

**THE CONTRIBUTION OF SUBSISTENCE  
FARMING TO FOOD SECURITY  
IN SOUTH AFRICA**

**Mompati N. BAIPHETHI**

PhD Intern

**Peter T. JACOBS**

Chief Research Specialist

Centre for Poverty, Employment and Growth

Human Sciences Research Council

31 March 2009



---

**centre for poverty employment and growth**

## **Human Sciences Research Council**

**31 March 2009**

### ***Acknowledgements***

*This paper forms part of the Food Security Project jointly funded by ComMark Trust and the HSRC Parliamentary Grant Allocation – “Ensuring affordable quality food for poor households: Considering the Short- and Long-Term Contribution of Food Security to the government’s poverty and unemployment reduction strategies”. The support of both ComMark Trust and the HSRC is gratefully acknowledged. The insightful review and comments on the original draft by Tim Hart and Innocent Matshe of the Human Sciences Research Council, Pretoria, and Ward Anseeuw, CIRAD Researcher at the University of Pretoria, Pretoria are greatly appreciated. The views expressed are those of the authors and do not necessarily reflect those of any other party.*

**Produced by:** Mompoti N. Baiphethi & Peter T. Jacobs  
**Contact:** Dr Miriam Altman  
Executive Director, CPEG  
**E-mail:** [maltman@hsrc.ac.za](mailto:maltman@hsrc.ac.za)  
**Tel:** +27 12 302 2402

## Contents

ACKNOWLEDGEMENTS .....	2
TABLES .....	3
ABBREVIATIONS AND ACRONYMS .....	4
EXECUTIVE SUMMARY .....	5
1. INTRODUCTION.....	6
2. SUBSISTENCE PRODUCTION AND FOOD SECURITY: AN OVERVIEW .....	7
3. FOOD ACCESS AND INSTITUTIONS .....	9
3.1. Some evidence on South African agricultural markets.....	9
4. ACCESS TO IMPROVED INPUTS AND TECHNOLOGIES.....	13
5. CONSTRAINTS AND OPPORTUNITIES FOR SUBSISTENCE SMALLHOLDER FARMING.....	18
6. SMALLHOLDER OR SUBSISTENCE/SEMI-SUBSISTENCE AGRICULTURE AND FOOD SECURITY IN SOUTH AFRICA.....	20
7. CONCLUSION .....	23
REFERENCES.....	24

## Tables

Table 1 – Crop productivity in Malawi over three different seasons, 2004/05–2006/07.....	14
Table 2 – Maize surplus (deficit) over three different seasons, 2004–2007 .....	14

## **Abbreviations and acronyms**

AISP	Agricultural Input Subsidy Programme
IES	Income and Expenditure Survey
IFSS	Integrated Food Security Strategy
JFPM	Johannesburg Fresh Produce Market
LEISA	low external input sustainable agriculture
LEIT	low external input technology

## **Executive summary**

Poor households access their food mainly from three sources: the market, subsistence production and transfers from public programmes or other households. In the past rural households produced most of their own food, whereas urban households purchased most of their food. However, recent studies have shown an increase in dependence on market purchases by both urban and rural households, in some cases reaching 90% of the food supplies. Consequently, food expenditures can be as much as 60–80% of the total household income for low-income households in some parts of sub-Saharan Africa. This could be mitigated, especially for those most vulnerable rural food-insecure households, by the promotion of subsistence/smallholder production. Therefore production of food for self-provisioning has to significantly increase as a fallback, against a backdrop of inflation and proliferating cash needs for both urban and rural poor households.

Even though subsistence production is important for household food security, the productivity of the sub-sector is quite low, even by the standards of this sub-sector. Poor yields may be one important reason why urban and rural households either abandon or are uninterested in agricultural production. The productivity of the subsistence and semi-subsistence farmers can be improved by increasing access to assets and inputs, as they are the major determinants of the ability to participate in agricultural input and output markets and secure livelihoods through agricultural production. The main assets needed are land, water and human capital. The lack of assets for agricultural production in most parts of sub-Saharan Africa is evidenced by unsustainably small and falling farm sizes, land that is degraded, and negligible investment in irrigation, in addition to poor health and education, thus limiting productivity and access to other livelihood options.

Subsistence agriculture can play an important role in livelihoods creation amongst the rural poor. There is a need to significantly increase the productivity of subsistence/smallholder agriculture and ensure long-term food security. This can be achieved by encouraging farmers to pursue sustainable intensification of production through the use of improved inputs. This will require a dramatic increase in the use of fertiliser, organic inputs and conservation investments, combined with the development of well-functioning input and output markets so as to help farmers acquire and use improved inputs, market their (surplus) output and reduce transaction costs and risks. Increased productivity will reduce pressure on marginal lands, as the intensification of cultivated land will reduce pressure to crop fragile marginal lands. In improving access to inputs, access to off-farm income is also important as it is used to purchase farm inputs and investment, hence increase food security. Finally, there is a need to determine methods of identifying cost-effective ways to improve access to inputs by, among other things, improving delivery, and assisting farmers to earn cash to purchase the inputs (e.g. in the cases of Malawi, Zambia and Mozambique).

## **1. Introduction**

The main aim of this paper is to discuss the contribution of availability of, and access to, improved farm inputs for subsistence/smallholder farmers to improving household food production, and hence food security. This will feed into consideration of the broader questions concerning possible policy interventions to mitigate against the impacts of increased food prices for both the rural and urban poor. It is expected that increased subsistence production will reduce dependence on market purchases and improve the availability of food for the most vulnerable households. The paper will also contribute towards the development of the most likely scenarios to enhance sustainable food security through the subsistence production of food, and estimate the likely costs involved in ensuring food security and sustainable livelihoods.

In order to address the main objective, the paper will specifically deal with the following questions:

- To what extent do people produce their own food and how much does this add to their current levels of food security (livelihoods)? What scope exists to improve (up-scale) this and how could it be achieved?
- Would subsistence production increase the value of food available? In other words, would you get more for your money by producing your own food? Where would we get information/data to actually work this out and make an accurate assessment?
- Are low external input sustainable agriculture (LEISA) principles and technologies important in this regard (initially self-production with the possibility of expanding to produce saleable surplus), and also important in mitigating the effects of poverty by improving household production for own consumption in marginal areas?

