WINNER OF THE AEASA BEST STUDENT ESSAY AWARD FOR 2007

Expenditure elasticities for rural households in the Embo ward, Umbumbulu, KwaZulu-Natal

M Browne[1], GF Ortmann[2] and S Hendriks[3]

Abstract

Household consumption patterns were investigated to determine the impact of an income shock on household expenditure and to establish the potential for demand-led growth in a rural area of KwaZulu-Natal. Household consumption data were collected from sample households in the Embo ward of Umbumbulu, KwaZulu-Natal during October 2004 and March 2005. Budget shares and expenditure elasticities were estimated for household consumption categories for the two study periods, allowing for a comparison of expenditure elasticities between the two seasons. Results suggest that expenditure elasticities for consumer expendables, durables and transport were highly elastic, while expenditure elasticities for the aggregate food category were negative (October) and highly inelastic (March). Analysis of the expenditure categories of tradable and non-tradable goods and services showed expenditure on tradable non-farm goods and services to have the greatest potential for demand-led growth with expenditure elasticities of 2.88 and 2.91, respectively. The category of non-tradable non-farm goods and services was not statistically significant for both periods and the category non-tradable farm goods and services was not statistically significant for October. A seasonal difference in expenditure patterns was apparent, suggesting that responses to income changes vary at different times of the year.

Keywords: Expenditure elasticities; demand-led growth; Umbumbulu region; KwaZulu-Natal

[1] *BScAgric student in Agribusiness, School of Agricultural Sciences and Agribusiness, University of KwaZulu-Natal, Private Bag X01, Scottsville 3209, South Africa. browne.mich@gmail.com*

[2] *Professor of Agricultural Economics, School of Agricultural Sciences and Agribusiness, University of KwaZulu-Natal, Private Bag X01, Scottsville 3209, South Africa. ortmann@ukzn.ac.za*

[3] *Director: African Centre for Food Security, School of Agricultural Sciences and Agribusiness, University of KwaZulu-Natal, Private Bag X01, Scottsville 3209, South Africa. hendriks@ukzn.ac.za*

1. Introduction

Agriculture in most developing countries plays an important role in the welfare of the poor (Hazell & Haggblade, 1993). Stimulating agriculture can produce strong demand incentives through the increase in consumer demand as a result of increased incomes (Vogel, 1994). Increased production of local farm and non-farm goods can generate employment opportunities and broaden rural incomes as a result of growth linkages (Mellor 1976:187; Hazell & Haggblade 1991; Delgado *et al*., 1998). An increase in demand for local demand-constrained goods, as a result of an income shock, can stimulate a supply response from local farm and non-farm production (Hendriks, 2002:1). It is the supply response that can generate employment opportunities and broaden rural incomes. Increases in rural household spending on non-tradable goods (goods that are rarely traded beyond the borders of the study region) could mobilise rural resources such as land, labour and capital for growth (Delgado *et al*., 1998). Increases in household expenditures on consumer goods and services as a result of increased farm incomes can lead to significant indirect growth in non-farm incomes and employment (Hazell & Röell, 1983). In order to develop appropriate policies focused on agricultural growth, the effect of increased rural household income on the demand for commodities consumed by rural households and the potential for demand-led growth in the local rural economy must be known.

Consumer expenditure patterns and estimates of expenditure elasticities can give an indication of the potential for demand-led growth in a particular economy. An expenditure elasticity is a measure of the responsiveness of expenditure on, or consumption of, a good to a change in real income, *ceteris paribus* (Tomek & Robinson, 2003:35) where expenditure is a proxy for income. If non-tradable commodities have a high estimated expenditure elasticity it means that additions to income will be spent on non-tradable commodities thus retaining additions to income within the local economy. Goods that cannot be traded outside of a 100km radius of the study household are classified as non-tradable (Delgado *et al*., 1998). If tradable goods are estimated to be highly expenditure elastic then additions to income will leak out of the local economy as increased incomes will lead to increased expenditure on tradable goods and services. If increments to income are spent on non-tradable goods, then a sustained income shock will benefit the local economy, provided the supply of the non-tradable goods and services is price elastic. If increments to income are spent only on tradable goods and services then increments to income will leak out of the local economy and the local economy will not benefit.

