using farm-gate selling prices.

3.5 Estimation of annual household expenditure

The expenditure data were annualised to account for the different recall periods used in the study. Since the survey gathered information for three of the average four weeks in a month, it was necessary to estimate expenditure on frequently purchased items during the missing week. Expenditure patterns showed a once-a-month bulk purchase, followed by weekly (or most often, daily) purchase of perishable and smaller items from local stores. In all cases, the week following pension and end-of-month income receipts had been included in the three rounds of surveys. The missing week's purchases were estimated for each frequently purchased item, and for each

household, by interpolating the expenditure pattern over the three weeks of recalled purchases. Monthly hire purchase instalments were multiplied by 12 months. Where only the cash price of durables was reported, these were converted into annual flows using the capital recovery method (Monke and Pearson, 1989, p139). Infrequent expenditures on occasions such as feasts for weddings, funerals and births were also converted into annual flows, on the assumption that each such event occurred every ten years. Appendix D contains the data set used for the analyses.

Since savings rates were negligible, household expenditure was almost equivalent to income. Household expenditure was therefore used as a proxy for income, as recommended by Alderman (1993); Devereux (1993); Puetz (1993); Vivier *et al* (1993); and Hazell and Röell (1983). Total household expenditure was calculated as the sum of expenditures in the categories of: alcohol and tobacco; clothing and footwear; communication and personal services; consumer expendables; durables; food; health; housing; investments; social obligations; transport and utilities. Per capita household expenditures were used to control for variations in household sizes, as household size directly influences total household expenditure. The sample was divided first into districts and then into two wealth groups (the wealthiest top decile of households and the remaining 90 percent of poor households). For the purpose of estimating growth multipliers, the commodities were reclassified into farm tradables, farm non-tradables, non-farm tradables and non-farm non-tradables.

Following Delgado *et al* (1998), non-tradable commodities were defined as those goods:

- that were neither imported nor exported from the districts,
- where the prices for these goods are largely determined by local supply and demand, and
- for which there were no close consumption substitutes.

An increase in district demand for a non-tradable commodity means increased demand for an item that cannot be imported, and which is not exported. By nature, services are inherently non-tradable. Delgado *et al* (1998) define 'region' as the area within 80 to 180 kilometres of the point of analysis. For this study, the district of analysis was confined to the tribal wards constituting the study districts. Although Umzumbe households were less than 80 kilometres from a small town, the commodities classified as non-tradable were seldom traded outside the districts. Most non-tradable products were bulky, highly perishable crops that could not be profitably imported or exported owing to poor infrastructure and transport services. A summary of non-tradable commodities included in each expenditure category is presented in Table 3.1.

Table 3.1 Classification of non-tradable goods and services for Swayimana and Umzumbe, 1997.

Non-tradable farm products and services	Non-tradable non-farm goods and services
Home and locally produced: <ul style="list-style-type: none"> • beer and spirits • bread substitutes (baked and fried) • eggs • fruit and vegetables • legumes • maize • milk • root crops Gathered wild vegetables	Home and locally produced: <ul style="list-style-type: none"> • building materials (wood, mud, thatch) • traditional medicines Home and locally provided services: <ul style="list-style-type: none"> • barber and hair services • child care • labour • mini bus transport • traditional healers Cattle held as investments Feasts and celebrations Family support Tribal dues

These non-tradable commodities included home produced foods and some non-food items such as services and locally sourced materials. Maize products and dry beans grown in the study districts were classified as non-tradables as they have few close substitutes and limited market demand outside of these districts. Local maize and bean products differ from those imported due to marked differences in variety (beans) and the unrefined character of processed products (maize).

3.6 Descriptive statistics

Sample households in Swayimana (n = 49) had on average nine members, while those in Umzumbe (n = 50) had seven members⁵. Sixty-nine percent of Swayimana households had migrant members compared to 77 percent for Umzumbe households. Per capita annual household expenditure averaged R 2 149 in Swayimana and R3041 in the Umzumbe wards during 1997 when the survey was conducted. From the expenditure data reported, 44 percent of households in Swayimana and 20 percent of those in Umzumbe fell below South Africa's annual rural poverty line of R4 236 per adult equivalent (May, 1998) (Table 3.2). Swayimana households reported double the number of unemployed adults per household (1.7) compared to Umzumbe households. Thirty percent of adults in the Swayimana sample, and nine percent of those in Umzumbe were unemployed.

Table 3.2 Annual expenditure per capita and adult equivalent, Swayimana and Umzumbe, 1997, n = 93.

Region	Mean (Rand)	Minimum (Rand)	Maximum (Rand)
Annual expenditure per capita			
Swayimana	2149.40	357.63	7545.11
Umzumbe	3041.55	654.73	16750.55
Adjusted annual expenditure per adult equivalent			
Swayimana	2099.20	298.03	7545.11
Umzumbe	3190.82	763.85	16750.55

⁵Although these sample means - and those that follow - were computed as if all sample households had equal probability of selection, they are not necessarily biased estimates of the district means as the PSUs were of roughly equal size within each stratum.

With regard to infrastructure, 12 percent of Swayimana households were supplied with electricity compared to eight percent at Umzumbe. Fifteen of the surveyed households, all in Swayimana, had on-site piped water. Only two households (both in the Umzumbe sample) had a telephone in their homes. The average Swayimana respondent had to travel 9.26 kilometres to a public telephone, while Umzumbe respondents travelled 2.76 kilometres to reach a telephone. The local cellular phone network could not be accessed from either district at the time the survey was conducted. Swayimana households were on average further from a tarred road (35.35 km) than were Umzumbe households (16.86 km). Only three households, all in Umzumbe owned a vehicle.

The two districts showed some differences in agricultural enterprises, livestock levels, home consumption of livestock and the sale of agricultural products. Agriculture's share of household income (including cash sales and the opportunity cost of home production) was 16.26 and 6.48 percent respectively for Swayimana and Umzumbe. Swayimana households reported larger crop areas. Seventy-seven percent of Swayimana and 66 percent of Umzumbe households farmed crops and/or livestock. Maize, amadumbes (*taro*), and beans were the major crops grown in both districts. Swayimana households produced more maize than Umzumbe households, while Umzumbe households produced relatively more beans. The types of vegetables and fruit grown by households in the two districts were similar. Vegetable crops included cabbage, swiss chard, tomatoes and pumpkins. Avocados were grown in both districts, and bananas at Umzumbe. Three sample households in each district farmed sugar cane. Sixty-three percent of Swayimana households owned cattle compared to 43 percent of Umzumbe households. Most households (96 and 80 percent for Swayimana and Umzumbe respectively) kept poultry.

Despite being prime agricultural land, little cash income was generated from the sale of farm produce (Table 3.2 and Figure 3.2). Swayimana households earned twice as much income from the sale of crops than did Umzumbe households, especially from maize, potatoes and sweet potatoes. On average, home production contributed 6.39 percent of total household expenditure for the entire sample, and 9.66 and 4.21 percent respectively for Swayimana and the Umzumbe households. This was less than half the contribution reported for other rural areas of South Africa by Kirsten *et al* (1998).

Table 3.3 Average annual income from sale of farm produce, Swayimana and Umzumbe, 1997, n = 93.

	Sample (Rand)	Swayimana (Rand)	Umzumbe (Rand)
Total household expenditure	19349.9	16307.21	21797.29
Average annual income from livestock sales*			
Cattle	42.59	41.67	43.47
Poultry	3.79	4.79	2.86
Average annual income from crop sales*			
Amadumbes	43.43	48.65	38.23
Beans	33.37	46.38	21.15
Fruit	0.56	0.65	0.5
Maize	16.23	27.47	6.12
Potatoes	11.83	22.67	2.69
Sugar cane	304.12	414.89	200
Sweet potatoes	6.74	11.2	2.55
Vegetables	2.37	0.25	4.4
Percentage of total household income*	6.39%	9.66%	4.21%

*Expenditure is used as a proxy for income.

In summary, the two districts varied in many respects, especially with regard to household and farm incomes. Swayimana households are larger and relatively poorer than Umzumbe households. Very little income was generated from agricultural production, especially in Umzumbe, which is supposed to have better agricultural potential than Swayimana. In addition, physical infrastructure was lacking, especially an electricity supply, access to tarred roads, access to piped water in Umzumbe, and access to telephones in Swayimana.

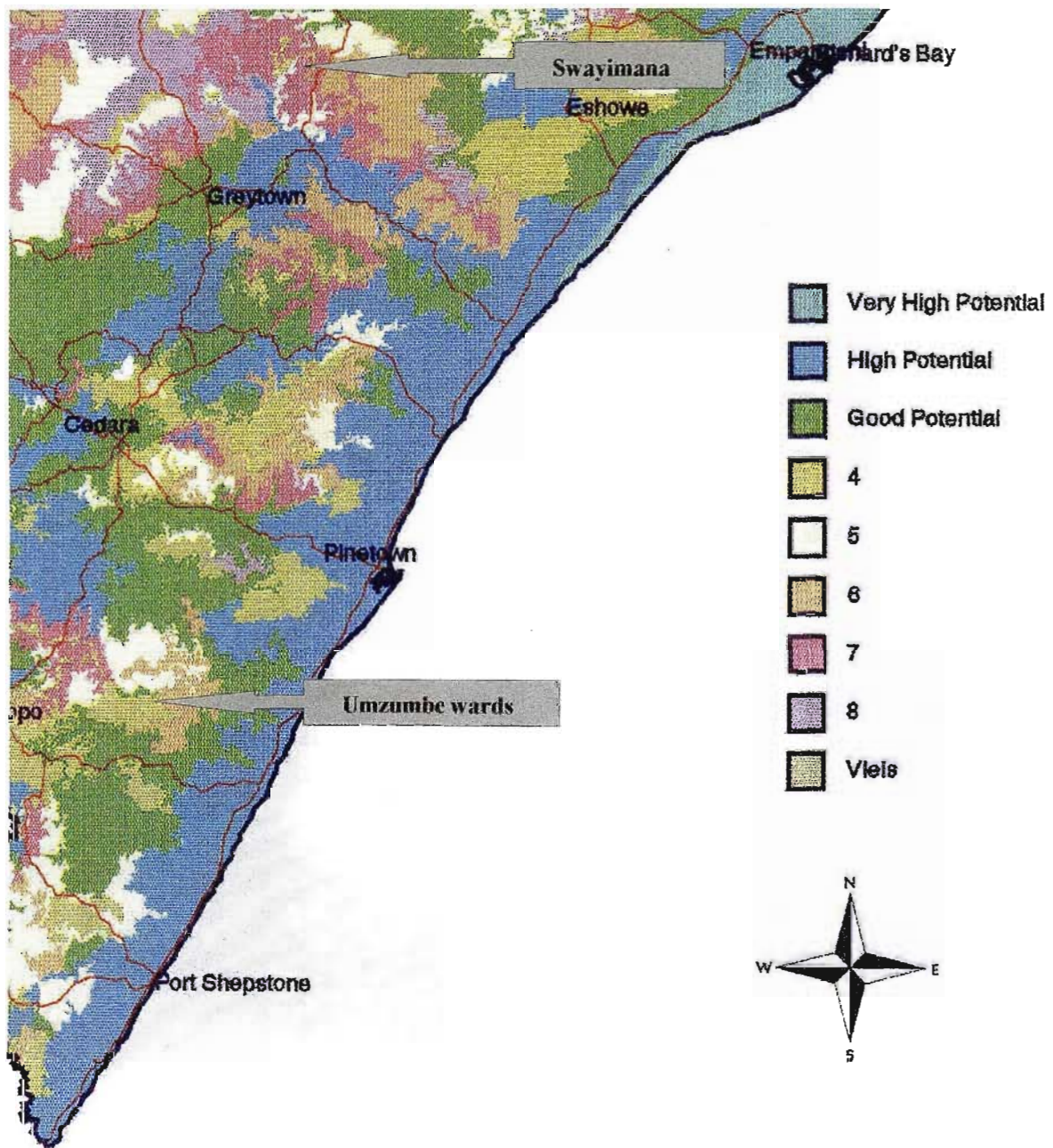


Figure 3.4 Agronomic potential of Swayimana and Umzumbe (after Guy and Smith, 1998, p8)

CHAPTER 4:

EXPENDITURE ELASTICITIES AND GROWTH MULTIPLIER METHODOLOGY

This chapter provides a detailed explanation of the empirical models used to predict average budget shares (ABS_i), marginal budget shares (MBS_i), expenditure elasticities (ξ_i) for goods and services and their estimated t-statistics, and to estimate growth multipliers.

4.1 Estimation of expenditure elasticities

A variant of the Working-Leser model (Hazell and Röell, 1983; Delgado *et al*, 1998), was used to estimate the absolute budget shares (ABSs), marginal budget shares (MBSs), and expenditure elasticities for each commodity group. ABS measures the percentage of household expenditure going to a group of goods, while MBS measures the direct impact of income changes on the consumption of a group of goods (Delgado *et al*, 1998). The Working-Leser model employed in this study allows for non-linear relationships between consumption and expenditure (equation 4.1). This model can be used where a common Engel curve has to fit a wide range of commodities, as is the case in this study. It is important for the function to have a slope which is free to change with expenditure so that the effect of a redistribution of income can be investigated (Hazell and Röell, 1983).

Household characteristic variables included in the model are listed in Table 4.1. These variables were selected from those reported in the linkage studies reviewed in Chapter 2. The final choice was based on the best fitting model, judged through inspection of comparative R^2 , Ra^2 and F-statistics, and the plausibility (sign) and reliability (t-statistic) of their regression coefficients over the range of commodity groups. Household characteristic variables capture differences in family composition and their influence on household expenditure. They are included in a way that allows

them to alter both the slope and intercept of the expenditure function. Per capita expenditure (E_i) on commodity group i is therefore expressed as:

$$E_i = a_i + b_i E + c_i E \log E + \sum_j (\mu_{ij} Z_j + \lambda_{ij} E Z_j) \quad (4.1)$$

where E is the total per capita consumption expenditure, Z_j denotes the j^{th} household characteristic variable and a_i , b_i , c_i , μ_{ij} and λ_{ij} are parameters to be estimated.

Table 4.1 Household characteristic variables included in the model

The household characteristics included in the model were:

- age of the household head in years,
- per capita number of infants,
- per capita number of children (aged 1 - 15),
- per capita household crop area in hectares,
- \log_{10} of household size, and
- a district dummy variable (Umzumbe = 0, Swayimana = 1).

The age of household head, per capita number of children and the log of household size were chosen to control for inter-household variations in household consumption. Per capita household crop area was included as a control variable because households with relatively larger crop areas have greater access to home produced foods at farm-gate prices (Hazell and Röell, 1983). This variable also distinguished farming from non-farming households. Areas cropped were chosen over farm size as a better indicator of subsistence production because many sample households only cultivated small portions of their arable land. Communal grazing lands are, in any case, excluded from estimates of farm size.

A dummy variable was included in the model to control for differences in expenditure patterns between districts. It was assumed that the inclusion of the dummy variable would account primarily for the effect of differences in infrastructure, the location of the sample households in

relation to the nearest town, and to a lesser extent, agricultural potential. Evidence of these differences is presented in Chapter 3. The model was estimated in share form in order to limit heteroscedasticity as variability in E_i increases with total expenditure in cross-sectional data (Hazell and Röell, 1983, cited by Delgado *et al*, 1998). Share equations of the following general form were estimated by ordinary least squares:

$$S_i = b_i + a_i/E + c_i \log E + \sum_j (\mu_{ij} Z_j / E + \lambda_{ij} Z_j) \quad (4.2)$$

where $S_i = E_i / E$ is the share of commodity i in total per capita expenditure. Share equations were estimated for the entire sample as the sample was not large enough to estimate separate models for each district. Delgado *et al* (1998) explain that the additive properties of the MBSs permit estimation of the model parameters for the entire data set and results for specific strata using subgroup means. District MBS_{*i*}, ABS_{*i*}, and expenditure elasticities (ξ_i) for each category of expenditure were calculated using district and then wealth group means. Following Delgado *et al* (1998), the equations used for these calculations were:

$$\text{MBS}_i = \delta E_i / \delta E = b_i + c_i (1 + \log E) + \sum_j \lambda_{ij} Z_j \quad (4.3)$$

$$\text{ABS}_i = S_i, \text{ and} \quad (4.4)$$

$$\xi_i = \text{MBS}_i / \text{ABS}_i \quad (4.5)$$

By way of illustrative example, the budget shares and elasticity for the category “food” are calculated below. The regression coefficients and sample means used for these illustrative purposes are presented in Table 4.2.

Table 4.2 Illustrative coefficients, sample means and standard errors for whole sample food category, Swayimana and Umzumbe, 1997 (n=93).

Variable	Indicates	Coefficient Denoted by	Regression Coefficient	Sample Mean (Z_j)	SE
(Constant)	Intercept	b_i	-0.164	-	0.752
INVPCEX	1/per capital total expenditure	a_i	913.192	0.00062	510.7
LGPCTEXP	\log_{10} per capita total expenditure	c_i	0.085	3.29490	0.171
DUMMYRE	District dummy (=1 for Swayimana)	λ_1	0.099	0.48480	0.08
DUMMYEXP	District dummy/per capita total expenditure	μ_1	37.026	0.00034	131.8
HEADAGE	Age of household head in years	λ_2	0.007	53.0909	0.003
AGETEXP	Age of household head/per capita total	μ_2	-9.028	0.03374	4.228
PINFANT	Number of infants/household size	λ_3	0.485	0.10670	0.301
INFANTEX	Number of infants/per capita total expenditure	μ_3	-28.739	0.00067	44.38
PCCROP	Crop land size/household size	λ_4	0.398	0.04364	0.459
CROPEXP	Crop land size/per capita total expenditure	μ_4	-121.005	0.00027	63.19
PCCHILD	Number of children/household size	λ_5	0.034	0.23250	0.198
CHILDTEX	Number of children/per capita total expenditure	μ_5	26.747	0.00153	33.57
LGHH SIZE	\log_{10} household size	λ_6	-0.053	0.92440	0.207
LGSIZPCT	\log_{10} household size/per capita total	μ_6	-329.988	0.00060	522.7

$$MBS_i = \delta E_i / \delta E \quad (4.6)$$

$$= b_i + c_i(1 + \log E) + \sum_j \lambda_{ij} Z_j \quad (4.7)$$

$$= b_i + c_i (1 + LGPCTEXP) + (\lambda_1 DUMMYREG + \lambda_2 HEADAGE + \lambda_3 PINFANT + \lambda_4 PCCROP + \lambda_5 PCCHILD + \lambda_6 LGHH SIZE) \quad (4.8)$$

$$= -0.164 + 0.085(1 + 3.29490) + \{(0.099 \times 0.48480) + (0.007 \times 53.09090) + (0.485 \times 0.10670) + (0.398 \times 0.04364) + (0.034 \times 0.23250) + (-0.053 \times 0.92440)\}.$$

$$= 0.640 \quad (4.9)$$

$$ABS_i = S_i \quad (4.10)$$

$$= b_i + a_i / E + c_i \log E + \sum_j (\mu_{ij} Z_j / E + \lambda_{ij} Z_j) \quad (4.11)$$

$$= b_i + a_i INVPCEX + c_i LGPCTEXP + \mu_1 DUMMYEXP + \lambda_1 DUMMYREG + \mu_2 AGEEXP + \lambda_2 HEADAGE + \mu_3 INFANTEX + \lambda_3 PINFANT +$$

$$\mu_4\text{CROPEXP} + \lambda_4\text{PCCROP} + \mu_5\text{CHILDTTEX} + \lambda_5\text{PCCHILD} + \mu_6\text{LGSIZPCT} + \lambda_6\text{LGHHHSIZE} \quad (4.12)$$

$$\begin{aligned} = & -0.164 + (913.192 \times 0.00062) + (0.085 \times 3.29490) + \{(37.026 \times 0.00034) \\ & + (0.099 \times 0.48480) + (-9.028 \times 0.03374) + (0.007 \times 53.09090) + \\ & (-28.739 \times 0.00067) + (0.485 \times 0.10670) + (-121.005 \times 0.00027) + \\ & (0.398 \times 0.04364) + (26.747 \times 0.00153) + (0.034 \times 0.23250) + \\ & (-329.998 + 0.00060) + (-0.053 \times 0.92440)\}. \quad (4.13) \\ = & 0.665 \end{aligned}$$

$$\text{Therefore, } \xi_i = \text{MBS}_i / \text{ABS}_i \quad (4.14)$$

$$= 0.640/0.665 \quad (4.15)$$

$$= 0.962$$

4.2 Reliability of the estimated model, expenditure shares and elasticities

Various combinations of household characteristics were tested and the best fitting model was selected, primarily on the basis of the R^2 statistic over the range of commodity groups. The R^2 statistics ranged from 49.7 to 74.0 percent for the commodity groups with statistically significant share equations (Appendixes F - I). Hazell and Röells' (1983) R^2 statistics ranged from 11.8 to 29.5 percent, and Belete *et al's* (1999) from 38 to 67 percent. These relatively high R^2 statistics lend confidence to the estimated ABSs.

Inspection of the collinearity diagnostics (variance inflation factors and condition indexes) indicated some multi-collinearity between explanatory variables (refer to Appendix E for a list of the variance inflation factors). Multi-collinearity does not affect the accuracy of the predicted ABSs provided that relationships between correlated explanatory variables remain unchanged.

Figure 4.1 shows that predicted ABSs were almost identical to the actual ABSs observed for most commodity groups. For food, the largest expenditure category, the predicted ABS was approximately ten percent lower than the sample means computed for Swayimana and Umzumbe

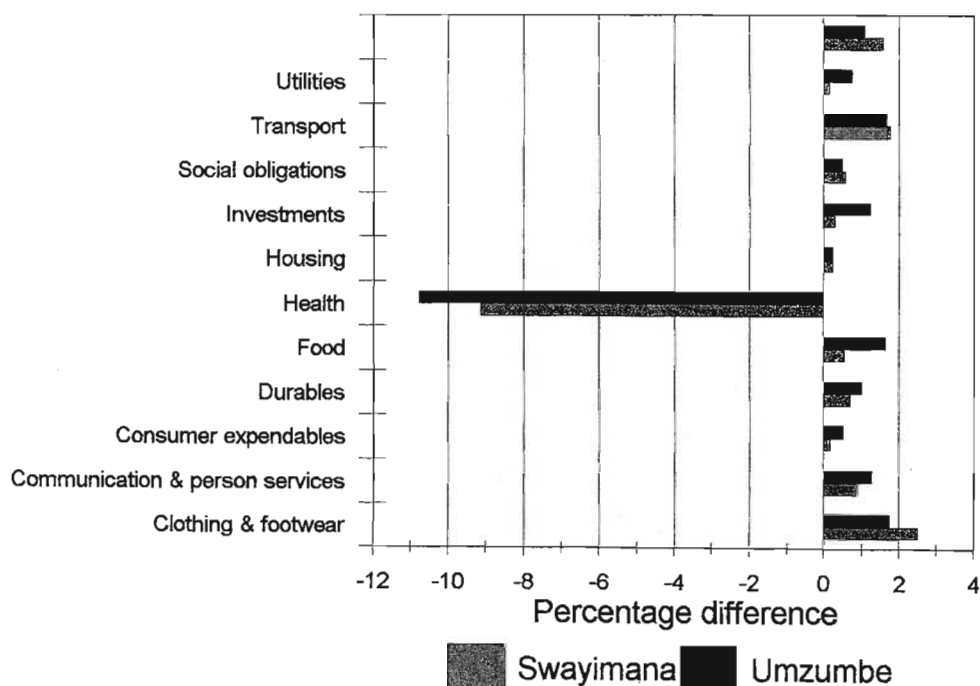


Figure 4.1 Percentage difference in predicted ABS and actual ABS in Swayimana and Umzumbe, 1997 (n=93).

respectively.

MBSs are computed from a sub-set of the estimated parameters (Equation 4.5), introducing the possibility of bias in both the estimated MBSs and ξ_i due to multi-collinearity. T-statistics computed for the ABS_i , MBS_i , and ξ_i are presented in italics beneath these estimates in the appendixes and tables which follow in Chapters 5 and 6. They test the null hypothesis that the estimated MBSs and ABSs differ from zero, and that the estimated ξ_i differ from unity. Similar

studies by Nqgawweni (2000); Delgado *et al* (1998); Delgado *et al* (1994) and Hazel and Röell (1983) pay little attention to the reliability of their results.

Since the ABSs and MBSs are linear combinations of the estimated parameters, their t-statistics are calculated from the standard errors of the estimated parameters (Hazell & Röell, 1983). The t-statistic for the ABS was calculated following the steps detailed below (Gujarati, 1988, p119):

$$Var(\overline{ABS}) = \sigma^2 x'_0 (X'X)^{-1} x_0 \quad (4.16)$$

where: $Var(\overline{ABS})$ = variance of the average budget share predicted for each category of expenditure using the mean values (sub-group mean values) of the independent variables (\bar{x}_i),

σ^2 = the residual mean square for each category of expenditure,

x_0 = a vector of the means of the descriptive variables in the share equation,

X = the matrix of raw data for the independent variables.

Therefore,
$$SE_{(ABS)} = \sqrt{Var(\overline{ABS})} \quad (4.17)$$

where SE represents the standard error, and,

$$t_{(ABS)} = \frac{\overline{ABS}}{SE_{(ABS)}} \quad (4.18)$$

By way of example, for the whole sample category “food”, the product of $X'_0 (X'X)^{-1} X_0$ is 0.189.

Since the regression estimate of σ^2 for food is 0.026, the t-statistic for the whole sample ABS for

food is:
$$Var_{\overline{ABS}} = \sigma^2 (0.189) \quad (4.19)$$

$$= 0.026 \times 0.189$$

$$= 0.004914$$

Therefore,
$$SE_{(\overline{ABS})} = \sqrt{0.004914} = 0.0701 \quad (4.20)$$

and,
$$t_{(\overline{ABS})} = \frac{0.665}{0.0701} = 9.486 \quad (4.21)$$

Likewise, t-statistics for the MBSs were computed as follows:

$$Var_{(\overline{MBS})} \approx \sigma^2 x_0'(X'X)^{-1} x_0 \quad (4.22)$$

where: $Var_{(\overline{MBS})}$ = variance of the marginal budget share predicted for each category of expenditure using the mean values (sub-group mean values) of the independent variables ($\overline{x_i}$),

σ^2 = the residual mean square for each category of expenditure,

x_0 = a vector of the means of the descriptive variables included in the marginal budget share equation,

X = the matrix of raw data for the sub-set of included independent variables.

Therefore,
$$SE_{(\overline{MBS})} = \sqrt{Var_{(\overline{MBS})}} \quad (4.23)$$

where SE represents the standard error, and,

$$t_{(\overline{MBS})} = \frac{\overline{MBS}}{SE_{(\overline{MBS})}} \quad (4.24)$$

By way of example, for the whole sample category “food”, the product of $X_0'(X'X)^{-1} X_0$ is 0.011.

Since the regression estimate of σ^2 for food is 0.026, the t-statistic for the whole sample MBS for

food is:
$$Var_{(\overline{MBS})} \approx \sigma^2 (0.011) \quad (4.25)$$

$$\approx 0.026 \times 0.011$$

$$\approx 0.000286$$

Therefore,

$$SE_{(\overline{MBS})} \approx \sqrt{0.000286} = 0.016912 \quad (4.26)$$

and,

$$t_{(\overline{MBS})} \approx \frac{0.640}{0.016912} = 37.843 \quad (4.27)$$

The difference between the ABS and MBS is also a linear combination of the estimated parameters (Hazell & Röell, 1983). Therefore, a t-statistic to test the null hypothesis that $\xi_i = 1$ (ie MBS - ABS = 0) was calculated as follows (Rayner, 1967, p100):

$$Var_{(\overline{MBS-ABS})} = Var_{\xi_i = 1} = \frac{Var_{(\overline{MBS})} + Var_{(\overline{ABS})}}{N} \quad (4.28)$$

Therefore, the standard error of the mean difference between the ABS and the MBS is:

$$SE_{\xi_i = 1} = \sqrt{Var_{\xi_i = 1}} \quad (4.29)$$

and,

$$t_{\xi_i = 1} = \frac{MBS - ABS}{SE_{\xi_i = 1}} \quad (4.30)$$

By way of example, the t-statistic for the elasticity for the whole sample food category is calculated as follows:

$$Var_{\xi_i = 1} \approx \frac{0.000286 + 0.004914}{93} \approx 0.0000559 \quad (4.31)$$

The standard error of the mean difference between the ABS and the MBS is:

$$SE_{\xi_i = 1} \approx \sqrt{0.0000559} \approx 0.007477 \quad (4.32)$$

Finally,

$$t_{\xi_i = 1} \approx \frac{0.665 - 0.640}{0.007477} \approx 3.344 \quad (4.33)$$

The implication is that when $\xi_i = 1$, the t-statistic will be zero or non-significant. Significant t-values are likely only when the estimated expenditure elasticity is noticeably smaller or larger than unity.

4.3 Estimation of growth multipliers

Growth multipliers were computed from the MBS_i estimated for **non-tradables** to determine whether raised household incomes would generate additional income in the rural economy. The simplified semi-input-output model (Hazell, 1984, cited by Haggblade *et al*, 1991) was used to compute the multipliers. The multiplier (M) measures the effect of an initial R1.00 increase in household incomes on local income through increased production and consumption of non-tradables (Delgado *et al*, 1998).

Hazell's (1984, cited by Haggblade *et al*, 1991) simplified multiplier makes a number of assumptions which need to be taken into account in evaluating the estimated multipliers. First, it assumes that intermediate inputs used per unit of tradable output do not change as a result of the initial increase in tradable output. Second, it assumes (as do all fixed-price models) that tradables are supply constrained and that non-tradables are perfectly price elastic in supply. The simplified model is derived from the following fixed-price multiplier (Haggblade *et al*, 1991):

$$M = \frac{1 - a_m + a_n \left(\frac{v_n}{v_t} \right)}{1 - a_m - \beta_n v_n (1 - s)} \quad (4.34)$$

where:

$a_{mn}, a_{nt} =$ the share of non-tradable intermediate inputs in non-tradable and tradable output, respectively (between 0 and 1),

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

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

$v_t =$ same as v_n , for tradables, with value equal to $1 - a_{tt} - a_{nt}$,

- β_n = marginal propensity to consume non-tradables (ie the MBS for non-tradables), and
- s = leakages (savings and tax rate) assumed as a proportion of total income (here expenditure was used as a proxy for income).

Hazell's simplified version of the multiplier ignores non-tradable intermediate inputs, and assumes that $a_{nm} = a_{nt} = a_n$ (intermediate demand for non-tradables) and $v_n = v_t = v$ (value-added shares). These assumptions are not unreasonable for many developing country districts (Haggblade *et al*, 1991). Although the supply response for non-tradables is not known, the supply (of non-tradable) agricultural products is most likely to be price inelastic in the short run. However, the assumptions made do bias the results downward by approximately five to ten percent (Delgado *et al*, 1998). On the other hand, the assumption that all additional demand for non-tradables is directed only to increased production (due to fixed prices) overstates the multiplier by 20 to 30 percent (Delgado *et al*, 1998). Following these 'rules of thumb', the simplified multiplier given by Equation 4.35 is overstated by ten to 25 percent.

$$M = \frac{1}{1 - \beta_n(1 - s)} \quad (4.35)$$

For the whole sample the observed level of s was 0.0159. Therefore, substituting the estimated non-tradable MBSs for β_n and 0.0159 for s , the final multiplier equation used in this study is:

$$M = \frac{1}{1 - \text{MBS}_n(1 - 0.0159)} \quad (4.37)$$

The results of the expenditure analyses for the district and wealth group commodity categories are presented and discussed in Chapter 5, while the results of the expenditure analysis for tradable and non-tradable commodities are presented in Chapter 6, along with the estimated multipliers.

CHAPTER 5: DISTRICT AND WEALTH GROUP EXPENDITURE ELASTICITIES

Appendix F shows that six of the 12 share equations estimated for commodity groups are not significant at either the one or five percent levels of probability. The rejected equations are for alcohol and tobacco; clothing and footwear; communication and personal services; health; investments; and utilities. Investments included cash savings, and purchases of cattle and jewellery. The statistical insignificance of this group of expenditures suggests a low propensity to save and therefore to finance investments from local savings. Utilities included fuel (wood, paraffin, diesel and coal), electricity and water. Four equations were significant at the one percent level of probability (consumer expendables, housing, social obligations, and transport), while the equations estimated for durables and food were significant at the five percent level of probability. Budget shares, expenditure elasticities, and t-statistics were computed from the parameters of the statistically significant equations by substituting district and wealth group means for the explanatory variables.

5.1 Expenditure elasticities for districts

Table 5.1 presents a comparison of significant ABS_i estimated for each district (a more detailed table of results for the district expenditure patterns is presented in Appendix F). Expenditure on food accounted for the greatest share of total household expenditure (as would be expected for poor households). The estimated ABSs for Swayimana and the relatively wealthier Umzumbe households are 69.5 and 59.0 percent respectively. The corresponding elasticities are 1.092 and 0.983, indicating that expenditure on food in both districts varies in almost direct proportion to a small change in household income. This finding is consistent with the results of studies by van

Zyl *et al* (1991), Nieuwoudt and Vink (1989) and van Seventer (1987), who reported income elasticities for food of around one for poor rural communities in South Africa. It is also consistent with Delgado *et al*'s (1998) estimate for the Eastern Province of Zambia (0.88), and with Hazell and Röells' (1983) estimate for Gusau, Nigeria (0.94). However, Belete *et al* (1999) report an expenditure elasticity for food of just 0.685 for households sampled in the Eastern Cape province of South Africa.

Table 5.1 Expenditure elasticities for significant aggregate commodity groups in Swayimana and Umzumbe, 1997 (n = 93)

Expenditure group	F-statistic	Swayimana (n = 46)			Umzumbe (n = 47)		
		ABS	MBS	Elasticity	ABS	MBS	Elasticity
Consumer expendables	6.738	0.02	0.02	0.76	0.03	0.02	0.71
		<i>4.23</i>	<i>13.41</i>	<i>9.52</i>	<i>6.68</i>	<i>19.65</i>	<i>18.50</i>
Durables	1.906	0.02	0.05	2.17	0.06	0.12	2.20
		<i>0.76</i>	<i>6.84</i>	<i>8.29</i>	<i>1.99</i>	<i>18.23</i>	<i>22.32</i>
Food	1.829	0.70	0.76	1.09	0.59	0.58	0.98
		<i>9.84</i>	<i>44.81</i>	<i>8.48</i>	<i>8.36</i>	<i>34.28</i>	<i>1.31</i>
Housing	2.860	0.02	0.04	2.46	0.06	0.17	2.72
		<i>0.50</i>	<i>5.09</i>	<i>6.79</i>	<i>1.69</i>	<i>19.12</i>	<i>27.16</i>
Social obligations	2.951	0.06	0.02	0.31	0.06	-0.02	-0.29
		<i>2.11</i>	<i>2.73</i>	<i>13.61</i>	<i>2.32</i>	<i>-2.84</i>	<i>-28.14</i>
Transport	1.972	0.01	0.05	8.30	0.03	0.08	2.52
		<i>0.44</i>	<i>15.37</i>	<i>30.40</i>	<i>2.25</i>	<i>23.65</i>	<i>32.06</i>

Note: Figures in italics are t-statistics for the null hypothesis that the predicted average and marginal budget shares are zero and that the expenditure elasticity is unity.

The commodity group for food was disaggregated into the following sub-groups for closer examination of the likely influence of income changes on expenditure: staple foods (maize, rice, root crops and wheat products), eggs, legumes, meat and poultry, and horticultural products. Comparative contributions of the significant commodity sub-groups are presented in Figure 5.1. Food staples accounted for 34.3 and 24.9 percent of household expenditure on food in Swayimana and Umzumbe respectively. The equations estimated for eggs and legumes were not statistically significant (see Appendix G) and are therefore not discussed.

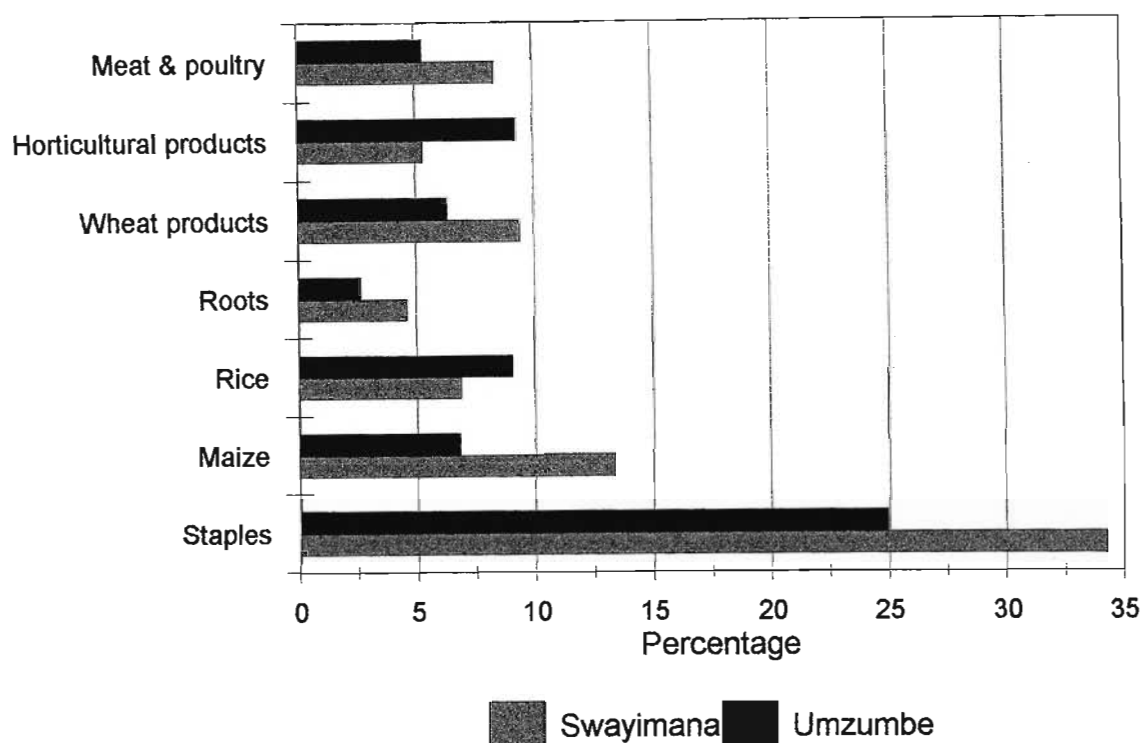


Figure 5.1 Comparison of predicted average budget shares predicted for Swayimana and Umzumbe, 1997 (n = 93).

Table 5.2 shows that the estimated expenditure elasticities for staple foods in Swayimana and Umzumbe were 0.166 and -0.110. This implies that expenditure on staple foods would remain virtually unchanged or possibly decrease as household incomes rise. These elasticities are lower than those reported by van Zyl *et al* (1991) and Nieuwoudt and Vink (1989) who estimated income elasticities of approximately 0.4 for staple foods. Within the food staples group, the expenditure elasticity for maize is 0.101 for Swayimana and close to zero for Umzumbe. Elliot and van Zyl (1991) report slightly higher income elasticities for maize and maize products (0.196 and 0.147) for rural areas in South Africa. Swayimana households produced almost double the harvest value for maize than did Umzumbe households. From Figure 5.1 it would appear that households in the Umzumbe district, which is less suited to maize production, and where households are comparatively wealthier, substitute imported rice for maize in consumption.