The paper will perform a review of the relevant literature. It is expected that the review will offer important lessons from other parts of the world, specifically sub-Saharan Africa, and where possible Southern Africa, which will provide an understanding of how these experiences can inform interventions in South Africa. From this exercise conclusions will be drawn and recommendations made as regards the importance of subsistence production and improved access to farm inputs and technologies for sustained livelihoods and improved food security.

## **2. Subsistence production and food security: an overview**

There is a general consensus that households access food mainly through three sources. These are the markets, subsistence production and transfers from public programmes or other households. In the past a distinguishing factor between rural and urban households' food access was that rural households produced most of their own food, whereas urban households purchased most of their food. Recent studies have shown substantial increases in dependence on market purchases on the part of both urban and rural households (Maxwell et al., 1998; Ruel et al., 1998). As a result food expenditures can be as much as 60–80% of the total household income of low-income households (Ruel et al., 1998).

In most of sub-Saharan Africa, the problem of food insecurity is even more serious among the urban poor, as they are mostly dependent on the market, unlike their rural counterparts who are able to exploit natural resources to provide for food or to generate income. For urban areas, the ability to earn cash income and prices of food are crucial components in the achievement of household food security (Ruel et al., 1998). Therefore, the efficiency of the marketing and distribution systems, household purchasing patterns, ability to produce own food, and access to public transfers (food subsidies or food aid) or private transfers (exchange with rural relatives) are some of the important factors affecting the cost of food, especially for urban households.

While farming still remains important for rural households, people are looking for diverse opportunities to increase and stabilise their incomes. Therefore rural livelihoods are based not solely on agriculture but on a diverse array of activities and enterprises (Chapman & Tripp, 2004). The extent of dependence on non-farm income sources varies across countries and regions. Evidence from a sample of rural villages in Tanzania (Chapman & Tripp, 2004; Ellis & Mdoe, 2003) shows that on average half of the household income came from crops and livestock and the other half from non-farm wage employment, self-employment and remittances. The proportion of non-farm income was higher for the upper income groups than for the lowest income groups. Therefore, the poorest households were more reliant on agriculture, and the reliance on agriculture decreased with increased diversification into non-farm activities. In another study of 11 Latin American countries (Reardon et al., 2001) non-farm income accounted for 40% of rural household incomes. The extent to which households, especially rural ones, are able to feed themselves depends on non-farm income as well as on their own agricultural production (Chapman & Tripp, 2004), since non-farm income is used by many households to purchase their staple grain; thus the concept of subsistence agriculture needs to be understood in this context of diversified income sources. According to Jayne et al. (1999), 61% of maize-growing households in Kenya were found to be net buyers of maize. Therefore such households may be more interested in lower food prices than in investments to increase subsistence production. It is, however, generally believed that surpluses from off-farm income can provide farmers with the security that enables greater on-farm innovation. This depends to a large extent on whether the households diversified out of agriculture due to a lack of opportunities for on-farm innovation or whether they are exploiting a particularly high demand for their labour off-farm (Chapman & Tripp,

2004). Furthermore, on-farm investment is likely to occur when non-farm work is of short duration and the home farm has not been neglected.

According to Bryceson (2000, 2002), based on a case study of seven countries (Nigeria, Ethiopia, Tanzania, Congo-Brazzaville, Malawi, Zimbabwe and South Africa), the countries were all undergoing “de-agrarianisation” and “de-peasantisation”. This was driven mostly by, restrictions on access to land (South Africa), urbanisation (Congo-Brazzaville and Nigeria) and the removal of agricultural subsidies with the enforcement of structural adjustment policies in the other four countries. During this period, peasant agriculture, with its subsistence orientation and relatively low yields, was discouraged in favour of agro-industrial production. Despite the abovementioned changes, African rural-dwellers value the pursuit of farming activities (Bryceson, 2000). Subsistence production of food is gaining importance against the backdrop of food price inflation and proliferation of cash needs, but a green revolution is still to happen in sub-Saharan Africa. The use of improved input packages is declining since effective input packages have not yet been developed, especially for the drier parts of the region. In addition, the input packages that exist for the higher rainfall areas need to be supplemented with expansion of intermediate and appropriate technology to improve returns to labour. To address the above, there is a need to look at how to deal with sub-Saharan Africa’s food deficit, and more specifically the role that peasant farmers can play in increasing food output. This underscores the importance of subsistence production and/or smallholder production in order to increase food supplies and thus cushion households from food price shocks, thereby improving household food security. Even though increased subsistence production may play an important role in reducing food insecurity, access to food from such producers also warrants careful consideration. The section that follows addresses the issue of food access and institutions that may drive or constrain such access.

### **3. Food access and institutions**

Amartya Sen's seminal work on food insecurity in the 1980s (Maxwell & Slater, 2003) reoriented and expanded insights into food security, with greater prominence given to food access. Some earlier researchers gave marginal and fragmented attention to food consumption and the nutritional intake issues. But by and large before Sen, the most influential research on food security was almost exclusively concerned with food availability and production. Naturally, the importance of these supply-side issues in the food security debate could not be ignored. The sharp dichotomy between supply-side and demand-side perspectives on food security impeded holistic and in-depth assessments of food insecurity. Virtually all economists had upheld a supply-side view, in which they focused on national-level food production, availability and access. Nutritionists, on the other hand, paid closer attention to food demand or consumption at the household level. However, over time the emerging consensus was that sufficient agricultural output did not automatically translate into reduced food insecurity, either transitory food shortages or chronic hunger (Maxwell & Slater, 2003; Webb et al., 2006).

The debate opened by Amartya Sen and his co-workers, most notably Jean Dréze, focused the debate on food security and food entitlements. This brought to the fore the roles that institutions, markets and states have in food trading and improving access to food. Although food access is a main focus in modern food security debates and prominently influences food security, Webb et al. (2006) have noted with concern that there is no precise measurement of access. Webb and Thorne-Lyman (2006) specifically note that food access is "embedded in markets, prices and legal systems". Access to food, seen in this way, is thus closely tied to the notion of institutions, following recent thinking in economics (Dorward et al., 2005). To get some idea of the potential role of the agro-food markets in food security, let us look at recent developments in agro-food value chains with specific reference to smallholder farmers in South Africa.