The objective of this study is to estimate expenditure elasticities for consumption goods and services of rural households in the Embo ward of Umbumbulu, KwaZulu-Natal. In doing so, the potential for demand-led growth in the area can be ascertained. A second objective is to compare expenditure elasticities estimated for two main crop production seasons, namely winter and summer. The paper is organised as follows: The next section is a review of the literature of similar studies and contains summaries of expenditure elasticities estimated by other authors for various regions in South Africa. Section 3 describes the sample and study area, which is followed by an outline of the research methodology used in the study. Expenditure elasticities estimated for various commodity groups for households in the study area are presented and discussed in section 5. The paper ends with conclusions and policy implications.

2. Review of related literature

As a result of the market forces of supply and demand there are linkages between the agricultural sector and the non-agricultural sector. The expansion of the agricultural sector can enhance growth in the local economy and has a poverty-reducing effect through increased employment opportunities (Hazell & Röell, 1983; Hazell & Haggblade, 1993). Whether accelerated agricultural growth can decrease absolute poverty more rapidly than other growth strategies depends on the extent of the relationship between agriculture and non-agriculture (Mellor, 1995).

Increased productivity in agriculture leads to increases in real income and it is the expenditure of increments to income that stimulate other sectors of the economy (Mellor, 1995). Studies of rural household and consumption surveys have shown that there exists the potential for increased income (in the agricultural sector) to drive local economic growth (Hendriks, 2002). Increased incomes result in increased spending on consumer goods and services (Hazell & Haggblade, 1993). Increases in rural spending on non-tradable goods and services can mobilize underused resources through the creation of enterprise and employment opportunities in the non-tradable farm and non-farm sectors (Delgado *et al*., 1998; Hendriks, 2002). Delgado *et al*. (1998) define non-tradable items as goods or services that are rarely traded across the borders of the region of interest, and that are not close substitutes for goods that are traded, for example traditional foods, medicines or services of traditional healers. Increased demand for these goods cannot be met by imports, by definition, and so increased demand for non-tradable items would be met by increased local production (Hazell & Haggblade, 1991; Delgado *et al*., 1998). The increase in local

production would result in the creation of enterprise and employment opportunities, thus mobilizing underutilized resources. This forms the basis of demand-led growth and its success depends on the price elasticity of supply of non-tradable goods and services.

2.1 The theory of demand-led growth

Delgado *et al*. (1998) concluded, from rural income and consumption studies conducted in various African countries in the 1980s, that household spending of higher rural incomes has the potential to stimulate further rural income increases. The idea behind this lies in the stimulative role of demand for consumption goods and services (Mellor, 1995). Increases in income lead to increases in expenditure. Increased expenditure on certain goods can increase the demand for those goods, which exerts upward pressure on prices (Delgado *et al*., 1998). Rising prices encourage increased production, as long as the supply of the particular good(s) is elastic. Increased production creates further employment opportunities and brings underutilized resources into production. If incremental income is spent on local non-tradable goods and services then local production will be stimulated. Increased local production benefits the local economy through the creation of enterprise and employment opportunities, thus improving the welfare of local households.

2.2 Income elasticity and the Engel function

The income elasticity of a good is a measure of the responsiveness of expenditure on, or consumption of, a good to a change in real income, *ceteris paribus* (Tomek & Robinson, 2003:35). The Engel (or consumption) function describes the relationship between income and the consumption of a good. The slope of the Engel function measures the income elasticity for a good or service, which is an indication of the effect a rise in real income will have on the demand for a particular good. It may be interpreted as the percentage change in demand for a good as a result of a one percent change in real income, *ceteris paribus* (Tomek & Robinson, 2003:35).

Estimated income elasticities can be used to assess how increments in rural household income will be spent. Expenditure can be used as a proxy for income especially in rural areas where savings and investments are often negligible (Hazell & Röell, 1983). Expenditure elasticities measure the percentage change in expenditure on specific goods or services as total expenditure increases (Tomek & Robinson, 2003:36). A positive expenditure elasticity for a group of goods or

services indicates that expenditure on that group will increase as total expenditure increases. An expenditure elasticity of one or more indicates that expenditure on the group in question will increase at a greater rate than total expenditure increases. A negative expenditure elasticity for a group of goods or services implies that expenditure in that particular group will decrease with increasing total expenditure. Goods or services with such a characteristic are known as inferior goods. Knowledge of household consumption patterns plays an important role in ascertaining the potential for demand-led growth in a region.