Nevertheless, the expenditure elasticities for rice were estimated to be slightly negative in both districts, suggesting that demand for rice would not increase as incomes rise. Elliot and van Zyl (1991) estimated a small but positive income elasticity for rice (0.157).

Table 5.2 Expenditure elasticities for significant food commodity groups in Swayimana and Umzumbe, 1997 (n = 93)

Expenditure group	F-statistic	Swayimana (n = 46)			Umzumbe (n = 47)		
		ABS	MBS	Elasticity	ABS	MBS	Elasticity
Staples	5.330	0.34	0.06	0.17	0.25	-0.03	-0.11
		<i>8.30</i>	<i>5.73</i>	<i>64.95</i>	<i>6.04</i>	<i>-2.77</i>	<i>-62.84</i>
Maize	5.323	0.13	0.01	0.10	0.07	0.00	0.04
		<i>5.30</i>	<i>2.22</i>	<i>44.70</i>	<i>2.69</i>	<i>0.42</i>	<i>24.29</i>
Rice	1.751	0.07	-0.01	-0.12	0.09	-0.01	-0.07
		<i>3.24</i>	<i>-1.65</i>	<i>-34.10</i>	<i>4.28</i>	<i>-1.23</i>	<i>-42.94</i>
Roots	6.887	0.05	0.01	0.19	0.03	-0.01	-0.24
		<i>5.97</i>	<i>4.62</i>	<i>45.64</i>	<i>3.46</i>	<i>-3.45</i>	<i>-40.18</i>
Wheat products	2.971	0.09	0.04	0.44	0.06	-0.02	-0.32
		<i>5.57</i>	<i>10.57</i>	<i>29.43</i>	<i>3.75</i>	<i>-4.92</i>	<i>-46.19</i>
Horticultural products	2.651	0.05	0.42	7.91	0.09	0.42	4.56
		<i>1.18</i>	<i>38.87</i>	<i>76.37</i>	<i>2.06</i>	<i>39.10</i>	<i>68.62</i>
Meat and poultry	2.110	0.08	0.08	0.97	0.05	0.06	1.04
		<i>4.49</i>	<i>18.07</i>	<i>1.44</i>	<i>2.84</i>	<i>12.36</i>	<i>1.18</i>

Note: Figures in italics are t-statistics for the null hypothesis that the estimated average and marginal budget shares are zero and that the expenditure elasticity is unity.

For root crops (potatoes, sweet potatoes, and amadumbes or *taro*), the expenditure elasticity is also negative (-0.239) in Umzumbe, but slightly positive (0.185) in Swayimana. Although sample households in both districts consumed similar amounts of root crops per capita, the relatively poorer Swayimana households spent a higher proportion of their total household expenditure on root crops than did Umzumbe households. A similar trend holds for wheat products (bread and flour), with an expenditure elasticity of 0.436 in Swayimana and -0.315 in Umzumbe. Overall, the elasticities show little chance of increased demand for staple crops, should incomes rise.

The equation estimated for meat, meat products and poultry included all meat, processed meat products and poultry, but excluded eggs. There was little difference within districts between the estimated ABSs and MBSs for this group. However, between districts there was a substantial difference in ABSs. The ABS for Swayimana was 8.4 percent compared to 5.3 percent in Umzumbe. Elasticities of 0.996 and 1.044 were computed for Swayimana and Umzumbe respectively, suggesting that an increase in income would result in a proportionate increase in demand for meat and poultry products. For poor households, it may have been expected that an increase in income would result in a proportionally larger increase in meat consumption. A possible explanation for this anomaly is the fact that sample households lacked storage (refrigeration) facilities for these highly perishable products, making consumption response less elastic.

The results reported in Table 5.2 indicate a possible dramatic increase in expenditure on horticultural products (fresh and processed fruit and vegetables) in response to higher incomes, with elasticities of 7.906 and 4.555 for Swayimana and Umzumbe respectively. The strong likelihood that the consumption of fruit and vegetables will increase substantially with increased income concurs with findings for Asia and Africa (Delgado *et al*, 1998), and other South African studies (van Zyl *et al*, 1991; Nieuwoudt and Vink, 1989). In conclusion, there is little possibility of income induced growth in the demand for food, except for horticultural products, and to a lesser extent, for meat, meat products, and poultry. For these two categories, the elasticities indicate likely growth as income increases, especially for horticultural products.

Returning to the aggregate commodity groups (Table 5.1), the consumer expendables commodity group included a wide range of commodities, including household and personal cleaning

requirements; leisure requirements, stationery, sport, magazines, newspapers, pocket money and toys; as well as household items such as bedding, dishes, lamps, buckets, plastic items, and soft furnishings. This category of expenditure was small, accounting for just 2.0 (Swayimana) and 3.2 (Umzumbe) percent of household expenditure. The district elasticities for consumer expendables, were similar (0.760 and 0.705 for Swayimana and Umzumbe respectively), suggesting that demand for these items would increase with an increase in household income, but by a less than proportionate amount. The result may have been influenced by the wide range of commodities included in this category. Earlier studies by van Zyl *et al* (1991) and Nieuwoudt and Vink (1989) have shown the opposite to be true, that is, expenditure on these items is generally income elastic. However, Belete *et al's* (1999) results for the Eastern Cape sample also indicated an expenditure inelastic demand for such consumer items.

As expected, the results showed that households in both districts would substantially increase their expenditure on durable items (furniture and appliances) should incomes increase. The elasticities for both districts are well above unity (2.167 and 2.195 respectively for Swayimana and Umzumbe). This suggests that the demand for imported consumer durables may grow faster than the demand for locally produced commodities when incomes rise, directing part of any additional income out of the local economy. This will tend to lower the strength of local growth linkages.

Umzumbe households spend a higher proportion of total expenditure on housing (6.1 percent) than the average Swayimana household (1.8 percent). This category accounted for annual expenditure on rent, building materials and repairs, and the labour cost for these activities. Both districts showed a strong positive elasticity for housing expenditure (2.457 and 2.716 for Swayimana and Umzumbe respectively). This has positive implications for the local economy as

building materials (eg. concrete blocks), construction, and repair services tend to use local resources, especially labour.

For social obligations, the ABSs were 5.6 and 6.2 percent for Swayimana and the Umzumbe districts respectively. In both districts, the corresponding MBSs were considerably less than the ABSs for the average household (1.7 and -1.8). This indicates little additional expenditure on social obligations in Swayimana, and declining contributions to family support, church and tribal dues, funerals, weddings, births, festivals, birthdays, and religious feasts in the Umzumbe district. Consequently, the elasticities for this category were low (0.311 and -0.293 respectively for Swayimana and Umzumbe).

The estimated expenditure elasticities for transport were very high in both districts (8.298 for Swayimana and 2.518 the Umzumbe district). Expenditure on transport represented 0.6 and 3.0 percent of total household expenditure in these respective districts. Residents rely heavily on minibus taxis to cover the large distances between their homes and urban centres. The transport ABS for Swayimana was one fifth of that observed for the average sample household in Umzumbe. Yet, Swayimana households are much further away from the nearest major city, indicating that Swayimana residents are less mobile than Umzumbe dwellers. Swayimana households had fewer commuters and almost double the number of unemployed persons than the Umzumbe households who were closer to employment opportunities in the urban tourist centres along the KwaZulu-Natal south coast.

Apart from the large distances from major urban centres, poor infrastructure separates most rural South African communities from services located in the main urban centres. The average distance

from a tarred road was 35.4 and 16.9 km for Swayimana and Umzumbe households respectively. In addition, the cost of transport services is high. For example, Swayimana households paid R28 per return trip to Pietermaritzburg, the nearest large urban centre. One trip equated to approximately one percent of the average monthly household income for the district. Only three surveyed households owned vehicles (all in the Umzumbe sample).

5.2 Expenditure elasticities for wealth groups

Following the same approach used for the district analysis, group means were used to estimate the budget shares and elasticities for poorer and relatively wealthier households. The sample households were divided into two groups, namely the wealthier ten percent (per capita household income greater than R4 070) and the poorer 90 percent of sample households, irrespective of district. Thirty-four percent of households in the poorer group had per capita expenditures below the national poverty line of R4 236 per adult equivalent (May,1998) when expenditures were adjusted for adult equivalents. Per capita household expenditure ranged from R358 to R4 069 in the poorer group, while per capita expenditure for the nine households in the wealthier group ranged from R4 117 to R1 7051.

For both wealth groups, increased incomes are likely to generate proportional increases in expenditure on food, and more than proportional increases for durables, housing and transport. Table 5.3 presents the results of the analysis for disaggregated food categories. More detailed results are reported in Appendixes H and I. Expenditure elasticities for staple foods were close to zero for both groups, even though the ABSs for wheat and rice were higher for the wealthier group (roughly 28 percent higher than for poorer households). However, the inclusion of services in the consumption estimates could explain this anomaly as the wealthier consume comparatively

more refined and convenience foods. Similarly, the expenditure elasticities for meat and poultry were close to unity in both groups (0.964 and 0.997 for wealthier and poorer households respectively) despite a higher ABS for wealthier households. This indicates a proportionate increase in expenditure on meat and poultry as income rise, regardless of relative wealth status.

Table 5.3 Expenditure elasticities for food commodity groups by wealth group in Swayimana and Umzumbe, 1997 (n = 93)

Expenditure category	F-statistic	Wealthier households (n = 9)			Poorer households (n = 84)		
		ABS	MBS	Elasticity	ABS	MBS	Elasticity
Staples	5.330	<i>0.28</i>	0.03	0.09	0.30	0.03	0.08
		<i>6.65</i>	<i>2.56</i>	<i>56.62</i>	<i>7.08</i>	<i>1.52</i>	<i>63.02</i>
Maize	5.323	<i>0.11</i>	0.00	0.04	0.10	0.01	0.09
		<i>4.19</i>	<i>0.68</i>	<i>37.72</i>	<i>3.69</i>	<i>0.57</i>	<i>33.31</i>
Rice	6.887	<i>0.06</i>	-0.01	-0.12	0.08	-0.01	-0.08
		<i>2.78</i>	<i>-1.33</i>	<i>-29.02</i>	<i>3.80</i>	<i>-1.33</i>	<i>-38.57</i>
Roots	1.751	0.05	0.00	0.07	0.04	0.00	0.05
		<i>5.85</i>	<i>1.81</i>	<i>50.78</i>	<i>4.78</i>	<i>0.98</i>	<i>42.59</i>
Wheat products	2.971	0.06	0.02	0.35	0.08	0.01	0.17
		<i>3.82</i>	<i>5.52</i>	<i>23.44</i>	<i>4.84</i>	<i>3.50</i>	<i>37.51</i>
Horticultural products	2.110	<i>0.10</i>	0.40	4.14	0.08	0.42	5.37
		<i>2.15</i>	<i>37.18</i>	<i>63.41</i>	<i>1.74</i>	<i>38.89</i>	<i>71.17</i>
Meat and poultry	2.651	<i>0.08</i>	0.07	0.95	0.06	0.06	1.00
		<i>4.16</i>	<i>16.39</i>	<i>2.12</i>	<i>3.29</i>	<i>13.67</i>	<i>0.10</i>

Note: Figures in italics are t-statistics for the null hypothesis that the predicted average and marginal budget shares are zero and that the expenditure elasticity is unity.

For horticultural products, the estimated expenditure elasticities were high for both wealthy (4.139) and poor (5.366) households. Both elasticities reflect strong potential for increased consumption of fresh and processed fruit and vegetables should incomes in the study districts increase. This potential growth in demand is slightly higher for poorer households which constitute the vast majority of rural households. Large elasticities were also found for durables and housing, but not for consumer expendables, which are equally expenditure inelastic in both wealth groups (Appendix H).

Expenditure shares for social obligations were trivial for wealthier and poorer households, and neither group exhibits elastic expenditure in this category. For the transport category, both groups showed highly elastic expenditure. Apart from horticulture, transport showed the highest potential for increased expenditure as household incomes rise. Elasticities of 3.693 and 2.981 were estimated for wealthier and poorer households respectively.

The magnitude of the expenditure elasticities, as with the district analysis, suggests that rural households are much more likely to spend additional income on goods other than food, although there is potential for substantial increases in demand for horticultural products, and to a lesser extent, for meat and poultry products. Wealthier and poorer households display similar expenditure behaviour for most products, but the higher incomes would mean stronger growth in the demand for durables, housing, and horticultural products if they accrued to poorer households.

CHAPTER 6:

EXPENDITURE ELASTICITIES FOR TRADABLE AND NON-TRADABLE GOODS AND SERVICES, AND LOCAL GROWTH MULTIPLIERS

All four share equations estimated for tradable and non-tradable farm and non-farm goods and services were statistically significant at either the one or five percent levels of probability. Budget shares and expenditure elasticities were computed for each of these categories by district and wealth group (sections 6.1 and 6.2). Growth multipliers are presented in section 6.3.

6.1 Tradable and non-tradable expenditure elasticities for districts

The district ABSs, MBSs, and elasticities estimated for tradable and non-tradable commodity groups are presented in Table 6.1. The bulk of household expenditure pays for tradables and therefore represents leakage from the districts. Swayimana and Umzumbe households spent only 22 and 17 of total expenditure respectively on goods and services produced within the districts. The larger ABSs observed for non-tradables in Swayimana most likely reflects its relative remoteness relative to Umzumbe. Nevertheless, estimated expenditure elasticities were very similar for both districts (Table 6.1).

Although expenditure on **farm tradables** comprises the largest portion of household expenditure, this proportion is lower than that found in Delgado *et al's* (1998) sub-Saharan country studies. Estimated expenditure elasticities are positive, but less than unity (0.53 for the relatively poorer and more remote Swayimana households, and 0.41 for Umzumbe households) suggesting that increases in consumption are proportionately smaller than increases in household income, *ceteris paribus*. This finding concurs with other South African studies that have shown expenditure on

food to be much less responsive to income changes than are other commodities (Belete *et al.*, 1999; van Zyl *et al.*, 1991 and Nieuwoudt and Vink, 1989).

Table 6.1 Results of the district expenditure analysis for tradable/non-tradable commodity groups, Swayimana and Umzumbe, 1997 (n = 93)

Expenditure category	F-statistic	Swayimana (n = 46)				Umzumbe (n = 47)			
		Observed ABS	ABS	Estimated MBS	Elasticity	Observed ABS	ABS	Estimated MBS	Elasticity
Farm tradables	2.719	0.64	0.65 <i>15.93</i>	0.34 <i>27.08</i>	0.53 <i>88.49</i>	0.53	0.53 <i>19.24</i>	0.22 <i>42.18</i>	0.41 <i>85.60</i>
Farm non-tradables	1.827	0.09	0.10 <i>1.48</i>	0.12 <i>7.55</i>	1.23 <i>3.08</i>	0.05	0.05 <i>2.83</i>	0.06 <i>14.47</i>	1.22 <i>6.00</i>
Non-farm tradables	3.549	0.15	0.15 <i>8.70</i>	0.37 <i>70.52</i>	2.58 <i>76.98</i>	0.30	0.29 <i>4.32</i>	0.57 <i>46.53</i>	1.94 <i>64.15</i>
Non-farm non-tradable	2.274	0.12	0.12 <i>3.71</i>	0.17 <i>19.16</i>	1.47 <i>8.27</i>	0.13	0.12 <i>3.44</i>	0.15 <i>21.15</i>	1.24 <i>15.29</i>

Note: Figures in italics are t-statistics for the null hypothesis that the predicted average and marginal budget shares are zero and that the expenditure elasticity is unity.

The district expenditure elasticities for **non-tradable farm goods** suggest that increases in consumption are proportionately larger than increases in household income with expenditure elasticity estimates of 1.23 and 1.22 for Swayimana and Umzumbe respectively. These results mirror the results presented in Chapter 5 which indicated demand growth for meat, meat products, and poultry, and exceptional demand growth for horticultural products following an increase in household incomes. Increased demand for these currently demand-constrained farm goods could therefore generate higher turnover and employment on local farms.

The consumption of **tradable non-farm commodities** in the study districts is very income elastic (estimated expenditure elasticities of 2.59 and 1.94 for Swayimana and Umzumbe respectively). Again this finding is consistent with other South African studies (van Zyl *et al.*, 1991; Nieuwoudt and Vink, 1989) showing that rural households are twice as likely to spend additions to income on commodities other than food. This represents a direct leakage from the local economy that would lower the potential for growth linkages. Expenditure elasticities estimated for **non-**

tradable non-farm commodities are also elastic but lower than for tradable non-farm commodities (1.47 and 1.24 for Swayimana and Umzumbe respectively). These results suggest some potential for income-induced growth in the local economy, mainly through greater demand for local housing materials, building and repair services, transport, catering and hospitality services.

In sum, the results of the district analysis show that increased income could lead to less than proportional increases in demand for tradable farm commodities, and more than proportional increases in demand for non-tradable farm, tradable non-farm, and non-tradable non-farm commodities. Therefore, raised incomes could generate growth in the local economy through increased demand for non-tradable goods and services.

6.2 Tradable and non-tradable expenditure elasticities for wealth groups

Following the same approach used in the district analysis, group means were used to estimate budget shares and expenditure elasticities for the relatively wealthier ten percent and the poorer 90 percent of sample households irrespective of district. The results of the expenditure analysis for these wealth groups are presented in Table 6.2.

Table 6.2 Results of wealth group expenditure analysis for tradables and non-tradables in Swayimana and Umzumbe, 1997 (n = 93)

Expenditure category	F-statistic	Wealthier households (n = 9)				Poorer households (n = 84)			
		Observed ABS	ABS	Estimated MBS	Elasticity	Observed ABS	ABS	Estimated MBS	Elasticity
Farm tradables	2.719	0.54	0.54 <i>16.19</i>	0.28 <i>34.76</i>	0.52 <i>73.67</i>	0.59	0.57 <i>17.12</i>	0.26 <i>32.49</i>	0.46 <i>87.44</i>
Farm non-tradables	1.827	0.10	0.07 <i>2.13</i>	0.09 <i>11.56</i>	1.30 <i>6.03</i>	0.07	0.07 <i>2.17</i>	0.09 <i>11.00</i>	1.22 <i>4.40</i>
Non-farm tradables	3.549	0.27	0.26 <i>7.67</i>	0.45 <i>56.00</i>	1.75 <i>54.09</i>	0.22	0.23 <i>6.99</i>	0.49 <i>61.01</i>	2.09 <i>71.67</i>
Non-farm non-tradables	2.274	0.09	0.13 <i>3.84</i>	0.18 <i>21.98</i>	1.37 <i>13.40</i>	0.12	0.11 <i>3.55</i>	0.16 <i>19.81</i>	1.34 <i>11.22</i>

Note: Figures in italics are t-statistics for the null hypothesis that the predicted average and marginal budget shares are zero and that the expenditure elasticity is unity.

Like the district analysis, the expenditure elasticities for each category of commodities did not differ much between wealth groups. Elasticities for farm tradables were positive but inelastic, while elasticities for the other three commodity categories exceeded unity for both wealth groups. Again, reasonably strong growth linkages seem possible, driven mainly by increased local demand for farm non-tradables and non-farm non-tradables. However, these linkages are likely to be weakened by increased expenditure on non-farm tradables, a leakage from the local economy. Hazell and Röell (1983) found that marginal budget shares varied considerably across income deciles, increasing with income for non-food and tradable commodities and decreasing for food commodities. Since the estimated MBS, did not differ much between districts or relative wealth groups in this study, growth linkages in the communal areas of KwaZulu-Natal are less likely to depend on location or on which rural households receive increased incomes. The next section presents growth multipliers for the districts and wealth groups.

6.3 Growth multipliers

The results of the multiplier calculation are presented in Table 6.3, which reports the resultant additions from farm and non-farm non-tradables to gross income of local households following an initial income shock of one South African Rand. This shock could come from any positive outside effect such as improved technology, better infrastructure or institutional support that increases profit in the production and marketing of rural tradables. The study results show that a R1.00 increase in the income of the entire sample could lead to R0.09 and R0.19 of additional income from spending on farm and non-farm non-tradables respectively. The multiplier (1.28) implies total value added from spending on these demand constrained items of R0.28.

The total value added by a R1.00 income shock in Swayimana households is R1.32 for farm and non-farm tradables, slightly higher than the R1.24 estimated for the less remote Umzumbe households. The multiplier for the wealthier income group is only four cents higher than the multiplier for the poorer households, implying negligible difference between income groups with regard to the way in which they would spend additions to income. Distance from urban centres appears to have more influence on consumption than does relative wealth in these rural areas. Hazell and Röell (1983) explained that consistency of MBSs across wealth deciles observed in Muda, Malaysia, were probably due to the isolation of most villages from small towns or urban areas, forcing purchases from within the local area. The same may be true for the sample households in this study.

Table 6.3 Growth multipliers for Swayimana and Umzumbe, 1997 (n = 93)

Commodity	Whole sample	Swayimana	Umzumbe	Wealthier decile	Poorer households
Tradables	1.00	1.00	1.00	1.00	1.00
Value added from farm non-tradables	0.09	0.12	0.06	0.10	0.09
Value added from non-farm non-tradables	0.19	0.20	0.18	0.21	0.18
Multiplier	1.28	1.32	1.24	1.31	1.27

The study multiplier is slightly lower than Belete *et al's* (1999) estimate of 1.35 for a sample of food plot farmers in the Eastern Cape province, 35 percent lower than Ngqangweni's (2000) estimate of 1.98 for the local economy of Middledrift in the Eastern Cape, and lower than all but one multiplier estimated for other African and Asian countries. These results suggest that agriculture does have potential to drive growth in rural KwaZulu-Natal, but that growth linkages are weaker than for most other African economies. South African households are generally less remote and less isolated than are rural households in other parts of Africa.

The expected value added from farm non-tradables is roughly half that from non-farm non-tradables. This finding is consistent with Ngqangweni's (2000) results for Middledrift which showed R0.35 and R0.63 of additional income from farm and non-farm non-tradables respectively. However, the results are lower relative to estimates from other sub-Saharan African countries (Delgado *et al* 1998), where the farm contribution is usually larger than the non-farm contribution. Table 2.4 demonstrates the influence of patterns of increased spending between farm and non-farm sectors on multipliers in African countries. For Delgado *et al*'s (1998) two Senegal studies, growth from farm non-tradables was much higher than for non-farm tradables, resulting in strong multipliers.

Overall, the results suggest that rural incomes could grow by an additional 28 cents in KwaZulu-Natal following an initial income shock of R1,00 with most of this growth coming from the non-farm sector. Although this does not represent a particularly strong growth linkage, it is clear that increased incomes could generate additional growth through consumption linkages. The results raise two important policy issues. First, the multiplier only indicates *potential* growth linkages because the supply of non-tradables may not be perfectly elastic. Second, while potential growth linkages are driven by non-tradables, these non-tradables are unlikely to generate the initial income shock as they are demand constrained. In rural areas, where most households have access to farm land, a widespread income shock requires increased production of farm tradables.

CHAPTER 7: POLICY IMPLICATIONS AND CONCLUSIONS

This study set out to estimate budget shares for commodity groups and tradable and non-tradable goods and services, expenditure elasticities, and growth multipliers for sample households in two communal regions (Swayimana and Umzumbe) of KwaZulu-Natal in order to verify the potential strength for agriculture-led growth in the province. It was hypothesised that local consumption pattern changes resulting from an initial exogenous income shock in the two communal districts of Swayimana and Umzumbe could stimulate agricultural production, raise household incomes, and increase rural employment through growth linkages.

The results of the study indicate that growth multipliers may be relatively weak, but that an income shock, driven by increased agricultural production, can induce economic growth particularly in the local non-farm goods and services sector. The findings confirm that investment in South Africa's communal areas may have direct and indirect benefits for poor rural households. It should not be noted that generalisations to other communities within the province and South Africa should be automatically made due to the specific assumptions made about tradability of goods and services in the two study districts. Nevertheless, since most households in South Africa's communal areas have the resources and skills needed to farm, agriculture offers an opportunity for broad-based increases in household income.

Like the findings reported by other South African studies (van Zyl *et al*, 1991; Nieuwoudt and Vink, 1989), the results of this study suggest that demand for goods and services is likely to grow more than twice as fast as the demand for food, should real incomes rise. The only food products

for which increased income could generate substantial local demand are meat, poultry, and horticultural products. Increased income is also likely to generate greater demand for housing (materials, services, and labour) and transport services with substantial benefit for local incomes and employment. Rural communities rely heavily on local labour, building materials (such as concrete blocks), and repair services. Demand for staple foods is not predicted to increase with rising incomes, even though almost one-third of the sample households were classified as poverty stricken.

Widespread increases in income typically come from the production of tradable agricultural commodities (Delgado *et al*, 1998) since most rural households have farming skills and resources. Increased demand for meat, poultry and horticultural products could benefit the local economy as these are bulky, perishable, and therefore expensive to import. However, to benefit the local economy, the supply of these products should be price elastic. For horticultural products, local supply is unlikely to be price elastic in the short-run. Cattle are kept principally for investment (rather than consumption purposes), and the price elasticity of local meat supply will be constrained by the carrying capacity of grazing land, even though the incidence of cattle ownership is high. Likewise, many households keep poultry for egg production and goats for ceremonial purposes. Assuming a price elastic supply of meat and poultry, the results of this study suggest that increased incomes will generate some consumption linkages to stimulate growth in the local economy. However, the absence of abattoir facilities and refrigeration will limit opportunities for added income and employment through local processing and other value-adding activities.

Other local studies suggest that the production of tradable commodities is generally constrained by three main factors. Firstly, suitable land is often inaccessible to productive farmers (especially

women) owing to imperfections in the rental market for communal land (Thompson and Lyne, 1993). The second factor is that farmers are often unwilling to finance long-term investments, eg. fruit crops, due to insecure land tenure and theft (Underwood, 1999; Thompson and Lyne, 1993). Finally, liquidity constraints and high transaction costs constrain agricultural supply in the communal areas of KwaZulu-Natal (Fenwick and Lyne, 1999). Household savings are negligible and infrastructure poor, as shown in this study. Low incomes and the absence of a land market also reduce access to credit. For these reasons, the local supply of both tradable and non-tradable crops is expected to be price inelastic. Policy implications are outlined in the next section.

7.1 Policy implications

The results of this study suggest that an increase in farm incomes has the potential to stimulate economic growth in the communal areas of KwaZulu-Natal, but that this growth may be considerably lower than government expects from the small-scale agricultural sector. Agriculture-led growth requires a vision that transcends traditional approaches based on production (Bathrick, 1998), requiring a conducive regulatory environment and informed policy measures to transform non-tradables into tradable commodities, increase income from farm tradables, and improve the price elasticity of supply for non-tradables.

Increased production of farm tradables requires the adoption of new technology, while market participation (i.e. the conversion of non-tradables into tradables) requires the reduction of transaction costs. Several local studies have shown that the adoption of new technology is stifled by:

- insecure tenure (Kille, 1993, p72) which also constrains the land rental market (Crookes, 2002, p87; Thomson, 1996, p62);

- high transaction costs (Matungul, 2002, p122), especially for women farmers (Fenwick, 1998, p18); and
- cash flow (liquidity) problems (Fenwick, 1998, p60).

Better access to credit would help alleviate cash flow problems but credit markets are also constrained by high transaction costs. High transaction costs, in turn, result from weak physical and institutional infrastructure (Matungul, 2002, p121). Public policy should therefore focus on alleviating these constraints in communal areas where most of South Africa's rural poor live. Although most rural households have access to some arable land (Bonti-Ankomah, 2001; Cousins, 2001) there is little chance of advancing rural livelihoods through agricultural intensification without addressing insecure land tenure and inefficient rental markets for crop-land in communal areas.

The adoption of non-traditional, high-value and niche market products, and diversification into non-farm activities such as product processing, poses risks which households may not be prepared to take, and requires investments that these households may not be willing to make without secure land tenure (Kaiser, 2001; Underwood, 1999). Insecure tenure and weak legal and regulatory institutions constrain the land rental market, reducing access to unused and underutilised arable land - thereby limiting farm sizes, the profitability of new technology and the establishment of rural value-adding enterprises (Cousins, 2001; Wiggins *et al*, 2000; Essa, 2002, p19, citing Feder *et al*, 1985; Hazell and Haddad, 2001). Without securing land tenure for communal farmers, "...there is little chance of attracting investment, nor of enhancing the livelihoods of impoverished rural communities" (Kepe *et al*, 2001, p1).

Changes in land policy offer multiple leverage possibilities including: creating capital, facilitating credit, and mobilising and investing of resources (United Nations, 2002). Quisumbing and Meizen-Dick (2001) argue that customary tenure has the comparative advantage of institutional capacity to support existing land rights. However, tenure systems must be clear regarding the duration and content of rights, should ensure independent control, and provide enforcement to defend and enforce land rights (Quisumbing and Meizen-Dick, 2001). Crookes and Lyne (2002) show that adaptive strategies involving small incremental changes to customary tenure can stimulate rental markets at little cost to taxpayers.

Geographical isolation and weak infrastructure result in high transaction costs for rural communities. Substantial public investment in physical infrastructure (like all-weather roads, bridges, telecommunications and postal services, education, electricity and treated water) is needed to lower these costs, transport products swiftly to markets, increase exposure to market opportunities and to improve access to information, technology, credit and both input and product markets (Rosegrant *et al*, 2001, p 150; Ruhiiga, 2000; Fan *et al*, 1999). Although improved infrastructure stimulates growth of an efficient and competitive rural sector, Islam (1997) warns that improvement of physical infrastructure may have a negative impact on the rural non-farm sector. As rural areas become more accessible, competition from cheaper imported products increases and rural consumption patterns may change. According to Islam (1997), public investment in infrastructure should facilitate the development of rural agglomerations of non-farm enterprises. In addition, studies such as Fan *et al*'s (1999) of how different public investments affect agricultural growth and rural poverty should be conducted to better target scarce public resources.

Transaction costs faced by small scale farmers and the private sector could be lowered by promoting marketing agreements between commercial and communal farmers (Matungul, 2002, p122) and other forms of collective action such as: stockvel-based cooperatives (Ruhiga, 2000), producer-marketing cooperatives (Delgado *et al*, 2001), contract farming⁶ (Delgado *et al*, 2001; Eaton and Shepherd, 2001); traders' associations (Markets and Structural Studies Division, 2002); indigenous franchises⁷ (Aliber, 2001; Cousins, 2001; Choy and Goh, 1997; Henriques and Nelson, 1997); "corporatives"⁸ (FAO, 2001, p9) and community-based equity share enterprises (de Beer *et al*, 1998 cited by Kepe *et al*, 2001); partnerships with financial and donor agencies (Cousins, 2001); and community-private-public partnerships (Kepe *et al*, 2001). Matungul *et al* (2001) propose that government should play a greater role in reducing and/or bearing some of the costs of these collective actions, and ensuring that contracts are enforced in an unbiased and predictable way by local regulatory institutions such as tribal courts. Furthermore, Crookes (2002, p92) suggests that public extension agents should facilitate land rental transactions by identifying and maintaining lists of willing lessors and lessees, supplying copies of *proforma* lease agreements, and facilitating and witnessing rental contracts.

⁶Contract farming is defined as an agreement between groups of farmers and a processing or marketing firm for the production and supply of agricultural products under forward agreements, frequently at predetermined prices, and usually including production support, technical advice, and transfer of technical skills to farmers (Eaton and Shepherd, 2001).

⁷Franchise arrangements involve the owner of a business granting the right to another party to replicate the business in another geographic locality (Choy and Goh, 1997). "The franchise approach effectively combines many of the most successful features of traditional entrepreneurship development programmes" (Henriques and Nelson, 1997), such as: an emphasis on small enterprise expansion rather than start-ups, mutually beneficial large-small enterprise linkages, highly focussed and sustained training and extension support to the franchisee, improved access to credit, and collective purchasing and marketing arrangements.

⁸A 'corporative' is a cooperative that operates as a company to avoid free-rider and forced-rider problems that constrain equity investment in traditional cooperatives. In the Philippines, corporatives provide integrated support services to small farmer shareholders including loans, pre- and post-harvest facilities, and farmer development (Food and Agricultural Organisation, (FAO), 2001).

Public, non-governmental and community-based extension services play a critical role in mobilising, empowering and supporting emerging rural enterprises (Aliber, 2001; Kepe *et al.*, 2001). Public extension needs to adopt a client-orientated, problem solving approach, which in turn, will require changes in incentive structures and new partnerships with NGOs, private sector firms, and farmers (Hazell and Haddad, 2001). In addition, public extension services should address issues beyond agricultural production (Ndlela, 2002, p86), and together with non-governmental and community-based organisations, offer training, technical and business support for a range of farm and non-farm enterprise opportunities. The reach of these service providers relies on public-private partnerships and private sector philanthropic assistance (Cousins, 2001). Human development and capacity building are required by both extension staff and their clients through training, technical and business support to:

- Identify, produce, package, market, and actively promote crops with comparative advantage and competitiveness (Ngqangweni *et al.*, 1999; Bathrick, 1998; Ngqangweni *et al.*, 1998), to increase sales (Delgado *et al.*, 1999), and reduce seasonality in demand and supply (Taylor and Cairns, 2001);
- Explore local and export markets for high value food products and 'niche' markets which may include traditional (ethnic) and modern foods that lie outside the mainstream trade, especially those foods valued by consumers as organic or having traditional uses in medicines and food preservation (Cousins, 2001; Delgado *et al.*, 2001; Farias, 2001, p 1; Kaiser, 2001; Shackleton *et al.*, 2000, cited by Cousins, 2001);
- Investigate on- and off-farm value-adding opportunities (Farias, 2001; Delgado, 1997).
- Develop management and marketing skills among farmers and the ability to identify market opportunities (Cousins, 2001; Bathrick, 1998);
- Organise trade exhibitions to develop strategic alliances and vertical coordination; offer enterprise owners better access to information regarding products and market

opportunities; actively advertise products and services (including agri-tourism enterprises), reduce search and information costs; create opportunities for technology transfer; develop a culture of entrepreneurship; and enhance human capital (de Beer *et al*, cited by Kepe *et al*, 2001; Farias, 2001);

- Establish quality standards and certification compatible with local and export market requirements (Delgado *et al*, 2001; Farias, 2001).

Such actions could create tradable opportunities for commodities that are currently non-tradable, increase effective demand for non-tradables and improve the supply elasticity of non-tradable commodities. Broadening the diversity of farm and non-farm enterprises strengthens linkages between the farm and non-farm sectors, and offers greater rural income and employment opportunities. However, non-farm enterprise is unlikely to flourish in South Africa's communal areas without secure property rights to fixed improvements (such as warehouses and processing plants), and the establishment of effective institutions to enforce contracts.

Government has an essential and lead role to play in stimulating agriculture-led growth and mobilising under-utilised rural resources. The results of the study suggest that public and private interventions should be targeted in areas of high agricultural potential as the realised multipliers are likely to be smaller in areas of lower potential. In addition, sustained growth must be supported by congruous public policy, skilled technical support, and adequate funding for emerging rural enterprises (Farias, 2001).

7.2 Conclusions

The findings, in general, concur with those for other African studies and reflect expenditure patterns similar to those reported for other South African farm household expenditure studies.

There were no marked differences in the expenditure elasticities estimated for the two study districts or between wealthier and poorer households. As expected, elasticities tended to be slightly higher in Swayimana than in Umzumbé where average incomes are relatively higher. Although the elasticities estimated for food in aggregate were close to unity, the elasticities for both districts and wealth groups suggest that demand for staple crops would not increase should incomes rise. However, the demand for meat, poultry, and horticultural crops could grow rapidly, creating opportunities for increased local production. Expenditure elasticities estimated for these products were high, even amongst the minority of relatively wealthy rural households. Expenditure on housing and transport is also expected to increase with additional income.

Growth linkages focus on the effect of increased farm production on income re-spent on non-tradable farm and non-farm commodities. Expenditure elasticities estimated in this study for rural households in KwaZulu-Natal indicate that increases in income will lead to more than proportional increase in demand for non-tradable farm, tradable non-farm and non-tradable non-farm commodities; and increased but income inelastic demand for tradable farm commodities. These findings were consistent between study districts and across wealth groups. Income elastic demand for non-tradables is crucial for growth linkages. Increasing consumption of these commodities stimulates increased production of local non-tradables, particularly non-farm goods and services, creating further income and employment opportunities in the local economy.

A growth multiplier of 1.28 was estimated for two communal districts in KwaZulu-Natal. This is marginally lower than Belete *et al's* (1999) multiplier for the Eastern Cape (1.35) but considerably lower than Ngqangweni's (2000) estimate of 1.98 for the same province. Considering that the two areas selected for this KwaZulu-Natal study had high agricultural potential, the multipliers estimated for the two districts are relatively low but possibly higher than

in districts with lower agricultural potential where agricultural improvements in agricultural productivity would be less effective in alleviating demand constraints. Local growth linkages in rural South Africa appear to be weaker than in most Asian and African countries. Nevertheless, it is clear that increased farm incomes could generate additional growth - mainly through consumption linkages with non-farm goods and services - but that this growth is unlikely to meet government expectations, even in areas of high agricultural potential. Furthermore, for local economies to benefit from growth linkages, it is important (a) that the local supply of non-tradables is price elastic and (b) that the initial income shock is widespread

Economic growth is generated through an initial exogenous income shock (such as technological change or improved infrastructure), resulting in extra income derived from stimulated regional demand and production in the local non-tradable sector. In under-productive, but good potential areas such as Swayimana and Umzumbe, where most households have knowledge of farming and access to land, this initial income shock would best come from increased agricultural production. Although many opportunities could be exploited by small-scale farmers in these districts, agricultural production and farm incomes remain low. Due to prevailing levels of household and infrastructural impoverishment in these districts, agricultural intensification and diversification are unlikely to happen without substantial investment in public goods.

Agricultural intensification requires new technology and improved infrastructure (both physical and institutional) to increase crop yields, expand farm sizes, reduce unit production and transaction costs, and to convert non-tradables into tradables. In these two districts, as is typical in many South African communal areas, poor roads, inadequate telecommunication and postal services, insecure land tenure and a weak legal-regulatory system contribute to high transaction costs that constrain market activity, including the land rental arrangements needed to intensify

production of both tradable and non-tradable farm products. Increased public and private investment in physical and institutional infrastructure is therefore recommended, particularly in areas of high agricultural potential. Agricultural production and marketing in Swayimana and Umzumbe would benefit from construction of all-weather road networks, more widely accessible telecommunication and postal services, irrigation, electrification for Swayimana households, and treated water provision in Umzumbe.

Mobilisation of underutilised resources in South African communal areas depends on motivating the emergence of agricultural entrepreneurs through carefully targeted investments and incentives. Agriculture-led growth requires public investment in both physical and institutional infrastructure to reduce transaction costs and risk in all markets, encouraging greater participation by local entrepreneurs and the private sector. In addition, the roles, functions and services offered by extension agents should be extended to promote collective marketing, facilitate land rental contracts, and to reduce enterprise entry risks through training, technical and business support for farm and non-farm entrepreneurs.

SUMMARY

The study set out to investigate the potential impact of a widespread income shock from increased agricultural production on growth in two communal areas of KwaZulu-Natal. South African policy assumes that agriculture is an engine for growth for rural communities. However, government confidence in the strength of growth linkages in South Africa's communal areas is not confirmed by convincing empirical evidence. Amidst numerous constraints, demotivated rural households produce primarily for subsistence. Although at least 40 percent of the country's population draw on agriculture and related livelihood activities it is questionable whether higher farm incomes could significantly increase employment and enterprise opportunities in communal areas where most of these poor people live.