#### **3.1. Some evidence on South African agricultural markets**

There are typically three most common marketing destinations for smallholder farmers, namely fresh produce markets, informal markets and supermarket chains.<sup>1</sup>

The Johannesburg Fresh Produce Market (JFPM) is the largest fresh produce market in Southern Africa and an important outlet for smallholders in Limpopo Province and elsewhere. The JFPM board has been active in expanding access to its trading facility to smallholders as well as informal traders. Examples of how the JFPM board has been trying to improve market access to smallholders include the following: it is conducting targeted extension officer training programmes, so that extension officers

---

<sup>1</sup> This section is based on a case study of smallholder farmers and markets in a report on strategies to develop the "second economy" (PLAAS 2009).

are better able to convey or transmit market information (such as prices, packaging, quality, storage and delivery times, market agents, etc.) to farmers in localities as far as 300 kilometres away; it regularly runs small-farmer and informal-trader open days, in which these market actors are brought on tours to the JFPM facilities to raise their understanding of the workings of fresh produce markets and how they can benefit them; and more recently, the JFPM has worked together with selected municipalities (e.g. Vhembe District Municipality) to build decentralised pack-houses and grading point facilities so as to better integrate small and emerging farmers into fresh produce markets. These “satellite” facilities aim to significantly reduce the transport costs for smallholders and, with modern cold storage facilities, will enable smallholders to deliver better quality produce to the JFPM and capture more benefits.

Informal markets in which large numbers of small traders participate are common across the agro-food value chain. In their study of the Tshakhuma and Khumbe informal markets in the Vhembe district, Nesamvuni et al. (n.d.) found that both markets trade mainly in sub-tropical fruits. Women comprise roughly two-thirds of the sellers, with another 30% mainly children, and 56% of women respondents reported income from trading as their only source of livelihood. Of greater relevance to this study is the extent to which these informal traders use smallholder farmers as their sources of supply. Smallholders supply a limited range of fruits with low input intensity and of indigenous varieties (such as mango and avocado). However, most of the fruits sold in the market have been bought in relatively larger volumes from large-scale commercial farmers in the Levubu Valley, transported and delivered to Tshakhuma and Khumbe by hawkers. To raise the supply of fruits from smallholders to these markets, Nesamvuni et al. (n.d.) recommended downstream contract arrangements between smallholders and informal traders. But complementary investments in storage facilities and transport may be needed to improve the absorption capacity of these informal traders, as well as to reduce the rapid deterioration of produce on display that forces traders to sell at huge discounts and often at a loss.

Downstream linkages of smallholder farmers with large retail chains (or supermarkets) have received increasing attention in recent research because supermarkets attract a mass consumer market. As a result of the growth of South African supermarkets and their movement into smaller rural towns, the farming market space has become radically altered. Alongside this development, rural poor households (including many smallholder farmers) are increasingly net consumers rather than net producers of foods, and they tend to purchase their food from the expanding network of supermarkets in nearby rural towns and cities. These expanding trends in the sources of local food purchases in communal villages have been observed in Limpopo, Eastern Cape and KwaZulu-Natal in the post-1994 era (D’Haese & Van Huylenbroeck 2005; Louw et al., 2007). The 2005/06 Income and Expenditure Survey (IES) of Statistics South Africa (Stats SA, 2007) reveals just how extreme this development has now become: for grain products, 92% of rural black households report that they effect most of their purchases in chain stores or other formal sector

retailers.<sup>2</sup> For meat, dairy and vegetables, the figures are 94%, 94% and 72%, respectively. Supermarkets are making foods available at lower prices than informal vendors in local markets because of the economies-of-scale advantages this type of “networked retailer” enjoys in procurement. Their competitors for the local demand, especially informal traders, have often been forced out of business because they are unable to withstand the competitive pricing of these large retailers. While the implications for consumers would appear to be positive, the consequences for smallholder farmers are mixed but on the whole appear to be negative.<sup>3</sup>

Supermarkets generally specialise in supplying a targeted group of customers with niche products of relatively high value. As such, they offer a potential market to smallholders that produce high-value agricultural foods, which are usually produced in smaller volumes. To explore ways in which smallholders can realise the advantages to be derived from access to this market, Louw et al. (2007) suggest a more nuanced understanding of the purchasing strategies and other goals of supermarkets. Large supermarkets that serve mainly high-income groups need to be split from decentralised chains that procure their fresh agro-foods from local suppliers. The first type of supermarket chain operates a centralised procurement and distribution system which is designed to reduce transaction costs. Within such a system, separate and once-off transactions with scattered smallholders increase transaction costs and lower efficiency (Louw et al., 2007). To qualify as a supplier to large high-value supermarkets, smallholders need to comply with a host of standards, such as organic farming certificates, food quality and safety regulations and packaging criteria. As a consequence, most smallholders are not able to take advantage of opportunities offered by these agro-food chains.

But localised supermarket chains, in contrast to the above type, often rely on small-scale farmers in close proximity to supply the fresh produce needs of their customers. Louw et al. (2007) report case study evidence of the Thohoyandou Spar, the largest supermarket in Limpopo, as an example of a success story of the linkages smallholders have managed to forge with a local supermarket in a specific area. Smallholders supply up to 30% of Spar’s fresh vegetable sales, such as cabbages, spinach, carrots and beetroot. Prices and quality are verbally negotiated when farmers deliver the products to the store, following the inspection of a sample of the produce. Evidence from recent interviews with the Spar manager reveals wide variations in the numbers of smallholders participating in this arrangement. In 2004, the number of smallholders participating had grown to approximately 23, but it then declined to a more recent average of 15 farmers per year. Interest-free loans and training programmes to ensure the supply of better quality produce, provided by Spar in the earlier period, seem to have been dropped from this arrangement.

---

<sup>2</sup> Unfortunately, the design of the 2005/06 IES does not enable one to estimate what share of expenditure is directed to particular types of establishment, merely the share of households who generally purchase particular types of items at particular types of establishments.

<sup>3</sup> In fact to suggest that the implications for consumers are mainly positive is more of an in-principle conclusion than an observation; over the period, South African consumers have experienced at least two bouts of rapid food price inflation, and a case could be made that the pervasiveness of supermarkets has aggravated food price inflation rather than attenuated it.