2.3 Rural household consumption patterns in South Africa

The potential for stimulating growth in the local rural economy through demand-led growth depends on the demand created in the rural area for non-tradable goods and services (Delgado *et al*., 1998). Increased spending on locally produced goods and services will stimulate local production, but increased spending on tradable goods and services will result in a leakage of income from the local economy to imported, manufactured goods (Hazell & Röell, 1983; Hendriks & Lyne, 2003). Studies of consumption patterns in South Africa have shown the demand for staple goods to be relatively non-responsive to changes in income (Van Zyl *et al*., 1991; Belete *et al*., 1999; Hendriks 2002:11). Van Zyl *et al*. (1991) found the income elasticity of non-staple foods to be double that for staples and the commodity most responsive to changes in income to be clothing. In his study of household consumption in the Eastern Cape, Ngqangweni (1999) found non-farm non-tradables, such as transport, education and health, to be the most responsive to changes in income for the rural location. Farm tradables were also responsive to income changes, while farm non-tradables and non-farm tradables were relatively less responsive. Even though increases in income may result in increased expenditure on tradable goods and services, locally produced goods and services (non-tradables) are relatively income elastic (Hendriks, 2002:11). Thus, increased rural incomes could stimulate rural economic growth.

Hendriks (2002) conducted a study of household expenditure patterns in two study areas of KwaZulu-Natal. A variant of the Working-Leser model was used to estimate the marginal budget shares and average budget shares for selected commodities from household consumption data. Expenditure elasticities for the commodities were then estimated. The two study areas, Swayimana and Umzumbe, are situated in the former KwaZulu homeland. Both areas were considered rural regions with high agricultural potential (Hendriks, 2002). Table 1 is a summary of selected estimated expenditure elasticities. Expenditure on

food in both regions varies in almost direct proportion to change in household income, as reflected in the estimated elasticities of 1.09 and 0.98 (Hendriks, 2002:67). Staple foods were found to be inelastic (0.17 and -0.11) while horticultural goods were highly elastic (7.91 and 4.56), suggesting that increases in household income will result in increased expenditure on horticultural products.

Table 1: Selected expenditure elasticities estimated for two regions in KwaZulu-Natal, 1997

	Expenditure Elasticity	
	Swayimana	Umzumbe
Expenditure Category	(n = 46)	(n = 47)
Consumer Expendables	0.76	0.71
Durables	2.17	2.20
Food	1.09	0.98
Housing	2.46	2.72
Social Obligations	0.31	-0.29
Transport	8.30	2.52

Source: Adapted from Hendriks (2002:67)

Hendriks (2002) concluded that little possibility of income induced growth in the demand for food existed, except for horticultural products. For non-food groups the category of durables was highly elastic (2.17 and 2.20). This category included items such as furniture and appliances. The result suggests that increased household incomes would lead to increased expenditure on imported goods thus directing part of additional income out of the local economy (Hendriks, 2002:71). The expenditure elasticity estimated for housing was relatively high in both study areas (2.46 and 2.72, respectively). This suggests a potential for demand-led growth in both areas if housing (building and maintenance) is a local, non-tradable service. Hendriks (2002:78) found that increased household income could lead to less than proportional increases in the demand for tradable farm commodities but more than proportional increases in demand for tradable non-farm, non-tradable farm and non-tradable non-farm commodities. Thus, there exists the potential for demand-led growth through increased demand for non-tradable goods and services (Hendriks, 2002:78).

3. Description of the sample and study area

The Embo ward in Umbumbulu, KwaZulu-Natal, is situated south-west of Durban in the Umbumbulu Magisterial District. It is located in a moist coastal

hinterland region with the climate being favourable for the growing of a wide range of crops (Camp, 1995). Crops grown include amadumbes, potatoes, beans, maize, some sugarcane, bananas, chillies and peanuts. Maize, legumes and potatoes are the main crops grown.

Surveys of 171 households were conducted by the LIMA Rural Development Foundation during October 2004 and March 2005. Household data were collected through interview sessions with the principal decision-maker of the household. The data were collected for a month at a time and then aggregated to an annual basis. The sample group of 171 households was made up of Ezemvelo Farmers' Organisation (EFO) members, partially certified EFO members and EFO non-members. The EFO members were small-scale commercial farmers who were certified to produce organically. The partially certified members included households in the process of converting to organic production. The non-EFO respondents comprised households whose members did not join the EFO, but who reside in the same area as EFO members. Although data were collected on many aspects of the households, data on consumption of goods and services were used in this study. In round one (October 2004), consumption data collected included the value spent (Rand per month) on all consumption goods including food and non-food goods. The second survey round (March 2005) questioned consumption of food items only. This allowed for a comparison of food consumption between the two seasons (represented by the two survey rounds) and gives an indication of possible changes in expenditure patterns related to crop seasons.