Expenditure data were collected from 99 households in Swayimana and Umzumbe in 1997 using three structured rounds of interviews to record household composition, income sources, savings, assets, agricultural enterprises, inputs, harvests, and sales. Since savings rates were negligible, household expenditure was almost equivalent to income. Per capita annual household expenditures were used to control for variations in household size. Expenditure elasticities were estimated for commodity groups in each district and in two wealth groups (the wealthier top decile of households and the remaining 90 percent of poor households) using a variant of the Working-Leser model. The tradable farm and non-farm goods and services, and elasticities were estimated for each of these four expenditure categories. These results were substituted into Hazell's (1984) simplified semi-input-output model to compute local growth multipliers.

Like findings reported by other South African studies, the results of this study suggest that demand for goods and services is likely to grow more than twice as fast as the demand for food,

should real incomes rise. The only food products for which increased income could generate substantial local demand are meat, poultry and horticultural products. Despite high levels of poverty, the demand for staple foods is not predicted to increase with rising incomes. Increased demand for meat, poultry and horticultural products could benefit the local economy as these are bulky, perishable products and potentially expensive to import. To benefit the local economy, the supply of these products should be price elastic which, for horticultural products, is unlikely in the short term. Cattle are kept principally for investment (rather than consumption purposes), and the price elasticity of local meat supply will be constrained by the carrying capacity of grazing land, even though the incidence of cattle ownership is high. Assuming a price elastic supply of meat and poultry, the results suggest that increased incomes will generate growth in the local economy. However, the absence of an abattoir, refrigeration and appropriate transport limits opportunities for added income and employment through processing and other value-adding activities. Local incomes and employment are more likely to benefit substantially from greater demand for housing (materials, services, and labour) and transport services as rural communities rely heavily on local labour, building materials (such as concrete blocks), and repair services.

Estimated expenditure elasticities indicate high income elasticities for non-tradable farm, tradable non-farm and non-tradable non-farm commodities, and low income elasticities for tradable farm commodities. High income elasticities are crucial for growth. Income-induced increases in consumption stimulates local production of non-tradables, particularly non-farm goods and services, creating further income and employment opportunities in the rural economy. The expenditure analyses indicate potential for a uniform response to income changes among sample rural households. The overall consumption multiplier (1.28) shows that increased rural incomes should promote rural employment through income re-spent on demand-constrained locally produced goods and services. Belete *et al's* (1999) multiplier for the Eastern Cape (1.35) may be

more a realistic estimate of the potential for growth linkages than Ngqangweni's (2000) estimate of 1.98 for the same province, and similar to the agriculture-led growth multiplier estimated here for KwaZulu-Natal using a larger sample and a more rigorous empirical technique.

Agriculture offers widespread increases in incomes (in areas of high agricultural potential) because most rural households have the skills and resources needed to farm. Increased, intensified and diversified agricultural production could stimulate much needed enterprise and employment opportunities, especially in the non-farm sector. Unfortunately consumer preference for imported goods may weaken growth linkages in South Africa relative to those reported in other African countries. Nevertheless, even weak linkages could potentially fuel sustained patterns of economic development. The relatively weak elasticities estimated in this study may also reflect the inadequate physical and institutional infrastructure in the study areas.

Technological and infrastructural development (physical and institutional) is required to reduce unit production costs and to transform non-tradables into tradables. Initial income shocks come from tradables. Although numerous tradable possibilities could be explored and exploited by communal framers, supply response is undermined by insecure land tenure, poor infrastructure, and a weak legal-regulatory environment which raises transaction costs, limits access to markets and diminishes both the incentive and ability to invest in agriculture. Urgent policy changes are required to improve the supply elasticity of non-tradables, increase income from farm tradables and enable transformation of non-tradable to tradable commodities.

Substantial public investment in infrastructure is recommended to lower production costs, transport products swiftly to markets, increase exposure to market opportunities, and to ensure access to inputs, information, technology, credit and markets. The following physical

infrastructure is urgently required to facilitate the supply-response of local production of non-tradables: all-weather roads, postal services, telecommunications, electricity and water for irrigation and domestic use. In addition, public investment in legal and regulatory institutions is required to ensure that contracts are upheld. Government should also bear the cost of collective actions needed to improve small-farmer access to markets.

Extension services need to assist smallholder farmers in improving farming practices, employing new technologies, identifying and accessing markets, and identifying crops of comparative advantage. Public and private extension services need to build marketing capacity among small holder farmers, enabling farmers to establish appropriate pricing strategies and identify, investigate and tap local and export niche markets. Extension services should incorporate farm and non-farm agro-industry linkages. Special attention should be focussed on training and support for non-farm enterprises, broadening local markets for farm products and opening new opportunities for value-adding, processing, packaging and service enterprises. This would improve the elasticity of non-tradable commodities, increase effective demand for farm tradables, and create tradable opportunities for commodities which are currently non-tradable. Broadening the base of farm and non-farm enterprises strengthens the linkages between the farm and non-farm sectors and offers greater rural employment opportunities.

Mobilisation of underutilised resources in South Africa's communal areas depends on the emergence of agricultural entrepreneurs through carefully targeted investments and incentives. Public investment in physical and institutional infrastructure is required to reduce transaction costs and risks in all markets, encouraging greater participation from local entrepreneurs and private investors. Expanding the roles, functions and services of extension agents could promote

collective marketing, facilitate land rental contracts, and provide training, technical and business support for farm and non-farm entrepreneurs.

REFERENCES

- AFRICAN NATIONAL CONGRESS, 1994. *The Reconstruction and Development Programme*. Umanyano: Braamfontein.
- ALDERMAN, H, 1993. Obtaining useful data on household incomes from surveys. In von Braun, J & Puetz, D, (Eds), *Data Needs for Developing Countries: New directions for household surveys*. International Food and Policy Research Institute: Washington DC. p 193-201.
- ALIBER, M, 2001. *Study of the Incidence and Nature of Chronic Poverty and Development Policy in South Africa: An overview*. Programme for Land and Agrarian Studies, School of Government, University of the Western Cape, Cape Town.
- BATHRICK, DD, 1998. *Fostering Global Well-being: A new paradigm to revitalise agriculture and rural development*. 2020 Vision, Brief 54. International Food and Policy Research Institute: Washington DC.
- BELETE, A., IGODAN, CO, M'MARETE, C & VAN AVERBEKE, W, 1999. Analysis of rural household consumption expenditure in South Africa: The case of food plot holders in the Tyefu irrigation scheme in the Eastern Cape Province. *Agrekon*:38(2):194-201.
- BELL, CLG & HAZELL, PBR, 1980. Measuring the indirect effects of an agricultural investment project on its surrounding region. *American Journal of Agricultural Economics*: 62:75-86.
- BELL, CLG, HAZELL, PBR & SLADE, R, 1982. *Project Evaluation in Regional Perspective*. Baltimore: Johns Hopkins University Press.
- BEMBRIDGE, TJ, 1986. Characteristics of small-scale farmers in the Transkei. *Social Dynamics*: 12(2):77-85.
- BONTI-ANKOMAH, S, 2001. *Addressing Food Insecurity in South Africa*. Paper presented at the South African Regional Poverty Network Conference, 4-5 June 2001, Pretoria.
- BRABY, undated. *KwaZulu-Natal: A beach, berg and bush bonanza*. Braby: Pietermaritzburg.

CHOY, CL & GOH, M, 1997. Franchising: A vehicle for entrepreneurship in Singapore. *Small Enterprise Development*: 8(2): 47-53.

COHEN, MJ, 2001. *2020 Vision: The prospects for universal food security in the next two decades*. Paper prepared for the 42nd Annual International Studies Association Convention, 20-24 February 2001, Chicago.

COUSINS, B, 2001. "Not rural development, but agrarian reform": *Beyond the neo-liberal agenda*. Paper presented at the Department of Land Affairs Land Tenure Conference, 7-9 November 2001, Durban.

CROOKES, TJ, 2002. *Sustaining a Rental Market for Arable Land in the Communal Areas of KwaZulu-Natal*. Unpublished M Agric Management Thesis, Discipline of Agricultural Economics, University of Natal, Pietermaritzburg.

CROOKES, TJ & LYNE, MC, 2002. Efficiency and equity gains in the rental market for arable land: Observations from a communal area of KwaZulu-Natal, South Africa, 1996-2000. Unpublished paper, Discipline of Agricultural Economics, University of Natal, Pietermaritzburg.

DEATON, A & CASE, A, 1988. *Analysis of Household Expenditures*. Living Standards Measurement Study Working Paper no 28. World Bank: Washington DC.

DE JANVRY, A, 1994. Farm-Non-Farm Synergies in Africa: Discussion. *American Journal of Agricultural Economics*: 76:1183-5.

DE KLERK, M, 1996. The sustainable livelihood creation potential of small-scale horticulture in the Western Cape. In Lipton, M., de Klerk, M and Lipton, M, (eds.). *Land, Labour and Livelihoods in Rural South Africa*. Volume 1. Indicator Press: Durban. p 201-44.

DELGADO, C, MINOT, N & WADA, N, 2001. *Shaping Globalisation for Poverty Alleviation and Food Security: High value agriculture*. 2020 Focus 8, Brief 6 of 13. International Food and Policy Research Institute: Washington DC.

- DELGADO, C, ROSEGRANT, M, STEINFELD, H, EHUI, S & COURBOIS, C, 1999. *Livestock to 2020: The next food revolution*. 2020 Brief 61. International Food and Policy Research Institute: Washington DC.
- DELGADO, CL, HOPKINS, J & KELLY, VA, 1998. *Agricultural Growth Linkages in Sub-Saharan Africa*. International Food and Policy Research Institute: Washington DC.
- DELGADO, C, HAZELL, P, HOPKINS, J & KELLY, V, 1994. Promoting Intersectoral Growth linkages in rural Africa through agricultural technology and policy reform. *American Journal of Agricultural Economics*: 76:1166-71.
- DELGADO, C, 1997a. Promoting Growth in Smallholder Farming Areas of South Africa through Agricultural Diversification. [WWW document]. URL: <http://www.ifrpi.org/themes/mp07/sa/sa.htm>
- DELGADO, CL, 1997b. The role of smallholder income generation from agriculture in sub-Saharan Africa. In Haddad, L, (ed.). *Achieving Food Security in Southern Africa*. International Food and Policy Research Institute: Washington DC.
- DEVEREUX, S, 1993. Collection of production and income data: A commentary. In von Braun, J & Puetz, D, (Eds), *Data Needs for Developing Countries: New directions for household surveys*. International Food and Policy Research Institute: Washington DC. p 202-6.
- DOROSH, P & HAGGBLADE, S, 1993. Agriculture-led growth: food grains versus export crops in Madagascar. *Agricultural Economics*:9:165-80.
- EATON, C & SHEPHERD, AW, 2001. *Contract Farming: Partnerships for growth*. Food and Agriculture Organisation: Rome.
- ELLIOT, MB & VAN ZYL, J 1991. The effect of income on the market for carbohydrates in South Africa. *Agrekon*: 30(4):269-271.

- ESSA, JA, 2002. *Adoption of Hybrid Maize Seed, Fertiliser and Machinery Technologies by Communal Farmers in KwaZulu-Natal*. Unpublished MSc (Agriculture) Thesis, Discipline of Agricultural Economics, University of Natal, Pietermaritzburg.
- FAN, S & HAZELL, P, 2000. *Promoting Sustainable Development in Less-favoured Areas: Returns to public investment; Evidence from India and China*. 2020 Focus 4, Brief 5 of 9. International Food and Policy Research Institute: Washington DC.
- FAN, S, HAZELL, P & THORAT, S, 2000. *Linkages Between Government Spending, Growth and Poverty in Rural India*. Research Report 110. International Food and Policy Research Institute: Washington DC.
- FAN, S, HAZELL, P & THORAT, S, 1999. *Linkages Between Government Spending, Growth and Poverty in Rural India*. Research Report Abstract. Report 110. [WWW document]. URL: <http://www.ifpri.org/pubs/abstract/abstr110.htm> (Accessed 01 October 1999).
- FARIAS, LR, 2001. *Globalisation and livelihood diversification through non-traditional agricultural products: The Mexico case*. Paper number 67, Natural Resource Perspectives. Overseas Development Organisation: Department for International Development: London.
- FENWICK, LJ & LYNE, MC, 1999. The relative importance of liquidity and other constraints inhibiting the growth of small-scale farming in KwaZulu-Natal. *Development Southern Africa*:15(3):141-55.
- FENWICK LJ, 1998. *Use of Credit and its Impact on Small-Scale Farmer Development in KwaZulu-Natal*. Unpublished M.Sc Thesis, Department of Agricultural Economics, University of Natal, Pietermaritzburg.
- FOOD AND AGRICULTURE ORGANISATION (FAO), 2001. *Financing term investments in agriculture*. Draft report prepared for the World Bank. Food and Agricultural Organisation: Rome.

- GANDAR, MV & BROMBERGER, N, 1981. *Subsistence Production and Household Budgets in Mahlabatini District, KwaZulu*. Development Studies Research Group, University of Natal: Pietermaritzburg.
- GEERATS, PJ HALL, PV & STRIJDOM, HG, 1990. *Information for Development Planning in Lebowa: Income and expenditure patterns*. Report no 5196, Institute for Sociological and Demographic Research, Human Sciences Research Council. Human Sciences Research Council: Pretoria.
- GROOTAERT, C & CHEUNG, KF, 1985. *Household Expenditure Surveys: Some methodological issues*. World Bank: Washington DC.
- GUJARATI, DN, 1988. *Basic Econometrics*. McGraw-Hill: New York.
- GUY, RM & SMITH, JMB, 1998. *Land Potential Classification for KwaZulu-Natal*. Cedara Report No. N/A/98/2. KwaZulu-Natal Department of Agriculture: Cedara.
- HAGGBLADE, S, HAMMER, J & HAZELL PBR, 1991. Modelling agricultural growth multipliers. *American Journal of Agricultural Economics*: 73:361-74.
- HAGGBLADE, S, HAZELL, PBR & BROWN, J, 1989. Farm-non-farm linkages in sub-Saharan Africa. *World Development*: 17(8):1173-1201.
- HAGGBLADE, S, HAZELL, PB & BROWN J, 1987. *Farm-Non-farm Linkages in Rural Sub-Saharan Africa*. Policy, Planning and Research Working Papers. World Bank: Washington DC.
- HANEKOM, D, 1999. *Agricultural Policy Reform and Food Security in South Africa*. Speech by South African Minister of Agriculture and Land Affairs to the International Consultative Conference on Food Security and Nutrition as Human Rights, 25-27 March 1999. National Department of Agriculture: Johannesburg.
- HAZELL, P & HADDAD, L, 2001. *Agricultural Research and Poverty Reduction*. 2020 Brief 70. International Food and Policy Research Institute: Washington DC.

- HAZELL, PBR & HAGGBLADE, S, 1993. Farm-non-farm growth linkages and the welfare of the poor. In Lipton, M & van der Gaag, J, (Eds), *Including the poor : Proceedings of a symposium organized by the World Bank and the International Food Policy Research Institute*. World Bank: Washington, DC. p 190-204.
- HAZELL, PBR & HAGGBLADE, S, 1991. Rural-urban growth linkages in India. *Indian Journal of Agricultural Economics*: 46(4):515-29.
- HAZELL, PBR & HOJJATI, B, 1995. Farm non-farm growth linkages in Zambia. *Journal of African Economies*:4(3):406-35.
- HAZELL, PBR, RAMASAMY, C & RAJAGOPALAN, V, 1991. An analysis of the indirect effect of agricultural growth on the regional economy. In Hazell, PBR & Ramasamy, C, (eds.). *The Green Revolution Reconsidered: The impact of high-yield rice varieties on South India*. Johns Hopkins University Press: Baltimore. p 153-80.
- HAZELL, PBR & RÖELL, A, 1983. *Rural Growth Linkages: Household expenditure patterns in Malaysia and Nigeria*. International Food and Policy Research Institute: Washington DC.
- HENRIQUES, M & NELSON, RE, 1997. Using franchises to promote enterprise development. *Small Enterprise Development*: 8(1): 23-30.
- HERON, GS, 1991. The household, economic differentiation and agricultural production in Shixini, Transkei. *Development Southern Africa*: 8(1):47-60.
- INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE, 2002. *Future Options for Rural Africa: IFPRI joins USAID to strategise on investment in agriculture in rural Africa*. [WWW document]. URL: http://www.ifpri.org/themes/fora/fora_webarticle.htm (Accessed 15 March 2002).
- ISLAM, N, 1997. *The Non-farm Sector and Rural Development: Review of issues and evidence*. 2020 Vision, Brief 47. International Food and Policy Research Institute: Washington DC.

- KAISER, C, 2001. *The potential of temperate fruit in KwaZulu-Natal*. Paper presented at the Agricultural Productivity Group meeting, 19 September 2001. Agricultural Productivity Group: Cedara.
- KEPE, T, NTSEBEZA, L & PITHERS, L, 2001. *Agri-tourism spacial development initiatives in South Africa: Are they enhancing rural livelihoods?* Overseas Development Institute, Natural Resource Perspectives, number 65. Overseas Development Institute: London.
- KILLE, GS, 1993. *Property Rights to Land, On-farm Investment and Farm Productivity: A study in Madadeni District of KwaZulu*. Unpublished PhD Thesis, Department of Agricultural Economics, University of Natal, Pietermaritzburg.
- KIRSTEN, J, TOWNSEND, R. & GIBSON, C, 1998. Determining the contribution of agricultural production to household nutritional status in KwaZulu-Natal, South Africa. *Development Southern Africa*:15:4:573-87.
- KWAZULU DEPARTMENT OF INTERIOR, 1978. *Field Survey of Interior KwaZulu*. Photography 498/106-1978. Office of the Provincial Director-General of Surveys: Pietermaritzburg.
- KWAZULU DEPARTMENT OF INTERIOR, 1982. *Field Survey of Interior KwaZulu*. Photography KZ7/81. Office of the Provincial Director-General of Surveys: Pietermaritzburg.
- LIPTON, M, ELLIS, F & LIPTON, M, 1996. Introduction. In Lipton, M, Ellis, F & Lipton, M, (eds.). *Land, Labour and Livelihoods in Rural South Africa*. Volume 1. Indicator Press: Durban. p v-xii.
- LOW, J, 1993. Strengths and weaknesses of different household survey approaches for food policy design. In von Braun, J & Puetz, D, (Eds), *Data Needs for Developing Countries: New directions for household surveys*. International Food and Policy Research Institute: Washington DC. p 168-72.

- LYNE, MC, 1981. *The design, conduct and analysis of a sample survey for the collection of agricultural statistics in KwaZulu*. Unpublished M Sc Agric Thesis, Department of Agricultural Economics, University of Natal, Pietermaritzburg.
- LYNE, MC, 1989. *Distortion of Incentives for Farm Households in KwaZulu*. Unpublished PhD Thesis, Department of Agricultural Economics, University of Natal, Pietermaritzburg.
- MACHETHE, CL, REARDON, T & MEAD, DC, 1997. Promoting farm/non-farm linkages for employment of the poor in South Africa: A research agenda focussed on small-scale farms and agro-industry. *Development Southern Africa*: 14(3)377-94.
- MAKHURA, MT, KIRSTEN, JF & MATTHYE, MM, 1999. The response of non-farm incomes to agricultural markets: Application of a multivariate analysis of variance (MANOVA). *Agrekon*: 38(4):594-602.
- MAKHURA, MT, GOODE, FM & COETZEE, GK, 1998. A cluster analysis of commercialisation of farms in developing rural areas of South Africa. *Development Southern Africa*: 15(3):429-48.
- MALIK, SJ, 1993. Farm production data in rural household surveys. In von Braun, J & Puetz, D, (Eds), *Data Needs for Developing Countries: New directions for household surveys*. International Food and Policy Research Institute: Washington DC. p 186-92.
- MARKETING AND STRUCTURAL STUDIES DIVISION, 2002. *Promoting Growth and Diversification through Markets for High-value Crop and Animal Products*. [WWW document]. URL: <http://www.ifrpi.org/themes/mp07.htm> (Accessed 16 March 2002).
- MARTINS, JH, 1985. *A Comparison of the Income and Expenditure Patterns of Metropolitan Households in the RSA*. Bureau of Market Research: Pretoria

- MATUNGUL, MP, 2002. *Market Constraints Faced by Communal Farmers in KwaZulu-Natal, South Africa: A case study of transactions costs*. Unpublished PhD Thesis, Discipline of Agricultural Economics, University of Natal, Pietermaritzburg.
- MATUNGUL, PM, LYNE MC & ORTMANN, GF, 2001. Transaction costs and crop marketing in the communal areas of Impendle and Swayimana, KwaZulu-Natal. *Development Southern Africa*: 18(3):347-364.
- MAY, J, 1998. *Poverty and Inequality in South Africa*. Report prepared for the office of the executive Deputy President and the Inter-Ministerial Committee for Poverty and Inequality. Summary Report. [WWW document]. URL: <http://www.gov.za/reports/1998/pirsum.htm> (Accessed 01/10/1999).
- MAY, J, ATTWOOD, H, EWANG, P, LUND, F, NORTON, A & WENTZAL, W, 1998. *Experience and Perceptions of Poverty in South Africa*. Praxis Publishing: Durban.
- MAY, J, CARTER, M & POSEL, D, 1995. *The Composition and Persistence of Poverty in Rural South Africa*. Policy Paper no. 15. Land and Agriculture Policy Centre: Pretoria.
- MAY, J & PETERS, AH, 1984. *A Study of Income and Expenditure in Rural KwaZulu: Ndongalwane*. Occasional paper no 3/84, KwaZulu Finance and Investment Corporation. KwaZulu Finance and Investment Corporation: Durban.
- MELLOR, J, 1976. *The new economics of growth: A strategy for India and the Developing World*. Cornell University Press: Ithaca, NY.
- MINISTRY FOR AGRICULTURE AND LAND AFFAIRS, 1998. *Agricultural Policy in South Africa: A discussion document*. Ministry of Agriculture and Land Affairs: Pretoria.
- MINISTRY FOR PROVINCIAL AFFAIRS AND CONSTITUTIONAL DEVELOPMENT, 1998. *The White Paper on Local Government*. Ministry for Provincial Affairs and Constitutional Development: Pretoria.

- MONKE, EA & PEARSON, SR, 1989. *The Policy Analysis Matrix for Agricultural Development*. Cornell University Press: Ithaca, NY.
- NATIONAL DEPARTMENT OF AGRICULTURE (NDA), 2002. *General Information on Agriculture in South Africa*. [WWW document]. URL: <http://www.nda.agric.za/history/> (Accessed 23 March 2002).
- NATIONAL DEPARTMENT OF AGRICULTURE (NDA), 2001. *The Strategic Plan for South African Agriculture*. Department of Agriculture Directorate Agricultural Information Services: Pretoria.
- NATIONAL DEPARTMENT OF AGRICULTURE (NDA), 1999. *Agricultural Policy in South Africa: A discussion document*. [WWW document]. URL: <http://www.nda.agric.za/> (Accessed 07 October 1999).
- NATIONAL DEPARTMENT OF AGRICULTURE (NDA), 1995. *White Paper on Agriculture*. Department of Agriculture Directorate Agricultural Information Services: Pretoria.
- NATIONAL MINISTRY OF PROVINCIAL AND LOCAL GOVERNMENT, 2000. *The Integrated Sustainable Rural Development Strategy*. Ministry of Provincial and Local Government: Pretoria.
- NATTRASS, N & MAY, J, 1996. Migration and dependency: Sources and levels of income in KwaZulu. *Development Southern Africa*: 3(4):583-99.
- NATTRASS, N & NATTRASS, J, 1990. South Africa, the homelands and rural development. *Development Southern Africa*: 7(4):517-34.
- NDLELA, NR, 2002. *Provincial Department of Agriculture Extension Service and the Needs of Women's Clubs in Hlanganani, KwaZulu-Natal*. Unpublished M Soc Sc Thesis, Discipline of Community Resources, University of Natal, Pietermaritzburg.
- NQGANGWENI, SS, 2000. *Promoting Income and Employment Growth in the Rural Economy of the Eastern Cape Through Smallholder Agriculture*. Unpublished PhD Thesis. Department of Agricultural Economics, Extension and Rural Development, University of Pretoria, Pretoria.

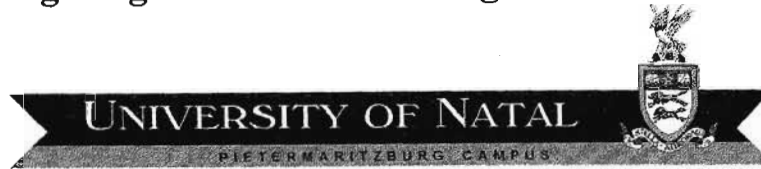
- NGQANGWENI, S, KIRSTEN, JF, LYNE, MC & HEDDEN-DUNKHORST, B, 1999. Measuring smallholder comparative advantage in three South African provinces. *Agrekon*:38 (special issue):235-42.
- NGQANGWENI, S, LYNE, MC, HEDDEN-DUNKHORST, B, KIRSTEN, JF, DELGADO, CL & SIMBI, T, 1998. *Indicators of competitiveness of South African smallholder farmers in selected activities*. Final report of track two, Promoting Employment Growth in Smallholder Farming Areas through Agricultural Diversification. Land and Policy Centre: Pretoria.
- NIEUWOUDT, WL, 1990. Efficiency of land use. *Agrekon*: 29(4):210-15.
- NIEUWOUDT, WL & VINK, N, 1989. The effects of increased earnings from traditional agriculture in southern Africa. *The South African Journal of Economics*:57(3):257-69.
- PUETZ, D, 1993. Improving data quality in household surveys. In von Braun, J & Puetz, D, (eds.). *Data Needs for Developing Countries: New directions for household surveys*. International Food and Policy Research Institute: Washington DC. p 173-85.
- QUISUMBING, AR & MEINZEN-DICK, RS, 2001. Overview. In Quisumbing, AR & Meinzen-Dick, RS, (eds.). *Empowering Women to Achieve Food Security*. 2020 Focus 6. International Food and Policy Research Institute: Washington DC.
- RANGARAJAN, C, 1982. *Agricultural Growth and Industrial Performance in India*. International Food and Policy Research Institute: Washington DC.
- RAYNER, AA, 1967. *A First Course in Biometry for Agriculture Students*. University of Natal Press: Pietermaritzburg.
- REARDON, T, CRAWFORD, E & KELLY, V, 1994. Links between non-farm and farm investment in African households: Adding the capital market perspective. *American Journal of Agricultural Economics*: 76:1172-6.
- ROSEGRANT, MW, PAISNER, MS, MEIJER, S & WITCOVER, J, 2001. *Global Food Projections to 2020: Emerging trends and alternative futures*. International Food and Policy Research Institute: Washington DC.
- RUHIIGA, TM, 2000. Rural settlement and retail trade business in the Eastern Cape. *Development Southern Africa*:17(2):189-200.

- SENDER, J & JOHNSTON, D, 1996. Some poor and invisible women: Farm labourers in South Africa. *Development Southern Africa*: 13(1):3-16.
- SINGH, N, 2002. *Address by Mr Narend Singh, KwaZulu-Natal Minister of Agriculture and Environmental Affairs and Patron of the KwaZulu-Natal Agricultural Development Trust, at the launch of the KwaZulu-Natal Agricultural Development Forum*. Cedara Research Station, 15 February, 2002, Cedara.
- STATISTICS SOUTH AFRICA, 1998. *Unemployment and Employment in South Africa*. [WWW document]. URL: http://www.statssa.gov.za/u&e/Prelim_p.htm. (Accessed 01 October 1999).
- STOPFORTH, P, 1974. *Minimum Living Levels among Black Employees in a Textile Processing Industry in Natal*. Institute for Social Research, University of Natal: Durban.
- TAYLOR, N & CAIRNS, R, 2001. *May Farming Make a Contribution to Poverty Alleviation in a 'Deep Rural' Area in South Africa? Lessons from Oxfam's GB's Sustainable Livelihoods Programme at Nkandla, KwaZulu-Natal*. Paper presented at the South African Regional Poverty Network Conference on Land Reform and Poverty Alleviation in Southern Africa, 4-5 June, 2001. South African Regional Poverty Network, Pretoria
- TECHNICAL CENTRE FOR AGRICULTURAL AND RURAL COOPERATION (CTA). 1998. Fair and long-lasting 'green revolutions' for the poorest countries. *Spore*: 73:1-3.
- THOMSON, DN, 1996. *A Study of Land Rental Markets and Institutions in Communal Areas of Rural KwaZulu-Natal*. Unpublished PhD Thesis, Department of Agricultural Economics, University of Natal, Pietermaritzburg.
- THOMSON, DN & LYNE, MC, 1993. Constraints to land rental in KwaZulu-Natal: Analysing the transaction costs. *Oxford Agrarian Studies*:21(2):143-50.
- UNDERWOOD, M, 1999. *Fruit trees, gender issues and community forestry in Zululand South Africa: A commentary*. Paper presented at the Workshop on Off-forest Tree Resources of Africa, 12-16 July 1999, ICRAF, Arusha, Tanzania.
- UNITED NATIONS, 2002. *Implementing Agenda 21*. United Nations Economic and Social Council: Geneva.

- UNITED NATIONS, 2001. *Economic Development in Africa: Performance, prospects and policy issues*. United Nations Conference on Trade and Development. United Nations Economic and Social Council: Geneva.
- VAN ROOYEN, J & VAN ZYL, J, 1990. Agricultural restructuring in South Africa: Some considerations on the food question. In Csaki, C, Dams, TJ, Metzger, D & van Zyl, J, (Eds), *Agricultural Restructuring in Southern Africa: Inter-conference Symposium of the International Association of Agricultural Economists, 24-27 July 1990*, Association of Agricultural Economists of Namibia: Swakopmund, Namibia. p 452-9.
- VAN SEVENTER, DEN, 1987. Income distribution, economics structure and employment in South Africa. *Development Southern Africa*: 4(1):133-45.
- VAN ZYL, J & KIRSTEN, J, 1998. Defining small-scale farmers in the South African context. *Agrekon*: 37(4):560-71.
- VAN ZYL, J & KIRSTEN, J, 1997. Economic empowerment in South African agriculture. In Haddad, L, (ed.). *Achieving Food Security in southern Africa: New challenges, new opportunities*. International Food and Policy Research Institute: Washington DC. p 174-94.
- VAN ZYL, J, MACHETHE, C, SARTORIUS VON BACH, H & SINGINI, R, 1991. The effects of increased earnings from traditional agriculture in Lebowa. *Agrekon*:30(4):276-8.
- VAN ZYL, J & VINK, N, 1992. Effects of farmer support programmes on consumption and investment. *Development Southern Africa*: 5(2):196-207.
- VIVIER, FL, CROWTHER, NAS & STRYDOM, HF, 1993. *Income and Expenditure Patterns of Households in the RSA*. Human Sciences Research Council: Pretoria.
- WORLD BANK, 2002. *Building Institutions for Markets*. World Development Report 2002. Oxford University Press: Oxford.
- WIGGINS, S, OTIENO, L, PROCTOR, S & UPTON, M, 2000. *Population, Migration and Rural Diversification: The implications for the crop post harvest sector*. Issues Paper 1, Crop Post-Harvest Programme. Crop Post-Harvest Programme: Chatham.

Appendix A:
Survey questionnaire for round one

Investigating the Potential for Agriculture-led Growth



Survey round number	1	Interviewer	
Random number		Date	
Family name		Respondent's first name	

Instructions to interviewers:

All items in bold or in brackets () are for the interviewer's information and need not be read to the respondent.

- 1 These questions relate to **all household members** including members not present at the time of interview (e.g. migrant workers who contribute to household income).
- 2 A household refers to a family that has its own crop land, or a group of families that have rights to the same crop land.
- 3 The respondent should be, ideally, a male or female household head, or an adult familiar with the household's farming and other income generating activities and their consumption.
- 4 If the respondent cannot, or prefers not to answer a question, code the reply DK (don't know). All "yes" responses may be recorded as a "1" and all "no" responses as a "0".

Please tell the respondent the following information before the interview:

- 1 Thank them for participating in this study.
- 2 The information is confidential. Each household is assigned a number which is the only identifier of the household after the questionnaire is complete.
- 3 The data will be used by researchers to assist the government in designing programmes aimed at improving household welfare. Please tell them that this is the first of four surveys.
- 4 We will return three more times before the end of October to update our information. These surveys will be considerably shorter than this one.

1 Observe and record the following before interviewing the respondent (if possible – if there is a question, ask the respondent):

Question	Answer	For Office Use Distance (km)
1.1 Which post office does the household use?		
1.2 Distance (km) from a tar road:		
1.3 Distance (km) from tribal authority:		
1.4 Where is the nearest telephone?		
1.5 Are fields fenced with barb-wire or other sturdy material:		
1.6 Are all of the fields next to the house:		
1.7 What type of roofing material do the main buildings have?		
1.8 Is there electricity available to this homestead?		

2 Household Composition (include those who board away from home but return on weekends or holidays and those who pay remittances)

Household members (first name)	Age	Gender (record a 1 for females, 0 for males)	Does this person eat and sleep at home almost every day (record "yes" as "1" and "no" as "0")
1			
2			
3			
4			
5			
6			
7			
8			
9			
20			
11			
12			
13			
14			
15			
(for office use only) TOTAL			

2	Ask the respondent who makes the following decisions. Explain carefully that you want to know who actually makes the decision, not who traditionally should (for example grandmothers or men normally make specific decisions). Reassure the respondent that the information is confidential.	Office Use Only	
2.1	Which household members usually decide what crops will be planted, and when the crop will be weeded and harvested?	Age	
		Gender	
2.2	Which household members usually decide how many agricultural inputs e.g. fertilizer and seed and ploughing services, to buy?	Age	
		Gender	
2.3	Which household members usually decide how much food to use or to buy?	Age	
		Gender	
2.4	Which household members usually decide what furniture or appliances to buy?	Age	
		Gender	

3 Income

(List all members of the household over the age of 15. Remember, typically, all pensioners (those over the age of 60) and those with disabilities receive at least R470 per month.)

Household members who are over 15 years old	Highest Education level reached for all persons no longer attending school	Primary occupation and is it a full-time job or a casual one ¹	Average monthly earnings ² (Rands)	Amount of cash or in kind payments to household in June (Rand value or quantity) ³	Amount of cash or in kind payments to household in May (Rand value or quantity)	Amount of cash or in kind payments to household in March (Rand value or quantity)	Amount of cash or in kind payments to household in February (Rand value or quantity)
1							
2							
3							
4							
5							
6							
7							
		TOTAL (office use only)					

¹ Record these occupations with the following codes: old age or disability pensioner (1), casual labourer (2), unskilled or semi-skilled regular wage worker (3), professional wage earner (4), (full-time) farmer (5), business person(6), housewife (7), scholar (8), unemployed (9).

² Business income e.g. from contracting services or hawking should be reported on next page under "Enterprise activity"

³ If the payment is in kind, attempt to get a value for it in rand e.g. R20 worth of maize. If that is not possible, note the quantity and type of item e.g. 3 square metres of wood.

4 Enterprise Activity

Did the household earn any INCOME from any of the following sources during the **past year** (NOT INCLUDING INCOME ALREADY RECORDED ABOVE)? (Period of activity is assumed to be a month, if it is easier for the respondent to remember it in terms of some other time frame, just make a note of it.)

List the following possible income sources one by one giving the respondent time to respond yes or no after each one. (Emphasise that we are only interested in activities which earned income, not those they did for themselves): hiring out accommodation; (1) hiring out contractor services or equipment; (2) milling grain or processing other agricultural crops; (3) baking, brewing or selling meals; (4) building or repairing houses or other structures; (5) block making, stone- or metalwork; (6) making or repairing furniture; (7) thatching roofs or gathering or preparing grass; (8) gathering water, wood, or herbs for sale; (9) taking care of children or other people for pay; (10) repairing vehicles or machinery; (11) sewing or shoemaking; (12) shop-keeping; (13) hawking; (14) handicrafts or (15) basket making or weaving.

Activity	Total monies received from this activity per month (or other activity period) (rand)	Total cost of doing this activity per month (or other activity period) (rand)	Months of the year activity undertaken or frequency e.g. "4 times a year" or "only during March and May" or "every month"	(Is this income included on the previous page, "yes" is "1" and "no" is "0")

*NB **** Are there any other ways in which they usually get money besides these activities or from the workers and pensioners reported above or from livestock and crops? (ask each respondent carefully). Add the answers into the table above.*

(Remind the respondent that their names will be hidden from even the researchers once a number is assigned and that all information is confidential)

Other income	Date	No of days prior to survey
4.2 How many days has it been since the household has received one of the monies listed above from enterprise work, remittances, wages, or pensions? (i.e. When was the last time they actually received any of this income?)		
Monetary gifts		
4.3 Has the household received a gift or loan of money or goods e.g. food in the last year?		
4.2 How much was it for?		
4.3 Who gave it to them?		
4.4 How often have they/do they receive this money (e.g. once or weekly)?		
4.4 How many household members have money saved in a bank?		
4.5 How much money does each person currently have in the bank?		
4.6 How much money does the household currently have kept safely at home?		
4.6 How much money does the household or its members currently have kept with others for safekeeping?		
4.7 How much money did the household or its members put in the bank, away at home, or with others for safekeeping this last month?		
4.8 How much money did the household members put in stokvels, food clubs, savings clubs, burial societies, and other investments in this last month? Record the total amounts		
4.9 In the last year, has any household member been able to get any goods or services before paying for them completely? List the items (e.g. on accounts paid over three months, HP/hire-purchase):		

4.10	How much money did the household members pay in credit payments in the last month total e.g. hire-purchase (eg input loans, loan repayments, account payments, laybies, etc...)?	
4.10.1	What proportion went to repay for:	
	Clothing	
	Medical costs	
	Furniture/appliances/household items	
	Building	
	Vehicle purchase/repayment	
	Jewelry	
	School expenses	
	Feasts/personal expenses	

5 Assets

5.1 Does the household own any of the following? Ask about a motor car; bakkie or truck; motorbike; tractor; trailer or cart; TV; music canters; refrigerator, freezer; generator. Record only those the household has access to.

Assets	How much would it cost to buy a similar one?
Does the household own any other big items like these? (write it in)	

5.2 Agriculture

5.2.1	How much land does the household get to use for its own use including the garden next to the house (get number of fields and estimated size in hectares, if the respondent does not know, walk around the fields and measure them. Record the number of paces ie 10 paces X 15 paces)?	
5.2.2	Who decides who gets what piece of land and when animals can roam freely e.g the chief or his <i>indunas</i> or a government extension agent?	
5.2.3	Is the household a member of a cooperative (1), out grower scheme (2), labour club (3), farmer's association (4)(record number is "yes" or nothing if "no")?	
5.2.4	What is the number of times the household has been visited by an extension agent in the last three months?	

5.3 Livestock

Animal	Number of Each	Number Eaten in past 12 months	Total Income from sales in last 12 months
Poultry			
Cattle			
Goats			
Sheep			

5.4 Crops Grown During the Last Season: ask about maize (1); sorghum (2); timber (3); sugar (4); potatoes (5); sweet potatoes or *amadumbies* (6); peas (7); dry beans (8); green vegetables (9); fruit (10). List only those they grew. Include even small crops grown for home consumption such as spinach, pumpkins etc.

Crop type	Harvest this season (get tonnage or number of bags or tins and size of bags or tins)	Gross income from sales (Rand)	Where sold
Other (specify)			

5.5 Stored crops from last season. Ask whether the household has any of the following crops stored?

Crop type	Stored this season (get tonnage or number of bags or tins and size of bags or tins)
Maize	
Beans	
Other (specify)	

5.6 Purchased Inputs During the Last Season. Ask the respondent whether the household bought any of the following agricultural items in the last season (Spring or September last year until now).