Better and sustainable market access of smallholders to the opportunities offered by supermarkets turn on the strategies adopted to reduce transaction costs. To lower the transaction costs for both the smallholders and supermarkets, Louw et al. (2007: 548) advocate strengthening forms of collective action among smallholders to promote equity and competitiveness. More specifically this should facilitate coordinated efforts to do the following: train farmers in product quality and marketing; enable farmers to comply with delivery schedules; overcome transport problems; and access cheaper inputs.

## **4. Access to improved inputs and technologies**

Recent research indicates that subsistence food production is increasing in importance in some countries, mainly as a fallback against a backdrop of inflation and proliferating cash needs (Bryceson, 2002). Rural family farmers in sub-Saharan Africa continue to value the pursuit of farming activities for home consumption. In South Africa, this is even more important against the backdrop of food price differentials between urban and rural households, the latter seeming to pay higher prices than the former while they currently have access to productive resources not being used to their full potential. South African studies have shown that the number of households engaging in subsistence agriculture as a main source of food and income is declining, while there is a rise in the number of households engaging in subsistence production as an extra source of food (Aliber, 2005, 2009). However, there is evidence of agricultural resources (especially communal land in former homeland areas) being under-utilised (Aliber, 2005, 2009).

In the context of rising food prices, Smale et al. (2009) propose improving agricultural production through the use of targeted subsidies in favourable environments (e.g. good soils and moisture) and market infrastructure. The above can be achieved through the delivery of improved varieties of seed, fertilisers and other inputs coupled with targeted subsidies in order to realise higher yields. This will result in the expansion of domestic staple food production in order to improve food security and reduce dependence on food imports. According to Bryceson (2002), low domestic food production has a negative impact on the country's general standard of living, so there is reason to move towards improved agricultural production. However, the productivity of the staple food production is low, due mainly to the decline in the use of improved input packages by farming households. This is partly due to the reduction in support for farmers to continue taking up the improved input packages as a result of structural adjustment programmes. The use of improved input packages could be increased by reinstating some "smart or targeted" input subsidies (Bryceson, 2002; Smale et al., 2009). These inputs should be made available at affordable prices and tailored to the local climate and soil conditions. It should be noted that smallholder farmers in most parts of sub-Saharan Africa rely heavily on informal channels to access inputs (Smale et al., 2009). Some of these channels for seed access include on-farm seed saving, farmer-to-farmer exchange and unregulated sales. In the case of Southern Africa, smallholder farmers access only 10% of their seeds from the formal markets. Therefore, informal or village markets are important channels that may need to be improved or developed in order to improve smallholder farmer access to inputs.

In Southern Africa, some countries (Malawi, Zambia and Mozambique) have embarked on some of these "smart" subsidies; the commonly cited example is the Malawi case which involved the government's Agricultural Input Subsidy Programme (AISP), with significant development aid support, from 2005 (Dorward et al., 2008; SOAS et al., 2008). The main objectives of the programme were to improve smallholder agricultural productivity, improve food and cash crop production, and reduce vulnerability to food insecurity and hunger. The programme resulted in increased crop productivity during the two years of its implementation, especially

increases in maize, which is a staple food for Malawians. In addition, the country was able to realise surpluses in maize production, allowing it to export to other countries in the region like Botswana, Zimbabwe, Lesotho and Namibia (FANRPAN, 2008).

The changes in crop production (mt/ha) from before the inception of the programme (2004/05) to after its inception (2005/06 & 2006/07) are indicated for different crops in Table 1.

**Table 1 – Crop productivity in Malawi over three different seasons, 2004/05–2006/07**

Crop	Yield (mt/ha)		
	2004/05	2005/06	2006/07
Maize	0.83	1.61	2.04
Rice	0.91	1.75	1.95
Groundnuts	0.57	0.83	1.02
Pulses	0.42	0.62	0.69
Cotton	0.67	0.94	1.04
Cassava	14.27	17.13	18.78
Sweet potatoes	8.08	13.51	15.32
Tobacco	0.51	0.89	0.99
Wheat	0.46	1.20	2.30
Millet	0.30	0.65	0.72
Sorghum	0.28	0.77	0.86

*Source: Adapted from FANRPAN, 2008*

From Table 1 we can see that the AISP led to a general increase in yields during the years in which it was implemented. For maize, the yields per hectare more than doubled during the first year of implementation relative to the previous year (0.83 to 1.61 mt/ha) (FANRPAN, 2008). Yields continued to increase in the subsequent production season. In addition, the country was able to attain surpluses above the national requirements for maize and other crops (Dorward et al., 2008; FANRPAN, 2008). Table 2 shows the surplus (deficit) that Malawi realised above (below) the national requirements (FANRPAN, 2008).

**Table 2 – Maize surplus (deficit) over three different seasons, 2004–2007**

Year	National requirements (mt)	Production (mt)	Surplus (deficit) (mt)
2004	2 039 291	1 733 125	(306 166)
2005	2 115 317	1 259 332	(855 985)
2006	2 183 506	2 611 486	427 980
2007	2 255 049	3 444 655	1 189 606

*Source: FANRPAN, 2008*

It is worth noting that the majority of the producers in Malawi are smallholder farmers, some of whom were targeted by the input subsidy programme. The fertiliser subsidy reached 1.7 million vulnerable maize-producing households, 250 000 tobacco and cotton producers, and 2 million households received open pollinating varieties and higher-yielding hybrid seeds (Dorward et al., 2008; SOAS et al., 2008). Based on some semi-formal engagement with various stakeholders in Malawi in late 2008,<sup>4</sup> it was determined that the average area cropped by most of the beneficiary households ranges between 0.5 and 0.6 ha of land, and production is primarily rainfed/dryland. It is generally agreed that the programme, and significantly favourable weather conditions, resulted in the country being able to move from being food-insecure to being a surplus producer of staple foods (FANRPAN, 2008). One of the consulted stakeholders was of the view that the impact of the food price shocks was not being felt by the majority of the households, as they produced their own food and there were enough surpluses to be marketed. However, another stakeholder did mention that apart from the input subsidy programme, the country had also had favourable planting seasons as they had experienced good rains during the two seasons in which the programme was implemented.