Household crop area ranged from none to 8.60 ha with a mean of 0.54 ha per household. The mean monthly household income over the two survey rounds was R1570. The main sources of household incomes were migrant remittances, wages and state pensions. Sources of non-farm income included wages, remittances, hiring out of accommodation, catering services, building houses, hawking, shop keeping, furniture making, sewing, hair braiding and taxi operations (Hendriks *et al*., 2005). The mean household expenditure was R25,872 per year for round 1 and R27,216 per year for round 2. Expenditure exceeds income as the amount for total expenditure includes the value of crops grown that were consumed whereas the income value does not include the values of crops that were consumed instead of sold. Household size ranged from 1 to 25 persons with a mean household size of 7.62. The age of the household head varied from 27 to 85 years with a mean household head age of 56.64 years. Approximately 45% of household heads were female. The number of adult men, adult women and non-adults per household was similar with means of 2.13, 2.71

and 2.03 persons, respectively. Further household characteristics are summarized in Table 2.

Table 2: Characteristics of households in the Embo ward, Umbumbulu, KwaZulu-Natal (n=171)

Characteristic	Mean	Minimum	Maximum
Number of males in household	3.44	0	14
Number of females in household	4.26	0	13
Number of scholars per household	2.65	0	10
Number of infants (0 to 6yrs) per household	0.87	0	7
Number of wage employed members in household	0.64	0	4
Number of farmers in household	0.54	0	4
Number of self-employed members in household	0.19	0	4
Number of pensioners in household	0.48	0	5
Number of household members unemployed, but seeking work	1.48	0	7
Number of members of household with 1-7yrs of schooling	2.5	0	9
Number of members of household with 8-12yrs of schooling	2.9	0	14

4. Research methodology

A variant of the Working-Leser model (Hazell & Röell, 1983; Delgado *et al*., 1998; Hendriks, 2002) was used to estimate the income-consumption relationships for individual commodity categories consumed by sample households. The use of annualized cross-sectional data helps to control for the fact that the purchase of some goods and services may be seasonal, while the purchase of other goods or services may only occur infrequently or after harvest (Delgado *et al*., 1998). The absolute budget shares (ABSs), marginal budget shares (MBSs) and expenditure

elasticities for selected commodity groups were estimated. The ABS is a measure of the percentage of total household expenditures spent on a group of goods or services, while the MBS measures the percentage of additions to income that are allocated to the group of goods or services (Delgado *et al*., 1998). The model used in this study is a flexible functional form allowing for non-linear relationships between consumption and expenditure (Hazell & Röell, 1983). Since a common Engel curve has to fit a wide range of commodities, the functional form must have a slope that is free to change with income (Hazell & Röell, 1983). Details of the theoretical models are discussed by Browne (2006:22-25).

5. Results and discussion

5.1 Estimated expenditure elasticities for aggregate commodity groups

Table 3 presents a comparison of significant ABS_i, MBS_i and expenditure elasticities (ξ_i) estimated for selected commodities for each survey period (October 2004 and March 2005). 'Food' expenditure accounted for the greatest share of household expenditure for both survey rounds (ABS of 0.67 and 0.70). This is consistent with Ngqangweni (1999) and Hendriks (2002) and would be expected for low income households.

For October 2004 the estimated expenditure elasticity for the 'food' category is negative (-0.05). This means that an increase in household income will result in a decrease in expenditure on 'food'. This result is inconsistent with estimated elasticities for 'food' of near one for Nieuwoudt and Vink (1989), Van Zyl *et al*. (1991), Ngqangweni (1999) and Hendriks (2002). Belete *et al*. (1999) estimated an expenditure elasticity for 'food' of 0.685 for households in the Eastern Cape. The result of -0.05 estimated for 'food' in this study is unexpected as 'food' is a necessity and is expected to have a positive expenditure elasticity. As income (expenditure) increases the proportion of income spent on 'food' should decrease and the category of 'food' should be income inelastic. For low income households the income elasticity for 'food' is expected to be higher than that for high income earners as a larger proportion of the budget is spent on 'food' in low income households.