Purchased Inputs	Used last season	Total cost (Rands)	Main supplier ⁴	Did the household have to pay for the good or service immediately and in full from its own money?
Fertiliser				
Seed: Maize Or Sorghum				
Beans				
Potatoes				
Other (specify)				
Ploughing service or fuel costs			Pvt or Gvt	
Transport service or fuel costs			Pvt or Gvt	
Farm Labour			Nil	
Chemicals				
Livestock Feed				
Veterinary Medicines				
Other (specify)				
Ash to preserve stored grain				

⁴ Name of Store and Town, or neighbour, farmers' association, cooperative, LAC, etc...

Item	Item code	Bought or spent outside local community	Bought or spent in local community	From home production
		Value (R,c)	Value (R,c)	Value (R,c)

CONSUMPTION OF FOOD ITEMS: Guide for field workers

Refer to the master list of **food items** on page 14. For each item, ask the respondent to think back over the past **week** and answer the following questions. Fill in the answers on page 10.

All answers are for the entire household. Include food eaten by children at school (eg vetkoek) but not that eaten by migrant workers at their place of work. Record the respondent's answers in the tables on the next pages. Sometimes the household may answer yes to all three questions below. The answers must then be filled in for each question.

- 1 Go to the list of food items on the list. For each one ask the respondent: "Did your household buy this item in the last week from a source **outside of the local community** or a store/spaza in the local community?". Allow the respondent to reply yes or no. If yes, write this item on the table and ask the following questions.
 - a) What quantity was this item bought in? (number of 500g, 470 g tin, 12,5 kg, or 1ℓ units)?
 - b) How much did this cost?

- 2 After going through the list. Ask the respondent if the household bought this item in the last week from a **producer in the local community** (for example a neighbour)? Go through the headings of each section (ie dairy, meat etc) and list the items again. If yes, ask the following questions:
 - a) What quantity was this item bought in? (number of 500g, 470 g tin, 12,5 kg, litres, 50/80 kg bags or per uogogo)?
 - b) How much did this cost?

- 3 Finally, ask the respondent if their household used or consumed this item in the last week **but the household produced it itself?** Again, list the headings and then the items. Pay attention to the items marked with stars. If yes, ask the following questions:
 - a) What quantity was used (number of 500g, 470 g tin, 12,5 kg, litres, 50/80 kg bags or per uogogo)?
 - b) What would you say the value was of this item to your household?

You do not have to fill in the columns which are shaded

CONSUMPTION OF FOOD ITEMS

Dairy products:

- * Fresh milk
- * Amaasi (sour milk)
- Milk Powder
- Condensed milk
- Sterilised milk/long life
- * Cheeses

Maize:

- * Mealie meal
- * Samp
- * Mealie rice
- * Fresh corn/Green mealies
- * Mealie bread

Cereals:

- Rice
- Flour
- Pasta (macaroni etc)
- Oats
- Other

Baked Goods

- Bread, rolls, buns
- * Steamed Bread
- * Biscuits
- * Cakes
- Rusks
- * Vetkoek
- Other

Fruit

List any fruit in the following forms:

- * Fresh fruit
- * Tinned or bottled fruit

Vegetables

- * Fresh vegetables (eg cabbage, pumpkin, gems, imifino etc)
- Tinned vegetables
- * Bottled/pickled vegetables
- * Dried/dehydrated

Root crops

- * Potato
- * Sweet potato
- * Amadumbe

Legumes

- * Dried beans
- * Peanuts

- * Peanut butter
- Soya products eg "Imana"

Meat

- * Beef
- * Mutton
- * Pork
- * Chicken or poultry
- * Goat
- Sausage and Wors
- Bacon and Ham
- Polony and Viennas
- Tinned meat
- * Head and feet
- * Inyama yangaphathi/offal
- Wild meat, eg Ivondo
- Other

Fish:

- * Fresh, Tinned fish

Fats and oils:

- Cooking oil
- Margarine (eg Rama), Holsum or butter
- * Animal fat
- Other

Sugar

- * Eggs

Additional items:

- Aromat or Knorax/stock
- Atjar and pickles
- Baking powder, bicarb
- Chewing gum
- Chocolates, sweets
- Chips (Go slow)
- Curry powder
- Custard/powder
- * Honey
- Instant puddings
- * Jam
- Jellies
- Pepper
- Salt
- Soup powder or tins
- Syrup
- Tomato sauce
- Vinegar
- Yeast

Beverages:

- Squash eg Lecol
- Fizzy drinks eg Coke
- Hot drinks eg Tea, Rooibos, Coffee, Cocoa
- Other

Baby Foods:

- Baby cereals
- Milk formulas and powders (eg S26)
- Infant vegetables and fruit (eg Purity)
- Other baby foods

Prepared Foods like:

- Take aways (eg Kentucky chicken, pap and wors
- Pies,
- Potato chips
- Cooked fish
- Ikota
- Wors rolls, etc

Alcoholic Beverages:

- Beer
- * Mahewu,
- * Sorghum beer (Umqomboth)
- Wine, * Marula
- Spirits eg Vodka, Gin
- Others:

CONSUMPTION OF NON FOOD AND SERVICES ITEMS: Guide

Follow the same procedure as for the food questions, but refer to the master list of **non food and service items** supplied. For each item, ask the respondent to think back over the past month (FOR THE FIRST SURVEY AND THEN THE TIME SINCE THE LAST VISIT/INTERVIEW FOR ROUNDS 2,3 and 4) and answer the following questions.

All answers are for the entire household. Record the respondent's answers in the tables on the next pages.

Sometimes the household may answer yes to all three questions below. The answers must then be filled in for each question.

- 1 Did your household buy or use this non food or service item in the last month from a **producer or supplier from outside the local community** or from a store or spaza in the local community where the supplies are bought from outside the community? Go through each item one by one. If yes, ask the following questions:
 - a) How much did this cost?
 - b) Go to question 2

- 2 Did your household buy or use this non food or service item in the last month or since the last survey from a source **in the local community** ie a neighbour? Go through the headings again, and list each item. If yes, ask the following questions:
 - a) How much did this cost?

- 3 Finally ask if the household used or consumed this non food or service item in the last month or since the last survey **but the household produced or provided it itself?** Go through the headings again, and list each item. Pay special attention to the items marked with stars on the list of items. If yes, ask the following question:
 - a) What would you say the value was of this item to your household?

You do not have to fill in the columns which are shaded

CONSUMPTION OF NON-FOOD AND SERVICE ITEMS

Fuel:

Batteries
 * Candles
 Coal
 Electricity
 Gas
 Matches
 Paraffin
 * Wood
 Other:

Household cleaning, laundry products, Toiletries, cosmetics, personal services and medicines

Washing power eg Omo
 * Soaps for bath, dishes and washing
 Cleaning agents eg Jik, Vim
 Cleaning cloths/sponges
 Blades
 Tooth paste and brushes
 Hair products eg glycerine
 Cosmetics eg lipstick
 * Creams and lotions eg Dawn, vaseline
 * Hair salons/barbers
 Paper and pens
 Medicines from clinic/hospital
 * Traditional medicines
 Other

Entertainment

* Tobacco
 Sports and equipment
 Magazines, newspapers
 Books
 Gambling/lotto/horses (Zamazama)
 Other recreation expenses:

Clothing, shoes and soft furnishings

* Baskets
 * Clothes or shoes
 * Baby's clothing

Medical

Doctors/Specialists
 Hospital/Clinic for doctors, teeth and eyes
 * Traditional Healers
 Other medical expenses:

Education

Tuition
 Boarding fees
 Allowances for boarders
 Other education expenses:

Insurances

Medical insurance
 Life insurance
 Vehicle insurance
 Other insurances:

Transport

Taxis
 Busses
 Petrol for vehicles
 Vehicle repairs and spares
 Other transport costs:

Communication

Telephone Rental
 Telephone calls
 Postage
 Other:

Other services/expenses

Child care/creches
 Church contributions
 Donations/Gifts outside home
 Pocket money
 Support for relatives
 Others:

Housing

Rent
 Water and sewage
 Loan repayments
 Other housing expenses

**DURABLES AND ANNUAL CONSUMPTION ITEMS
EXPENSES IN THE PAST 12 MONTHS**

Fill in the information at the top of the following page. Give the following information:

Household number, Survey date

Refer to the master list of **durables and annual consumption items** supplied. For each item, ask the respondent to think back over the past **12 months (ie from 1 October 1996 to 30 September 1997)** and answer the following questions.

Sometimes the household may answer yes to all three questions below. The answers must then be filled in for each question.

- 1 Did your household buy or use item in the last 12 months from a source **outside of the local community** or from a store or spaza in the local community where the supplies are bought from outside the community? Go through each item one by one. If yes, ask the following question:
 - a) How much did this cost?

- 2 Did your household buy or use this item in the last 12 months from a **producer or source in the local community** (for example a neighbour)? Go through the headings again, and list each item. If yes, ask the following question:
 - a) How much did this cost?

- 3 Finally ask if the household used or consumed this non food or service item in the last 12 months **but the household produced or provided it itself?** Go through the headings again, and list each item. Pay special attention to the items marked with stars on the list of items. If yes, ask the following question: If yes, ask the following question:
 - a) What would you say the value was of this item to your household?

You do not have to fill in the columns which are shaded

DURABLE AND CONSUMERABLE ITEMS

Clothing, shoes and soft furnishings

Cloth nappies
 Baby products (including prams, cots etc)
 * Clothing
 * Jewellery

Home Furnishings

* Furniture
 * Household appliances
 * Blankets and bedding
 Dishes
 Dishes, pots, cutlery, crockery
 Lamps
 Buckets
 Plastic dishes
 Water drums (Isipakupaku)
 Toys
 Other:

Farm expenses

Livestock or poultry
 * Food processing equipment
 * Farm equipment/implements
 Property/Land purchase or rental

Housing repairs/ improvement/maintenance

* Building materials (eg thatching, clay bricks, window frames)?
 Labour to carry out these tasks?

Other

Gifts given outside the house
 Rental of a post box
 Vehicle purchases

Appendix B:

Survey questionnaire for round two



Investigating the Potential for Agriculture-led Growth

Survey round number	2	Interviewer	
Random number		Date	
Family name		Respondent's first name	

Instructions to interviewers:

All items in bold or in brackets () are for the interviewer's information and need not be read to the respondent.

- 1 These questions relate to **all household members** including members not present at the time of interview (e.g. migrant workers who contribute to household income).
- 2 A household refers to a family that has its own crop land, or a group of families that have rights to the same crop land.
- 3 The respondent should be, ideally, a male or female household head, or an adult familiar with the household's farming and other income generating activities and their consumption.
- 4 If the respondent cannot, or prefers not to answer a question, code the reply DK (don't know). All "yes" responses may be recorded as a "1" and all "no" responses as a "0".

Please remind the respondent the following information before the interview:

- 1 Thank them for participating in this study.
- 2 The information is confidential. Each household is assigned a number which is the only identifier of the household after the questionnaire is complete.
- 3 The data will be used by researchers to assist the government in designing programmes aimed at improving household welfare. Please tell them that this is the second of four surveys.
- 4 The survey consists of four questionnaires. We will return two more time/s before the end of November to update our information. These surveys will be considerably shorter than the first one.

Income	Date	No of days prior to survey
1.1 How many days has it been since the household has received one of the monies listed above from enterprise work, remittances, wages, or pensions? (i.e. When was the last time they actually received any of this income?)		
Monetary gifts		
1.2 Has the household received a gift or loan of money or goods e.g. food in the last year?		
1.3 How much was it for?		
1.4 Who gave it to them?		
1.5 How often have they/do they receive this money (e.g once or weekly)?		
1.6 How many household members have money saved in a bank?		
1.7 How much money does each person currently have in the bank?		
1.8 How much money does the household currently have kept safely at home?		
1.9 How much money does the household or its members currently have kept with others for safekeeping?		
1.10 How much money did the household or its members put in the bank, away at home, or with others for safekeeping this last month?		
1.12 How much money did the household members put in stokvels, food clubs, savings clubs, burial societies, and other investments in this last month? Record the total amounts		
1.13 In the last year, has any household member been able to get any goods or services before paying for them completely? List the items (e.g. on accounts paid over three months, HP/hire-purchase):		
1.14 How much money did the household members pay in credit payments in the last month total e.g. hire-purchase (eg input loans, loan repayments, account payments, laybies, etc...)? What proportion went to repay for:		
Clothing		
Medical costs		
Furniture/appliances/household items		
Building		
Vehicle purchase/repayment		
Jewelry		
School expenses		
Feasts/personal expenses		

**CONSUMPTION OF NONFOOD ITEMS AND SERVICES
SINCE LAST VISIT/INTERVIEW**

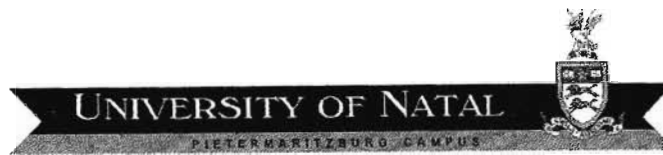
Refer to the master list of questions and **nonfood and service items list** supplied to ask this section.

Item	Item code	Bought or spent outside local community	Bought or spent in local community	From home production
		Value (R,c)	Value (R,c)	Value (R,c)

THANK THE RESPONDENTS FOR THEIR ASSISTANCE.

Appendix C:
Survey questionnaire for round three

Investigating the Potential for Agriculture-led Growth



Survey round number	3	Interviewer	
Random number		Date	
Family name		Respondent's first name	

Instructions to interviewers:

All items in bold or in brackets () are for the interviewer's information and need not be read to the respondent.

- 1 These questions relate to **all household members** including members not present at the time of interview (e.g. migrant workers who contribute to household income).
- 2 A household refers to a family that has its own crop land, or a group of families that have rights to the same crop land.
- 3 The respondent should be, ideally, a male or female household head, or an adult familiar with the household's farming and other income generating activities and their consumption.
- 4 If the respondent cannot, or prefers not to answer a question, code the reply DK (don't know). All "yes" responses may be recorded as a "1" and all "no" responses as a "0".

Please remind the respondent the following information before the interview:

- 1 Thank them for participating in this study.
- 2 The information is confidential. Each household is assigned a number which is the only identifier of the household after the questionnaire is complete.
- 3 The data will be used by researchers to assist the government in designing programmes aimed at improving household welfare.
- 4 This is the final survey.

Income	Date	No of days prior to survey
1.1 How many days has it been since the household has received one of the monies listed above from enterprise work, remittances, wages, or pensions? (i.e. When was the last time they actually received any of this income?)		
Monetary gifts		
1.2 Has the household received a gift or loan of money or goods e.g. food in the last year?		
1.3 How much was it for?		
1.4 Who gave it to them?		
1.5 How often have they/do they receive this money (e.g once or weekly)?		
1.6 How many household members have money saved in a bank?		
1.7 How much money does each person currently have in the bank?		
1.8 How much money does the household currently have kept safely at home?		
1.9 How much money does the household or its members currently have kept with others for safekeeping?		
1.10 How much money did the household or its members put in the bank, away at home, or with others for safekeeping this last month?		
1.12 How much money did the household members put in stokvels, food clubs, savings clubs, burial societies, and other investments in this last month? Record the total amounts		
1.13 In the last year, has any household member been able to get any goods or services before paying for them completely? List the items (e.g. on accounts paid over three months, HP/hire-purchase):		

1.14	<p>How much money did the household members pay in credit payments in the last month total e.g. hire-purchase (eg input loans, loan repayments, account payments, laybies, etc...)?</p> <p>What proportion went to repay for:</p>	
	Clothing	
	Medical costs	
	Furniture/appliances/household items	
	Building	
	Vehicle purchase/repayment	
	Jewelry	
	School expenses	
	Feasts/personal expenses	

Crops Grown since beginning of July 1997 until now (duration of survey).

Ask about maize (1); sorghum (2); timber (3); sugar (4); potatoes (5); sweet potatoes or madumbies (6); cow peas (7); dry beans (8); green vegetables (9); fruit (10). List only those they grew.

Crop type	Harvest this year (get tonnage or number of bags or tins and size of bags or tins)	Gross income from sales (Rand)	Where sold
Other (specify)			

Purchased farm inputs from beginning of July until now (duration of the survey)

Purchased Inputs	Used last season	Total cost (Rands)	Main supplier¹	Did the household have to pay for the good or service immediately and in full from its own money?
Fertiliser				
Seed: Maize Or Sorghum				
Beans				
Potatoes				
Other (specify)				
Ploughing service or fuel costs			Pvt or Gvt	
Transport service or fuel costs			Pvt or Gvt	
Farm Labour			Nil	
Chemicals				
Livestock Feed				
Veterinary Medicines				
Other (specify)				
Ash to preserve stored grain				

Name of Store and Town, or neighbour, farmers' association, cooperative, LAC, etc...

ANNUAL OR SEASONAL EXPENDITURE

Fill in the information at the top of the following page. Give the following information:

Household number, Survey date

Refer to the list of **annual or seasonal expenditure** below. For each item, ask the respondent to think back over the past **12 months (ie from 1 October 1996 to 30 September 1997)** and answer the following questions.

Family occasions

Weddings,
Funerals,
Births,
Birthdays,
Anniversaries,
Feasts and parties
Holidays

Education

Tuition (eg school fees)
Books and stationery

Other expenses

Club memberships
Dues to Tribal authorities

Ask: **Did your household buy or use item in the last 12 months?**

If yes, ask: How much did this cost?

Item	Item Code	Value (Rands)

Appendix D:
Coding list and data set

VARIABLES	SECTION	PERIOD	RECORDS	SOURCE	UNITS
ADJFIELD	Demographics		Fields adjacent to homestead		Y/N
AMAAMT3	Agricultural inputs	Annual	Amadumbe input		kg
AMACST3	Agricultural inputs	Annual	Amadumbe cost		R
AMACST3	Agricultural inputs	Season	Cost of amadumbes planted		R
AMAD1A	Food	Week	Amadumbes		kg
AMAD1H	Food	Week	Amadumbes	Home	R
AMAD1L	Food	Week	Amadumbes	Local	R
AMAD1O	Food	Week	Amadumbes	Imported	R
AMADUM3	Harvest	Season	Amadumbe harvest		kg
AMASALE3	Income from harvest	Season	Income from amadumbe sales		R
AMASUP3			Supplier amadumbe seeds		area
AMAWHE3			Surplus sold where amadumbes		area
APPLE1O	Food	Week	Apples	Imported	R
APPLIANY	Durables	Annual	Appliances		R
B/SOAP1	Nonfood	B/SOAP3	Bath and bar soaps		R
BABYY	Durables	Annual	Baby clothes and equipment		R
BAKE1O	Food	Week	Baking Powder	Imported	R
BAN1O	Food	Week	Bananas	Imported	R
BANK1	Assets		Bank balance		R
BANK2	Assets	Month	Bank balance		R
BANK3	Assets	Month	Bank balance		R
BATT1O	Nonfood	BATT3O	Batteries		R
BCEAR1O	Food	Week	Baby cereals	Imported	R
BCER1P	Food	Week	Baby cereals		R/kg
BCLOTH1	Nonfood	BCLOTH3	Baby clothes and equipment		R
BCLOTH1H	Nonfood		Baby clothes and equipment		R
BDAYS	Durables	Annual	Birthdays		R
BEAN3	Harvest	Season	Bean harvest		kg
BEANAMT3	Agricultural inputs	Annual	Bean input		kg
BEANCST3	Agricultural inputs	Annual	Bean cost		R
BEANPAY3	Credit use		Used credit for beans		Y/N
BEANSLE3	Income from harvest	Season	Income from bean sales		R
BEANSTR1	Storage		Beans in storage survey 1		kg
BEANSTR2	Storage		Beans in storage survey 2		kg
BEANSUP3			Supplier bean seeds		kg
BEANWHE3			Surplus sold where beans		kg
BEDDINGY	Durables	Annual	Bedding and linen		R
BEEF1O	Food	Week	Beef	Imported	R
BEER1H	Food	Week	Amahewu	Home	R
BEER1L	Food	Week	Amahewu	Local	R
BEER1O	Food	Week	Beer	Imported	R
BIRTHY	Durables	Annual	Births		R
BLADES1	Nonfood	BLADES3	Blades		R
BLDMATHY	Durables	Annual	Building material	Home	R
BLDMATLY	Durables	Annual	Building material	Local	R
BLDMATOY	Durables	Annual	Building material	Imported	R
BMILK1O	Food	Week	Baby milk formulae	Imported	R
BMILK1P	Food	Week	Baby milk formulae	Imported	R/kg
BOARD1	Nonfood	BOARD3	Boarding fees		R
BOOKS1	Nonfood	BOOKS3	Books		R
BREAD1A	Food	Week	Bread	Imported	loaves
BREAD1H	Food	Week	Steamed bread	Home	R
BREAD1L	Food	Week	Steamed bread	Local	R
BREAD1O	Food	Week	Bread	Imported	R
BREAD1P	Food	Week	Bread	Imported	R/loaf
BUCKETY	Durables	Annual	Buckets		R
BUILD2	Expenditure	Month	Building survey 2		R
BUILD3	Expenditure	Month	Building survey 3		R
BUS1	Nonfood	BUS3	Bus fares		R
CAB1A	Food	Week	Cabbage		R
CAB1H	Food	Week	Cabbage	Home	R
CAB1L	Food	Week	Cabbage	Local	R
CAB1O	Food	Week	Cabbage	Imported	R
CAB1P	Food	Week	Cabbage		R/unit
CAKES1H	Food	Week	Cakes and biscuits	Home	R
CAKES1L	Food	Week	Cakes and biscuits	Local	R
CAKES1O	Food	Week	Cakes and biscuits	Imported	R
CANDL1O	Nonfood	CANDL3C	Candles		R
CARROT1O	Food	Week	Carrots	Imported	R
CATLSALE	Income	Annual	Income from cattle sales		R
CATTLEAT	Home Production	Annual	Cattle eaten		number
CATTLENO	Assets		Number of cattle		number

CEREALS1	Food	Week	Cereals (pasta, oats)	Imported	R
CHEESE1	Food	Week	Cheese	Imported	R
CHEMS1	Agricultural inputs	Annual	Cost of chemicals		R
CHILD	Demographics		Number of children (6 - 15 years)		No.
CHIPS10	Food	Week	Chips	Imported	R
CHURCH1	Nonfood	CHURCH:Varies	Church contributions		R
CLEAN1	Nonfood	CLEAN3:Varies	Cleaning materials		R
CLINIC1	Nonfood	CLINIC3:Varies	Clinic and hospital fees		R
CLOTHES1	Nonfood	CLOTHER:Varies	Clothes		R
CLOTHESY	Durables	Annual	Clothes		R
CLOTHS1	Nonfood	CLOTHS3:Varies	Cleaning cloths		R
CLUB1	Expenditure	Month	Expenditure on savings clubs survey 1		R
CLUB2	Expenditure	Month	Savings and food clubs survey 2		R
CLUB3	Expenditure	Month	Savings and food clubs survey 3		R
COFFE10	Food	Week	Coffee	Imported	R
CON10	Food	Week	Condiments	Imported	R
COOPS	Demographics		Member of cooperatives or out growers		Y/N
COSMTC1	Nonfood	COSMTC:Varies	Cosmetics and fragranced toiletries		R
CREAMS1	Nonfood	CREAMS:Varies	Creams and lotions		R
CRECHE1	Nonfood	CRECHE:Varies	Creche fees		R
CRECHEY	Durables	Annual	Creche fees		R
CROPAGE	Demographics		Age of decision maker for crops		Years
CROPSIZE	Assets		Crop size		ha
DATE1	Demographics		Date of survey 1		Date
DATE2	Demographics		Date of survey 2		Date
DATE3	Demographics		Date of survey 3		Date
DBEAN1A	Food	Week	Dry beans		kg
DBEAN1H	Food	Week	Dry beans	Home	R
DBEAN1L	Food	Week	Dry beans	Local	R
DBEAN1O	Food	Week	Dry beans	Imported	R
DBEAN1P	Food	Week	Dry beans		R/kg
DISHESY	Durables	Annual	Dishes, crockery and cutlery		R
DISTPHONE	Demographics		Distance from a telephone		km
DISTPOST	Demographics		Distance from a post office		km
DISTRIBE	Demographics		Distance from tribal court		km
DISTTAR	Demographics		Distance from tar road		km
DMCROP	Demographics		Decision maker for crops		M/F
DMDUR	Demographics		Decision maker for durables		M/F
DMFOOD	Demographics		Decision maker for food purchases		M/F
DMINPUT	Demographics		Decision maker for agricultural inputs		M/F
DMLAND	Demographics		Decision maker for grazing use		Codes
DOCTORS1	Nonfood	DOCTOR:Varies	Doctors fees		R
DSHSOAP1	Nonfood	DSHSOAF:Varies	Dish washing liquid		R
DURAGE	Demographics		Age of decision maker for durables		Years
EDUC1	Nonfood	EDUC3:Varies	Educational fees		R
EGG1H	Food	Week	Eggs	Home	R
EGG1L	Food	Week	Eggs	Local	R
EGG1O	Food	Week	Eggs	Imported	R
EGG1P	Food	Week	Eggs		R/dozen
ELECT	Demographics		Household has electricity		Y/N
ELECT1	Nonfood	??:Varies	Electricity		R
ENTERPRI	Enterprise		Does the household engage in entrepreneurial activ		Codes
ENTINCY	Enterprise	Annual	Income from entrepreneurial activities		R
EXTNVSIT	Demographics	3 months	Number of extension visits		No.
F6-8	Demographics		Females with 8 - 10 years of schooling		No.
F9-10	Demographics		Females with 11 - 12 years of schooling		No.
FADULT	Demographics		Female adults		No.
FARMEQHY	Durables	Annual	Farm equipment	Home	R
FARMEQLY	Durables	Annual	Farm equipment	Local	R
FARMEQY	Durables	Annual	Farm equipment	Imported	R
FAT1A	Food	Week	Fat eg lard, holsum		kg
FAT1O	Food	Week	Fat eg lard, holsum	Imported	R
FAT1P	Food	Week	Fat eg lard, holsum		R/kg
FEASTY	Durables	Annual	Feasts		R
FEED1	Agricultural inputs	Annual	Cost of livestock and poultry feed		R
FEMALE	Demographics		Number of females		No.
FENCE	Demographics		Are the fields fenced?		Y/N
FERTAMT3	Agricultural inputs	Annual	Amount of fertiliser used		kg
FERTCST3	Agricultural inputs	Annual	Cost of fertiliser		R
FERTPAY3	Credit use		Used credit for fertiliser		Y/N
FERTSUP1			Supplier fertiliser		area
FISH10	Food	Week	Fresh fish	Imported	R
FIZZY10	Food	Week	Fizzy drinks	Imported	R

FJPRIM	Demographics			Females with 4 - 7 years of schooling	No.
FLOUR1A	Food		Week	Flour	kg
FLOUR1O	Food		Week	Flour	Imported R
FLOUR1P	Food		Week	Flour	R/kg
FMGRNT	Demographics			Female migrants	No.
FMORED	Demographics			Females with more than 12 years education	No.
FNOED	Demographics			Females with no education	No.
FOODAGE	Demographics			Age of decision maker for food purchases	Years
FPENS	Demographics			Female pensioners (60+)	No.
FPROTEQY	Durables		Annual	Food Processing equipment	R
FRTUSLE3	Income from harvest		Season	Income from fruit sales	R
FRUIT1O	Food		Week	Fruit	Imported R
FRUIT3	Harvest		Season	Fruit harvest	kg
FRUTWHE3				Surplus sold where fruit	area
FSPRIM	Demographics			Females with 1 - 3 years of education	No.
FUELOTH1	Nonfood	FUELOTH	Varies	Other fuel costs eg generator fuel and coal	R
FUNERALY	Durables		Annual	Funerals	R
GAS1	Nonfood	GAS31	Varies	Gas	R
GBEAN1O	Food		Week	Green beans	Imported R
GBEAN1P	Food		Week	Green beans	R/kg
GIFTS1	Nonfood	GIFTS3	Varies	Gifts and donations given	R
GIFTSRECY	Income		Annual	Gifts received	R
GOAT1O	Food		Week	Goat	Imported R
GOATEAT	Home Production		Annual	Goats eaten	number
GOATNO	Assets			Number of goats	number
GOATSALE	Income		Annual	Goat sales	R
GRANT2	Income		Month	Income from grants, pensions survey 2	R
GRANT3	Income		Month	Income from grants, pensions survey 3	R
GROWSUG	Demographics			Does household grow sugar cane?	Y/N
H&F1O	Food		Week	Heads and feet	Imported R
HAIR1	Nonfood	HAIR3	Varies	Hair toiletries	R
HAIRCUT1	Nonfood	HAIRCUT	Varies	Haircuts and barber fees	R
HEADAGE	Demographics			Age of de jure household head	Years
HEADOCCP	Demographics			Occupation of the household head	Codes
HHACC2	Income		Month	Contribution of household members to accounts sur	R
HHACC3	Income		Month	Contribution of household members to accounts sur	R
HHCASH2	Income		Month	Cash contribution of household members survey 2	R
HHCASH3	Income		Month	Cash contribution of household members survey 3	R
HHCLUB2	Income		Month	Contribution of household members to savings club	R
HHCLUB3	Income		Month	Contribution of household members to savings club	R
HHEAD	Demographics			Je dure household head	M/F
HHFOOD2	Income		Month	Contribution of household members in food survey	R
HHFOOD3	Income		Month	Contribution of household members in food survey	R
HHINC2				Total household income survey 2	R
HHINC3				Total household income survey 3	R
HHOTHR2	Income		Month	Contribution of household members to other expenses	R
HHOTHR3	Income		Month	Contribution of household members to other expenses	R
HHSAVE2	Income		Month	Contribution of household members to savings surv	R
HHSAVE3	Income		Month	Contribution of household members to savings surv	R
HHSIZE	Demographics			Household size	No.
HMINC2				Total household members' income survey 2	R
HMINC3				Total household members' income survey 3	R
HOMEKEEP	Demographics			Number of home keepers	No.
HPBUILD	Hire Purchases		Month	Building expenses survey 1	R
HPCLOTH	Hire Purchases		Month	Hire purchase repayments on clothes survey 1	R
HPDUR	Hire Purchases		Month	Hire purchase repayments on durables survey 1	R
HPMED	Hire Purchases		Month	Hire purchase repayments on medical survey 1	R
HPPERSNL	Hire Purchases		Month	Hire purchase repayments on personal survey 1	R
HPSCHOL	Hire Purchases		Month	Hire purchase repayments on school survey 1	R
HPVEHICL	Hire Purchases		Month	Hire purchase repayments on vehicles survey 1	R
IMIFIN1H	Food		Week	Imifino (wild spinach)	Home R
INCGEN2	Income		Month	Income from entrepreneurial activities survey 2	R
INCGEN3	Income		Month	Income from entrepreneurial activities survey 3	R
INFANTS	Demographics			Number of infants (0 - 5 years)	No.
INPUTAGE	Demographics			Age of decision maker for agric inputs	Years
INTERV1	Demographics			Interviewer for survey 1	Codes
INTERV2	Demographics			Interviewer for survey 2	Codes
INTERV3	Demographics			Interviewer for survey 3	Codes
JAM1O	Food		Week	Jam	Imported R
JAM1P	Food		Week	Jam	R/kg
JEWELSY	Durables		Annual	Jewellery	R
JUICE1O	Food		Week	Cordials	Imported R
LABOUR3	Agricultural inputs		Annual	Cost of labour	R

LABOUROY	Durables	Annual	Labour	Home	R
LABOURY	Durables	Annual	Labour	Local	R
LAMPSY	Durables	Annual	Lamps		R
LAND	Assets		Land size		ha
LIFEINS1	Nonfood	LIFEINS3	Life insurances		R
LIVESTCKY	Durables	Annual	Livestock		R
M6-8	Demographics		Males with 8 - 10 years of schooling		No.
M9-10	Demographics		Males with 11 - 12 years of schooling		No.
MAAS1O	Food	Week	Sour milk	Imported	R
MAAS1P	Food	Week	Sour milk		R/l
MADULT	Demographics		Male adults		No.
MAGS1	Nonfood	MAGS3	Magazines		R
MAIZE3HAR	Harvest	Season	Maize harvest		kg
MALES	Demographics		Number of males		No.
MARG1A	Food	Week	Margarine		kg
MARG1O	Food	Week	Margarine	Imported	R
MARG1P	Food	Week	Margarine		R/kg
MATCH1	Nonfood	MATCH3	Matches		R
MEDICIN1	Nonfood	MEDICIN3	Medicines		R
MEDINS1	Nonfood	MEDINS3	Medical insurances		R
MILK1L	Food	Week	Fresh milk	Local	R
MILK1O	Food	Week	Fresh milk	Imported	R
MILK1P	Food	Week	Fresh milk	Imported	R/l
MJNPRIM	Demographics		Males with 4 - 7 years of schooling		No.
MMEAL1A	Food	Week	Maize meal		kg
MMEAL1H	Food	Week	Maize meal	Home	R
MMEAL1L	Food	Week	Maize meal	Local	R
MMEAL1O	Food	Week	Maize meal	Imported	R
MMEAL1P	Food	Week	Maize meal		R/kg
MMGRNT	Demographics		Male migrants		No.
MMORED	Demographics		Males with more than 12 years education		No.
MNOED	Demographics		Males with no education		No.
MPENS	Demographics		Female pensioners (60+)		No.
MQOMB1H	Food	Week	Sorghum beer	Home	R
MQOMB1L	Food	Week	Sorghum beer	Local	R
MSPRIM	Demographics		Females with 1 - 3 years of education		No.
MUTT1O	Food	Week	Mutton	Imported	R
MZEAMT3	Agricultural inputs	Annual	Maize planted		kg
MZECST3	Agricultural inputs	Annual	Cost of maize		R
MZEPAY3	Credit use		Used credit for maize		Y/N
MZESALE3	Income from harvest	Season	Income from maize sales		R
MZESTR1	Storage		Maize in storage survey 1		kg
MZESTR2	Storage		Maize in storage survey 2		kg
MZESUP3			Supplier maize		area
MZEWHE3			Surplus sold where maize		area
NOSKIL	Demographics		Household members with no skills		No.
OFFAL1O	Food	Week	Offal	Imported	R
OIL1A	Food	Week	Cooking oil		litres
OIL1O	Food	Week	Cooking oil	Imported	R
OIL1P	Food	Week	Cooking oil		R/l
OINPUT1	Agricultural inputs	Annual	Other inputs		R
ONION1H	Food	Week	Onions	Home	R
ONION1O	Food	Week	Onions	Imported	R
ORNGE1O	Food	Week	Oranges	Imported	R
OTHPAY3	Credit use		Used credit for other inputs		Y/N
OTHRCS1	Agricultural inputs	Annual	Cost of other inputs		R
OTHRSUP3			Supplier other inputs		area
OTHVEG1H	Food	Week	Other vegetables	Home	R
OTHVEG1O	Food	Week	Other vegetables	Imported	R
OTRAMT3	Agricultural inputs	Annual			R
PAPER1	Nonfood	PAPER3	Newspapers		R
PARFN1O	Nonfood	PARFN3C	Paraffin		R
PBUT1O	Food	Week	Peanut butter	Imported	R
PBUT1P	Food	Week	Peanut butter		R/kg
PEAR1O	Food	Week	Pears	Imported	R
PENSIONS	Demographics		Male pensioners		No.
PERSONL2	Expenditure	Month	Personal expenditures survey 2		R
PERSONL3	Expenditure	Month	Personal expenditures survey 3		R
PETROL1	Nonfood	PETROL3	Petrol for private vehicles		R
PHONE	Demographics		Distance from a telephone		km
PHONE1	Nonfood	PHONE3	Phone rentals		R
PLASTICY	Durables	Annual	Plastic ware		R
PLOUGH1	Agricultural inputs	Annual	Cost of ploughing service		R

PLOUGHY	Durables	Annual	Ploughing/tractor service	R
PMILK10	Food	Week	Powdered milk	Imported R
PMILK1P	Food	Week	Powdered milk	R/kg
PMONEY1	Nonfood	PMONEY:Varies	Pocket money	R
PNUTS10	Food	Week	Peanuts	Imported R
POLON10	Food	Week	Processed meats	Imported R
POLON1P	Food	Week	Processed meats	R/kg
PORK10	Food	Week	Pork	Imported R
POST	Demographics		Distance from a post office	km
POSTRENT	Durables	Annual	Rental of a post box	R
POT1A	Food	Week	Potatoes	kg
POT1H	Food	Week	Potatoes	Home R
POT1L	Food	Week	Potatoes	Local R
POT10	Food	Week	Potatoes	Imported R
POT1P	Food	Week	Potatoes	R/kg
POTAMT3	Agricultural inputs	Annual	Potatoes planted	kg
POTAT3	Harvest	Season	Potato harvest	kg
POTCST3	Agricultural inputs	Annual	Cost of potatoes	R
POTPAY1	Credit use		Used credit for potatoes	Y/N
POTSALE3	Income from harvest	Season	Income from potato sales	R
POTSUP3			Supplier potatoes	area
POTWHE3			Surplus sold where potatoes	area
POUL1H	Food	Week	Poultry	Home R
POUL1L	Food	Week	Poultry	Local R
POUL10	Food	Week	Poultry	Imported R
POUL1P	Food	Week	Poultry	R/bird
POULEAT	Home Production	Annual	Poultry eaten	number
POULNO	Assets		Number of poultry	number
POULSALE	Income	Month	Income from poultry sales	R
POULTY	Durables	Annual	Poultry	R
PROFESS	Demographics		Professional people	No.
PSU	Demographics		Primary sampling unit	No.
PUMP1H	Food	Week	Pumpkin	Home R
PUMP1L	Food	Week	Pumpkin	Local R
PUMPO1	Food	Week	Pumpkin	Imported R
PURTY10	Food	Week	Baby foods	Imported R
PURTY1P	Food	Week	Baby foods	R/kg
PVTINC2	Income	Month	Private incomes survey 2	R
PVTINC3	Income	Month	Private incomes survey 3	R
RENTY	Durables	Annual	Rent	R
REPAIRSY	Durables	Annual	Home repairs	R
RICE1A	Food	Week	Rice	kg
RICE10	Food	Week	Rice	Imported R
RICE1P	Food	Week	Rice	R/kg
ROIB10	Food	Week	Herbal tea	Imported R
ROOF	Demographics		Roofing on main house	Codes
SAFELY1			Money in safekeeping at home	R
SAFEOTH			Money in safekeeping with others	R
SALT10	Food	Week	Salt	Imported R
SAVE 3	Expenditure	Month	Savings survey 2	R
SAVE2	Expenditure	Month	Savings survey 3	R
SAVED1			Money saved in month prior to survey 1	R
SCHOLARS	Demographics		Number of scholars (< 16 years)	No.
SCHOOL2	Expenditure	Month	School costs survey 2	R
SCHOOL3	Expenditure	Month	School costs survey 3	R
SCHOOLY	Durables	Annual	School fees	R
SCLOTH1	Nonfood	SCLOTH3:Varies	School clothing	R
SCLOTHEY	Durables	Annual	School clothing	R
SEMISKL	Demographics		Number of semiskilled workers	No.
SEMPLOY	Demographics		Number of self employed people	No.
SFURN1	Nonfood	SFURN3:Varies	Soft furnishing, bedding etc	R
SHEEPNO	Assets		Number of sheep	number
SHOES1	Nonfood	SHOES3:Varies	Shoes	R
SHOESY	Durables	Annual	Shoes	R
SMEIL1A	Food	Week	Stamped maize	kg
SMEIL1H	Food	Week	Stamped maize	Home R
SMEIL1L	Food	Week	Stamped maize	Local R
SMEIL10	Food	Week	Stamped maize	Imported R
SMEIL1P	Food	Week	Stamped maize	R/kg
SMILK10	Food	Week	Sterilised milk	Imported R
SMILK1P	Food	Week	Sterilised milk	R/l
SMOKE1	Nonfood	SMOKE3:Varies	Tobacco etc	R
SOUP10	Food	Week	Soup powder	Imported R