Other achievements of the programme included an increase in the use of improved technologies (hybrid seeds, pesticides and inorganic fertilisers). In terms of soil preparation, an improved ploughing technology was introduced. This led to an increased planting population. Traditionally, the ridges (rows) on which seeds are planted were 90 cm apart; this has now been reduced to 75 cm, and the distance between planting stations in a row has also been reduced to 25 cm. The improved planting technologies allowed farmers to plant more seeds per hectare and thus made possible increases in yield per hectare. According to SOAS et al. (2008) and Dorward et al. (2008), the programme improved household food security, as indicated by subjective household economic wellbeing. Rural households subjectively ranked their economic wellbeing to have increased between 2004 and 2007 by 8%. In addition, the proportion of households that reported major shocks due to high food prices decreased from 79% in 2004 to 20% in May/June 2007. This was mainly due to increased household food production, higher rural wages and lower food prices benefiting the poorer households (Dorward et al., 2008).

The *World Development Report 2008* (World Bank, 2007) noted that agricultural production is important (while also noting the inherent challenges) for food security as it is a source of income for the majority of the rural poor, especially due to the highly variable nature of domestic production, limited tradability of food staples and foreign exchange constraints in terms of the ability to purchase imports. Therefore, increasing and stabilising domestic production is essential for food security. In addition to the above, agriculture is a main source of livelihood for about 86% of rural people in sub-Saharan Africa (World Bank, 2007). Due to economic hardships in most African countries, subsistence production in some urban areas is increasing (Maxwell, 1994). The prevalence of this practice in African urban areas ranges from about 33% to as much as 80% (Seti, 2003) however the relative contribution of the

---

<sup>4</sup> One of the authors of this paper participated in a FANRPAN Workshop in Malawi where the AISP was flighted, and the workshop was followed by interviews/discussions with some stakeholders in Malawi, mainly based around Lilongwe.

practice to household food consumption is not very well documented (Maxwell, 1994; Ruel et al., 1998; Seti, 2003), owing mainly to its neglect on the agricultural development and/or smallholder research agenda (Maxwell, 1994; Von Braun et al., 1993). As in rural subsistence production, most of what is produced is used for home consumption (subsistence) and only a small proportion is aimed at sale in urban markets. Urban agriculture has thus been recognised as an alternative food security strategy that can be used to cushion the urban poor against economic backlashes associated largely with structural adjustment policies (Smit et al., 1994; Von Braun et al., 1993). Maxwell (1994) argues that urban agriculture is a deliberate effort by urban households to ensure a more secure source of food that is not dependent on cash incomes or fluctuating markets. This is driven mainly by falling real wages and decreased opportunity for wage employment, as well as by intra-household dynamics governing access to and control over resources, mainly cash.

Urban farmers can be categorised, based on case studies in Uganda, into at least four groups (Maxwell, 1994):

- those who produce mainly for the urban market;
- those producing largely for home consumption and self-sufficiency rather than for the market;
- those farming for food security, supplementing purchased food with subsistence production (i.e. purchasing the majority of their food);
- those for whom farming is the only means to access food.

The most common group is farming for food security. This group comprises mostly women who have access to some land on which they can produce food. However, the amount of food produced does not constitute the majority of what the household consumes. These households source most of their foodstuffs from the market. The women who farm for this purpose insist that they will continue to do so rather than seeking wage employment. There are three reasons given for this. Firstly, for them food is a form of income that is less easily expropriated by other members of the household than is cash (Maxwell, 1994). Secondly, the women may access cash from informal businesses that rely on agricultural produce, especially the preparation of food for sale. Finally, farming is a task that falls well within women's multiple roles and responsibilities in the household. The food produced by this group is used mainly to supplement that purchased during those times of the year when seasonal crops are harvested. Another use is the storage of this food in case of emergencies which prevent the household from accessing other sources, such as a decrease in household income. The need for reserve usage of food stems from erratic and unreliable household income, and more importantly, is necessary for times when the main income-earner is unable to provide money for food purchases. Therefore producing some food for the household increases its food security, as well as releasing cash for other household uses. It reduces the over-reliance on cash to access food and thus the demand for cash in feeding the household.

As pointed out above, the productivity of subsistence production will be greatly increased by the use of improved inputs and technologies (seeds, fertilisers, etc.). However, improved access to water and appropriate farmer support (through extension) would also have positive and significant impacts on improved yields for

subsistence farmers. Low external input technology (LEIT) is seen as accessible to resource-poor households and thus can be the basis for human and capital formation (Tripp, 2006). But the patterns of use are similar to those purchased inputs, as better-resourced farmers with better access to the markets are more likely to take advantage of technologies. This means that for resource-poor households to take advantage of the technologies, complementary investments, especially in extension, need to be made. Another important innovation to improve access to LEIT would be the development of broad-based farmer organisations in order to stimulate a demand-driven approach to technology generation and information provision. The farmer organisations would be important in view of the huge shortcomings with regard to agricultural extension that are rampant in most parts of sub-Saharan Africa.

## **5. Constraints and opportunities for subsistence smallholder farming**

While subsistence production has been shown to be important for household food security, the productivity of smallholder agricultural production is quite low and in some cases is given as the reason for the abandonment of agricultural production by both urban and rural households and their reliance on non-farm sources of income. According to the Rockefeller Foundation (2006), this is a consequence mostly of the non-use of high-yielding crop varieties that are widely used in other parts of the world. As a result, increasing yields depends mostly on increasing the area cultivated. If better seeds and technologies could reach the farmers, the inefficiency and food shortage risks could be significantly reduced. However, the challenges of bringing better seeds, fertilisers and technologies to smallholder farmers is much more complex. The complexity arises from the diversity of climate, soils and the range of suitable crops. Nonetheless, it is possible to deliver these improved inputs and assist farmers to use them more effectively (Rockefeller Foundation, 2006).

In addition there is a need to increase access to assets, as household assets are the major determinants of these farmers' ability to participate in agricultural production and markets and to secure livelihoods through subsistence agriculture. The lack of assets for agricultural production is predominant in sub-Saharan Africa, as evidenced by unsustainably small and falling farm sizes and poor-quality land, and the fact that investment in irrigation is negligible. In addition, poor health services and education further limit productivity of agriculture and access to other livelihood options. The World Bank (2007) proposes that commercial and subsistence smallholder farming can be made more productive and sustainable by, among other measures:

- improving price incentives and increasing the quality and quantity of public investment;
- making product markets work better;
- improving access to financial services and reducing risks;
- enhancing the performance of producer organisations;
- promoting innovation through science and technology.