Table 3: MBS, ABS and expenditure elasticities for significant aggregate commodity groups for households in the Embo ward, Umbumbulu, KwaZulu-Natal, 2004/2005

Expenditure Category	October 2004			March 2005		
	MBS	ABS	Elasticity	MBS	ABS	Elasticity
Food	-0.03	0.67	-0.05	0.15	0.70	0.21
Consumer Expendables	0.17	0.04	4.17	0.15	0.05	3.03
Durables	0.07	0.01	12.64	0.07	0.01	10.92
Transport	0.31	0.09	3.28	0.21	0.07	3.09

Note: (1) MBS = marginal budget share (percentage of additions to income that are allocated to the group of goods or services); (2) **ABS** = absolute budget share (percentage of total household expenditures spent on a group of goods or services); (3) the expenditure elasticity estimates were all significant at least at the 10% level of probability.

In March 2005 the expenditure elasticity estimated for the 'food' category was 0.21. This estimate is considerably lower than the expenditure elasticities estimated by Nieuwoudt and Vink (1989), Van Zyl *et al*. (1991), Ngqangweni (1999), Belete *et al*. (1999) and Hendriks (2002) who estimated values between 0.4 and 1.09. The estimate of 0.21 suggests that expenditure on 'food' will increase with increasing expenditure, but by a less than proportional amount. Again, it would be expected that for low income households the expenditure elasticity for 'food' would be higher than 0.21. Nevertheless, this result points to a difference in expenditure patterns between the two survey periods. This could be due to differences in seasons and harvesting times of the main crops which would affect the amount of income and food available during the two periods.

The 'durables' category accounts for expenditure on furniture. For both study periods the estimated expenditure elasticity is large and positive, namely 12.64 and 10.92, respectively. This implies that expenditure on 'durables' will increase with increasing expenditure (income). This result is consistent with those of Nieuwoudt and Vink (1989), Van Zyl *et al*. (1991), Ngqangweni (1999), Belete *et al*. (1999) and Hendriks (2002), although the estimates are somewhat higher. An expenditure elastic estimate for 'durables' would be expected as 'durables' (furniture) are a luxury, especially for low income households. The ABS values of 0.01 for both rounds show that only 1% of expenditure is spent on 'durables'. This proportion is expected to increase with rising income.

The elasticity estimate for the category 'consumer expendables' is positive and elastic, 4.17 for October 2004 and 3.03 for March 2005. This category comprised expenditure on household and personal cleaning requirements, such as kitchenware and bedding, as well as leisure requirements, entertainment, beer and cigarettes. As expenditure (income) increases, expenditure on 'consumable expendables' will increase by a more than proportionate amount. Nieuwoudt and Vink (1989) estimate an expenditure elasticity of 0.93 for household expenses. Van Zyl *et al*. (1991) report expenditure on these items to be generally income elastic. Ngqangweni (1999) report expenditure elasticities of -0.85 for cleansing materials, -3.61 for entertainment, but 2.88 for liquor and tobacco. Hendriks (2002:67) obtained positive, inelastic estimates for expenditure on 'consumer expendables'. The elasticity estimates of 4.17 and 3.03 obtained in the study suggest that as household income increases a larger proportion of income is spent on 'consumable expendables' (many of these are luxury items and will only be purchased or consumed once necessity items have been purchased). The ABS values of 0.04 and 0.05 indicate that only a small proportion of the budget is currently spent on 'consumer expendables'. The difference in elasticity estimates between the two study periods suggests that consumption patterns change with changing seasons.

Expenditure elasticities for 'transport' were estimated to be 3.28 and 3.09 for the two study periods, respectively. 'Transport' expenditure is a relatively large part of total expenditure after food, namely ABS values of 9% for October 2004 and 7% for March 2005. Van Zyl *et al*. (1991) and Hendriks (2002:67) report expenditure on 'transport' to be income elastic. Nieuwoudt and Vink (1989) and Ngqangweni (1999) estimate expenditure on 'transport' to be slightly income inelastic at 0.86 and 0.92, respectively. Household members rely heavily on public transport to cover distances between their homes and urban centres. The relatively large, positive values estimated for 'transport' in this study indicate that an increase in expenditure (income) would result in a proportionally greater increase in expenditure on 'transport'. The Embo ward is situated away from urban areas and has poor road infrastructure. Household members have to travel relatively long distances to reach larger shopping areas and so it would be expected that as incomes increased household members would spend relatively more on 'transport'.