SOUP1P	Food	Week	Soup powder		R/kg
SOYA1O	Food	Week	Soya products	Imported	R
SOYA1P	Food	Week	Soya products		R/kg
SPINAC1H	Food	Week	Spinach	Home	R
SPORT1	Nonfood	SPORT3	Sport events and activities		R
SPOT1A	Food	Week	Sweet potatoes		kg
SPOT1H	Food	Week	Sweet potatoes	Home	R
SPOT1L	Food	Week	Sweet potatoes	Local	R
SPOT1O	Food	Week	Sweet potatoes	Imported	R
SPOTAMT3	Agricultural inputs	Annual	Sweet potatoes planted		kg
SPOTAT3	Harvest	Season	Sweet potato harvest		kg
SPOTCST3	Agricultural inputs	Annual	Cost of sweet potatoes planted		R
SPOTPAY3	Credit use		Used credit for sweet potatoes		Y/N
SPOTSLE3	Income from harvest	Season	Income from sweet potato sales		R
SPOTSUP3			Supplier sweet potatoes		area
SPOTWHE3			Surplus sold where sweet potatoes		area
SPRT1O	Food	Week	Spirits	Imported	R
STUDENT	Demographics		Number of students		No.
SUGAR1A	Food	Week	Sugar		kg
SUGAR1O	Food	Week	Sugar	Imported	R
SUGAR1P	Food	Week	Sugar		R/kg
SUGAR3	Harvest	Season	Sugar cane harvest		kg
SUGSALE3	Income from harvest	Season	Income from sugar sales		R
SUGWHE3			Surplus sold where sugar		area
SUPPORT1	Nonfood	SUPPORT1	Support for relatives		R
SWTS1O	Food	Week	Sweets and chocolates	Imported	R
TAXIS1	Nonfood	TAXIS3	Taxis fees		R
TEA1O	Food	Week	Tea	Imported	R
TELECRD1	Nonfood	TELECRD	Phone calls		R
TFISH1O	Food	Week	Tinned fish	Imported	R
TFISH1P	Food	Week	Tinned fish		R/kg
THATCHY	Durables	Annual	Thatching	Home	R
TIMBER3	Harvest	Season	Timber harvest		kg
TIMSALE3	Income from harvest	Season	Income from timber sales		R
TIMWHE3			Surplus sold where timber		area
TINVEG1O	Food	Week	Tinned vegetables	Imported	R
TMED1	Nonfood	TMED3	Traditional medicines		R
TOM1H	Food	Week	Tomatoes	Home	R
TOM1O	Food	Week	Tomatoes	Imported	R
TOYSY	Durables	Annual	Toys		R
TPAPER1	Nonfood	TPAPER3	Toilet paper and tissues		R
TPASTE1	Nonfood	TPASTE3	Toothpaste		R
TRADE	Demographics		Number of trade workers		No.
TRADHE1	Nonfood	TRADHE3	Traditional Healers		R
TRANSPT1	Agricultural inputs	Annual	Transport		R
TRIBALY	Durables	Annual	Tribal dues		R
TWAYS1O	Food	Week	Take away foods	Imported	R
UNEMPLOY	Demographics		Number of unemployed		No.
VAGRANT	Demographics		Number of vagrants		No.
VEG1H	Food	Week	Vegetables from home production		R
VEGIES3	Harvest	Season	Vegetable harvest		kg
VEGSALE3	Income from harvest	Season	Income from vegetable sales		R
VEGWHE3			Surplus sold where vegetables		area
VEHICLE	Durables	Annual	Vehicle purchases		R
VEHICLE2	Expenditure	Month	Vehicle costs survey 2		R
VEHICLE3	Expenditure	Month	Vehicle costs survey 3		R
WATER1	Nonfood	WATER3	Water fees		R
WATERY	Durables	Annual	Water installation		R
WEDDINGY	Durables	Annual	Weddings		R
WINE1O	Food	Week	Wine	Imported	R
WOOD1H	Nonfood	WOOD3H	Wood	Home	R
WOOD1L	Nonfood	WOOD3L	Wood	Local	R
WOOD1O	Nonfood	WOOD3O	Wood	Imported	R
WOODHY	Durables	Annual	Wood	Home	R
WOODLY	Durables	Annual	Wood	Local	R
WOODOY	Durables	Annual	Wood	Home	R
WORS1O	Food	Week	Sausages and wors	Imported	R
WPOWD1	Nonfood	WPOWD3	Washing powders		R
WTERDMY	Durables	Annual	Water drums		R
YEAST1O	Food	Week	Yeast	Imported	R

CASE	RANDNO	AMADH	AMADL	AMADO	APPLEO	BAKEO	BANH	BANO	BCEARO	BEEFO	BEERH	BEERL	BEERO	BMLKO	BREADH
1	1013	0.00	0.00	0.00	0.00	24.00	0.00	0.00	0.00	288.00	0.00	0.00	0.00	0.00	270.00
2	1019	0.00	0.00	0.00	48.00	0.00	0.00	0.00	0.00	420.00	300.00	0.00	877.20	0.00	33.12
3	1021	120.00	0.00	24.00	60.00	71.64	0.00	0.00	0.00	120.00	0.00	0.00	36.00	0.00	33.12
4	1038	10.67	0.00	0.00	240.00	150.24	0.00	0.00	0.00	1120.00	0.00	0.00	0.00	0.00	44.16
5	1047	0.00	0.00	0.00	576.00	0.00	0.00	0.00	0.00	640.00	0.00	0.00	0.00	0.00	179.68
6	1068	266.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	640.00	400.00	0.00	64.00	0.00	202.48
7	1085	0.00	0.00	0.00	95.84	0.00	0.00	0.00	0.00	1024.00	0.00	0.00	1601.60	0.00	134.08
8	1099	120.00	0.00	0.00	120.00	0.00	0.00	120.00	216.00	702.00	1950.00	0.00	0.00	840.00	439.20
9	1113	0.00	0.00	0.00	384.00	101.64	0.00	144.00	0.00	680.00	1200.00	0.00	288.00	450.00	152.46
10	1130	0.00	0.00	0.00	0.00	61.92	0.00	0.00	0.00	741.00	750.00	0.00	486.00	0.00	33.12
11	1165	0.00	0.00	24.00	48.00	0.00	0.00	0.00	0.00	120.00	0.00	0.00	0.00	0.00	235.44
12	1167	0.00	0.00	0.00	96.00	0.00	0.00	0.00	0.00	412.48	0.00	0.00	0.00	0.00	0.00
13	1170	106.67	0.00	0.00	64.00	0.00	0.00	0.00	960.00	2240.00	0.00	0.00	240.00	0.00	134.88
14	1175	0.00	160.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	192.00	0.00	178.24
15	1181	0.00	0.00	0.00	0.00	32.04	0.00	0.00	1367.88	0.00	0.00	0.00	0.00	659.88	252.90
16	1182	0.00	0.00	0.00	24.00	59.88	0.00	0.00	71.88	1044.00	0.00	0.00	0.00	174.00	66.24
17	1196	0.00	100.00	0.00	48.00	0.00	0.00	0.00	0.00	1140.00	0.00	0.00	0.00	0.00	200.52
18	1202	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	400.00	0.00	0.00	560.00	0.00	312.32
19	1203	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	1206	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	384.00	400.00	0.00	0.00	0.00	0.00
21	1211	0.00	0.00	0.00	480.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	192.00	0.00	0.00
22	1212	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	135.20
23	1215	53.33	0.00	0.00	64.00	22.08	0.00	0.00	78.24	0.00	0.00	0.00	0.00	1088.00	89.92
24	1216	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1983.36	2000.00	144.00	1024.00	0.00	134.88
25	1229	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
26	1230	0.00	0.00	0.00	192.00	103.20	0.00	0.00	0.00	382.40	400.00	0.00	0.00	0.00	88.32
27	2247	0.00	0.00	0.00	80.00	110.24	0.00	80.00	463.84	640.00	0.00	0.00	0.00	0.00	44.16
28	2254	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	335.84	0.00	0.00	0.00	0.00	0.00
29	2270	0.00	0.00	0.00	0.00	82.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	89.92
30	2276	0.00	0.00	0.00	335.84	0.00	0.00	320.00	0.00	3072.00	800.00	0.00	504.00	0.00	310.72
31	2280	0.00	0.00	0.00	64.00	0.00	0.00	192.00	192.00	320.00	0.00	0.00	0.00	1152.00	0.00
32	2302	0.00	0.00	0.00	128.00	20.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	89.92
33	2304	0.00	0.00	0.00	186.42	46.44	0.00	0.00	0.00	360.00	1500.00	0.00	0.00	144.00	491.22
34	2314	0.00	0.00	0.00	48.00	9.60	0.00	24.00	0.00	72.00	0.00	0.00	0.00	0.00	99.36
35	2317	0.00	0.00	0.00	0.00	80.00	0.00	64.00	0.00	96.00	400.00	0.00	760.00	0.00	0.00
36	2337	0.00	0.00	0.00	0.00	28.80	0.00	0.00	0.00	0.00	300.00	0.00	108.00	0.00	83.70
37	2339	0.00	0.00	0.00	96.00	0.00	0.00	64.00	600.00	240.00	0.00	0.00	0.00	2585.60	44.16
38	2344	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	360.00	0.00	0.00
39	2346	0.00	0.00	0.00	36.00	0.00	0.00	24.00	0.00	180.00	0.00	0.00	0.00	0.00	0.00
40	2367	0.00	0.00	0.00	70.40	9.60	0.00	64.00	0.00	0.00	0.00	0.00	0.00	0.00	178.24
41	2382	0.00	0.00	0.00	160.00	0.00	0.00	32.00	0.00	240.00	0.00	0.00	80.00	272.00	132.48
42	2384	0.00	120.00	0.00	48.00	0.00	0.00	48.00	0.00	0.00	0.00	0.00	162.00	0.00	0.00
43	2387	0.00	160.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00
44	2393	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
45	2401	0.00	0.00	0.00	32.00	0.00	0.00	32.00	0.00	736.00	0.00	0.00	0.00	0.00	44.16
46	2423	0.00	0.00	150.00	0.00	12.00	0.00	0.00	0.00	335.82	0.00	0.00	0.00	0.00	168.60
47	2424	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
48	2426	0.00	0.00	0.00	64.00	0.00	0.00	64.00	0.00	0.00	800.00	0.00	0.00	0.00	88.32
49	2432	0.00	0.00	0.00	240.00	0.00	0.00	240.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
50	2435	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
51	2436	0.00	0.00	0.00	48.00	0.00	0.00	24.00	0.00	120.00	0.00	0.00	0.00	0.00	101.16
52	3003	0.00	0.00	0.00	96.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
53	3023	100.00	0.00	0.00	0.00	94.80	0.00	0.00	0.00	780.00	0.00	0.00	0.00	0.00	0.00
54	3029	0.00	0.00	0.00	168.00	0.00	0.00	96.00	0.00	1025.82	0.00	0.00	0.00	0.00	0.00
55	3056	0.00	0.00	0.00	48.00	0.00	0.00	0.00	0.00	413.88	60.00	0.00	0.00	0.00	0.00
56	3059	0.00	0.00	0.00	0.00	0.00	0.00	0.00	233.82	0.00	600.00	0.00	0.00	125.88	0.00
57	3080	170.00	0.00	0.00	0.00	22.80	0.00	0.00	0.00	600.00	1050.00	0.00	639.00	0.00	0.00
58	3102	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00
59	3104	266.67	0.00	0.00	0.00	118.40	0.00	0.00	0.00	800.00	400.00	0.00	0.00	0.00	0.00
60	3142	133.33	0.00	0.00	0.00	96.00	0.00	0.00	0.00	800.00	400.00	0.00	252.80	0.00	0.00
61	3143	0.00	0.00	0.00	96.00	0.00	0.00	64.00	0.00	320.00	0.00	0.00	0.00	0.00	0.00
62	3219	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	600.00	600.00	0.00	0.00	0.00	0.00
63	3241	293.33	0.00	0.00	0.00	44.80	0.00	0.00	0.00	1040.00	0.00	0.00	0.00	0.00	0.00
64	3245	26.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	80.00	0.00	0.00	568.00	0.00	0.00
65	3247	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	568.00	0.00	0.00
66	3250	66.67	0.00	0.00	32.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	144.00	0.00	0.00
67	3328	400.00	0.00	0.00	24.00	10.80	0.00	0.00	0.00	1260.00	300.00	0.00	144.00	0.00	0.00
68	3331	266.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	640.00	0.00	0.00	0.00	0.00	0.00
69	3336	320.00	0.00	0.00	0.00	18.00	0.00	0.00	0.00	1320.00	0.00	0.00	0.00	0.00	0.00
70	3360	26.67	0.00	0.00	0.00	31.84	0.00	0.00	0.00	1120.00	400.00	0.00	64.00	0.00	0.00
71	3383	186.67	133.33	0.00	0.00	16.00	0.00	0.00	136.00	1232.00	160.00	0.00	464.00	0.00	0.00
72	3398	0.00	266.67	0.00	64.00	79.84	0.00	0.00	0.00	320.00	0.00	0.00	0.00	0.00	0.00
73	3454	0.00	0.00	0.00	0.00	0.00	0.00	0.00	112.00	480.00	0.00	0.00	592.00	0.00	0.00
74	3458	53.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00
75	3476	0.00	133.33	0.00	0.00	0.00	0.00	32.00	79.84	0.00	0.00	0.00	64.00	0.00	0.00
76	3501	30.00	0.00	0.00	24.00	0.00	0.00	0.00	0.00	563.82	0.00	0.00	0.00	0.00	0.00
77	3510	300.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00
78	3530	100.00	150.00	0.00	36.00	0.00	0.00	24.00	0.00	804.00	0.00	0.00	1062.00	0.00	0.00
79	3549	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1950.00	0.00	0.00	0.00	0.00
80															

BREADL	BREADO	CABH	CABL	CABO	CAKESH	CAKESL	CAKESO	CARRTO	CEREALS	CHEESE	CHIPS	COFFEE	CON	DBEANH	DBEANL
0.00	614.40	0.00	0.00	336.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	192.00	132.00	0.00	0.00
0.00	798.00	0.00	0.00	324.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	95.88	202.02	0.00	0.00
0.00	444.00	0.00	0.00	228.00	0.00	0.00	35.88	0.00	0.00	0.00	0.00	51.48	167.88	0.00	0.00
0.00	1177.60	0.00	0.00	256.00	112.00	0.00	0.00	96.00	0.00	0.00	336.00	276.64	1169.92	0.00	0.00
0.00	991.20	0.00	0.00	239.84	0.00	0.00	288.00	0.00	0.00	0.00	409.60	0.00	268.16	0.00	0.00
0.00	1115.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	64.00	0.00	0.00
0.00	1203.20	0.00	0.00	280.00	0.00	0.00	128.00	0.00	0.00	0.00	0.00	428.48	357.92	0.00	0.00
0.00	1619.40	138.96	0.00	72.00	0.00	0.00	156.00	0.00	83.76	0.00	156.00	336.00	438.60	0.00	0.00
0.00	705.00	0.00	0.00	431.82	0.00	0.00	53.82	0.00	0.00	0.00	0.00	269.70	551.52	0.00	0.00
0.00	529.80	0.00	0.00	252.00	84.00	0.00	0.00	0.00	0.00	0.00	0.00	72.00	102.60	0.00	0.00
0.00	382.80	0.00	0.00	36.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	120.30	0.00	0.00
0.00	451.20	0.00	0.00	32.00	0.00	0.00	47.84	0.00	0.00	0.00	0.00	0.00	185.92	0.00	0.00
0.00	2041.60	0.00	0.00	240.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	215.84	0.00	0.00
0.00	280.80	0.00	0.00	255.84	0.00	0.00	47.84	0.00	0.00	0.00	0.00	0.00	375.68	0.00	0.00
0.00	957.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	432.00	0.00	0.00	378.12	233.94	0.00	0.00
0.00	1257.60	0.00	0.00	36.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	155.88	391.56	0.00	0.00
0.00	892.20	0.00	0.00	165.60	0.00	0.00	503.88	0.00	35.88	0.00	0.00	0.00	434.10	0.00	300.00
0.00	841.60	0.00	0.00	160.00	0.00	0.00	0.00	95.84	0.00	128.00	52.00	0.00	80.00	0.00	0.00
0.00	644.00	0.00	0.00	48.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	68.64	94.24	0.00	0.00
0.00	185.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	144.00	0.00	0.00
0.00	415.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	256.00	0.00	0.00	0.00	0.00	0.00
0.00	891.20	0.00	0.00	160.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	105.28	0.00	0.00
0.00	313.60	0.00	0.00	40.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	32.00	0.00	0.00
0.00	265.60	0.00	0.00	80.00	0.00	0.00	80.00	0.00	0.00	0.00	0.00	112.00	188.00	0.00	0.00
-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
0.00	1264.00	0.00	0.00	347.20	0.00	0.00	295.68	0.00	0.00	0.00	0.00	257.12	269.92	16.00	0.00
0.00	547.20	0.00	0.00	232.00	0.00	0.00	256.00	0.00	68.64	0.00	0.00	575.84	253.92	0.00	0.00
0.00	89.60	0.00	0.00	0.00	0.00	0.00	175.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	636.80	0.00	0.00	144.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	128.00	179.04	8.00	0.00
0.00	497.60	0.00	0.00	0.00	0.00	0.00	79.20	0.00	0.00	0.00	480.00	74.40	1640.00	0.00	0.00
0.00	1090.24	0.00	0.00	464.00	0.00	0.00	40.00	0.00	0.00	0.00	16.00	142.40	669.92	8.00	0.00
0.00	859.20	0.00	0.00	208.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	318.40	156.48	16.00	0.00
0.00	352.80	0.00	0.00	591.84	0.00	132.00	275.82	0.00	0.00	0.00	0.00	103.08	278.34	0.00	0.00
0.00	966.30	0.00	0.00	81.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	60.00	186.60	0.00	0.00
0.00	692.80	0.00	0.00	80.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	29.60	152.00	0.00	0.00
0.00	263.70	0.00	0.00	30.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	27.84	0.00	0.00
0.00	1113.60	0.00	0.00	80.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	127.84	0.00	0.00
0.00	610.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	96.00	0.00	0.00
0.00	768.00	0.00	0.00	0.00	48.00	0.00	0.00	70.80	0.00	0.00	72.00	0.00	57.48	0.00	0.00
0.00	976.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	79.20	173.44	0.00	0.00
0.00	580.16	0.00	0.00	223.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	38.40	167.84	0.00	0.00
0.00	208.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	142.80	0.00	0.00
0.00	497.60	0.00	0.00	104.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	176.00	0.00	0.00
0.00	691.20	0.00	0.00	48.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	84.64	105.44	0.00	0.00
0.00	1067.20	0.00	0.00	48.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	349.80	0.00	0.00	132.00	0.00	0.00	0.00	0.00	0.00	0.00	10.80	0.00	73.86	0.00	0.00
0.00	371.20	0.00	0.00	40.00	0.00	0.00	0.00	0.00	0.00	0.00	38.40	0.00	126.24	0.00	0.00
0.00	744.00	0.00	0.00	120.00	0.00	0.00	0.00	0.00	0.00	0.00	16.00	0.00	149.92	0.00	0.00
0.00	348.00	0.00	0.00	144.00	0.00	0.00	0.00	0.00	0.00	0.00	324.00	0.00	736.68	0.00	0.00
0.00	713.40	0.00	0.00	45.00	0.00	33.60	67.20	0.00	0.00	0.00	0.00	0.00	580.62	0.00	0.00
0.00	417.60	0.00	0.00	309.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	117.48	0.00	0.00
0.00	567.00	0.00	54.00	7.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	105.48	0.00	0.00
0.00	907.20	0.00	27.00	24.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	264.00	0.00	0.00
0.00	1105.86	0.00	45.00	9.00	0.00	0.00	0.00	27.00	0.00	0.00	0.00	0.00	95.76	36.00	0.00
0.00	506.40	56.70	0.00	45.00	0.00	0.00	0.00	0.00	0.00	0.00	51.00	0.00	151.62	0.00	0.00
0.00	80.40	0.00	0.00	132.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	202.86	0.00	0.00
0.00	1512.00	0.00	0.00	204.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	350.04	60.00	0.00
0.00	851.20	0.00	0.00	40.00	0.00	0.00	0.00	0.00	0.00	0.00	271.84	0.00	48.00	0.00	0.00
0.00	732.80	0.00	0.00	224.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	168.00	800.00	0.00
0.00	172.80	0.00	0.00	96.00	95.84	0.00	0.00	0.00	0.00	608.00	0.00	0.00	432.00	0.00	0.00
0.00	521.60	0.00	0.00	280.00	175.84	0.00	0.00	0.00	0.00	0.00	184.00	0.00	480.32	0.00	0.00
0.00	333.90	0.00	18.00	45.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	72.00	0.00	0.00
0.00	907.20	0.00	0.00	288.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	264.00	80.00	0.00
0.00	1305.60	0.00	0.00	152.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	59.84	0.00	0.00
0.00	599.20	0.00	0.00	32.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	112.00	0.00	0.00
0.00	283.20	0.00	0.00	160.00	0.00	0.00	0.00	0.00	0.00	0.00	24.00	0.00	28.64	80.00	0.00
0.00	1146.60	0.00	0.00	348.00	0.00	0.00	36.00	0.00	0.00	0.00	0.00	72.00	294.00	1922.40	0.00
0.00	508.00	0.00	24.00	32.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	144.00	0.00	0.00
0.00	469.80	26.06	0.00	8.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	81.00	517.50	0.00
0.00	511.20	0.00	0.00	64.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	159.84	80.00	0.00
0.00	734.40	0.00	0.00	383.36	0.00	0.00	31.84	0.00	0.00	0.00	0.00	0.00	152.00	80.00	0.00
0.00	1030.40	0.00	0.00	160.00	0.00	0.00	0.00	0.00	0.00	0.00	64.00	0.00	225.12	0.00	320.00
0.00	480.00	0.00	84.00	60.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	80.00	0.00	0.00
0.00	599.20	0.00	30.00	28.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	40.00	0.00	0.00
0.00	907.20	0.00	0.00	128.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	256.00	80.00	0.00
0.00	1260.00	0.00	0.00	93.00	0.00	0.00	0.00	0.00	0.00	0.00	120.00	0.00	485.70	9.00	0.00
0.00	372.60	28.35	0.00	6.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	180.00	180.00	0.00
0.00	424.80	0.00	0.00	132.00	0.00	0.00	0.00	0.							

MARGO	MILKL	MILKO	MMEALH	MMEALL	MMEALO	MQOMBH	MQOMBL	MUTTO	OFFALO	OILO	ONIONH	ONIONO	ORNGEO	OVEGH	OVEGO
96.00	0.00	63.60	0.00	0.00	864.00	0.00	0.00	0.00	0.00	646.80	0.00	0.00	0.00	0.00	0.00
58.20	0.00	63.00	0.00	0.00	2604.00	600.00	0.00	0.00	0.00	479.82	0.00	108.00	64.00	0.00	0.00
48.00	0.00	0.00	0.00	75.00	665.82	0.00	0.00	0.00	0.00	137.16	0.00	0.00	131.88	0.00	0.00
406.08	0.00	616.00	0.00	0.00	1311.88	0.00	0.00	0.00	80.00	751.84	0.00	128.00	106.67	0.00	128.00
147.20	0.00	0.00	0.00	0.00	1312.00	0.00	0.00	0.00	0.00	336.00	0.00	0.00	106.67	0.00	0.00
208.00	0.00	126.40	0.00	0.00	608.00	1600.00	0.00	0.00	0.00	640.00	0.00	0.00	0.00	0.00	0.00
172.32	0.00	0.00	0.00	0.00	1151.84	0.00	0.00	0.00	0.00	535.84	0.00	0.00	181.23	0.00	0.00
264.00	0.00	0.00	0.00	0.00	1758.00	1500.00	0.00	0.00	0.00	960.00	0.00	0.00	200.00	0.00	0.00
140.70	0.00	48.60	0.00	0.00	701.82	0.00	0.00	0.00	0.00	712.02	0.00	144.00	256.00	0.00	0.00
59.88	0.00	45.00	0.00	0.00	1140.00	2400.00	0.00	0.00	0.00	924.00	0.00	0.00	0.00	0.00	0.00
67.08	0.00	105.48	0.00	0.00	1199.88	0.00	0.00	0.00	0.00	407.88	0.00	0.00	0.00	0.00	0.00
31.84	0.00	0.00	0.00	0.00	927.52	0.00	0.00	0.00	0.00	743.68	0.00	0.00	0.00	0.00	0.00
128.00	0.00	434.40	0.00	0.00	2864.00	1600.00	0.00	0.00	0.00	911.84	0.00	0.00	64.00	0.00	0.00
55.84	0.00	0.00	0.00	0.00	1213.92	3200.00	0.00	0.00	480.00	511.36	0.00	0.00	64.00	0.00	0.00
210.12	0.00	0.00	0.00	0.00	725.82	0.00	0.00	0.00	216.00	701.82	0.00	0.00	0.00	0.00	0.00
289.08	0.00	97.20	0.00	0.00	689.82	0.00	0.00	0.00	0.00	527.88	0.00	0.00	16.00	0.00	0.00
59.76	0.00	97.20	0.00	0.00	851.88	0.00	0.00	0.00	0.00	321.60	0.00	71.88	32.00	0.00	0.00
162.40	0.00	217.60	0.00	0.00	0.00	1200.00	0.00	0.00	0.00	559.84	0.00	192.00	0.00	0.00	0.00
107.04	0.00	0.00	0.00	0.00	303.84	0.00	0.00	0.00	0.00	131.84	0.00	32.00	0.00	0.00	0.00
100.80	0.00	56.00	0.00	0.00	352.00	0.00	0.00	0.00	0.00	284.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	43.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	256.00	0.00	0.00
163.04	0.00	400.00	0.00	0.00	616.00	0.00	0.00	0.00	384.00	783.52	0.00	0.00	0.00	0.00	0.00
0.00	0.00	43.20	0.00	0.00	950.88	0.00	0.00	0.00	0.00	447.84	0.00	0.00	0.00	0.00	0.00
83.20	0.00	0.00	0.00	0.00	784.00	0.00	0.00	0.00	208.00	496.00	0.00	0.00	0.00	0.00	0.00
-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-0.67	-1.00	-1.00
257.12	0.00	237.60	0.00	0.00	568.00	0.00	0.00	0.00	0.00	660.48	0.00	160.00	85.33	0.00	0.00
164.48	0.00	411.20	0.00	0.00	599.20	0.00	0.00	0.00	0.00	804.64	64.00	32.00	53.33	0.00	0.00
156.48	0.00	0.00	0.00	0.00	751.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	74.67	0.00	0.00
152.00	0.00	0.00	0.00	0.00	1664.00	0.00	0.00	0.00	0.00	688.00	0.00	64.00	0.00	400.00	0.00
527.52	0.00	0.00	0.00	0.00	1327.84	2800.00	0.00	0.00	0.00	943.68	0.00	400.00	53.33	0.00	0.00
254.24	0.00	160.00	0.00	0.00	756.64	0.00	0.00	0.00	0.00	63.84	0.00	0.00	213.33	0.00	102.40
168.72	0.00	0.00	0.00	0.00	469.60	0.00	0.00	0.00	0.00	1101.60	0.00	32.00	256.00	0.00	0.00
152.70	0.00	48.96	0.00	0.00	2303.64	0.00	0.00	0.00	0.00	639.24	0.00	386.82	219.88	0.00	0.00
123.60	0.00	75.60	0.00	0.00	588.00	0.00	0.00	0.00	0.00	624.00	0.00	36.00	87.92	0.00	0.00
96.00	0.00	0.00	0.00	0.00	880.00	3200.00	0.00	0.00	0.00	688.00	0.00	0.00	0.00	0.00	0.00
30.00	0.00	54.00	0.00	0.00	627.60	360.00	0.00	0.00	0.00	358.20	0.00	0.00	0.00	0.00	0.00
72.00	0.00	0.00	0.00	0.00	640.00	0.00	0.00	0.00	0.00	407.84	0.00	32.00	128.00	0.00	0.00
131.20	0.00	0.00	0.00	0.00	560.00	1600.00	0.00	0.00	0.00	896.00	0.00	0.00	0.00	0.00	0.00
72.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	48.00	16.00	0.00	0.00
104.00	0.00	0.00	0.00	0.00	768.00	0.00	0.00	0.00	0.00	832.00	0.00	0.00	106.67	0.00	0.00
143.68	0.00	431.68	0.00	0.00	937.60	0.00	0.00	0.00	0.00	811.04	0.00	0.00	106.67	0.00	0.00
48.00	0.00	54.00	0.00	0.00	228.00	450.00	0.00	0.00	0.00	263.88	0.00	0.00	32.00	0.00	0.00
128.00	0.00	54.40	0.00	0.00	1024.00	0.00	0.00	0.00	0.00	832.00	0.00	0.00	0.00	0.00	0.00
68.84	0.00	0.00	0.00	0.00	607.68	0.00	0.00	0.00	0.00	404.80	0.00	0.00	0.00	0.00	0.00
194.08	0.00	86.40	0.00	0.00	350.24	0.00	0.00	0.00	0.00	150.40	0.00	0.00	21.33	0.00	0.00
84.00	0.00	0.00	0.00	0.00	719.70	1350.00	0.00	0.00	0.00	371.88	0.00	0.00	24.00	0.00	0.00
111.84	0.00	43.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	44.00	0.00	96.00	0.00	0.00	0.00
158.08	0.00	0.00	0.00	0.00	735.52	800.00	0.00	0.00	0.00	959.68	0.00	0.00	42.67	0.00	0.00
107.88	0.00	258.00	0.00	0.00	1127.64	0.00	0.00	0.00	0.00	300.00	0.00	131.88	160.00	0.00	0.00
54.00	0.00	0.00	0.00	0.00	576.00	0.00	0.00	0.00	0.00	340.50	0.00	0.00	128.00	0.00	0.00
45.00	0.00	0.00	0.00	0.00	719.88	0.00	0.00	0.00	0.00	983.40	0.00	0.00	32.00	0.00	0.00
0.00	0.00	58.80	0.00	0.00	485.52	0.00	0.00	312.00	0.00	557.82	0.00	0.00	0.00	0.00	0.00
219.00	0.00	161.82	0.00	0.00	1932.00	0.00	0.00	60.00	0.00	414.00	0.00	0.00	48.00	0.00	0.00
431.82	0.00	562.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	64.62	0.00	0.00	0.00	0.00	27.00
0.00	0.00	0.00	0.00	0.00	2400.00	0.00	0.00	0.00	0.00	500.40	0.00	0.00	0.00	0.00	0.00
81.00	0.00	0.00	0.00	0.00	549.00	0.00	0.00	0.00	0.00	627.84	0.00	0.00	0.00	0.00	0.00
110.88	0.00	0.00	0.00	0.00	1770.00	600.00	405.00	0.00	0.00	690.00	0.00	0.00	0.00	0.00	0.00
41.44	0.00	483.20	0.00	0.00	1184.00	800.00	0.00	0.00	0.00	543.84	0.00	0.00	0.00	0.00	0.00
240.00	0.00	0.00	0.00	0.00	1520.00	1200.00	0.00	0.00	0.00	1168.00	0.00	0.00	0.00	0.00	0.00
240.00	0.00	0.00	0.00	0.00	928.00	2800.00	0.00	0.00	0.00	912.00	0.00	0.00	21.33	0.00	0.00
183.20	0.00	0.00	0.00	0.00	1872.00	0.00	0.00	0.00	0.00	592.00	0.00	0.00	21.33	0.00	0.00
0.00	59.88	0.00	0.00	0.00	882.00	2100.00	0.00	0.00	0.00	447.18	0.00	0.00	0.00	0.00	0.00
175.84	0.00	230.40	0.00	0.00	1664.00	0.00	240.00	0.00	0.00	224.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	639.84	0.00	0.00	0.00	0.00	420.80	0.00	0.00	0.00	0.00	0.00
72.00	0.00	0.00	0.00	0.00	2000.00	2000.00	0.00	0.00	0.00	1023.84	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	608.00	0.00	0.00	0.00	0.00	479.84	0.00	0.00	21.33	0.00	0.00
170.40	0.00	0.00	0.00	0.00	2106.00	3000.00	270.00	0.00	0.00	612.00	0.00	0.00	0.00	0.00	0.00
56.00	0.00	0.00	0.00	0.00	2000.00	0.00	0.00	0.00	0.00	199.84	0.00	0.00	0.00	0.00	0.00
47.88	0.00	0.00	0.00	0.00	690.00	0.00	0.00	0.00	0.00	504.00	0.00	0.00	0.00	0.00	0.00
63.84	0.00	0.00	0.00	0.00	1631.84	2400.00	0.00	0.00	0.00	872.00	0.00	0.00	0.00	0.00	0.00
168.00	0.00	0.00	0.00	0.00	3296.00	800.00	480.00	0.00	0.00	1200.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	3343.84	0.00	0.00	0.00	0.00	623.68	0.00	0.00	58.67	0.00	0.00
0.00	0.00	0.00	0.00	0.00	2735.20	800.00	0.00	0.00	0.00	624.00	0.00	0.00	0.00	0.00	0.00
48.00	0.00	0.00	0.00	0.00	1488.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
208.00	0.00	0.00	0.00	0.00	1792.00	0.00	0.00	0.00	0.00	1040.00	0.00	0.00	0.00	0.00	0.00
42.96	0.00	0.00	0.00	0.00	1427.52	0.00	0.00	0.00	0.00	642.30	0.00	0.00	167.88	0.00	0.00
124.20	0.00	0.00	0.00	0.00	3504.00	0.00	0.00	0.00	0.00	714.00	0.00	0.00	0.00		