In view of the low productivity of agriculture in Africa, long-term food security on the continent can be improved by encouraging farmers to pursue sustainable intensification of production through the use of improved inputs (Gill, 2002; Reardon et al., 1996; Rockefeller Foundation, 2006; Smale et al., 2009, Southgate & Graham, 2006). This will require a dramatic increase in the use of fertiliser, organic inputs and conservation investments. Well-functioning input and output markets need to be established as they will help farmers acquire and use improved inputs as well as market their produce (Dorward et al., 2005). These will effectively reduce transaction costs and risks. Furthermore, well-functioning markets will ensure that the benefits of productivity are passed on to the consumers. Increasing productivity will reduce pressure on marginal lands, as the intensification of cultivated land will reduce the need to expand production into fragile marginal lands (Reardon et al., 1996). In

improving access to better inputs, off-farm income is also important as it is used to purchase farm inputs and investment, hence increase food security. Therefore, any proposed improved technologies should “not only be financially and economically profitable, but also attractive relative to alternative uses of household resources outside cropping” (Reardon et al., 1996: 4). Finally, the promotion of improved inputs needs to be situated within the context of household constraints, since they have usually been promoted in ways that are not economically sustainable. As a result, the reduction of government support has tended to discourage their use, for it has resulted in dramatic increases in costs and resultant decrease in access to inputs. Therefore, governments have to start investing in understanding how to promote the cost-effective use of improved inputs such as fertiliser, animal traction, organic inputs, water and soil conservation technologies as these are the appropriate inputs required for sustainable intensification of agricultural production. There is a need to determine ways of identifying cost-effective means of increasing access to inputs, improving delivery thereof, and assisting farmers to earn cash to purchase the inputs.

## 6. Smallholder or subsistence/semi-subsistence agriculture and food security in South Africa

Until recently South Africa has been self-sufficient in food production, at least at the national level, but for a long time there have been considerable levels of household food insecurity. However, a national average proportion of households which are vulnerable to food insecurity and/or suffer from food poverty is still a question of debate.<sup>5</sup> The majority of poor households are concentrated mostly in the rural areas, especially in the former homelands. Since the majority of the poor reside in rural areas, it is possible that the food-insecure are also in these areas. If this is the case, it is expected that agriculture will play an important role in alleviating poverty, as the rural development literature posits. As indicated earlier, the problems of food insecurity could be addressed to some extent in rural areas through household subsistence production. While not discounting the importance of other agricultural sub-sectors, this section mainly deals with the importance of subsistence/semi-subsistence or smallholder agriculture in alleviating food insecurity in South Africa.

In South Africa, an estimated four million people engage in smallholder agriculture for various reasons, and the majority of these people are in the former homeland areas.<sup>6</sup> The most common reason given for engaging in agriculture is procuring “an extra source of food”, which has seen an expansion over time at the expense of the reason given for engaging in agriculture as a “main source of food” or purely for subsistence. In addition, the number of people engaged in agriculture as a main or extra source of income is small but consistent over time. However, the challenge is that there are no credible, long-term data on a national scale that establish trends in the subsistence/smallholder agricultural sector which specifically illustrate the sub-sector’s contribution to food security. Household survey data indicate that black households with access to agricultural land reported that agriculture contributes 15% of the total household income, but for the poorest quintile the contribution stands at 35% (Aliber, 2005). While the contribution of agriculture to household income is small, evidence from case studies indicates that agriculture in the former homelands is undergoing a decline. The commonly cited reason for this decline is the removal of support that farmers in former homelands used to receive from pre-1994 governments. An example is Thaba Nchu in the Free State where, with the removal of government subsidies, communal lands stopped being cultivated owing to farmers not being able to afford the farm inputs and a collapse of some of the institutions which used to “drive” agriculture during the homeland era (Kundhlande et al., 2004). Other reasons include the extension of freedom of movement, which has seen an increase in migration from the rural areas to the urban centres. The effects of increased access to social protection transfers on smallholder agriculture are still a matter of debate.

---

<sup>5</sup> Tim Hart (2009) discusses in detail the proportions of the food-insecure in South Africa based on the different data sets used.

<sup>6</sup> Aliber (2009) offers a more detailed analysis of the participation in agriculture by black households in South Africa.

Even though subsistence agriculture is declining in rural areas, efforts have been made to improve its contribution, especially to household food security. From the Labour Force Surveys conducted between 2000 and 2004 (Aliber, 2005) it can be seen that the proportion of households that practised agriculture as a main source of food declined from 33% to 6%, whereas those who used it as an extra source of food increased from 54% to 88%. This may imply that rural “people are practising agriculture less intensively as they find other, more remunerative, economic activities” (Aliber, 2005: 91).

However, the government of South Africa places particular importance on subsistence agriculture in its efforts to fight food insecurity and poverty. One of the objectives of the Integrated Food Security Strategy (IFSS) (DoA, 2002) is to improve household food production, trade and distribution. This is to be achieved through:

- the development of policy interventions that target access to resources such as land, technology, credit and training;
- promotion of irrigation and rainwater harnessing technologies;
- improving access to credit by the poor, including women;
- improving access to food production and food processing technologies, particularly technologies for women;
- enhancing the ownership and exchange entitlement of the poor in the trade of agriculture and food sectors;
- improving household food security by commercialising agriculture to increase income and employment generation among food-insecure households.

Several studies have been undertaken in South Africa to understand and/or address some of the issues raised relating to improving household food production (see for example Baiphethi, 2004; Dovie et al., 2003; Hart & Vorster, 2007; Kundhlande et al., 2004; Seti, 2003; Shackleton et al., 2001). The studies recognise the multiple and diverse nature of the livelihood base of rural households but, more significantly, they underscore the importance of land-based strategies of arable farming, livestock husbandry and consumption and trade in natural resources (e.g. indigenous vegetables) and further that the contribution of land-based activities is much greater than generally appreciated. Previous studies of household livelihoods overlooked the direct-use value derived by households from land-based strategies, including small stock, goods and services associated with livestock, produce from home gardens, wild or indigenous foods harvested from amongst staple crops, and the collection of natural resources for home consumption etc. (Shackleton et al., 2001). Even more important is the use of the land-based strategies as safety nets for households during times of need.