5.2 Estimated expenditure elasticities for tradable and non-tradable commodities

Consumption category goods were aggregated depending on whether they are a tradable or non-tradable good and whether they originate on farm (farm goods) or not (non-farm goods). Farm goods include horticultural, crop and livestock items produced on the household land. Non-farm goods are those that originate off-farm, such as furniture, bedding and cleaning requirements. Tradability was based on local boundaries. Delgado *et al*. (1998) define 'local' as within an approximate 100km radius around the household. Non-tradables are defined as those goods that are freely traded within the local area, but are not traded outside it, while tradables are those goods that are traded outside the local region (Delgado *et al*., 1998). Table 4 summarizes the elasticity estimates for the tradable/non-tradable goods categories. Results for the non-tradable, non-farm goods for both study periods and non-tradable farm goods for the first study period were not significant. A possible reason for this is the low expenditure on these categories of goods (low ABS values).

Table 4: Expenditure elasticities for tradable and non-tradable commodity groups for households in the Embo ward, Umbumbulu, KwaZulu-Natal, 2004/2005

Expenditure Category	October 2004			March 2005		
	MBS	ABS	Elasticity	MBS	ABS	Elasticity
Tradable farm	0.019	0.322	0.06	0.149	0.326	0.46
Tradable non-farm	0.936	0.325	2.88	0.872	0.30	2.91
Non-tradable farm	-0.006[a]	0.028 [a]	-0.22[a]	0.021	0.12	0.17
Non-tradable non-farm	0.127[a]	0.053[a]	2.41[a]	0.115[a]	0.047 [a]	2.45[a]

Note: a = estimated coefficients not statistically significant

Expenditure elasticities for tradable farm goods for both study periods were positive, but inelastic (0.06 and 0.46, respectively). This suggests that expenditure on tradable farm goods, such as vegetables, meat and staples, purchased rather than grown, will increase with increased income, but by a less than proportional amount. As incomes increase some of the additional income will be spent on tradable farm goods thus representing a leakage of income from the local region, but only by a small amount. The result is consistent with Hendriks (2002:77) who

estimated the expenditure elasticity of farm tradable goods as 0.53 for Swayimana and 0.41 for Umzumbe. Ngqangweni (1999) estimated an expenditure elasticity of 0.94 for farm tradable goods. An inelastic estimate for tradable farm goods is preferable from a local economy perspective as increases in incomes would result in less leakage of income out of the local economy than if the category was elastic. Currently, the bulk of household expenditure is on tradables, as seen from the higher ABS estimates for tradables compared to non-tradables, and therefore represents a leakage of income from the Embo ward.

The category of tradable non-farm goods is estimated to be elastic for both study periods, namely 2.88 and 2.91 respectively. Consumption of tradable non-farm goods will increase with increasing incomes at a more than proportionate amount. The ABS values for this category are relatively high (33% and 30%), suggesting that a comparatively large portion of household expenditure is spent on tradable non-farm goods. The results are consistent with Hendriks (2002:77) who estimated expenditure elasticities for this category to be 2.58 for Swayimana and 1.94 for Umzumbe. Ngqangweni (1999) estimated an expenditure elasticity of 0.92 for tradable non-farm goods in the Eastern Cape. The highly elastic estimates obtained for tradable non-farm goods in this study show that rural households are much more likely to spend additions to income on commodities other than food, which represents a direct leakage of income from the local economy that would lower the potential for demand-led growth.

The category of non-tradable farm goods was estimated to be inelastic in the second study period but not significant in the first. The estimate of 0.17 in round two is inconsistent with the value of 1.09 estimated by Ngqangweni (1999), and 1.23 for Swayimana and 1.22 for Umzumbe estimated by Hendriks (2002:77). This result suggests that expenditure on non-tradable farm goods in the study region will increase only slightly with additions to income. Non-tradable goods are those that are not traded outside the local economy, suggesting that increased expenditure on this category will not result in a leakage of income from the local economy.

The expenditure elasticity estimates for non-tradable non-farm goods were not significant in either study period. A possible reason for this is the low household expenditure on this category, just 5% for both periods. Nevertheless, the non-significant expenditure elasticities estimated were 2.41 and 2.45 for the two study periods, respectively. Although these estimates are not statistically significant, they are mentioned here as a means of comparison. Ngqangweni (1999) estimated an expenditure elasticity for non-tradable non-farm goods of 1.09;

additions to income will result in an almost proportional increase in expenditure. Hendriks (2002:77) estimated expenditure elasticities for this category of 1.47 for Swayimana and 1.24 for Umzumbe. Increased expenditure on this category would not result in a leakage of income from the local economy as the goods are non-tradable. A highly elastic result for non-tradable non-farm goods suggests potential for demand-led growth as additions to income are spent within the local economy.