PBUTO	PEAR0	PMILKO	PNUTSO	OLONO	PORKO	POTH	POTL	POTO	POULH	POULL	POULO	PUMPH	PUMPL	PUMPO	PURTY
0.00	0.00	288.00	0.00	0.00	0.00	0.00	0.00	384.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	341.82	0.00	0.00	192.00	0.00	0.00	593.82	0.00	0.00	600.00	0.00	0.00	48.00	0.00
0.00	0.00	312.12	0.00	96.00	0.00	0.00	0.00	264.00	0.00	0.00	336.00	54.00	0.00	54.00	0.00
0.00	0.00	335.84	0.00	207.84	0.00	0.00	0.00	671.36	0.00	0.00	2447.36	24.00	0.00	24.00	0.00
0.00	0.00	399.84	0.00	0.00	0.00	0.00	0.00	560.00	0.00	0.00	840.00	24.00	0.00	0.00	0.00
0.00	0.00	160.00	0.00	0.00	0.00	0.00	0.00	400.00	0.00	0.00	320.00	0.00	0.00	0.00	0.00
110.24	0.00	335.84	0.00	103.84	0.00	0.00	0.00	511.68	0.00	0.00	1024.00	0.00	0.00	0.00	0.00
0.00	0.00	594.00	0.00	60.00	0.00	0.00	0.00	510.00	0.00	0.00	804.00	0.00	0.00	0.00	0.00
71.88	0.00	305.82	0.00	0.00	0.00	0.00	0.00	683.82	0.00	0.00	1200.00	36.00	0.00	36.00	0.00
0.00	0.00	144.00	0.00	0.00	0.00	0.00	0.00	510.00	0.00	0.00	480.00	54.00	0.00	54.00	0.00
0.00	0.00	75.48	0.00	0.00	0.00	0.00	0.00	540.00	0.00	0.00	240.00	0.00	0.00	0.00	0.00
0.00	64.00	543.84	0.00	102.40	0.00	0.00	0.00	543.68	0.00	0.00	960.00	0.00	0.00	0.00	0.00
159.84	0.00	208.00	0.00	80.00	0.00	0.00	0.00	800.00	0.00	0.00	1280.00	0.00	0.00	0.00	800.00
0.00	0.00	332.64	0.00	96.00	0.00	0.00	0.00	352.00	0.00	0.00	832.00	0.00	0.00	0.00	0.00
0.00	0.00	161.82	0.00	0.00	0.00	0.00	0.00	246.00	0.00	0.00	0.00	0.00	0.00	0.00	179.28
0.00	0.00	377.40	0.00	0.00	0.00	0.00	0.00	335.88	0.00	0.00	480.00	0.00	0.00	0.00	0.00
0.00	0.00	371.88	0.00	0.00	0.00	0.00	0.00	263.88	0.00	0.00	480.00	0.00	0.00	0.00	0.00
0.00	0.00	176.00	0.00	0.00	0.00	0.00	0.00	368.00	0.00	0.00	944.00	0.00	0.00	0.00	0.00
0.00	0.00	183.84	0.00	115.20	0.00	0.00	0.00	96.00	0.00	0.00	70.40	0.00	0.00	0.00	0.00
0.00	0.00	479.84	0.00	0.00	0.00	0.00	0.00	560.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	127.84	0.00	0.00	0.00	783.84	0.00	0.00	768.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	320.00	0.00	0.00	320.00	0.00	0.00	0.00	0.00
0.00	0.00	207.84	0.00	0.00	0.00	0.00	0.00	640.00	0.00	0.00	480.00	0.00	0.00	0.00	0.00
-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
0.00	0.00	95.68	0.00	64.00	0.00	0.00	0.00	495.84	0.00	0.00	960.00	120.00	0.00	120.00	0.00
143.84	80.00	0.00	0.00	288.00	0.00	0.00	0.00	400.00	0.00	0.00	544.00	72.00	0.00	72.00	0.00
0.00	0.00	0.00	0.00	256.00	0.00	0.00	0.00	176.00	0.00	0.00	396.80	0.00	0.00	0.00	0.00
0.00	0.00	175.84	0.00	0.00	0.00	0.00	0.00	640.00	316.00	0.00	320.00	0.00	0.00	0.00	0.00
180.48	0.00	569.28	0.00	160.00	0.00	0.00	0.00	1296.00	0.00	0.00	584.00	0.00	0.00	0.00	0.00
0.00	0.00	455.84	0.00	142.40	0.00	0.00	0.00	767.84	0.00	0.00	640.00	12.00	0.00	12.00	0.00
0.00	0.00	242.24	0.00	0.00	160.00	0.00	0.00	483.84	0.00	0.00	320.00	0.00	0.00	0.00	0.00
0.00	0.00	390.24	0.00	0.00	0.00	0.00	0.00	713.82	0.00	0.00	840.00	0.00	0.00	108.00	0.00
72.00	0.00	272.40	0.00	0.00	0.00	0.00	0.00	516.00	0.00	0.00	216.00	0.00	0.00	0.00	0.00
0.00	0.00	220.80	0.00	0.00	0.00	0.00	0.00	464.00	0.00	0.00	608.00	0.00	0.00	0.00	0.00
0.00	0.00	241.20	0.00	0.00	0.00	0.00	0.00	216.00	0.00	0.00	216.00	0.00	0.00	0.00	0.00
0.00	0.00	56.00	0.00	0.00	0.00	0.00	0.00	240.00	0.00	0.00	364.48	0.00	0.00	0.00	280.00
0.00	0.00	352.00	0.00	0.00	0.00	0.00	0.00	304.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	168.00	161.82	0.00	36.90	0.00	0.00	0.00	252.00	0.00	0.00	227.88	0.00	0.00	0.00	0.00
0.00	0.00	528.00	0.00	0.00	0.00	0.00	0.00	480.00	0.00	0.00	672.00	0.00	0.00	0.00	0.00
0.00	0.00	160.00	0.00	0.00	0.00	0.00	0.00	383.84	0.00	0.00	320.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	156.00	362.52	0.00	216.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	726.40	0.00	320.00	320.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	559.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	387.20	0.00	0.00	0.00	160.00	0.00	0.00	320.00	0.00	0.00	0.00	0.00
0.00	36.00	305.70	0.00	0.00	0.00	0.00	0.00	264.00	0.00	0.00	498.48	0.00	0.00	0.00	0.00
0.00	0.00	233.44	0.00	0.00	0.00	0.00	0.00	384.00	0.00	0.00	384.00	0.00	0.00	0.00	0.00
0.00	0.00	252.48	0.00	46.40	0.00	0.00	0.00	623.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	143.88	0.00	0.00	0.00	0.00	0.00	119.88	0.00	0.00	432.00	0.00	0.00	0.00	0.00
0.00	0.00	523.86	0.00	36.00	0.00	0.00	0.00	204.00	0.00	0.00	360.00	0.00	0.00	0.00	0.00
0.00	0.00	443.88	0.00	0.00	0.00	0.00	0.00	496.80	0.00	0.00	671.88	0.00	0.00	0.00	0.00
0.00	0.00	215.82	0.00	0.00	0.00	0.00	0.00	120.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
210.00	0.00	315.42	0.00	83.88	0.00	0.00	0.00	540.00	0.00	0.00	2088.00	0.00	0.00	0.00	0.00
119.70	108.00	648.00	0.00	0.00	0.00	45.00	0.00	45.00	0.00	0.00	372.96	0.00	0.00	0.00	0.00
0.00	0.00	252.00	0.00	0.00	0.00	0.00	0.00	300.00	0.00	0.00	414.00	0.00	0.00	0.00	0.00
0.00	0.00	143.88	0.00	0.00	0.00	0.00	0.00	461.40	0.00	0.00	288.00	0.00	0.00	0.00	0.00
84.00	0.00	226.20	0.00	0.00	0.00	0.00	0.00	450.00	0.00	0.00	654.00	0.00	0.00	0.00	645.84
68.64	0.00	0.00	0.00	0.00	0.00	0.00	200.00	367.84	0.00	0.00	2304.00	0.00	0.00	0.00	0.00
0.00	0.00	527.84	0.00	0.00	0.00	0.00	0.00	720.00	0.00	0.00	720.00	0.00	0.00	0.00	0.00
351.84	0.00	479.68	0.00	223.84	0.00	0.00	0.00	720.00	0.00	0.00	752.00	0.00	0.00	0.00	0.00
0.00	0.00	575.84	0.00	0.00	0.00	0.00	0.00	512.00	0.00	0.00	1104.00	0.00	0.00	0.00	0.00
53.88	0.00	215.82	0.00	0.00	0.00	0.00	0.00	359.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00
256.00	0.00	208.00	0.00	0.00	0.00	0.00	0.00	720.00	644.48	0.00	1360.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	464.00	0.00	0.00	368.00	0.00	0.00	0.00	0.00
0.00	0.00	399.68	0.00	0.00	0.00	0.00	0.00	399.84	0.00	0.00	1072.00	0.00	0.00	0.00	0.00
0.00	0.00	399.84	0.00	0.00	0.00	0.00	0.00	560.00	0.00	0.00	0.00	12.00	0.00	12.00	0.00
52.80	0.00	498.00	0.00	0.00	0.00	0.00	0.00	1146.00	0.00	0.00	1080.00	0.00	0.00	0.00	0.00
0.00	0.00	303.68	0.00	0.00	0.00	0.00	0.00	431.84	0.00	0.00	1152.00	0.00	0.00	0.00	0.00
0.00	0.00	83.82	0.00	0.00	0.00	337.68	0.00	90.00	0.00	0.00	360.00	0.00	0.00	0.00	0.00
0.00	0.00	614.08	0.00	0.00	132.00	0.00	0.00	200.00	0.00	0.00	240.00	0.00	0.00	0.00	0.00
0.00	0.00	560.00	432.00	0.00	240.00	0.00	0.00	640.00	0.00	0.00	880.00	0.00	0.00	0.00	0.00
0.00	0.00	223.84	0.00	0.00	0.00	0.00	0.00	736.00	0.00	0.00	888.00	8.00	0.00	8.00	0.00
0.00	0.00	575.68	0.00	0.00	0.00	0.00	0.00	192.00	0.00	0.00	591.84	0.00	0.00	0.00	0.00
0.00	0.00	299.84	0.00	0.00	0.00	0.00	0.00	208.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
112.00	0.00	383.84	480.00	112.00	0.00	0.00	0.00	960.00	0.00	0.00	1008.00	0.00	0.00	0.00	0.00
0.00	0.00	388.08	0.00	0.00	0.00	0.00	0.00	431.82	0.00	0.00	966.00	0.00	13.50	13.50	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	180.00	0.00	0.00	756.00	0.00	0.00	0.00	0.00
84.00	0.00	108.00	0.00	0.00	0.00	0.00	0.00	390.00	0.00</						

RICE	ROIBOS	SALT	SMEILH	SMEILO	SMILKO	SOUPO	SOYAO	SPOTH	SPOTL	SPOTO	SPRTO	SUGAR	SWEETS	TEA	TFISH
1872.00	0.00	120.00	0.00	384.00	0.00	84.00	0.00	0.00	0.00	0.00	0.00	240.00	0.00	0.00	0.00
1457.82	0.00	67.20	0.00	2151.00	0.00	0.00	155.22	0.00	0.00	0.00	0.00	286.20	0.00	340.80	0.00
1266.00	0.00	71.88	0.00	612.00	0.00	0.00	60.00	144.00	0.00	24.00	0.00	827.70	0.00	150.00	48.00
2736.00	0.00	207.36	0.00	623.84	0.00	0.00	527.20	0.00	0.00	0.00	0.00	603.04	40.00	207.84	0.00
2080.00	0.00	79.84	0.00	336.00	0.00	0.00	602.72	0.00	0.00	0.00	0.00	592.00	0.00	204.48	0.00
736.00	0.00	128.00	0.00	608.00	160.00	0.00	336.00	480.00	0.00	0.00	0.00	456.00	0.00	224.00	128.00
1279.84	0.00	52.64	0.00	288.00	0.00	0.00	959.04	0.00	0.00	0.00	1536.00	623.84	0.00	196.64	383.84
5760.00	0.00	150.00	0.00	930.00	0.00	0.00	451.08	0.00	0.00	0.00	0.00	1044.00	36.00	357.60	323.28
2159.64	0.00	302.10	0.00	678.00	0.00	0.00	119.76	0.00	0.00	0.00	3132.00	990.00	0.00	239.88	0.00
3684.00	0.00	36.00	0.00	480.00	0.00	0.00	306.00	0.00	0.00	0.00	0.00	144.00	0.00	209.28	0.00
1808.00	0.00	87.60	0.00	1212.00	45.00	0.00	328.80	144.00	0.00	0.00	0.00	634.80	0.00	178.80	0.00
1822.88	0.00	152.80	0.00	719.68	0.00	0.00	78.24	0.00	0.00	0.00	0.00	238.08	0.00	255.68	192.00
4447.68	0.00	252.80	0.00	560.00	0.00	408.00	289.60	0.00	160.00	0.00	0.00	1788.80	0.00	255.84	0.00
1664.00	0.00	140.00	0.00	0.00	0.00	72.00	51.20	0.00	0.00	0.00	0.00	291.04	0.00	103.84	276.00
1973.82	0.00	393.60	0.00	425.82	0.00	372.06	178.02	0.00	0.00	0.00	0.00	1185.90	0.00	394.92	0.00
2376.00	0.00	545.40	0.00	797.82	0.00	53.82	353.88	0.00	0.00	0.00	0.00	1571.88	0.00	300.30	252.00
1097.88	0.00	106.80	0.00	227.88	0.00	0.00	215.76	0.00	0.00	0.00	0.00	1515.96	0.00	75.48	197.82
3264.00	0.00	36.80	0.00	0.00	0.00	0.00	48.00	0.00	0.00	0.00	0.00	128.00	0.00	207.84	0.00
307.20	0.00	27.20	0.00	0.00	0.00	0.00	39.84	0.00	0.00	0.00	0.00	60.00	40.00	91.20	0.00
2128.00	0.00	64.00	0.00	369.60	0.00	0.00	192.00	0.00	0.00	0.00	0.00	195.84	0.00	118.40	80.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	48.00	0.00
3840.00	0.00	216.64	0.00	0.00	289.60	0.00	287.52	0.00	0.00	0.00	0.00	229.92	0.00	64.00	0.00
1215.68	0.00	38.40	64.00	192.00	0.00	35.20	32.00	0.00	0.00	0.00	0.00	304.00	0.00	128.00	0.00
1532.80	0.00	188.80	0.00	560.00	0.00	0.00	111.84	0.00	0.00	0.00	0.00	128.00	0.00	121.28	0.00
-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
1196.80	43.04	54.08	0.00	271.84	0.00	111.84	255.52	0.00	0.00	0.00	0.00	223.36	190.40	212.48	224.00
815.84	0.00	176.00	0.00	671.84	1120.00	556.80	384.00	0.00	0.00	120.00	0.00	1204.64	0.00	447.20	816.00
0.00	0.00	19.20	0.00	0.00	0.00	35.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	44.80	0.00
4320.00	0.00	198.24	96.00	288.00	0.00	0.00	112.00	160.00	0.00	0.00	0.00	768.00	0.00	176.00	248.00
2015.20	0.00	81.12	0.00	848.00	0.00	0.00	380.32	0.00	0.00	0.00	480.00	1087.20	224.00	239.84	1119.20
3936.00	0.00	64.00	0.00	411.04	0.00	174.24	40.00	0.00	0.00	0.00	0.00	670.24	46.24	63.84	0.00
352.00	0.00	304.00	16.00	48.00	0.00	25.60	121.60	0.00	0.00	0.00	0.00	493.60	45.60	206.24	0.00
2542.02	0.00	81.48	0.00	1720.02	0.00	0.00	106.68	0.00	0.00	120.00	0.00	410.40	0.00	294.42	192.00
660.00	0.00	54.00	0.00	846.00	24.00	0.00	36.00	0.00	0.00	0.00	144.00	379.14	0.00	184.80	180.00
720.00	0.00	64.00	0.00	396.80	120.00	0.00	240.00	0.00	0.00	0.00	96.00	64.00	0.00	201.60	0.00
732.00	0.00	18.00	0.00	0.00	0.00	0.00	28.80	0.00	0.00	0.00	1200.00	518.40	0.00	128.40	0.00
2031.84	0.00	16.00	0.00	0.00	0.00	36.80	75.04	0.00	0.00	0.00	0.00	615.84	0.00	80.00	0.00
1928.00	0.00	128.00	0.00	368.00	0.00	0.00	240.00	0.00	0.00	0.00	0.00	432.00	0.00	230.40	160.00
0.00	0.00	0.00	0.00	0.00	0.00	43.08	0.00	0.00	0.00	0.00	0.00	1745.28	0.00	52.68	0.00
3423.68	0.00	172.80	0.00	768.00	201.60	0.00	112.00	0.00	0.00	0.00	0.00	1648.00	0.00	360.00	110.40
1056.00	0.00	48.00	0.00	912.00	112.00	0.00	211.20	0.00	0.00	0.00	0.00	1760.00	0.00	255.84	200.00
1686.00	0.00	81.60	0.00	348.00	381.60	0.00	72.00	0.00	120.00	0.00	0.00	480.00	0.00	204.00	72.00
1264.00	0.00	160.00	0.00	1312.00	0.00	0.00	80.00	0.00	0.00	0.00	0.00	1920.00	0.00	294.40	0.00
828.80	0.00	16.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	204.64	0.00	103.84	0.00
560.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2112.00	0.00	161.64	0.00	215.88	0.00	48.60	117.60	0.00	0.00	0.00	0.00	467.88	0.00	41.22	0.00
352.00	0.00	48.00	32.00	96.00	0.00	0.00	0.00	0.00	0.00	3.00	0.00	281.44	0.00	94.40	0.00
1823.04	0.00	84.32	0.00	0.00	0.00	0.00	382.88	0.00	0.00	0.00	0.00	1412.16	0.00	282.88	40.00
1620.00	0.00	54.00	0.00	300.00	0.00	431.46	89.88	0.00	0.00	0.00	0.00	504.00	0.00	0.00	0.00
2327.64	0.00	72.00	0.00	44.82	0.00	305.64	160.38	0.00	0.00	0.00	0.00	160.20	0.00	0.00	0.00
1896.00	0.00	88.80	0.00	287.88	0.00	47.40	0.00	0.00	0.00	0.00	0.00	247.20	0.00	83.40	0.00
1290.00	0.00	0.00	0.00	0.00	0.00	108.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1104.00	0.00	161.40	0.00	0.00	0.00	0.00	192.00	72.00	0.00	0.00	0.00	1734.00	0.00	364.20	270.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	5400.00	0.00	0.00	0.00	0.00	0.00	0.00	95.88	0.00
1206.00	0.00	56.28	0.00	0.00	198.00	0.00	47.88	0.00	0.00	0.00	0.00	737.70	0.00	0.00	0.00
1152.72	0.00	72.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	133.02	0.00
1176.00	0.00	213.42	0.00	156.00	0.00	0.00	173.82	204.00	0.00	0.00	0.00	1217.82	0.00	265.62	216.00
1264.00	0.00	0.00	0.00	68.64	64.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
816.00	0.00	168.00	0.00	0.00	0.00	0.00	184.00	320.00	0.00	0.00	480.00	1728.00	0.00	219.20	0.00
1104.00	0.00	153.60	0.00	112.00	0.00	0.00	280.00	160.00	0.00	0.00	0.00	1024.00	0.00	236.80	48.00
1231.68	0.00	134.40	0.00	0.00	0.00	0.00	126.24	0.00	0.00	0.00	0.00	992.00	127.84	143.52	56.00
713.82	0.00	41.88	0.00	449.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1104.00	96.00	214.40	0.00	352.00	0.00	0.00	0.00	32.00	0.00	0.00	0.00	1328.00	0.00	182.24	192.00
79.84	0.00	26.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	531.68	0.00	83.20	84.32
735.84	0.00	64.00	0.00	288.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	544.00	0.00	96.00	112.00
864.00	0.00	43.84	0.00	0.00	0.00	0.00	100.00	80.00	0.00	0.00	0.00	751.84	0.00	165.60	0.00
966.00	0.00	115.80	0.00	168.00	0.00	0.00	0.00	120.00	0.00	0.00	0.00	1632.00	0.00	163.08	222.00
719.84	0.00	14.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	592.00	0.00	102.40	0.00
333.60	0.00	87.60	0.00	0.00	0.00	0.00	0.00	204.00	0.00	0.00	0.00	444.00	0.00	158.40	0.00
999.04	0.00	80.00	28.80	86.40	0.00	0.00	0.00	352.00	0.00	0.00	0.00	368.00	0.00	143.84	0.00
1136.00	0.00	48.00	0.00	384.00	0.00	0.00	0.00	160.00	120.00	0.00	0.00	1199.84	0.00	240.00	236.80
864.00	0.00	207.52	0.00	0.00	37.44	0.00	279.84	0.00	0.00	0.00	0.00	591.68	0.00	215.84	0.00
1086.40	0.00	0.00	0.00	320.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	288.00	0.00
734.24	0.00	0.00	0.00	67.20	0.00	0.00	0.00	64.00	0.00	0.00	0.00	0.00	0.00	55.84	0.00
2528.00	0.00	60.80	0.00	384.00	0.00	64.00	0.00	160.00	120.00	0.00	0.00	1200.00	0.00	284.64	216.00
324.00	0														

TINVEG	TOMH	TOMO	TWAYS	VEGH	WINEO	WORSO	YEAST	BATT	CANDLO	ELECT	GAS	MATCH	PARFN	FUELOTH	WPWD
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	28.91	17.35	180.69	0.00	9.76	108.42	0.00	20.24
0.00	0.00	72.00	0.00	0.00	0.00	0.00	0.00	30.69	34.50	0.00	0.00	18.38	137.92	0.00	22.61
0.00	0.00	0.00	0.00	56.03	0.00	120.00	0.00	58.66	27.34	293.30	0.00	12.68	185.76	0.00	26.04
0.00	120.00	40.00	0.00	0.00	0.00	576.00	75.84	0.00	0.00	960.53	899.69	4.77	0.00	0.00	76.20
0.00	0.00	0.00	0.00	153.75	0.00	0.00	60.80	63.17	115.47	0.00	0.00	64.47	228.13	0.00	42.08
0.00	0.00	0.00	0.00	180.48	0.00	0.00	83.20	249.91	74.32	0.00	0.00	18.74	328.83	0.00	87.14
0.00	0.00	0.00	0.00	105.75	0.00	288.00	0.00	106.59	81.66	0.00	64.60	38.70	402.11	0.00	45.16
0.00	0.00	0.00	0.00	182.52	0.00	0.00	43.20	78.21	85.38	0.00	0.00	21.51	651.79	0.00	50.51
0.00	0.00	108.00	0.00	164.68	0.00	120.00	0.00	51.82	76.52	0.00	0.00	40.31	351.96	0.00	64.82
0.00	0.00	0.00	0.00	56.07	0.00	0.00	0.00	85.50	39.76	0.00	0.00	12.13	82.21	0.00	56.20
0.00	0.00	0.00	0.00	113.60	0.00	0.00	36.00	54.40	28.50	256.14	0.00	9.29	256.14	0.00	48.95
0.00	0.00	0.00	0.00	0.00	0.00	193.60	0.00	167.83	2.25	0.00	0.00	57.32	277.01	0.00	47.19
0.00	0.00	0.00	0.00	134.88	0.00	0.00	32.00	46.00	50.28	0.00	0.00	19.07	340.30	0.00	81.88
0.00	0.00	0.00	0.00	0.00	0.00	0.00	127.04	16.44	98.78	0.00	65.77	27.79	259.77	0.00	19.70
0.00	0.00	0.00	0.00	35.27	0.00	0.00	0.00	61.85	64.82	0.00	0.00	33.60	391.07	0.00	84.63
0.00	0.00	0.00	0.00	0.00	0.00	0.00	159.00	51.92	98.12	0.00	0.00	39.10	236.76	0.00	113.08
119.52	0.00	0.00	0.00	23.58	0.00	0.00	11.70	854.87	82.99	0.00	0.00	38.90	305.77	0.00	85.39
0.00	0.00	0.00	0.00	108.60	0.00	0.00	64.00	0.00	0.00	544.30	0.00	7.68	204.59	0.00	54.43
0.00	0.00	128.00	0.00	0.00	0.00	0.00	0.00	0.00	9.36	686.32	0.00	17.75	55.22	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	82.49	44.12	0.00	0.00	17.11	82.52	0.00	111.06
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	81.78	28.57	0.00	0.00	15.42	173.06	0.00	58.49
0.00	0.00	272.00	70.40	0.00	0.00	0.00	62.08	0.00	27.67	977.68	0.00	12.06	61.92	0.00	68.37
0.00	0.00	0.00	0.00	30.75	0.00	0.00	0.00	0.00	25.91	0.00	0.00	7.04	6.58	0.00	0.00
0.00	0.00	0.00	0.00	44.25	0.00	128.00	38.40	81.81	65.13	0.00	0.00	11.33	62.93	0.00	44.05
-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	94.68	28.00	0.00	74.76	0.00	0.00	43.04	94.48	69.25	0.00	0.00	25.35	348.71	0.00	79.13
0.00	120.00	224.00	0.00	74.76	0.00	0.00	94.24	94.63	43.94	0.00	439.35	57.45	371.76	0.00	68.10
0.00	144.00	48.00	0.00	0.00	0.00	480.00	0.00	60.28	15.44	0.00	130.60	31.08	0.00	0.00	127.55
0.00	0.00	112.00	0.00	141.75	0.00	0.00	38.40	55.37	23.43	0.00	0.00	34.84	247.68	162.95	40.74
0.00	0.00	320.00	287.20	74.91	0.00	320.00	26.40	217.42	74.58	0.00	58.79	19.27	345.24	0.00	118.10
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	60.83	47.99	0.00	1155.83	33.80	456.25	0.00	38.46
0.00	0.00	128.00	0.00	0.00	0.00	0.00	0.00	71.70	22.16	0.00	0.00	14.99	227.47	71.70	51.49
0.00	0.00	158.22	0.00	180.00	0.00	0.00	0.00	129.67	35.19	0.00	0.00	28.46	176.10	0.00	102.10
0.00	0.00	0.00	0.00	48.06	0.00	108.00	14.40	183.12	46.24	0.00	22.81	25.06	130.36	0.00	64.30
0.00	0.00	0.00	0.00	64.08	0.00	0.00	48.00	97.77	10.43	0.00	0.00	11.73	192.28	0.00	46.73
0.00	0.00	0.00	0.00	0.00	0.00	0.00	26.40	76.84	24.97	0.00	64.04	11.53	65.32	0.00	53.47
0.00	0.00	32.00	576.00	106.65	0.00	0.00	0.00	0.00	98.62	0.00	0.00	26.31	503.11	0.00	89.70
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	78.21	43.02	0.00	0.00	14.99	130.36	0.00	103.28
0.00	27.00	48.00	0.00	0.00	0.00	485.82	0.00	86.73	25.08	0.00	401.83	16.51	93.76	0.00	90.38
0.00	0.00	0.00	0.00	130.35	0.00	0.00	67.20	76.32	69.68	0.00	49.77	19.91	99.55	0.00	109.43
0.00	0.00	0.00	0.00	64.08	0.00	96.00	72.00	51.65	40.39	0.00	0.00	16.47	203.50	0.00	83.95
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	97.11	44.87	0.00	0.00	14.73	200.92	0.00	63.62
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	87.87	33.12	0.00	0.00	21.63	135.19	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.74	23.41	0.00	0.00	15.50	196.06	0.00	37.50
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	26.55	92.58	0.00	504.36	30.20	411.45	0.00	66.00
0.00	0.00	0.00	144.00	67.44	0.00	81.00	16.80	59.56	82.86	0.00	0.00	25.82	165.91	0.00	64.04
0.00	150.00	50.00	0.00	0.00	0.00	0.00	0.00	27.04	38.16	0.00	0.00	22.88	71.65	0.00	30.38
0.00	0.00	0.00	0.00	0.00	0.00	38.40	0.00	90.75	57.60	0.00	0.00	19.69	381.74	0.00	10.05
0.00	0.00	0.00	0.00	0.00	0.00	360.00	0.00	67.59	152.08	0.00	878.70	29.91	148.70	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	80.37	29.77	0.00	0.00	22.67	388.44	0.00	0.00
0.00	0.00	0.00	0.00	37.94	0.00	132.00	0.00	51.23	41.62	0.00	0.00	14.98	365.00	0.00	81.64
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	50.69	878.70	0.00	4.36	20.28	0.00	33.80
0.00	0.00	0.00	0.00	0.00	0.00	60.00	204.00	91.25	158.17	0.00	0.00	20.28	101.39	0.00	70.97
0.00	0.00	0.00	0.00	0.00	0.00	48.00	60.83	24.33	0.00	0.00	0.00	0.00	64.21	0.00	15.51
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	33.80	0.00	0.00	204.97	0.00	0.00	9.46
0.00	0.00	0.00	0.00	168.00	0.00	0.00	0.00	37.14	75.77	0.00	0.00	19.57	30.42	0.00	68.94
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	87.96	71.70	0.00	0.00	19.23	291.67	0.00	42.37
0.00	0.00	0.00	0.00	0.00	0.00	488.96	19.20	27.29	88.66	0.00	269.49	6.14	286.54	0.00	98.82
0.00	0.00	0.00	0.00	0.00	0.00	128.00	0.00	92.10	96.88	0.00	0.00	16.37	238.79	0.00	85.28
0.00	0.00	0.00	808.00	0.00	0.00	240.00	57.60	76.75	103.36	0.00	0.00	12.28	102.34	0.00	97.22
0.00	0.00	0.00	0.00	0.00	0.00	112.00	89.28	81.84	68.57	0.00	0.00	20.47	92.10	0.00	34.04
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	47.28	0.00	0.00	0.00	172.36	0.00	33.80
0.00	0.00	0.00	0.00	0.00	0.00	172.80	76.04	73.00	0.00	0.00	0.00	22.31	337.96	0.00	10.14
0.00	0.00	0.00	0.00	0.00	0.00	492.80	66.60	35.83	0.00	0.00	0.00	1.00	269.90	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	72.00	0.00	74.32	0.00	0.00	4.06	64.18	0.00	70.94
0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.64	0.00	8.02	0.00	0.00	4.95	6.14	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	43.20	90.41	133.94	0.00	0.00	20.09	251.15	0.00	167.43
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	41.15	0.00	0.00	21.24	66.00	0.00	59.73
0.00	0.00	0.00	0.00	0.00	0.00	0.00	24.00	97.11	59.61	0.00	0.00	18.08	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	112.00	30.42	58.10	0.00	0.00	0.00	13.01	136.84	0.00	57.42
0.00	0.00	0.00	0.00	21.36	0.00	0.00	95.20	85.70	80.93	0.00	0.00	16.50	174.57	0.00	77.73
0.00	0.00	0.00	80.00	0.00	0.00	0.00	41.60	0.00	81.32	0.00	0.00	11.21	0.00	0.00	28.82
0.00	0.00	0.00	0.00	336.75	0.00	0.00	80.00	0.00	8.00	1946.67	0.00	9.61	0.00	0.00	100.41
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	51.23	0.00	0.00	12.81	0.00	0.00	16.01
0.00	0.00	0.00	0.00	0.00	0.00	112.00	108.80	87.99	78.87	0.00	0.00	23.40	84.73	0.00	153.17
0.00	0.00	0.00	0.00	0.00	0.00	48.00	74.40	120.58	19.55	0.00	0.00	9.78	71.70	0.00	58.66
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	86.45	98.29	0.00	0.00	33.17	144.08	0.00	32.02
0.00	0														

DSHSOAFB/SOAP	CLEAN	CLOTHS	TPAPER	BLADES	TPASTE	HAIR	COSMTC	CREAMS	HAIRCUT	PAPER	MEDICIN	TMED	SMOKE	SPORT
0.00	27.10	0.00	0.00	0.00	0.00	18.07	0.00	25.30	43.37	0.00	0.00	0.00	0.00	0.00
0.00	45.22	0.00	0.00	0.00	0.00	0.00	0.00	17.09	0.00	0.00	0.00	161.50	0.00	0.00
0.00	115.30	13.00	0.00	0.00	0.00	45.27	0.00	78.77	0.00	0.00	29.30	0.00	0.00	0.00
0.00	103.35	82.22	54.40	0.00	0.00	60.10	15.98	192.11	35.16	0.00	5.12	28.46	0.00	0.00
0.00	112.31	0.00	14.04	0.00	0.00	43.76	0.00	52.61	45.59	0.00	4.21	21.06	0.00	82.12
0.00	74.97	0.00	0.00	0.00	0.00	29.59	0.00	105.23	0.00	0.00	36.17	0.00	121.67	0.00
0.00	116.90	8.04	0.00	0.00	0.00	41.96	0.00	50.32	0.00	0.00	19.38	0.00	15.18	0.00
-3.26	89.26	19.55	0.00	0.00	0.00	44.00	0.00	81.80	0.00	0.00	40.74	0.00	81.47	0.00
0.00	115.89	24.41	29.33	0.00	0.00	31.22	0.00	69.28	0.00	0.00	32.59	0.00	74.96	0.00
0.00	47.68	0.00	0.00	0.00	0.00	41.10	0.00	52.58	0.00	0.00	0.00	0.00	161.13	0.00
0.00	32.02	0.00	0.00	0.00	0.00	28.78	0.00	56.00	0.00	0.00	19.21	0.00	138.96	0.00
20.86	38.06	7.82	9.42	0.00	0.00	35.16	0.00	78.05	0.00	0.00	39.11	0.00	0.00	0.00
0.00	117.59	0.00	230.18	0.00	22.99	46.53	14.44	26.27	84.74	0.00	65.73	197.30	0.00	0.00
0.00	61.16	7.86	0.00	0.00	0.00	16.44	26.31	0.00	64.09	0.00	6.58	19.73	0.00	164.41
0.00	84.02	22.75	10.43	0.00	0.00	45.53	0.00	103.83	0.00	0.00	19.55	0.00	0.00	0.00
0.00	58.17	0.00	6.58	0.00	0.00	13.15	0.00	39.43	162.01	0.00	0.00	0.00	147.97	0.00
51.23	135.75	58.56	35.22	0.00	0.00	34.55	20.49	115.26	50.88	0.00	9.57	0.00	0.00	0.00
0.00	118.98	11.53	9.57	0.00	0.00	30.42	0.00	59.23	0.00	28.82	35.22	0.00	0.00	0.00
0.00	82.64	114.40	6.24	9.36	0.00	15.57	0.00	31.13	97.52	0.00	0.00	0.00	162.22	0.00
0.00	80.93	0.00	0.00	0.00	0.00	27.30	0.00	95.19	0.00	0.00	19.04	0.00	16.82	0.00
0.00	62.93	0.00	0.00	0.00	0.00	32.06	0.00	41.82	0.00	0.00	18.88	0.00	56.64	0.00
0.00	169.43	64.82	0.00	0.00	0.00	50.51	0.00	86.36	0.00	0.00	19.55	0.00	35.85	0.00
0.00	50.21	50.15	0.00	0.00	0.00	4.24	82.21	0.00	42.68	0.00	0.00	0.00	0.00	0.00
0.00	32.72	0.00	0.00	0.00	0.00	39.65	0.00	79.61	0.00	0.00	37.76	0.00	176.21	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	98.42	30.28	9.78	0.00	0.00	19.55	0.00	107.54	76.78	0.00	13.04	0.00	26.07	0.00
23.62	96.29	101.36	0.00	0.00	0.00	22.27	0.00	34.78	88.75	0.00	17.57	0.00	0.00	0.00
0.00	59.07	103.81	0.00	0.00	0.00	0.00	0.00	23.44	89.71	0.00	26.79	0.00	0.00	0.00
0.00	125.79	7.50	0.00	0.00	0.00	42.37	0.00	73.55	0.00	0.00	8.15	0.00	0.00	0.00
0.00	98.16	123.57	14.00	49.13	0.00	37.83	22.78	0.00	89.00	0.00	26.39	0.00	0.00	0.00
54.04	80.33	61.44	10.14	23.62	0.00	33.80	0.00	40.56	143.87	0.00	4.06	20.28	0.00	16.90
0.00	94.51	28.97	0.00	0.00	0.00	20.53	24.77	0.00	84.34	0.00	19.55	0.00	0.00	0.00
0.00	87.06	32.95	0.00	0.00	0.00	35.48	0.00	85.87	0.00	0.00	35.22	0.00	29.74	0.00
0.00	87.34	17.60	9.78	0.00	0.00	33.89	0.00	58.66	0.00	0.00	19.55	0.00	17.92	0.00
0.00	79.84	6.45	0.00	0.00	0.00	28.91	0.00	41.78	0.00	0.00	19.55	0.00	41.84	0.00
0.00	73.00	0.00	0.00	0.00	0.00	27.21	0.00	64.04	0.00	0.00	20.81	0.00	208.11	0.00
0.00	127.26	31.40	9.86	0.00	0.00	13.15	0.00	105.06	0.00	0.00	59.19	0.00	0.00	0.00
0.00	72.35	0.00	0.00	0.00	0.00	18.58	0.00	65.50	0.00	0.00	28.03	0.00	97.77	0.00
0.00	46.51	13.49	0.00	0.00	0.00	13.06	53.91	26.76	34.46	17.95	40.18	0.00	0.00	0.00
0.00	113.15	0.00	0.00	0.00	0.00	36.47	0.00	79.40	0.00	0.00	32.19	0.00	0.00	0.00
38.76	67.80	11.24	0.00	0.00	0.00	12.89	0.00	87.21	0.00	0.00	0.00	0.00	0.00	0.00
0.00	113.85	8.37	0.00	0.00	0.00	36.83	0.00	21.57	0.00	0.00	20.09	0.00	100.46	0.00
0.00	111.53	16.90	0.00	0.00	0.00	49.00	0.00	121.67	0.00	0.00	50.69	0.00	0.00	0.00
26.79	40.52	0.00	20.09	0.00	0.00	18.75	0.00	28.76	0.00	0.00	20.09	0.00	0.00	0.00
0.00	79.64	34.08	0.00	0.00	0.00	46.39	0.00	72.97	39.09	0.00	19.91	0.00	0.00	0.00
4.94	78.94	0.00	0.00	0.00	0.00	45.09	0.00	38.29	0.00	0.00	56.41	0.00	0.00	0.00
27.04	39.88	0.00	0.00	0.00	0.00	23.66	0.00	49.68	0.00	0.00	20.28	0.00	0.00	0.00
0.00	124.27	11.02	0.00	0.00	0.00	57.60	0.00	50.50	0.00	0.00	44.50	0.00	0.00	0.00
11.83	226.91	10.78	0.00	0.00	0.00	15.21	0.00	35.45	0.00	0.00	33.80	0.00	0.00	0.00
14.37	82.01	17.21	0.00	0.00	0.00	36.13	0.00	28.46	67.61	0.00	0.00	0.00	0.00	0.00
0.00	82.29	0.00	0.00	0.00	0.00	42.90	0.00	51.16	83.25	0.00	19.21	0.00	0.00	0.00
0.00	30.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	152.08	0.00	0.00	0.00
0.00	0.00	42.25	0.00	0.00	0.00	37.14	0.00	64.15	0.00	0.00	0.00	0.00	106.12	0.00
0.00	82.13	0.00	0.00	33.80	0.00	0.00	0.00	0.00	0.00	26.36	0.00	0.00	0.00	0.00
0.00	40.22	0.00	0.00	0.00	0.00	0.00	0.00	47.25	0.00	0.00	0.00	0.00	39.20	0.00
16.86	22.54	0.00	0.00	0.00	0.00	32.61	0.00	51.71	0.00	0.00	0.00	0.00	0.00	0.00
0.00	7.17	9.78	0.00	0.00	0.00	24.41	0.00	37.41	0.00	14.96	65.18	0.00	55.37	0.00
0.00	37.49	13.61	0.00	0.00	0.00	15.66	0.00	44.99	100.60	0.00	37.49	0.00	0.00	0.00
0.00	0.00	29.00	0.00	0.00	0.00	39.23	0.00	47.76	0.00	7.50	0.00	0.00	30.70	0.00
17.06	0.00	40.93	0.00	0.00	0.00	40.90	0.00	63.11	0.00	22.51	0.00	0.00	317.24	0.00
0.00	55.26	0.00	0.00	0.00	0.00	10.20	0.00	69.83	0.00	21.83	0.00	0.00	0.00	6.82
0.00	0.00	0.00	0.00	0.00	0.00	16.90	0.00	16.86	0.00	0.00	0.00	0.00	0.00	0.00
0.00	37.18	28.69	0.00	0.00	0.00	38.87	0.00	54.07	0.00	0.00	0.00	0.00	0.00	0.00
0.00	28.80	0.00	0.00	0.00	0.00	11.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	23.62	13.48	0.00	0.00	0.00	15.21	0.00	24.30	0.00	16.22	0.00	0.00	0.00	0.00
0.00	17.06	0.00	0.00	0.00	0.00	0.00	0.00	8.53	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	26.79	0.00	0.00	0.00	45.21	0.00	75.31	0.00	0.00	0.00	0.00	0.00	0.00
0.00	19.88	0.00	0.00	0.00	0.00	0.00	0.00	11.61	0.00	0.00	0.00	0.00	0.00	0.00
0.00	45.54	11.72	0.00	0.00	0.00	15.07	0.00	16.74	0.00	0.00	0.00	0.00	0.00	0.00
0.00	25.31	30.42	0.00	0.00	0.00	28.97	0.00	54.01	0.00	0.00	0.00	0.00	60.83	0.00
0.00	0.00	26.98	0.00	0.00	0.00	39.67	0.00	30.15	0.00	7.62	0.00	0.00	60.30	0.00
0.00	62.43	0.00	0.00	0.00	0.00	8.96	0.00	64.96	0.00	0.00	0.00	0.00	0.00	0.00
0.00	6.40	12.81	0.00	0.00	0.00	33.30	0.00	33.14	0.00	0.00	0.00	0.00	12.81	0.00
0.00	38.42	0.00	0.00	0.00	0.00	0.00	0.00	16.01	0.00	0.00	19.21	0.00	0.00	0.00
0.00	0.00	26.04	0.00	0.00	0.00	42.37	0.00	68.44	0.00	28.68	0.00	0.00	0.00	0.00
0.00	39.11	0.00	0.00	0.00	0.00	0.00	0.00	21.77	0.00	0.00	0.00	0.00	16.29	0.00
0.00	17.93	12.78	0.00	0.00	0.00	25.61	0.00	14.41	0.00	0.00	0.00	0.00	14.41	0.00
0.00	13.65	19.01	0.00	0.00	0.00	20.60	0.00	26.95	0.00	6.35	0.00	0.00	101.57	0.00
0.00	19.21	0.00	0.00	0.00	0.00	37.75	0.00	35.22	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.65	0.00	3.52	0.00	0.00	0.00	0.00
0.00	32.02	10.57	0.00	0.00	0.00	0.00	0.00	35.16	0.00	0.00	0.00	0.00	0.00	0.00
0.00	86.84	9.13	0.00	0.00	0.00	0.00	0.00	32.25	0.00	0.00	15.73	0.00	0.00	0.00
0.00	39.06	0.00	0.00	0.00	0.00	10.57	0.00	3.84	0.00	0.00	0.00	0.00	0.00	0.00
0.00	15.98	0.00	0.00	0.00</										