In a study of direct-use value of smallholder crop production in Thorndale village in Limpopo, Dovie et al. (2002) found that the net direct-use value of arable crops was estimated at US\$443.4 per annum across the village. Maize, watermelon, peanuts and common beans contributed 90% to the total direct-use value of crops. Marketing of the output was limited to mostly maize and peanuts, and the farming was mainly done by employing technologies that required low production inputs. Hart and Vorster (2007) also argue strongly for indigenous technologies and knowledge, as their neglect

may have a negative effect on the household food security of rural-dwellers. Typically, government and donor project activities concentrate on the transfer of technologies centred on exotic crops, requiring large volumes of purchased inputs which are dependent on a large natural resource base. Inputs are often hard to obtain. Furthermore, conventional production is characterised by high input costs which most poor households cannot afford, thus strengthening the case for indigenous and low-input technologies. Existing and future research could build on these technologies, enhancing their effectiveness where needed.

Seti (2003) found that food gardens are popular among African women's groups in South Africa. The main aim of food gardens according to the respondents was to improve nutrition and create livelihoods for the urban poor. However, the study found that in Grahamstown East, only one in two households still grew vegetables in their food gardens, based on 1999 cross-sectional survey data, whereas previously the gardens had been in abundance in the townships. The main constraints to cultivation were found to be the high start-up costs, drought, access to produce from the market, inadequate land for production, and the lack of fencing. These constraints are commonly cited by many communities in the former homeland areas as stifling both home gardening and cultivation of communal arable lands (Baiphethi, 2004; Kundhlande et al., 2004). The implication is that most production has shifted towards conventional technologies common among commercial producers, who are able to access the inputs required much more easily than the small/subsistence farmer. The latter are generally situated in remote rural areas of the former homelands where there remains – despite government intervention in some instances – inadequate infrastructure and support services.

In response to some of the challenges faced by the small/subsistence farmers, there is consensus that appropriate technologies requiring low inputs would significantly improve the take-up of subsistence production. Some of the technologies include rainwater harvesting and soil and water conservation practices, indigenous technologies and organic inputs. The technologies have been shown to increase yields significantly and reduce risks of crop failure (Baiphethi, 2004; Botha et al., 2003). Furthermore, the uptake of farming by poor households will significantly reduce their dependence on purchasing food from the market and thus release some of the income for other household uses. However, this will require appropriate and targeted support to ensure the success of the efforts to improve subsistence production among the poor and food-insecure.

## **7. Conclusion**

The main sources of food for households are markets, subsistence production and transfers from the public programmes or other households. However, with the decline in household subsistence production, partly as a result of people taking up non-farm livelihood creation activities, accessing food from the market has grown significantly, in some cases making up 90% of all the food consumed by both rural and urban households, and implying that only 10% comes from the other two main sources (subsistence production and transfers). This has led to an increase in the proportion of household income spent on food; for low-income households the proportion ranges between 60% and 80% in some countries, whereas in South Africa, the proportion is relatively small at 37% of household income. Due to the dependence on the market for food, the ability to earn cash income and the prices of food are crucial for the achievement of household food security. Therefore the efficiency of the marketing and distribution systems, household purchasing patterns, ability to produce own food, and access to public or private transfers are important factors affecting the cost of food for both rural and urban households.

Against the backdrop of increasing prices of food, subsistence production is seen as important to attain household food security. This will reduce dependence on market purchases, especially for the rural poor, as they can exploit natural resources to provide food or generate income. Moreover, rural households continue to value the pursuit of farming activities for home consumption. In South Africa the number of households engaging in agriculture as a main source of food is declining, but there is a considerable increase in the number of households that engage in subsistence production to supplement market purchases. This further shows the important role that households attach to subsistence production as a source of food, and thus a way of reducing the pressure to generate income as they self-provide/supplement their food needs. It is thus important that households be assisted to increase their home/subsistence production to significantly reduce dependence on market purchases, and more importantly, mitigate against increasing food inflation. However, the smallholder/subsistence agriculture sector's productivity is known to be very low, and thus there is a need to significantly improve the productivity of the sub-sector if it is to make a significant impact on food security.

The low productivity of subsistence agriculture is largely a result of poor access to productive resources and improved inputs. The productivity can be improved by increasing access to household assets such as land, water and human capital, and by encouraging farmers to intensify production through the use of improved inputs. This includes the use of fertiliser, organic inputs and conservation investments. However, there is also a need to develop and/or improve input and output markets so as to reduce risks and transaction costs.

## References

- Aliber, M. 2005. Synthesis and conclusions. In Aliber, M., De Swart, C., Du Toit, A., Mbhele, T. & Mthethwa, T. *Trends and policy challenges in the rural economy: four provincial case studies*. Human Sciences Research Council Research Monograph, Employment and Economic Policy Research Programme. Cape Town: HSRC Press
- Aliber, M. 2009. Exploring Statistics South Africa's national household surveys as sources of information about food security and subsistence agriculture. Unpublished report, Centre for Poverty Employment and Growth, Human Sciences Research Council, Pretoria
- Baiphethi, M.N. 2004. An economic evaluation of water conservation systems for dryland crop production for small scale resource poor farmers: A case of Thaba Nchu, Free State Province. MSc thesis, Department of Agricultural Economics, Faculty of Natural and Agricultural Sciences, University of Free State, Bloemfontein
- Botha, J.J., van Rensburg, L.D., Anderson, J.J., Hensley, M., Macheli, M.S., Van Staden, P.P., Kundhlande, G., Groenewald, D.G & Baiphethi, M.N. 2003. *Water Conservation Techniques on Small Plots in Semi-arid Areas to Enhance Rainfall Use Efficiency, Food Security, and Sustainable Crop Production*. Water Research Commission Report No. 1176/1/03. Pretoria: Water Research Commission
- Bryceson, D.F. 2000. *Rural Africa at the crossroads: livelihood practices and policies*. ODI Natural Resource Perspectives Number 52. London: Overseas Development Institute
- Bryceson, D.F. 2002. The scramble in Africa: reorienting rural livelihoods, *World Development*, 30(5): 725–739
- Chapman, R. & Tripp, R. 2004. Background paper on rural livelihoods diversity and agriculture. Paper prepared for the 2004 AgREN electronic conference on the Implications of Rural Livelihood Diversity for Pro-poor Agricultural Initiatives
- D'Haese, M. & Van Huylenbroeck, G. 2005. The rise of supermarkets and changing expenditure patterns of poor rural households: case study in the Transkei area, South Africa, *Food Policy*, 30(1): 97–113
- DoA (Department of Agriculture, South Africa). 2002. *The Integrated Food Security Strategy for South Africa*. Pretoria: Department of Agriculture
- Dorward, A., Kydd, J., Morrison, J. & Poulton, C. 2005. Institutions, markets and economic co-ordination: linking development policy to theory and praxis, *Development Change*, 36(1): 1–25
- Dorward, A., Chirwa, E., Boughton, D., Crawford, E., Jayne, T., Slater, R., Kelly, V. & Tsoka, M. 2008. *Towards 'smart' subsidies in agriculture? Lessons from recent experience in Malawi*. ODI Natural Resource Perspectives 116. London: Overseas Development Institute