6. Conclusions

This study set out to estimate budget shares and expenditure elasticities for the two main crop production seasons (summer and winter) for sample households in the Embo ward of Umbumbulu, KwaZulu-Natal, in order to verify the potential for demand-led growth in the study region. The potential for demand-led growth can be ascertained by analysing the expenditure elasticities estimated for the tradable/non-tradable categories of goods and services. Both the categories of tradable non-farm goods (2.88 and 2.91) and non-tradable non-farm goods (2.41 and 2.45) are highly expenditure elastic indicating that an increase in household income will result in a proportionally greater increase in expenditure on non-farm goods both locally and outside the study region. Increased expenditure on non-tradable goods and services may stimulate local production thus creating new employment and enterprise opportunities. Thus, there is potential for demand-led growth in the Embo ward of Umbumbulu. The increased expenditure on tradable goods represents a leakage of income from the local economy. In this study tradable and non-tradable goods and services were classified by whether they were purchased (tradable) or produced by the household (non-tradable). This method of classification is not completely accurate as the category of non-tradable goods could include items purchased from other households or enterprises in the local area. In future studies the survey used to collect household data should include a category on where the good or service was purchased from.

There is a noticeable difference in the estimated expenditure elasticities between the two study periods. Total expenditure was greater, and the expenditure elasticities for the aggregated commodity groups (durables, consumer expendables and transport) were lower in March. This implies that the households were less sensitive to changes in income in the March period. This may be due to higher income generated in this period by the crop harvest. The first survey period (October) was at the end of winter and crop availability was lower. Seasonal differences in expenditure patterns and thus responses to

changing incomes should be considered in future studies of a similar type. An expenditure estimate for a single point in the production cycle cannot provide a complete description of a household's response to changes in income levels.

To obtain a more comprehensive idea of the potential for demand-led growth in the area, growth multipliers should be estimated. Agricultural growth multipliers measure the result of an exogenous income shock on extra income derived from stimulated regional demand, and hence production (Delgado *et al*., 1998). The marginal budget share (MBS) values, such as those estimated in this study, could be further used in the calculation of growth multipliers for the Embo ward of Umbumbulu, KwaZulu-Natal.

The results of this study indicate that an increase in farm incomes has the potential to stimulate economic growth in the Embo ward of Umbumbulu, through the stimulation of increased local production of non-farm goods and services such as housing materials and repairs, childcare facilities and goods and services currently not produced locally, such as processed foods and clothing. Increased incomes will also result in increased expenditure on goods not locally produced, which means a leakage of income from the local economy.

Increased production is limited by factors such as insecure tenure and cash flow problems (Hendriks, 2002:85). Insecure tenure results as the land in the Embo ward is communal land and not individually owned. This creates free-rider problems and disincentives to invest. Cash flow problems are amplified by high transaction costs associated with obtaining credit. Better access to credit would improve cash flow problems somewhat, but transaction costs need to be lowered through the improvement of physical and institutional infrastructure (Matungul *et al*., 2001). Poor physical infrastructure, such as roads, water and electricity, increase transaction and production costs for the households. Public policy should focus on alleviating limitations of production through improving tenure security and physical and institutional infrastructure.

Demand-led growth in the study area will be strengthened with the production of goods not currently produced in the study area. For example, the processing of raw food materials into more convenient items (such as maize into bread) would encourage increased local expenditure with increased income and possibly reduce the leakage of income from the local economy. The diversification into non-farm activities, such as product processing, requires investment and poses a risk that many households may not be prepared to take (Hendriks, 2002:85). Insecure tenure creates a disincentive to investment as producers are not

guaranteed the benefits from their investment. Once again, policies that improve tenure security would strengthen the potential for demand-led growth.

The expenditure elasticities estimated for the food category are not consistent with estimates obtained in other South African studies. Food, in aggregate, is expected to be a normal good and not an inferior good as estimated for the first study period (October). The estimate for March is positive, but lower than those estimated in other South African studies. This result does, however, point out a seasonal difference in consumption patterns in the study region. The expenditure elasticities estimated for the other aggregate commodity groups (durables, consumer expendables and transport) were consistent with other South African studies. There were slight differences between the expenditure elasticities estimated for the two periods, suggesting a seasonal effect on consumption.