PSTRENT	VEHICLE	WATER	FUNERAL	WEDDING	BDAYS	BIRTH	FEAST	SCHOOL	TRIBAL	CRECHE	WOODO	WOODL	WOODH	HHINCY	CROPSIZI
0.00	0.00	0.00	3500.00	0.00	0.00	0.00	0.00	620.00	100.00	0.00	0.00	0.00	0.00	22080.00	-1
0.00	0.00	0.00	2500.00	0.00	0.00	0.00	0.00	60.00	150.00	0.00	0.00	0.00	32.30	10920.00	0
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	75.00	120.00	0.00	0.00	130.36	0.00	17640.00	0
0.00	0.00	0.00	0.00	10000.00	0.00	0.00	0.00	0.00	20.00	0.00	0.00	0.00	32.02	12899.00	0
0.00	170.00	0.00	0.00	0.00	0.00	0.00	600.00	350.00	370.00	0.00	0.00	0.00	35.10	29460.00	0
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	250.00	120.00	0.00	0.00	0.00	0.00	4311.00	0
0.00	0.00	0.00	2000.00	0.00	0.00	0.00	0.00	200.00	45.00	0.00	129.20	0.00	-1.00	44640.00	0
0.00	0.00	0.00	0.00	0.00	0.00	0.00	1900.00	550.00	200.00	0.00	0.00	81.47	0.00	19200.00	0
0.00	0.00	0.00	0.00	0.00	0.00	60.00	500.00	306.00	120.00	0.00	0.00	0.00	32.59	14160.00	0
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	50.00	100.00	0.00	0.00	0.00	-1.00	14280.00	0
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	30.00	120.00	0.00	0.00	0.00	0.00	13200.00	0
0.00	0.00	0.00	0.00	0.00	0.00	0.00	5000.00	0.00	50.00	0.00	0.00	0.00	0.00	25080.00	0
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	400.00	450.00	0.00	0.00	0.00	0.00	7440.00	0
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	220.00	120.00	0.00	0.00	0.00	0.00	12840.00	0.0675
0.00	0.00	0.00	0.00	0.00	0.00	30.00	700.00	126.00	120.00	0.00	0.00	0.00	0.00	31596.00	0
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	60.00	120.00	0.00	0.00	0.00	0.00	13890.00	0
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	120.00	300.00	0.00	384.21	0.00	0.00	20880.00	0
0.00	1300.00	0.00	0.00	0.00	0.00	0.00	1500.00	450.00	200.00	0.00	0.00	0.00	0.00	9600.00	0
0.00	0.00	0.00	0.00	0.00	0.00	0.00	3000.00	180.00	70.00	0.00	0.00	0.00	0.00	8460.00	0
0.00	0.00	0.00	0.00	0.00	0.00	0.00	500.00	95.00	150.00	0.00	0.00	0.00	0.00	19320.00	0
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	150.00	150.00	0.00	0.00	0.00	0.00	3600.00	0
0.00	0.00	0.00	0.00	0.00	100.00	100.00	1080.00	400.00	500.00	0.00	0.00	0.00	0.00	4800.00	0
0.00	0.00	0.00	4000.00	0.00	150.00	500.00	2000.00	0.00	370.00	0.00	300.00	0.00	32.88	3288.00	0
0.00	0.00	0.00	0.00	0.00	0.00	0.00	1200.00	74.00	40.00	0.00	0.00	0.00	0.00	26754.00	0
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7800.00	0
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	400.00	600.00	0.00	0.00	0.00	-3.26	3000.00	0
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	148.00	70.00	0.00	0.00	0.00	-1.00	8746.00	-1
-1.00	-1.00	0.00	0.00	0.00	0.00	0.00	3000.00	2500.00	75.00	133.94	0.00	0.00	0.00	8600.00	0
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	120.00	100.00	0.00	0.00	0.00	130.36	17610.00	0
0.00	0.00	0.00	0.00	0.00	1800.00	0.00	0.00	0.00	260.00	0.00	0.00	0.00	0.00	7800.00	0
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	120.00	60.00	0.00	0.00	0.00	33.80	11160.00	0.45
0.00	0.00	0.00	0.00	3000.00	0.00	0.00	0.00	500.00	170.00	0.00	75.00	0.00	0.00	21000.00	0
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	70.00	64.04	0.00	0.00	0.00	52170.00	1.40625
0.00	0.00	0.00	0.00	0.00	0.00	200.00	3650.00	100.00	50.00	0.00	0.00	0.00	0.00	13020.00	0
0.00	0.00	0.00	0.00	0.00	0.00	0.00	1005.00	82.00	100.00	0.00	0.00	0.00	0.00	17280.00	0
0.00	0.00	0.00	0.00	2000.00	0.00	0.00	0.00	60.00	50.00	0.00	0.00	0.00	0.00	27380.00	0
0.00	0.00	0.00	1500.00	0.00	0.00	0.00	0.00	240.00	120.00	0.00	0.00	0.00	0.00	15530.00	0
0.00	0.00	0.00	0.00	0.00	0.00	0.00	2000.00	60.00	10.00	0.00	0.00	0.00	0.00	12288.00	0
0.00	0.00	0.00	0.00	0.00	500.00	0.00	2000.00	400.00	0.00	66.97	0.00	0.00	0.00	4500.00	0.18375
0.00	0.00	0.00	0.00	0.00	0.00	0.00	2000.00	80.00	50.00	0.00	0.00	0.00	0.00	2500.00	1.125
0.00	0.00	0.00	2000.00	0.00	0.00	100.00	300.00	100.00	100.00	0.00	0.00	0.00	0.00	6900.00	0
0.00	0.00	0.00	0.00	0.00	0.00	0.00	1005.00	300.00	100.00	0.00	0.00	0.00	0.00	4800.00	0
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	240.00	0.00	0.00	0.00	-1.00	-1.00	4200.00	0
0.00	0.00	0.00	0.00	0.00	0.00	0.00	2000.00	0.00	100.00	0.00	0.00	0.00	150.00	13440.00	0
0.00	0.00	0.00	0.00	0.00	0.00	0.00	800.00	600.00	200.00	0.00	0.00	0.00	0.00	13260.00	0
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	200.00	20.00	0.00	0.00	0.00	0.00	17363.28	0
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	60.00	25.00	0.00	150.00	0.00	0.00	17874.00	0
0.00	0.00	0.00	700.00	0.00	0.00	20.00	0.00	120.00	20.00	0.00	0.00	0.00	0.00	11280.00	0
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3100.00	148.00	0.00	0.00	0.00	0.00	6894.00	0
0.00	0.00	0.00	0.00	0.00	0.00	0.00	2650.00	1364.00	240.00	0.00	0.00	0.00	0.00	16194.00	0
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	17148.00	-1
0.00	0.00	77.73	0.00	0.00	700.00	0.00	0.00	400.00	0.00	0.00	0.00	150.00	150.00	15000.00	0.129
0.00	0.00	101.39	0.00	0.00	0.00	0.00	0.00	304.17	0.00	0.00	0.00	0.00	145.32	15000.00	0.51
0.00	0.00	0.00	0.00	0.00	0.00	0.00	3000.00	690.00	0.00	120.00	0.00	0.00	0.00	19500.00	0.5244
0.00	0.00	0.00	0.00	3000.00	0.00	0.00	40.00	40.00	0.00	0.00	0.00	0.00	0.00	11280.00	0.1784
0.00	0.00	0.00	4000.00	0.00	700.00	0.00	253.47	0.00	0.00	0.00	0.00	0.00	337.96	9120.00	2.475
0.00	0.00	35.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	374.78	0.00	0.00	24420.00	0.82875
0.00	0.00	78.46	0.00	800.00	0.00	0.00	0.00	75.00	0.00	0.00	0.00	341.12	0.00	13680.00	0.1365
0.00	0.00	0.00	0.00	0.00	0.00	0.00	1000.00	200.00	0.00	0.00	0.00	238.79	150.09	22080.00	0.1632
0.00	0.00	57.99	1500.00	0.00	0.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	146.68	12000.00	0.5472
0.00	0.00	0.00	1000.00	0.00	0.00	0.00	2500.00	0.00	0.00	0.00	0.00	0.00	0.00	17100.00	0.27945
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2331.94	0.00	0.00	0.00	337.96	0.00	33780.00	0.81
15.00	0.00	0.00	0.00	0.00	0.00	500.00	1000.00	100.00	0.00	0.00	152.08	152.08	152.08	22860.00	0.0576
15.00	0.00	0.00	1000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	18114.00	0.41
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	50.00	0.00	0.00	0.00	0.00	135.19	1500.00	0.946875
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	28134.00	0.3105
0.00	0.00	167.43	0.00	0.00	0.00	0.00	2000.00	-1.00	0.00	0.00	450.00	150.69	147.34	21120.00	3.42
0.00	0.00	0.00	3000.00	0.00	0.00	500.00	2000.00	189.00	0.00	0.00	0.00	-1.00	-1.00	11280.00	1.0342
0.00	0.00	0.00	0.00	0.00	0.00	500.00	1000.00	0.00	0.00	0.00	0.00	-1.00	-1.00	6780.00	1.155
0.00	0.00	0.00	0.00	0.00	0.00	300.00	0.00	500.00	0.00	0.00	0.00	152.08	0.00	29640.00	1.50675
0.00	0.00	285.65	0.00	0.00	0.00	200.00	0.00	100.00	0.00	63.48	0.00	142.83	139.65	14039.00	0.63
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	65.00	0.00	0.00	1600.88	0.00	0.00	7260.00	0.18
0.00	0.00	326.58	0.00	0.00	0.00	500.00	0.00	160.00	0.00	0.00	100.00	0.00	0.00	8340.00	0.170625
0.00	0.00	0.00	0.00	0.00	0.00	5000.00	0.00	146.00	0.00	0.00	150.00	0.00	316.97	15600.00	0.855
0.00	0.00	0.00	2000.00	0.00	0.00	400.00	100.00	0.00	0.00	0.00	0.00	0.00	179.24	6900.00	0.7875
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	179.24	488.84	85.00	0.00	21774.00	0.163
0.00	0.00	18.25	0.00	0.00	0.00	0.00	0.00	80.00	0.00	0.00	0.00	0			

LAND	ASSETS	BANKBAL	CATTLEN	SHEEPC	GOATNO	POULNO	OWNPLO	BEANCST	MZECST3	CHEMS1	FEED1	FERTCST	AMACST3	OINPUT1	OTHRCS
-1	3000	0	4	0	4	10	0	10.00	10.00	20.00	0.00	10.00	50.00	0.00	0.00
4	-1	0	2	0	3	5	0	-1.00	0.00	0.00	0.00	0.00	82.50	0.00	25.00
1	345	0	0	0	0	2	0	9.98	11.97	0.00	0.00	5.00	-1.00	0.00	0.00
6	2488.99	400	0	0	0	4	0	75.00	100.00	0.00	0.00	60.00	25.00	0.00	0.00
8	600	1200	3	0	5	8	0	20.00	20.00	0.00	0.00	18.00	-1.00	0.00	0.00
3	6210	200	6	0	7	11	0	100.00	100.00	0.00	0.00	0.00	25.00	0.00	0.00
4	2900	2000	0	0	0	0	0	100.00	6.00	0.00	0.00	130.00	-1.00	0.00	0.00
20	1700	800	5	0	3	50	1	100.00	66.00	0.00	0.00	47.50	-1.00	0.00	0.00
8	-1	0	0	0	0	1	0	150.00	100.00	0.00	0.00	40.00	60.00	0.00	0.00
3	-1	0	1	0	0	6	0	5.00	10.00	0.00	0.00	65.00	-1.00	0.00	0.00
14	120	600	0	0	2	7	0	40.00	20.00	0.00	25.00	0.00	50.00	0.00	0.00
7	6000	200	0	0	1	7	0	48.00	4.00	0.00	0.00	5.50	-1.00	0.00	0.00
10	8500	5000	2	0	1	25	0	40.00	25.00	0.00	27.98	22.50	50.00	0.00	0.00
-1	8725.69	-1	0	0	3	10	0	40.00	20.00	0.00	0.00	-1.00	0.00	0.00	0.00
6	49	-1	1	0	1	0	0	20.00	30.50	0.00	0.00	-1.00	-1.00	0.00	0.00
2	564	420	3	0	0	4	0	150.00	30.00	0.00	0.00	-1.00	25.00	0.00	0.00
3	8698.36	56497.34	6	0	1	18	0	30.00	27.00	0.00	150.00	80.00	-1.00	0.00	0.00
3	6709.76	700	5	0	0	21	0	120.00	100.00	25.00	0.00	75.00	300.00	0.00	0.00
2	3614	0	0	0	1	0	0	0.00	15.00	0.00	0.00	0.00	0.00	0.00	0.00
3.5	115	0	0	0	6	15	0	-1.00	100.00	0.00	0.00	60.00	150.00	0.00	0.00
4	560	0	0	0	0	10	0	-1.00	6.00	0.00	0.00	0.00	25.00	0.00	0.00
6	204	1000	0	0	1	3	0	4.00	14.00	0.00	0.00	20.00	75.00	0.00	0.00
5	40	0	2	0	1	7	0	0.50	0.50	0.00	0.00	0.00	20.00	0.00	0.00
2	-1	0	0	0	0	10	0	15.00	200.00	0.00	0.00	25.00	25.00	0.00	0.00
4	15000	600	4	0	0	2	0	0.00	-1.00	0.00	0.00	0.00	0.00	0.00	0.00
7	400	-1	1	0	2	16	0	20.00	40.00	0.00	0.00	70.00	300.00	0.00	0.00
4	13800	35000	5	0	0	3	0	50.00	40.00	0.00	0.00	97.50	250.00	0.00	68.00
2	47500	0	0	0	0	6	0	-1.00	10.00	0.00	0.00	102.50	75.00	0.00	0.00
4	2000	10000	7	0	0	10	0	50.00	50.00	0.00	0.00	111.00	330.00	0.00	0.00
2	-1	600	0	0	0	0	0	20.00	12.00	0.00	34.22	45.50	75.00	0.00	0.00
2	16000	-1	0	0	2	5	0	10.00	10.00	0.00	0.00	60.00	82.50	0.00	0.00
8	1800	4000	0	0	0	14	0	10.00	10.00	0.00	0.00	56.50	165.00	0.00	0.00
1.40625	1200	-1	0	0	0	0	0	120.00	80.00	0.00	0.00	75.00	450.00	0.00	0.00
5	5500	500	3	0	0	10	0	5.00	16.00	0.00	0.00	25.00	25.00	0.00	0.00
3	0	0	0	0	4	0	0	40.00	4.00	0.00	0.00	21.00	25.00	0.00	0.00
4	0	400	6	0	0	20	1	2.00	1.60	0.00	0.00	0.00	50.00	0.00	0.00
6	-1	600	2	0	3	6	0	40.00	20.00	0.00	0.00	-1.00	82.50	0.00	0.00
4	105	0	4	0	0	30	0	120.00	80.00	0.00	0.00	47.50	75.00	0.00	0.00
-1	4005	1500	3	0	3	12	0	0.50	3.50	0.00	0.00	12.45	20.00	0.00	0.00
1.125	60	700	0	0	0	18	0	75.00	250.00	0.00	0.00	21.00	100.00	0.00	0.00
1	70	0	0	0	0	3	0	20.00	60.00	0.00	0.00	25.00	75.00	0.00	0.00
4	306	700	3	0	0	18	0	40.00	30.00	0.00	0.00	60.00	100.00	0.00	0.00
2	1200	500	0	0	0	0	0	42.00	14.00	0.00	0.00	10.00	60.00	0.00	0.00
1	0	-1	0	0	0	0	0	10.00	15.00	0.00	0.00	16.00	10.00	0.00	0.00
2	6324	5000	0	0	2	10	0	100.00	130.00	0.00	14.00	60.00	0.00	0.00	0.00
4	580	800	3	0	3	15	0	100.00	20.00	0.00	28.00	0.00	150.00	0.00	0.00
10	0	0	0	0	3	0	0	-1.00	10.00	0.00	0.00	10.00	100.00	0.00	0.00
4	448	0	8	0	0	38	0	-1.00	10.00	0.00	0.00	0.00	50.00	0.00	0.00
2	17299	0	0	0	3	1	0	3.00	5.00	0.00	0.00	42.50	0.00	0.00	0.00
1	7499	0	0	0	0	4	0	0.50	3.00	0.00	8.70	0.00	0.00	0.00	0.00
-1	70	0	0	0	0	0	0	-1.00	5.00	0.00	0.00	8.00	0.00	0.00	0.00
0.129	-1	3000	2	0	0	10	0	40.00	30.00	0.00	0.00	76.00	-1.00	0.00	0.00
0.66375	5000	0	0	0	0	0	0	0.00	-1.00	0.00	0.00	40.00	0.00	0.00	0.00
0.524475	3908	-1	6	0	1	20	0	100.00	-1.00	0.00	0.00	195.00	0.00	0.00	0.00
0.2058	20	0	0	0	0	3	0	15.00	10.00	0.00	0.00	40.00	20.00	0.00	0.00
2.475	-1	15	2	0	1	15	0	30.00	20.00	0.00	0.00	72.50	60.00	0.00	0.00
5.775	40	250	0	0	0	15	0	-1.00	-1.00	0.00	0.00	72.50	-1.00	0.00	0.00
0.1365	4000	500	0	0	0	18	0	30.00	20.00	0.00	0.00	72.50	80.00	0.00	0.00
2.4765	5400	0	7	0	3	18	0	30.00	20.00	0.00	0.00	66.50	0.00	0.00	0.00
0.5472	4999	200	0	0	0	15	0	30.00	15.00	0.00	0.00	93.50	75.00	0.00	0.00
0.394875	30	-1	0	0	0	9	0	20.00	15.00	0.00	0.00	65.00	0.00	0.00	0.00
0.81	-1	-1	1	0	0	15	0	40.00	20.00	0.00	0.00	72.50	0.00	0.00	0.00
0.0576	8600	0	0	1	2	6	0	30.00	15.00	0.00	0.00	65.00	75.00	0.00	0.00
0.41	39	0	1	0	0	0	0	0.00	17.00	0.00	0.00	65.00	75.00	0.00	0.00
7.722	-1	200	4	0	0	7	0	30.00	15.00	0.00	0.00	62.50	0.00	0.00	0.00
0.3105	39	0	3	0	0	1	0	15.00	10.00	0.00	0.00	50.00	120.00	0.00	0.00
2.451	40	100	7	0	0	11	0	8.00	20.00	0.00	0.00	212.50	75.00	0.00	0.00
4.70925	-1	300	2	0	0	12	0	30.00	20.00	0.00	0.00	72.50	-1.00	0.00	0.00
3.828	10729	0	3	0	0	7	0	100.00	8.00	0.00	0.00	63.50	-1.00	0.00	-1.00
1.50675	9500	200	3	0	0	20	0	40.00	4.00	0.00	0.00	72.50	-1.00	0.00	0.00
1.683	2435	500	5	0	0	12	0	25.00	15.00	0.00	0.00	67.50	125.00	0.00	40.00
0.463275	499	0	0	0	0	2	0	25.00	30.00	0.00	0.00	97.50	0.00	0.00	0.00
-1	-1	-1	1	0	2	15	0	40.00	-1.00	0.00	0.00	67.50	60.00	0.00	0.00
3.80625	-1	0	8	0	2	4	0	40.00	8.00	0.00	0.00	70.00	-1.00	0.00	0.00
2.625	2559	0	0	0	0	5	0	-1.00	15.00	0.00	0.00	70.00	125.00	0.00	0.00
0.153	9848	100	0	0	0	30	0	25.00	-1.00	0.00	111.00	97.50	-1.00	0.00	0.00
3.8313	1550	0	2	0	2	10	0	100.00	8.00	0.00	0.00	70.00	-1.00	0.00	0.00
0.7875	150	0	0	0	0	7	0	70.00	15.00	0.00	0.00	67.50	75.00	0.00	0.00
0.399	-1	-1	3	0	0	8	0	25.00	15.00	0.00	0.00	70.00	40.00	0.00	0.00
3.525	200	0	5	0	0	15	0	30.00	15.00	0.00	0.00	72.50	0.00	0.00	0.00
1.47	39	0	0	0	0	15	0	20.00	-1.00	0.00	0.00	130.00	-1.00	0.00	0.00
0.9384	39	0	9	0	0	17	0	4.00	20.00	-1.00	0.00	195.00	-1.00	0.00	0.00
3.83625	-1	0	3	0	0	15	0	40.00	-1.00	0.00	0.00	72.50	45.00	0.00	0.00
2.85	-1	0	6	0	0	25	0	60.00	20.00	0.00	0.00	105.50	120.00	0.00	0.00
1.55025	5799	100	2	0	7	16	0	100.00	40.00	0.00	0.00	102.00	75.00	0.00	0.00
0.4437	1280	0	0	0	0	13	0	25.00	4.00	0.00	0.00	134.00	150.00	0.00	0.00
-1	539	0	2	0	0	8	0	-1.00	-1.00	0.00	0.00	227.50	-1.00	0.00	0.00
2.8125	-1	3000	12	0	0	40	0	30.00	20.00	0.00	0.00	272.50	60.00	0.00	0.00
0.7695	-1	0	7	0	0	10	0	40.00	8.00	0.00	0.00	66.00	75.00	0.00	0.00
2.6208	-1	0	0	0	0	15	0	20.00	8.00	0.00	0.00	62.50	75.00	0.00	0.00
1.4625</															

POTCST3	SPOTCST	TRANSP	AGCOSTS	SEEDCOE	AGCREDI	FNOED	FSPRIM	FPENS	HEADOCK	HHEAD	HHSIZE	FMORED	MMGRNT	DMLAND	FOODAGE	
0.00	0.00	0.00	220.00	70.00	0	0	2	0	14	0	10	0	0	0	3	47
0.00	0.00	0.00	106.50	81.50	0	1	0	1	3	1	5	0	0	0	3	69
0.00	0.00	0.00	125.95	20.95	0	0	2	0	1	1	4	0	0	0	2	48
0.00	0.00	0.00	460.00	200.00	0	1	1	1	3	1	11	0	1	1	2	16
0.00	0.00	0.00	257.00	39.00	0	0	0	0	12	1	9	0	1	1	2	47
0.00	0.00	0.00	225.00	225.00	0	1	1	1	1	1	8	0	3	2	2	61
0.00	0.00	0.00	385.00	105.00	0	0	0	0	4	1	5	0	0	0	-1	48
0.00	0.00	0.00	212.50	165.00	0	1	1	1	3	0	19	1	2	2	2	66
0.00	0.00	0.00	450.00	310.00	1	1	1	0	6	1	10	0	2	2	2	51
0.00	0.00	0.00	179.00	14.00	0	1	0	1	3	0	7	0	-1	2	2	60
0.00	25.00	0.00	160.00	135.00	0	1	0	1	1	1	6	0	0	0	3	67
0.00	0.00	0.00	56.50	51.00	0	1	0	0	6	1	1	0	0	0	3	39
0.00	50.00	0.00	215.48	165.00	0	2	0	1	3	1	9	0	1	1	3	50
0.00	0.00	0.00	59.00	60.00	0	1	0	0	9	0	11	0	1	1	3	32
-1.00	0.00	0.00	46.50	48.50	0	1	1	0	1	1	10	0	-1	3	1	1
0.00	0.00	0.00	204.00	205.00	0	1	2	1	12	0	10	0	4	3	3	57
0.00	0.00	0.00	286.00	56.00	2	1	0	1	3	0	8	1	0	3	3	67
6.00	0.00	0.00	626.00	526.00	0	1	0	1	12	0	8	0	1	2	2	52
20.00	0.00	0.00	35.00	35.00	0	1	0	0	4	1	11	0	2	3	3	56
6.00	0.00	0.00	315.00	255.00	0	0	1	1	3	1	10	0	1	2	2	62
0.00	0.00	0.00	30.00	30.00	0	0	1	0	6	1	10	0	0	2	2	56
0.00	0.00	0.00	113.00	93.00	0	0	1	1	6	1	11	0	2	2	2	64
0.00	0.00	0.00	21.00	21.00	0	0	0	0	-1	0	7	0	1	3	2	28
0.00	0.00	0.00	265.00	240.00	0	2	3	2	3	1	10	0	1	2	2	92
50.00	0.00	0.00	49.00	49.00	0	1	0	0	0	0	7	0	1	3	3	45
0.00	0.00	0.00	430.00	360.00	0	0	5	0	11	1	13	0	0	1	621	
0.00	0.00	0.00	505.50	340.00	0	0	1	0	6	0	8	0	0	2	2	35
0.00	0.00	0.00	186.50	84.00	0	1	0	1	3	1	11	0	4	2	2	42
20.00	8.00	0.00	569.00	458.00	0	1	0	0	4	0	6	0	0	2	2	43
64.00	0.00	0.00	313.72	171.00	0	0	1	0	5	0	5	0	1	2	2	29
0.00	0.00	0.00	262.50	102.50	0	0	1	0	13	0	8	0	1	2	2	32
0.00	-1.00	0.00	240.50	184.00	0	0	1	1	8	0	12	0	1	2	2	35
0.00	0.00	270.00	1095.00	650.00	0	1	0	0	4	1	10	0	0	2	2	30
0.00	0.00	0.00	71.00	46.00	0	0	1	1	14	1	12	1	2	2	2	41
0.00	0.00	0.00	90.00	69.00	0	1	0	0	1	1	7	0	0	2	2	63
0.00	0.00	0.00	53.60	53.60	0	0	1	1	1	1	6	0	-1	2	2	70
0.00	0.00	0.00	141.50	142.50	0	1	0	1	15	0	12	0	3	2	2	36
0.00	0.00	0.00	322.50	275.00	0	0	2	1	14	1	15	0	2	2	2	77
10.00	0.00	0.00	246.45	34.00	0	0	0	0	14	1	9	0	2	2	2	55
0.00	0.00	0.00	446.00	425.00	0	1	1	0	1	1	7	0	2	2	2	30
0.00	0.00	0.00	180.00	155.00	0	1	0	0	1	1	7	0	1	2	2	40
0.00	0.00	0.00	230.00	170.00	2	0	1	1	3	1	11	0	1	2	2	45
0.00	0.00	0.00	366.00	116.00	0	0	1	0	1	1	6	0	1	2	2	37
0.00	0.00	0.00	51.00	35.00	0	0	0	0	8	1	3	0	0	3	2	22
30.00	0.00	0.00	334.00	260.00	0	0	0	0	9	0	7	0	0	3	3	44
0.00	28.00	0.00	326.00	298.00	0	0	2	1	6	1	12	0	0	3	3	38
0.00	0.00	0.00	119.00	109.00	0	1	0	0	1	1	7	0	1	3	3	58
0.00	0.00	0.00	59.00	59.00	0	0	2	0	1	1	10	0	5	3	2	22
0.00	0.00	0.00	50.50	8.00	0	0	0	0	9	0	7	0	1	-1	1	49
0.00	0.00	0.00	12.20	3.50	2	2	0	1	3	1	6	0	2	3	3	33
0.00	0.00	0.00	12.00	4.00	0	0	2	0	3	1	4	0	0	3	3	55
-1.00	0.00	0.00	294.00	68.00	0	0	0	0	1	1	5	0	1	1	1	34
30.00	0.00	0.00	69.00	29.00	0	0	0	0	1	0	9	0	0	1	1	54
90.00	-1.00	-1.00	382.00	188.00	0	0	0	0	2	0	7	0	1	1	1	53
13.00	0.00	20.00	118.00	58.00	0	0	2	1	3	1	16	0	2	1	1	71
30.00	0.00	0.00	212.50	140.00	0	0	0	0	1	1	10	0	1	1	1	45
46.00	0.00	0.00	115.50	43.00	0	0	2	2	3	1	6	0	0	1	1	85
30.00	0.00	0.00	232.50	160.00	0	0	0	0	1	1	5	0	1	2	2	48
15.00	0.00	0.00	131.50	65.00	0	-1	-1	0	3	0	15	-1	0	-1	1	62
15.00	0.00	0.00	228.50	135.00	0	0	0	0	4	0	5	0	0	1	1	47
36.00	0.00	0.00	136.00	71.00	0	0	1	0	5	0	9	0	1	1	1	58
0.00	0.00	0.00	132.50	60.00	0	0	0	2	3	1	16	0	4	2	2	74
30.00	10.00	0.00	225.00	160.00	0	1	1	1	3	0	8	0	2	1	1	65
-1.00	0.00	0.00	156.00	91.00	0	0	2	0	6	1	4	0	1	1	1	40
0.00	0.00	0.00	107.50	45.00	0	0	1	0	7	0	12	0	1	1	1	28
12.00	0.00	0.00	207.00	157.00	0	0	2	0	4	0	5	0	1	1	1	59
30.00	0.00	0.00	345.50	133.00	0	2	1	1	3	0	11	0	2	1	1	78
0.00	0.00	0.00	121.50	49.00	0	0	3	1	3	1	14	0	3	1	1	67
15.00	0.00	0.00	184.50	122.00	0	0	0	1	3	0	7	0	2	1	1	82
60.00	0.00	0.00	175.50	103.00	0	0	1	0	1	1	7	0	1	1	1	46
20.00	0.00	0.00	292.50	185.00	0	0	5	1	3	0	16	0	3	1	1	47
15.00	0.00	0.00	167.50	70.00	0	0	1	1	3	1	12	0	2	1	1	67
45.00	0.00	0.00	211.50	144.00	0	0	0	0	1	1	8	0	1	1	1	41
0.00	0.00	0.00	117.00	47.00	1	0	0	1	3	1	14	0	0	1	1	45
40.00	0.00	0.00	249.00	179.00	1	0	0	0	8	0	11	0	0	1	1	43
0.00	0.00	0.00	231.50	23.00	0	0	0	0	8	0	4	0	0	1	1	49
15.00	0.00	0.00	192.00	122.00	0	0	0	0	3	0	10	0	2	1	1	52
15.00	0.00	0.00	242.50	175.00	0	0	0	0	3	0	5	0	0	1	1	65
40.00	-1.00	0.00	189.00	119.00	0	0	1	0	1	1	11	1	4	1	1	54
0.00	0.00	0.00	117.50	45.00	0	0	0	0	1	1	10	0	1	1	1	51
-1.00	0.00	0.00	147.00	17.00	0	0	1	1	3	1	5	0	1	1	1	80
15.00	0.00	-1.00	230.00	38.00	0	0	0	1	3	1	14	0	1	1	1	68
0.00	0.00	0.00	156.50	84.00	0	0	2	1	3	1	15	0	2	1	1	80
22.00	0.00	0.00	327.50	222.00	0	0	1	0	1	1	13	0	3	1	1	53
15.00	-1.00	0.00	331.00	229.00	0	0	1	1	6	1	8	0	0	1	1	31
-1.00	0.00	0.00	312.00	178.00	0	1	0	0	1	1	11	0	1	1	1	52
-1.00	0.00	0.00	223.50	-4.00	0	0	1	2	3	1	16	0	6	1	1	67
35.00	0.00	0.00	417.50	145.00	0	0	0	0	1	1	8	0	5	1	1	59
50.00	-1.00	0.00	238.00	172.00	0	0	3	2	3	1	16	0	1	1	1	62
15.00	-1.00	0.00	179.50	117.00	1	0	0	0	4	1	6	0	0	1	1	44
45.00	0.00	0.00	399.50	42.00	0	0	1	0	9	0	11	0	2	1	1	56
45.00	0.00	0.00	572.00	182.00	0	0	1	0	3	0	6	0	1	1	1	65
40.00	0.00	0.00	516.50	414.00	0	0	0	0	1	1	8	0	1	1	1	45
45.00	0.00	0.00	772.50	545.00	0	0	1	0	10	0	11	0	2	1	1	65
-1.00	0.00	0.00	320.50	168.00	0	1	0	0	3	0	10	0	0	1	1	

M6-8	GROWSU	DURAGE	DMDUR	FMGRNT	FJPRIM	HOMEKE	INFANTS	MSPRIM	HEADAGE	PENSION	INTERV2	ELECT	DISABLE	UNEMPLC	INTERV3
2	0	38	1	0	0	2	0	0	17	0	-1	1	0	0	6
1	0	69	1	0	0	0	0	1	69	2	5	0	0	0	4
1	0	48	1	0	0	1	0	0	48	0	6	0	1	0	6
1	0	36	1	1	0	0	0	0	76	1	5	1	1	1	5
1	0	47	0	1	1	0	1	1	47	0	5	0	0	0	5
2	0	23	0	0	0	2	0	2	53	1	6	0	0	0	6
0	0	48	0	0	0	0	0	1	48	1	5	0	0	0	5
2	1	66	0	2	0	2	3	1	65	1	6	0	1	2	6
1	0	51	1	0	0	0	0	1	51	0	5	0	0	0	5
0	0	60	1	-1	0	1	1	1	60	1	6	0	0	0	6
0	0	67	1	0	0	1	1	0	67	1	6	1	0	2	6
0	0	39	1	0	0	0	0	0	39	0	5	0	0	0	6
2	0	29	0	0	0	1	0	0	77	1	6	0	0	1	6
2	0	36	0	0	0	0	1	0	36	0	6	0	0	1	5
0	0	0	52	-1	0	1	1	2	45	1	5	0	0	0	5
0	0	57	1	0	0	1	1	1	55	1	6	0	0	2	5
1	0	67	1	0	0	0	1	1	53	2	5	0	0	0	5
0	0	52	0	0	1	0	0	0	52	1	6	1	0	1	5
2	0	56	1	0	0	0	1	0	56	0	5	1	0	3	5
1	0	62	1	1	0	1	2	0	62	1	6	0	0	3	6
0	0	63	0	2	0	0	0	2	56	0	5	0	0	3	6
1	0	64	0	0	0	0	3	1	35	1	6	1	0	0	6
0	0	28	1	0	0	1	3	0	25	0	5	0	0	2	5
0	0	92	1	0	0	0	0	0	92	2	-1	0	0	2	6
1	0	45	0	0	0	0	0	0	-1	0	6	0	0	0	0
1	0	62	0	2	0	0	0	1	69	1	5	0	0	1	5
1	1	45	0	0	0	0	0	2	45	0	5	0	0	1	5
1	0	42	0	1	0	0	1	0	68	1	5	0	0	1	5
2	0	43	0	0	0	0	0	1	43	0	6	0	0	1	5
2	0	29	0	0	0	1	1	0	29	0	6	0	0	0	5
0	0	32	0	0	0	0	1	2	57	0	5	0	0	2	5
1	0	28	1	5	0	0	0	0	35	2	6	0	0	0	5
0	0	30	0	0	0	0	2	2	65	1	5	0	0	3	5
3	0	41	0	2	1	1	1	1	21	1	5	0	0	0	6
1	0	63	0	0	0	1	1	1	47	0	6	0	0	0	6
1	0	70	0	-1	1	1	0	1	50	2	6	0	0	0	6
1	0	36	0	1	0	1	3	1	36	0	5	0	0	0	5
0	0	77	1	2	1	1	2	4	17	1	6	0	0	3	6
1	0	55	0	0	0	0	1	1	22	0	5	0	0	0	6
2	0	30	0	0	0	1	1	0	57	0	6	0	0	0	6
0	0	40	0	0	0	1	2	1	35	0	5	0	0	0	6
1	0	45	0	4	2	1	1	1	64	1	6	0	0	2	6
0	0	37	0	0	0	1	0	1	35	0	5	0	0	0	6
0	0	32	0	0	0	1	1	0	32	0	5	0	0	0	5
2	0	44	0	0	0	0	0	2	44	0	5	0	0	0	5
0	0	43	0	0	0	0	2	1	38	1	6	0	0	1	6
1	0	58	1	1	0	1	0	2	58	0	5	0	0	2	6
0	0	29	0	0	0	2	1	4	22	0	6	0	0	3	6
0	0	50	0	0	0	0	0	1	50	0	5	0	0	0	5
0	0	33	0	0	1	0	0	0	66	1	5	0	0	2	5
0	0	55	1	0	0	0	0	2	55	1	6	0	0	1	6
0	0	34	0	0	0	1	0	1	32	0	1	1	0	0	1
1	0	54	0	0	0	1	2	1	54	0	2	0	0	3	2
1	0	53	0	0	0	0	1	0	53	0	3	0	0	2	3
0	0	71	1	1	2	0	3	0	71	1	3	0	0	2	3
2	0	45	0	2	1	1	3	0	42	0	1	0	0	1	1
0	0	85	1	0	1	0	1	1	67	2	2	0	1	0	4
1	0	48	0	0	0	1	0	0	38	0	1	0	0	0	1
-1	0	62	0	0	-1	2	2	-1	62	2	2	0	0	2	2
1	0	47	1	0	0	0	1	0	44	0	2	0	0	2	2
1	0	58	0	3	0	1	0	0	55	0	3	0	0	0	3
2	0	74	0	2	2	0	0	3	70	2	2	0	0	4	1
3	0	65	1	1	1	0	0	0	65	1	2	0	0	3	2
1	0	40	1	2	1	0	0	0	40	0	3	0	0	2	3
1	0	28	0	1	0	1	0	2	59	0	1	0	0	3	1
0	0	59	0	1	0	1	0	0	59	0	3	0	0	1	3
0	0	65	1	2	0	0	1	0	78	2	2	0	0	1	2
2	0	67	1	2	0	0	4	1	67	1	2	1	1	1	1
2	0	77	1	1	2	1	0	0	82	1	2	0	0	4	2
1	0	46	0	0	0	1	1	0	43	0	1	0	0	3	1
3	0	71	0	4	1	4	0	1	71	2	2	0	0	4	2
0	0	67	1	1	0	0	2	2	67	1	-1	0	0	4	3
1	0	41	1	0	1	1	2	1	41	0	1	1	0	0	1
0	0	45	1	0	2	1	2	3	68	0	1	0	0	3	1
1	0	43	0	0	0	1	2	0	43	0	2	0	0	0	2
0	0	49	0	0	0	1	1	1	49	0	3	0	0	0	3
1	0	52	0	2	0	1	0	0	52	1	2	0	0	1	2
0	0	65	0	0	1	0	0	1	65	2	3	0	0	3	4
3	0	54	0	1	0	1	0	0	52	0	1	0	0	0	1
1	0	51	0	0	1	1	0	1	45	0	-1	0	0	0	1
0	0	80	1	0	1	0	1	1	81	1	3	0	0	1	3
3	1	68	1	0	1	0	4	0	68	1	3	0	0	4	4
1	0	80	1	0	2	0	1	2	80	1	3	0	0	2	1
2	0	53	1	1	0	1	0	1	53	0	1	0	0	2	1
1	0	31	1	0	1	0	2	0	31	1	2	0	0	0	2
0	0	52	1	2	0	1	2	1	52	0	3	0	0	0	3
0	1	67	1	5	1	1	3	0	67	2	-1	0	0	0	3
2	0	59	1	1	0	1	0	0	59	0	1	0	0	1	4
0	0	62	1	3	4	1	2	1	62	2	2	0	0	6	4
1	0	44	1	2	1	0	1	0	44	0	2	0	0	1	2
0	0	56	0	2	0	1	1	1	56	0	3	0	0	1	-1
1	0	65	0	0	1	1	0	0	65	1	1	0	0	1	4
0	0	45	0	0	1	1	1	1	47	0	1	0	0	1	4
1	0	65	0	0	0	1	2	0	65	0	3	0	0	2	4
0	0	76	0	0	0	1	0	0	76	2	1	0	0	0	4
1	1	60	1	1	1	0	1	0	65	1	2	0	0	3	4
0	0	59	0	3	0	0	2	0	59	0	3	1	0	3	4
0	0	42	0	0	0	1	2	1	42	0	1	0	0	0	4
0	0	57	1	2	3	0	0	3	57	1	2	0	0	5	2

SCHOLAR	SEMISKL	SEMPLOY	STUDENT	TRADE	FADULT	VAGRANT	MPENS	FEMALE	F6-8	F9-10	DMCROP	EXTNSIT	PROFESS	DMINPUT	MNOED
4	0	1	0	0	3	0	0	5	1	0	1	0	0	1	1
1	0	1	0	0	0	0	0	2	0	0	1	0	0	1	1
2	0	0	0	0	3	0	0	3	1	0	1	0	0	1	0
3	0	0	0	0	4	0	0	6	1	3	1	0	3	1	0
2	1	1	0	0	3	0	0	4	2	0	0	0	0	0	0
2	3	0	0	0	1	0	0	3	0	0	1	0	0	1	0
1	1	0	0	0	1	0	0	2	1	0	0	0	0	0	0
4	1	0	0	0	5	0	1	10	0	3	0	0	0	2	0
2	0	2	0	0	3	1	0	5	0	0	1	0	0	1	0
0	0	0	0	0	1	1	1	5	0	1	0	0	0	1	1
2	0	0	0	0	0	0	0	3	0	0	1	0	0	1	0
0	0	1	0	0	1	0	0	1	0	0	1	0	0	1	0
4	0	1	0	0	2	0	0	3	1	0	1	0	0	2	1
3	1	0	0	0	4	0	0	9	2	1	1	0	0	1	0
1	2	1	0	0	3	0	0	4	0	1	45	0	0	45	0
0	1	0	0	0	4	0	0	6	0	0	1	0	1	1	1
1	0	0	0	0	1	0	0	5	0	0	1	0	1	1	0
2	1	0	1	0	3	0	0	5	1	1	1	0	0	0	0
3	0	0	1	0	4	1	0	5	1	1	1	0	0	1	0
0	0	0	0	0	2	0	1	7	2	0	1	0	0	1	0
3	1	1	0	0	4	0	1	5	1	1	1	0	0	0	0
3	0	1	0	0	1	0	1	6	1	0	1	0	0	0	0
1	1	0	0	0	2	1	0	3	0	2	1	0	0	1	0
0	0	0	0	0	3	0	0	8	0	0	1	0	0	1	0
0	0	0	0	0	1	0	0	2	0	0	1	0	0	1	0
2	0	0	0	0	5	0	1	2	0	0	1	0	0	0	1
1	0	1	1	0	1	0	0	7	0	0	0	0	0	0	0
1	0	2	0	0	2	0	0	3	1	1	1	0	0	0	0
4	0	1	0	0	2	0	0	2	0	1	1	0	0	0	0
0	0	0	0	1	2	0	0	3	0	0	1	0	0	0	0
0	0	2	0	0	2	0	0	3	0	1	1	0	1	0	0
0	0	0	0	0	6	0	0	9	1	5	1	0	0	1	0
2	0	0	0	0	2	0	1	2	1	0	0	0	0	0	2
3	2	1	0	0	3	0	0	6	1	0	0	0	1	0	0
0	1	0	0	0	1	0	0	3	0	0	0	0	0	0	0
1	0	0	0	0	2	0	1	3	1	0	1	0	0	0	0
1	1	1	0	0	1	0	0	7	1	0	1	0	0	1	0
2	3	0	0	0	3	0	0	8	1	0	1	0	0	1	0
0	1	1	0	0	3	0	0	6	2	1	1	0	0	1	0
1	2	0	0	0	2	0	0	2	0	0	1	0	0	1	0
1	1	0	0	0	1	0	0	3	0	0	0	0	0	0	0
2	1	0	0	0	4	0	0	7	1	1	1	0	0	0	0
0	1	0	0	0	1	0	0	3	0	0	1	0	0	0	0
0	0	0	0	0	1	0	0	1	1	0	1	0	0	1	1
3	1	1	0	0	1	0	0	3	1	0	1	0	0	1	0
1	0	1	0	0	2	0	0	7	1	0	1	0	0	0	0
1	0	2	0	0	2	0	0	4	1	0	1	0	0	1	0
1	0	1	0	0	4	1	0	5	1	1	0	0	0	0	0
2	1	1	1	0	2	0	0	3	1	1	1	0	0	1	0
0	0	0	1	0	2	0	0	3	0	0	1	0	1	1	0
0	1	0	0	0	1	0	0	4	0	1	0	0	0	0	0
0	1	0	0	0	3	0	0	6	2	1	0	0	0	0	0
1	0	0	1	0	2	0	0	3	1	2	0	0	1	0	0
2	1	0	0	0	4	2	0	9	0	1	1	0	0	1	0
1	1	0	0	0	3	0	0	7	0	2	0	0	0	0	0
0	1	0	0	0	1	0	0	3	0	1	1	0	0	1	0
3	1	0	0	0	7	0	1	8	0	1	0	0	0	0	0
1	0	0	0	0	2	0	0	3	-1	-1	0	0	0	0	-1
3	0	0	0	1	4	0	0	4	0	3	0	0	0	0	1
0	1	0	0	0	3	0	2	5	0	0	0	0	0	0	0
1	2	0	0	0	4	0	0	5	2	0	1	0	0	1	0
0	0	2	0	0	3	0	0	3	0	0	1	0	0	1	0
0	0	1	0	0	2	0	0	3	1	0	0	0	0	0	0
2	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0
0	1	0	0	0	4	0	0	6	0	1	0	0	0	0	2
0	0	0	0	0	2	0	1	10	1	1	1	0	1	1	0
2	0	0	0	0	1	0	0	2	0	1	0	0	0	0	1
3	0	0	0	0	6	0	1	8	1	0	0	2	0	0	0
3	1	0	0	0	5	0	0	7	0	4	1	0	0	1	0
2	1	0	0	0	3	0	0	5	1	1	1	0	0	1	0
3	0	0	0	0	2	0	0	6	1	0	1	0	0	1	0
0	0	0	0	0	2	0	0	6	0	3	0	0	0	0	0
1	0	2	0	0	4	0	0	2	1	3	0	0	0	0	0
3	2	0	1	0	1	0	0	1	0	0	0	0	0	0	0
2	0	0	0	0	2	0	0	4	1	0	0	0	0	0	0
0	0	0	0	0	1	1	0	4	0	0	1	0	0	1	0
1	1	0	0	0	3	0	0	9	1	2	1	0	0	1	0
3	3	0	0	0	5	0	0	10	0	0	1	0	0	1	0
2	1	1	0	0	2	0	0	8	1	1	1	0	0	1	0
1	2	0	0	0	3	1	0	4	1	0	2	0	0	1	0
2	0	0	0	3	3	0	0	7	2	0	1	0	0	1	0
1	1	0	0	3	3	0	0	7	0	2	1	0	1	1	0
0	0	0	0	0	5	0	1	11	0	0	1	0	0	1	0
2	1	0	0	0	3	0	0	3	2	0	1	0	0	1	0
3	1	0	0	0	4	0	0	8	4	0	0	0	0	0	0
3	0	0	0	1	3	0	1	3	1	0	0	0	0	0	0
2	1	0	0	0	4	0	0	6	2	1	0	0	0	0	0
3	0	0	0	1	5	0	1	9	1	3	0	0	0	0	0
0	1	0	0	0	2	2	1	3	0	1	0	0	0	0	3
0	0	2	0	0	3	0	0	7	1	0	0	0	0	0	0
1	1	0	0	0	2	0	0	5	0	0	0	0	0	0	1
0	0	1	0	0	3	0	0	3	0	0	1	0	0	1	0

DMFOOD	INTERV1	NOSKIL	ROOF	ADJFIELD	CHILD	MJNPRIM	MALES	CROPAGE	MADULT	M9-10	COOPS	MMORED	FENCE	INPUTAGI	PSU
0	5	1	2	1	3	0	5	38	4	1	0	0	0	38	1.4
1	5	0	2	1	1	0	3	69	3	0	0	0	0	69	1.4
1	5	0	2	1	0	0	1	48	1	0	0	0	0	48	1.4
1	5	0	5	1	1	0	5	76	4	0	-1	3	0	76	1.4
0	5	0	2	1	3	0	5	47	2	0	-1	0	0	47	1.4
1	6	0	1	1	2	0	5	53	4	1	0	0	0	61	1.4
0	5	0	2	1	2	0	3	48	2	1	0	0	0	48	1.4
0	5	0	5	1	3	0	9	66	6	1	0	1	0	66	1.4
1	5	1	-1	1	3	1	5	51	4	1	0	0	0	51	1.4
1	5	1	-1	1	2	0	2	67	1	0	0	0	0	60	1.3
1	7	0	1	1	1	1	3	67	3	1	0	0	0	67	1.3
1	7	0	5	1	0	0	0	39	0	0	0	0	0	39	1.3
1	7	0	5	0	2	0	6	77	4	0	0	2	0	77	1.3
1	7	0	5	1	4	0	2	32	2	0	0	0	0	32	1.3
45	7	0	5	1	3	0	6	1	3	1	0	0	0	1	1.3
1	7	2	1	1	1	2	4	87	3	0	0	1	0	87	1.3
1	7	0	5	1	3	0	3	67	2	0	0	0	1	67	1.3
0	6	1	5	1	2	1	3	49	2	0	0	1	0	52	1.1
1	6	0	5	1	2	0	6	56	4	2	0	1	0	56	1.1
1	6	0	5	1	2	0	3	62	2	2	0	0	0	62	1.1
1	6	0	5	1	2	0	5	56	3	2	0	0	1	63	1.1
0	6	1	2	1	3	0	5	35	2	1	0	0	0	64	1.1
1	7	0	5	1	1	0	4	28	1	1	0	0	0	28	1.1
1	6	1	1	1	4	0	2	92	1	0	0	0	0	92	1.1
0	6	-1	2	1	4	1	5	43	2	0	0	0	1	43	1.1
0	6	1	5	1	2	0	6	57	4	2	0	0	0	62	1.1
1	5	0	2	1	2	0	6	45	3	0	4	1	0	45	2.8
0	5	0	2	1	4	0	8	68	3	2	4	0	0	42	2.8
0	5	0	5	1	1	0	4	38	3	0	0	0	0	43	2.8
0	5	0	1	0	1	0	2	47	1	0	0	0	0	29	2.8
0	5	0	5	1	2	0	5	54	3	0	0	1	0	32	2.8
0	5	5	5	1	4	0	3	65	1	0	0	0	0	65	2.8
0	5	1	1	1	2	0	8	30	3	0	0	0	0	30	2.8
0	6	0	5	1	3	0	6	41	4	0	0	0	0	41	2.6
0	6	0	5	1	3	0	4	63	2	0	0	0	0	63	2.6
0	6	0	5	1	0	1	3	50	2	1	0	0	0	70	2.6
0	6	1	5	1	4	0	5	32	3	1	0	0	0	32	2.6
1	6	0	1	1	3	0	7	77	4	0	0	0	0	77	2.6
0	6	0	5	1	3	0	3	45	2	0	0	0	0	45	2.6
0	6	0	1	1	2	0	5	67	2	0	0	0	0	67	2.6
0	6	0	1	1	2	1	4	40	2	0	0	0	0	40	2.6
0	6	1	5	0	3	0	4	64	2	0	0	0	0	45	2.6
0	5	0	2	1	4	0	3	35	1	0	0	0	0	37	2.5
1	7	1	5	1	0	0	2	22	1	0	0	0	0	22	2.5
0	7	0	5	1	2	0	4	39	4	0	0	0	0	39	2.5
1	7	0	5	1	6	0	5	38	1	0	0	0	0	43	2.5
1	7	0	5	0	2	0	3	58	3	0	0	0	0	58	2.5
1	7	0	5	1	1	0	5	29	4	0	0	0	0	29	2.5
1	7	0	5	1	2	0	4	49	3	1	0	1	1	49	2.5
0	7	0	5	1	0	0	3	66	3	2	0	1	0	66	2.5
1	7	0	1	1	0	0	1	55	0	0	0	0	0	55	2.5
0	1	0	5	1	3	0	1	34	1	0	3	0	1	34	1.1
0	2	0	5	1	2	0	3	54	2	0	0	0	0	54	1.1
0	3	1	5	1	1	0	4	53	3	1	0	0	1	53	1.1
1	3	3	5	1	4	4	7	71	4	0	0	0	0	71	1.1
0	1	0	5	1	2	0	3	45	2	0	-1	0	1	45	1.1
0	1	0	5	1	3	0	1	85	2	0	0	0	1	85	2.9
0	2	0	5	1	3	0	1	48	1	0	-1	0	1	48	2.9
1	2	0	5	1	3	-1	7	62	4	-1	0	-1	1	62	2.9
0	3	2	5	1	0	0	2	47	2	0	0	0	1	47	2.9
0	3	2	5	1	2	0	5	58	3	0	0	0	1	58	2.9
0	1	4	5	1	5	1	11	74	4	0	0	0	1	74	3.2
1	2	1	5	1	0	0	3	65	3	0	0	0	0	65	3.2
0	3	1	5	1	0	0	1	40	1	0	0	0	0	40	3.2
0	3	1	5	1	4	0	9	28	6	3	-1	0	1	28	3.2
0	3	2	5	1	1	2	3	59	2	0	0	0	0	59	3.2
0	2	2	5	1	3	0	5	78	2	1	0	0	1	78	4.0
1	1	1	5	1	2	0	4	67	3	0	0	0	1	67	4.0
0	2	0	5	1	0	0	4	82	3	1	0	0	1	82	4.0
0	2	0	5	1	2	0	5	46	3	2	0	0	1	46	4.0
0	2	1	5	1	3	1	8	71	5	1	0	0	1	47	4.2
1	-1	1	2	1	2	0	5	67	2	0	0	0	1	67	4.2
1	1	0	5	1	1	0	3	41	2	0	0	0	0	41	4.2
1	1	0	5	1	4	1	8	45	5	1	0	0	0	45	4.2
0	2	1	2	1	4	0	5	43	2	1	0	0	1	43	5
0	3	1	2	1	1	0	2	49	1	0	0	0	0	49	5
0	2	0	5	1	2	0	5	52	4	3	0	0	1	52	5
0	2	0	5	1	0	2	4	65	4	1	0	0	0	65	5
0	1	0	5	1	2	0	7	54	6	2	0	0	0	54	5
0	1	2	5	1	4	0	6	51	4	2	0	0	1	51	1.8
1	3	0	5	1	1	0	1	80	1	0	0	0	1	80	1.8
1	3	1	5	1	3	0	5	68	3	0	0	0	1	68	1.8
1	1	1	5	0	7	0	5	80	3	0	0	0	0	80	1.8
1	1	0	5	1	4	0	5	53	4	1	0	0	1	53	1.8
1	3	1	5	1	2	0	4	31	1	0	0	0	0	31	1.7
1	3	0	2	1	4	0	4	52	2	1	0	0	1	52	1.7
1	1	1	5	1	1	0	9	67	7	4	0	4	1	67	1.7
1	2	0	5	1	0	0	6	59	6	3	0	1	1	59	1.7
1	2	0	5	1	4	0	5	62	1	0	0	0	1	62	1.7
0	3	1	5	1	4	0	3	44	1	0	0	0	0	44	1.2
0	3	0	5	1	4	0	3	56	2	1	0	0	1	56	1.2
0	1	0	5	1	0	1	3	65	2	0	0	1	0	65	1.2
0	-1	1	5	1	2	0	2	45	1	0	0	0	1	45	1.2
0	1	0	5	1	2	0	2	65	1	0	0	1	0	65	1.2
0	2	0	5	1	1	1	4	65	1	0	0	0	1	76	8
0	3	0	1	1	2	1	3	59	3	0	0	0	0	65	8
0	1	0	5	1	3	1	3	42	2	0	0	0	0	59	8
1	2	0	5	1	1	1	5	57	4	0	0	0	1	57	8

DISTPOS1	DISTPHO1	DISTRIB1	DISTTAR	FERTDIST	OTHRDIS	SPOTDID	MZEDIST	POTDIST	BEANDIS	AMADIST
8319	1195	4018	12346	16346	0	0	8319	0	1	1
8807	1700	4707	12443	0	100	0	0	0	-1	1
12578	1411	4231	12578	22578	0	0	1	0	1	-1
7028	552	5095	11752	1	0	0	100	0	100	1
10309	744	5767	11944	21944	0	0	1	0	1	-1
11522	322	5580	11522	0	0	0	1	0	1	1
12234	1034	6494	12234	-1	0	0	1	0	100	-1
11804	604	6209	11804	21804	0	0	1	0	1	-1
12415	1215	6901	12415	22415	0	0	100	0	100	1
13992	507	3378	13992	1	0	0	1	0	1	-1
14748	1184	2566	14748	0	0	100	24748	0	24748	100
13656	1398	3125	13656	-1	0	0	23656	0	100	-1
13665	1889	3242	13665	-1	0	-1	49665	0	49665	-1
13747	1547	3021	13747	1	0	0	1	0	1	0
13261	2061	4260	13261	-1	0	0	100	-1	100	-1
13589	1973	3383	13589	-1	0	0	1	0	100	1
13733	1617	3002	13733	23733	0	0	23733	0	23733	-1
2714	3551	229	16145	26145	0	0	26145	-1	26145	26145
2817	2455	231	15895	0	0	0	100	25895	0	0
2599	2599	695	15807	2599	0	0	-1	-1	100	-1
2553	2553	251	15588	0	0	0	100	0	-1	-1
2644	2644	632	15257	4352	0	0	1	0	1	1
16156	2570	698	16156	0	0	0	-1	0	0	1
2684	1815	641	15144	25144	0	0	1	0	1	1
2206	2206	1469	4500	-1	0	-1	-1	-1	-1	-1
2206	2206	1469	16445	52445	0	0	2206	0	1	100
23912	23912	3946	23912	59912	59912	0	1	0	1	1
23208	100	2413	23208	100	0	0	100	0	100	-1
23853	2664	2258	23853	2664	0	6	1	2664	1	1
24132	24132	1922	24132	28132	0	0	100	38132	100	100
24314	24314	1386	24314	60314	0	0	1	0	1	1
25722	2241	2867	25722	2241	0	-1	-1	0	1	1
25690	2134	2585	25690	58690	0	0	58690	0	58690	100
22855	100	3512	22855	32855	0	0	1	0	1	1
23275	1011	2235	23275	1011	0	0	1	0	1	1
24260	714	1243	24260	0	0	0	1	0	1	1
23779	895	624	23779	1	0	0	895	0	56779	1
16904	872	1091	16904	49904	0	0	1	0	1	1
19383	960	813	19383	100	0	0	52383	52383	1	-1
24462	449	1281	24462	57462	0	0	1	0	1	-1
17068	514	3399	17068	50068	0	0	1	0	100	-1
23147	2039	2599	23147	33147	0	0	1	0	1	1
17719	100	3035	17719	1	0	0	100	0	100	-1
3090	218	2947	17522	218	0	0	218	0	218	100
6648	1237	2219	15266	51266	0	0	1	25266	25266	0
6070	688	2519	14628	0	0	-1	1	0	100	-1
2489	2489	2303	16441	26441	0	0	1	0	1	1
1827	633	2652	14723	0	0	0	1	0	1	1
5061	1263	2300	14728	-1	0	0	100	0	-1	0
1800	1828	2077	15457	0	0	0	-1	0	-1	0
1941	2021	2067	17535	27535	0	0	27535	0	-1	0
17520	17520	9966	4824	17520	0	0	100	-1	100	-1
17891	439	7560	5195	593	0	0	-1	9891	0	0
18107	10107	7926	5411	18107	0	-1	1	10107	1	0
18427	18427	8160	5731	100	0	0	100	100	100	100
18679	18679	11125	5983	18679	0	0	100	18679	100	10679
16404	80	7559	3708	16404	0	0	-1	1	-1	-1
17054	100	6442	4358	17054	0	0	100	9054	100	17054
767	767	6436	3589	767	0	0	100	767	100	0
17940	17940	6581	5244	591	0	0	1	45940	1	100
17709	17790	6520	5013	1281	0	0	100	9709	100	0
17041	17041	6758	4345	17041	0	0	9041	0	100	0
518	518	4302	4104	1055	0	100	44800	1044	1044	100
804	16342	255	3646	-1	-1	-1	-1	-1	-1	-1
17049	100	4583	4353	343	0	0	1	0	1	0
17040	17040	4611	4344	211	0	0	1	17040	1	1
17914	4353	2993	4368	17914	0	0	45914	9914	1	1
17652	17652	2810	4106	17652	0	0	9652	0	100	-1
2865	595	1833	4756	1933	-1	0	1	10302	1	1
18546	3447	3447	5000	2598	0	0	1	18546	1	-1
15016	15016	1506	1470	7016	15016	0	7016	15016	7016	100
15769	2336	2186	2223	2286	0	0	1	2286	100	0
17411	3071	3927	3865	17411	0	0	-1	24365	7057	9411
17847	3454	4342	4301	7057	0	0	-1	0	-1	-1
14189	719	110	643	6189	0	0	6189	6189	-1	100
15219	43219	1682	1673	1846	-1	0	1	0	100	1
1663	1663	1280	1555	1380	0	0	1	15219	1	-1
16093	16093	2583	2547	16093	0	0	16093	1663	100	16093
15487	1655	1947	1941	15487	0	-1	100	7487	100	7487
15904	15904	5204	2358	7904	0	0	100	0	100	0
15637	4262	5538	2091	7637	0	0	1	100	100	1
15637	15637	4755	2091	7637	0	0	1	7637	1	-1
15975	15975	4514	2429	7975	0	0	-1	0	100	7975
16059	16059	4510	2513	16059	0	0	100	100	100	16059
1497	835	3463	2198	7744	0	-1	1	43744	1	100
16013	1168	3822	2467	16013	0	0	1	-1	100	100
16495	16495	3696	2949	16495	0	0	1	-1	1	1
16304	16304	3336	2758	8304	0	0	8304	8304	16304	16304
100	100	2808	3229	315	0	-1	1	8775	1	100
356	356	2870	2691	356	0	-1	1	8237	1	100
16538	320	2786	2992	8538	0	0	1	8538	1	1
16871	944	4222	3325	8871	0	0	1	8871	1	1
18318	18318	3196	4772	18318	0	0	1	18318	1	1
16710	782	3708	3164	8710	0	0	1	8710	1	1
17478	17478	4725	3932	17478	0	0	1	-1	0	1
5305	18009	4792	4463	4892	0	0	100	5305	100	-1
18904	1111	4279	5358	10904	0	0	1	0	0	0
14131	100	3564	585	21085	0	0	6131	6131	1	1
1912	18571	3783	5025	1912	0	-1	100	0	100	100

Appendix E:

Table indicating variance inflation indexes

Variable	Beta In	Partial	Tolerance	VIF	Min Toler	T	Sig T
LNPPEXP	.026529	.020408	.495350	2.019	.495350	.168	.8668
PCFEMALE	-.126705	-.136281	.968433	1.033	.968433	-1.134	.2606
DISTAR	-.197212	-.209836	.947712	1.055	.947712	-1.770	.0813
INPPEXP	-.074833	-.058469	.511038	1.957	.511038	-.483	.6307
FEMALEXP	-.116917	-.109451	.733616	1.363	.733616	-.908	.3671
PCENTINC	.036454	.039366	.976161	1.024	.976161	.325	.7463
ENTINCEX	.099220	.108204	.995586	1.004	.995586	.898	.3726
PVINCOEX	-.026902	-.027747	.890554	1.123	.890554	-.229	.8196
PCPVINCO	-.103239	-.110252	.954706	1.047	.954706	-.915	.3636
AGINCEXP	-.053332	-.058232	.998016	1.002	.998016	-.481	.6321
PCAGINCO	-.099299	-.108374	.997113	1.003	.997113	-.899	.3718
EDUCEXP	-.105450	-.104275	.818554	1.222	.818554	-.865	.3903
PCEDUC	-.017327	-.018681	.973103	1.028	.973103	-.154	.8780
CHILDEXP	-.015254	-.014856	.793984	1.259	.793984	-.123	.9028
PCCHILD	.086083	.093831	.994586	1.005	.994586	.777	.4397
DISTPHON	.033414	.036503	.999032	1.001	.999032	.301	.7642
HHEAD	-.021563	-.023055	.957003	1.045	.957003	-.190	.8497
DISTRIBE	.087954	.096120	.999754	1.000	.999754	.796	.4286
DISTPOST	.072475	.077143	.948413	1.054	.948413	.638	.5256
HEADAGE	.099355	.108399	.996460	1.004	.996460	.899	.3717
HEDAGEEX	-.050833	-.045599	.673581	1.485	.673581	-.376	.7078
SUSISTEX	.071367	.076186	.954000	1.048	.954000	.630	.5308
PSUSIST	.043711	.047775	1.000000	1.000	1.000000	.394	.6945
DUMMYREG	.171582	.182314	.945108	1.058	.945108	1.529	.1309
LNSIZE	-.054227	-.059243	.999112	1.001	.999112	-.489	.6261

Appendix E:

Table indicating variance inflation indexes

Variable	Beta	In	Partial	Tolerance	VIF	Min Toler	T	Sig T
LNPPEXP	.026529		.020408	.495350	2.019	.495350	.168	.8668
PCFEMALE	-.126705	-.136281		.968433	1.033	.968433	-1.134	.2606
DISTTAR	-.197212	-.209836		.947712	1.055	.947712	-1.770	.0813
INPPEXP	-.074833	-.058469		.511038	1.957	.511038	-.483	.6307
FEMALEXP	-.116917	-.109451		.733616	1.363	.733616	-.908	.3671
PCENTINC	.036454	.039366		.976161	1.024	.976161	.325	.7463
ENTINCEX	.099220	.108204		.995586	1.004	.995586	.898	.3726
PVINCOEX	-.026902	-.027747		.890554	1.123	.890554	-.229	.8196
PCPVINCO	-.103239	-.110252		.954706	1.047	.954706	-.915	.3636
AGINCEXP	-.053332	-.058232		.998016	1.002	.998016	-.481	.6321
PCAGINCO	-.099299	-.108374		.997113	1.003	.997113	-.899	.3718
EDUCEXP	-.105450	-.104275		.818554	1.222	.818554	-.865	.3903
PCEDUC	-.017327	-.018681		.973103	1.028	.973103	-.154	.8780
CHILDEXP	-.015254	-.014856		.793984	1.259	.793984	-.123	.9028
PCCHILD	.086083	.093831		.994586	1.005	.994586	.777	.4397
DISTPHON	.033414	.036503		.999032	1.001	.999032	.301	.7642
HHEAD	-.021563	-.023055		.957003	1.045	.957003	-.190	.8497
DISTRIBE	.087954	.096120		.999754	1.000	.999754	.796	.4286
DISTPOST	.072475	.077143		.948413	1.054	.948413	.638	.5256
HEADAGE	.099355	.108399		.996460	1.004	.996460	.899	.3717
HEDAGEEX	-.050833	-.045599		.673581	1.485	.673581	-.376	.7078
SUSISTEX	.071367	.076186		.954000	1.048	.954000	.630	.5308
PSUSIST	.043711	.047775	1.000000		1.000	1.000000	.394	.6945
DUMMYREG	.171582	.182314		.945108	1.058	.945108	1.529	.1309
LNSIZE	-.054227	-.059243		.999112	1.001	.999112	-.489	.6261

Appendix F

Expenditure elasticities for aggregate commodity groups in Swayimana and Umzumbe, 1997 (n = 93)

Expenditure category	R ²	Ra ²	F-statistic	Swayimana (n = 46)				Umzumbe (n = 47)			
				ABS	Predicted		Elasticity	ABS	Predicted		Elasticity
					ABS	MBS			ABS	MBS	
Alcohol and tobacco	0.373	0.139	0.900	0.056	0.081 <i>2.420</i>	0.059 <i>7.287</i>	0.722 <i>6.304</i>	0.036	0.051 <i>1.533</i>	0.032 <i>3.992</i>	0.625 <i>5.395</i>
Clothing and footwear	0.398	0.158	1.047	0.017	0.026 <i>-1.495</i>	-0.027 <i>6.442</i>	-1.034 <i>-28.509</i>	0.027	0.040 <i>2.317</i>	-0.005 <i>-1.219</i>	-0.126 <i>-24.467</i>
Communication and personal services	0.409	0.167	1.120	0.002	0.004 <i>0.404</i>	0.006 <i>2.673</i>	1.586 <i>2.222</i>	0.012	0.017 <i>1.847</i>	0.026 <i>12.430</i>	1.614 <i>10.631</i>
Consumer expendables	0.740	0.547	6.738	0.013	0.020 <i>4.230</i>	0.015 <i>13.405</i>	0.760 <i>9.516</i>	0.022	0.032 <i>6.684</i>	0.022 <i>19.645</i>	0.705 <i>18.499</i>
Durables	0.505	0.255	1.906	0.017	0.021 <i>0.757</i>	0.046 <i>6.843</i>	2.167 <i>8.288</i>	0.040	0.056 <i>1.992</i>	0.122 <i>18.226</i>	2.195 <i>22.315</i>
Food	0.497	0.247	1.829	0.786	0.695 <i>9.843</i>	0.758 <i>44.810</i>	1.092 <i>8.475</i>	0.698	0.590 <i>8.361</i>	0.580 <i>34.281</i>	0.983 <i>1.310</i>
Health	0.366	0.134	0.863	0.005	0.007 <i>1.959</i>	0.017 <i>19.622</i>	2.402 <i>25.756</i>	0.005	0.007 <i>1.981</i>	0.011 <i>12.344</i>	1.494 <i>9.181</i>
Housing	0.582	0.339	2.860	0.015	0.018 <i>0.497</i>	0.044 <i>5.089</i>	2.457 <i>6.787</i>	0.048	0.061 <i>1.688</i>	0.166 <i>19.116</i>	2.716 <i>27.164</i>
Investments	0.410	0.168	1.125	0.014	0.020 <i>1.407</i>	0.007 <i>2.038</i>	0.347 <i>8.611</i>	0.017	0.022 <i>1.498</i>	0.002 <i>0.531</i>	0.085 <i>12.849</i>
Social obligations	0.588	0.346	2.951	0.039	0.056 <i>2.106</i>	0.017 <i>2.731</i>	0.311 <i>13.610</i>	0.046	0.062 <i>2.320</i>	-0.018 <i>-2.835</i>	-0.293 <i>-28.135</i>
Transport	0.511	0.261	1.972	0.005	0.006 <i>0.444</i>	0.049 <i>15.370</i>	8.298 <i>30.403</i>	0.023	0.030 <i>2.253</i>	0.076 <i>23.647</i>	2.518 <i>32.059</i>
Utilities	0.463	0.214	1.520	0.031	0.046 <i>3.515</i>	0.239 <i>76.181</i>	5.197 <i>138.371</i>	0.021	0.032 <i>2.465</i>	-0.014 <i>-4.766</i>	-0.464 <i>-33.833</i>
Totals					1.000	1.000	1.000		1.000	1.000	1.000

- Note:
1. Figures in italics are t-statistics for the null hypothesis that the predicted average and marginal budget shares are zero and that the expenditure elasticity is unity.
 2. Equations estimated for the highlighted categories were significant according to the F-statistic.

Appendix G

Expenditure elasticities for food commodity groups in Swayimana and Umzumbe, 1997 (n = 93)

Expenditure category	R ²	Ra ²	F-statistic	Swayimana (n = 46)				Umzumbe (n = 47)			
				ABS	Predicted ABS	MBS	Elasticity	ABS	Predicted ABS	MBS	Elasticity
Staples	0.699	0.489	5.330	0.222	0.343 <i>8.300</i>	0.057 <i>5.732</i>	0.166 <i>64.948</i>	0.170	0.249 <i>6.036</i>	-0.027 <i>2.773</i>	-0.110 <i>-62.842</i>
Maize	0.699	0.489	5.323	0.085	0.133 <i>5.299</i>	0.013 <i>2.222</i>	0.101 <i>44.695</i>	0.044	0.068 <i>2.689</i>	0.003 <i>0.416</i>	0.037 <i>24.285</i>
Rice	0.489	0.239	1.751	0.045	0.068 <i>3.240</i>	-0.008 <i>1.650</i>	-0.122 <i>-34.096</i>	0.061	0.090 <i>4.284</i>	-0.006 <i>1.227</i>	-0.069 <i>-42.937</i>
Roots	0.744	0.553	6.887	0.030	0.046 <i>5.974</i>	0.009 <i>4.620</i>	0.185 <i>45.636</i>	0.018	0.027 <i>3.458</i>	-0.006 <i>3.447</i>	-0.239 <i>-40.179</i>
Wheat products	0.590	0.348	2.971	0.062	0.094 <i>5.568</i>	0.041 <i>10.568</i>	0.436 <i>29.426</i>	0.045	0.063 <i>3.746</i>	-0.020 <i>4.922</i>	-0.315 <i>-46.194</i>
Eggs	0.432	0.041	1.280	0.005	0.007 <i>2.000</i>	0.016 <i>19.767</i>	2.370 <i>25.700</i>	0.004	0.005 <i>1.507</i>	0.013 <i>15.296</i>	2.434 <i>20.267</i>
Horticultural products	0.568	0.322	2.651	0.033	0.053 <i>1.179</i>	0.420 <i>38.873</i>	7.906 <i>76.369</i>	0.063	0.093 <i>2.059</i>	0.422 <i>39.095</i>	4.555 <i>68.622</i>
Legumes	0.440	0.194	1.340	0.022	0.034 <i>2.168</i>	0.041 <i>10.507</i>	1.162 <i>3.301</i>	0.024	0.037 <i>2.296</i>	0.053 <i>13.794</i>	1.441 <i>9.490</i>
Meat and poultry	0.524	0.275	2.110	0.054	0.084 <i>4.486</i>	0.081 <i>18.065</i>	0.966 <i>1.442</i>	0.035	0.053 <i>2.838</i>	0.055 <i>12.360</i>	1.044 <i>1.182</i>

- Note:
1. Figures in italics are t-statistics for the null hypothesis that the predicted average and marginal budget shares are zero and that the expenditure elasticity is unity.
 2. Equations estimated for the highlighted categories were significant according to the F-statistic.

Appendix H Expenditure elasticities for aggregate commodity groups by wealth group in Swayimana and Umzumbe, 1997 (n = 93)

Expenditure category	R ²	Ra ²	F-statistic statistic	Wealthier households (n = 9)				Poorer households (n = 84)			
				ABS	Predicted ABS	MBS	Elasticity	ABS	Predicted ABS	MBS	Elasticity
Alcohol and tobacco	0.373	0.139	0.900	0.083	<i>0.062</i> <i>1.847</i>	0.048 <i>5.973</i>	0.775 <i>3.889</i>	0.042	0.062 <i>1.852</i>	0.042 <i>5.184</i>	0.671 <i>5.709</i>
Clothing and footwear	0.398	0.158	1.047	0.020	<i>0.031</i> <i>1.821</i>	-0.017 <i>-4.106</i>	-0.541 <i>-26.313</i>	0.024	0.032 <i>1.867</i>	-0.016 <i>-3.898</i>	-0.501 <i>-26.279</i>
Communication and personal services services	0.409	0.167	1.120	0.004	0.005 <i>0.539</i>	0.013 <i>5.663</i>	2.518 <i>7.678</i>	0.009	0.011 <i>1.209</i>	0.018 <i>8.197</i>	1.626 <i>7.098</i>
Consumer expendables	0.74	0.547	6.738	0.022	0.032 <i>6.798</i>	0.019 <i>16.710</i>	0.589 <i>26.171</i>	0.017	0.025 <i>5.316</i>	0.017 <i>14.994</i>	0.686 <i>16.131</i>
Durables	0.505	0.255	1.906	0.031	<i>0.038</i> <i>1.355</i>	0.071 <i>10.682</i>	1.891 <i>11.318</i>	0.028	0.042 <i>1.523</i>	0.090 <i>13.519</i>	2.128 <i>16.117</i>
Food	0.497	0.247	1.829	0.669	0.639 <i>9.056</i>	0.672 <i>39.725</i>	1.052 <i>4.418</i>	0.748	0.636 <i>9.017</i>	0.660 <i>38.973</i>	1.037 <i>3.097</i>
Health	0.366	0.134	0.863	0.007	0.008 <i>2.121</i>	0.014 <i>16.693</i>	1.887 <i>17.653</i>	0.004	0.007 <i>1.920</i>	0.013 <i>15.172</i>	1.895 <i>16.121</i>
Housing	0.582	0.339	2.860	0.104	0.057 <i>1.578</i>	0.094 <i>10.800</i>	1.651 <i>9.630</i>	0.026	0.048 <i>1.326</i>	0.119 <i>13.660</i>	2.471 <i>18.290</i>
Investments	0.41	0.168	1.125	0.006	0.015 <i>1.024</i>	0.007 <i>2.100</i>	0.492 <i>4.883</i>	0.017	0.026 <i>1.768</i>	0.009 <i>2.483</i>	0.337 <i>10.996</i>
Social obligations	0.588	0.346	2.951	0.017	0.063 <i>2.343</i>	0.019 <i>2.994</i>	0.307 <i>15.234</i>	0.044	0.050 <i>1.868</i>	-0.013 <i>-1.955</i>	-0.251 <i>-21.911</i>
Transport	0.511	0.261	1.972	0.011	0.015 <i>1.098</i>	0.054 <i>16.904</i>	3.693 <i>27.722</i>	0.014	0.022 <i>1.665</i>	0.066 <i>20.691</i>	2.981 <i>30.923</i>
Utilities	0.463	0.214	1.520	0.026	0.035 <i>2.745</i>	0.239 <i>76.181</i>	6.657 <i>145.597</i>	0.027	0.038 <i>2.889</i>	-0.005 <i>-1.539</i>	-0.128 <i>-30.553</i>
Totals					1.000	1.000	1.000		1.000	1.000	1.000

- Note:
1. Figures in italics are t-statistics for the null hypothesis that the predicted average and marginal budget shares are zero and that the expenditure elasticity is unity.
 2. Equations estimated for the highlighted categories were significant according to the F-statistic.

Appendix I

Expenditure elasticities for food commodity groups b wealth group in Swayimana and Umzumbe, 1997 (n = 93)

Expenditure category	R ²	Ra ²	F-statistic	Wealthier households (n = 9)				Poorer households (n = 84)			
				ABS	Predicted ABS	MBS	Elasticity	ABS	Predicted ABS	MBS	Elasticity
Staples	0.699	0.489	5.330	0.179	0.275 <i>6.651</i>	0.025 <i>2.557</i>	0.092 <i>56.620</i>	0.202	0.292 <i>7.083</i>	0.015 <i>1.515</i>	0.051 <i>63.017</i>
Maize	0.699	0.489	5.323	0.068	0.105 <i>4.185</i>	0.004 <i>0.681</i>	0.039 <i>37.716</i>	0.065	0.093 <i>3.689</i>	0.003 <i>0.572</i>	0.037 <i>33.306</i>
Rice	0.489	0.239	1.751	0.039	0.059 <i>2.776</i>	-0.007 <i>-1.328</i>	-0.115 <i>-29.019</i>	0.056	0.080 <i>3.795</i>	-0.007 <i>-1.325</i>	-0.084 <i>-38.572</i>
Roots	0.744	0.553	2.971	0.029	0.045 <i>5.850</i>	0.003 <i>1.811</i>	0.074 <i>50.782</i>	0.024	0.037 <i>4.776</i>	0.002 <i>0.979</i>	0.049 <i>42.585</i>
Wheat products	0.590	0.348	6.887	0.042	0.064 <i>3.822</i>	0.022 <i>5.515</i>	0.346 <i>23.441</i>	0.056	0.081 <i>4.838</i>	0.014 <i>3.498</i>	0.173 <i>37.505</i>
Eggs	0.432	0.041	1.280	0.004	0.005 <i>1.589</i>	0.015 <i>18.148</i>	2.740 <i>25.918</i>	0.004	0.006 <i>1.740</i>	0.014 <i>17.429</i>	2.402 <i>22.878</i>
Horticultural products	0.568	0.322	2.110	0.023	0.097 <i>2.154</i>	0.402 <i>37.177</i>	4.139 <i>63.412</i>	0.046	0.078 <i>1.738</i>	0.420 <i>38.892</i>	5.366 <i>71.168</i>
Legumes	0.440	0.194	1.340	0.026	0.039 <i>2.421</i>	0.04 <i>10.177</i>	1.008 <i>0.185</i>	0.023	0.033 <i>2.056</i>	0.044 <i>11.370</i>	1.326 <i>6.290</i>
Meat and poultry	0.524	0.275	2.651	0.049	0.078 <i>4.158</i>	0.073 <i>16.394</i>	0.946 <i>2.120</i>	0.044	0.061 <i>3.290</i>	0.061 <i>13.672</i>	0.997 <i>0.104</i>

Note: 1. Figures in italics are t-statistics for the null hypothesis that the predicted average and marginal budget shares are zero and that the expenditure elasticity is unity.

2. Equations estimated for the highlighted categories were significant according to the F-statistic.