There exists the potential for demand-led growth within the Embo ward of Umbumbulu, KwaZulu-Natal. Increased household incomes in the study region will result in increased expenditure on both locally produced goods (non-tradables) and goods purchased from outside the study region (tradables). Increased expenditure on tradable goods will result in a leakage of income from the local economy. Increased expenditure on locally produced goods could mobilize underused resources and stimulate production of locally produced goods, thus creating further employment and enterprise opportunities. Public policy should focus on investment in physical and institutional infrastructure to reduce transaction costs and risk in all markets, so as to reduce constraints to production and encourage greater participation from local producers. Further research should focus on extending the study to estimate growth multipliers in order to obtain a more accurate idea of the potential for demand-led growth in the study area. Research on how to create the initial income shock in the study area is also required.

Acknowledgements

The authors thank the Ford Foundation, South Africa (Grant number 1035-1796), the National Research Foundation (GUN 2069798) and the Gift of the Givers Foundation for funding, and members of the Ezemvelo Farmers' Organisation and Embo community for their willing participation in the survey.

References

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.

Browne M (2006). *Expenditure elasticities for rural households in the Embo region of Umbumbulu, KwaZulu-Natal.* Unpublished BScAgric (Agribusiness) project, School of Agricultural Sciences and Agribusiness, University of KwaZulu-Natal, Pietermaritzburg, South Africa.

Camp KGT (1995). The Bioresource Units of KwaZulu-Natal. Cedara Report No. N/A/95/32. KwaZulu-Natal Department of Agriculture, South Africa.

Delgado CL, Hopkins J, Kelly VA, Hazell P, Mckenna AA, Gruhn P, Hojjati, B, Sil J & Courbois C (1998). *Agricultural growth linkages in Sub-Saharan Africa***.** Washington, DC: International Food Policy Research Institute.

Hazell P & Haggblade S (1991). Rural-urban growth linkages in India. *Indian Journal of Agricultural Economics* 46(4):515-529.

Hazell PBR & Haggblade S (1993). Farm-non-farm growth linkages and the welfare of the poor. In Lipton, M. & van der Graag, J. (Eds), *Including the poor: Proceedings of a symposium organized by the World Bank and the International Food Policy Research Institute*. Washington, DC: World Bank:190-204.

Hazell PBR & Röell A (1983). *Rural growth linkages: Household expenditure patterns in Malaysia and Nigeria*. Washington, DC: International Food Policy Research Institute.

Hendriks S, Lyne M, Darroch M, Modi A, Chitja J, Stilwell C, Morris C, Bower J, Ferrer S, Siwela M, Gubba G, Gadzikwa M, Katundu M, Lwayo M, Moyo Z, Mushayanyama T, Phiti N & Stefano L (2005). *Ensuring food security through farm and non-farm enterprises*. Project Brief 1. Food Security Programme, University of KwaZulu-Natal, Pietermaritzburg, South Africa.

Hendriks SL (2002). *Expenditure elasticities and growth linkages for rural households in two study areas of KwaZulu-Natal*. Unpublished PhD Thesis, Discipline of Agricultural Economics, University of Natal, Pietermaritzburg, South Africa.

Hendriks SL & Lyne MC (2003). Expenditure patterns and elasticities of rural households sampled in two communal areas of KwaZulu-Natal. *Development Southern Africa* 20(1):105-127.

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):347-363.

Mellor JW (1995). *Agriculture on the Road to Industrialization*. Baltimore: The John Hopkins University Press.

Mellor JW (1976). *The New Economics of Growth: A strategy for India and the developing world*. Ithaca, New York: Cornell University Press.

Ngqangweni S (1999). *Rural growth linkages in the Eastern Cape Province of South Africa*. MSSD Discussion Paper No. 33. Washington, DC: International Food Policy Research Institute.

Nieuwoudt WL & Vink N (1989). The effects of increased earnings from traditional agriculture in Southern Africa. *South African Journal of Economics* 57(3):257-269.

Tomek WG & Robinson KL (2003). *Agricultural Product Prices* (4th Edition). London: Cornell University Press.

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):276-278.

Vogel S (1994). Structural changes in agriculture: Production linkages and agricultural demand-led industrialization. *Oxford Economic Papers*, New Series, 46(1):136-156.