Dovie, D.B.K., Witkowski, E.T.F. & Shackleton, C.M. 2003. Direct-use value of smallholder crop production in a semi-arid rural South African village, *Agricultural Systems*, 76: 337–357

Ellis, F. & Mdoe, N. 2003. Livelihoods and rural poverty reduction in Tanzania, *World Development*, 31(8): 1367–1384

Food, Agriculture and Natural Resources Policy Analysis Network (FANRPAN), 2008. Citation for the nomination of Malawi president for the 2008 FANRPAN Leadership award. FANRPAN 2008 Regional Stakeholders Policy Dialogue and Annual General Meeting. Crossroads Hotel, Lilongwe, Malawi

Gill, G. 2002. *Applications of appropriate agricultural technology and practices and their impact on food security and the eradication of poverty: lessons learned from selected community based experiences*. ODI Food Security Briefs. London: Overseas Development Institute

Hart, T. 2009. Food security review: South Africa and Southern Africa. Unpublished report, Centre for Poverty Employment and Growth, Human Sciences Research Council, Pretoria

Hart, T.G.B. & Vorster, H.J. 2007. *African Indigenous Knowledge Systems in Agricultural Production*. Pretoria: Department of Science and Technology: National Indigenous Knowledge Office

Jayne, T., Mukumbu, M., Chisvo, M., Tschirley, D., Zulu, B., Weber, M., Johansson, R., Santos, P. & Soroko, D. 1999. *Successes and challenges of food market reform: experiences from Kenya, Mozambique, Zambia, and Zimbabwe*. International Development Working Paper 72. East Lansing: Michigan State University

Kundhlande, G., Groenewald, D.G., Baiphethi, M.N., Viljoen, M.F., Botha, J.J., Van Rensburg, L.D. & Anderson, J.J. 2004. *Socio-economic impact study of water conservation techniques in semi-arid areas*. WRC Report No. 1267/1/04. Pretoria: Water Research Commission

Louw, A., Vermeulen, H., Kirsten, J & Madevu, H., 2007. Securing small farmer participation in supermarket supply chains in South Africa. *Development Southern Africa* 24 (4): 539-551

Maxwell, D. 1994. Internal struggles over resources, external struggles for survival: urban women and subsistence household production. Paper presented to the 37th annual meeting of the African Studies Association, Royal York Hotel, Toronto Canada, November 3–6

Maxwell, D., Levin, C., Armar-Klemesu, M., Ahiadeke, C., Ruel, M. & Morris, S. 1998. *Urban livelihoods, food and nutrition security in greater Accra*. Research report. Washington DC: International Food Policy Research Institute

Maxwell, S. & Slater, R. 2003. Food policy old and new, *Development Policy Review*, 21(5–6): 531–553

Nesamvuni, A. E., Dagada, M. C., Raidimi, N. E., Tshovhote, N. J., n.d. *Marketing challenges and coping strategies of households in addressing the total value chain system – a case study of two informal markets in the Limpopo*. Research Report. Polokwane: Limpopo Department of Agriculture

PLAAS (Institute for Poverty Land and Agrarian Studies). 2009. Strategies to support South African smallholders as a contribution to government's second economy strategy. Draft report commissioned by the Second Economy Strategy Project. University of the Western Cape, Bellville: Institute for Poverty Land and Agrarian Studies

Reardon, T., Berdegue, J. & Escobar, G. 2001. Rural non-farm employment and incomes in Latin America, *World Development*, 29(3): 395–409

Reardon, T., Kelly, V., Crawford, E., Jayne, T., Savadogo, K. & Clay, D. 1996. *Determinants of farm productivity in Africa: A synthesis of four case studies*. Policy Synthesis Number 22. Washington DC: United States Agency for International Development

Rockefeller Foundation. 2006. *Africa's Turn: A new Green Revolution for the 21st Century*. New York: Rockefeller Foundation

Ruel, M.T., Garrett, J.L., Morris, S.S., Maxwell, D., Oshaug, A., Engle, P., Menon, P., Slack, A. & Haddad, L. 1998. *Urban challenges to food and nutrition security: a review of food security, health, and caregiving in the cities*. Food Consumption and Nutrition Division (FCND) Discussion Paper No. 51. Washington DC: International Food Policy Research Institute

Seti, S. 2003. *Subsistence gardening for food security: A case study of three townships in Grahamstown, Eastern Cape Province*. Fort Hare Institute of Social and Economic Research Working Paper No. 53. Paper presented at the Eastern Cape Historical Legacies and New Challenges conference, 27–30 August

Shackleton, C.M., Shackleton, S.E. & Cousins, B. 2001. The role of land-based strategies in rural livelihoods: The contribution of arable production, animal husbandry and natural resource harvesting in communal areas in South Africa, *Development Southern Africa*, 18(5): 581–604

Smale, M., Cohen, M.J. & Nagarajan, L. 2009. *Local markets, local varieties: Rising food prices and small farmers' access to seed*. IFPRI Issue Brief 2009. Washington DC: International Food Policy Research Institute

Smit, J. Nasr, J. & Rattu, A. 1994. *Urban agriculture: A neglected resource for food, jobs and sustainable cities*. Washington DC: Kumarian Press

SOAS (School of Oriental and African Studies, London), Wadonda Consult, Michigan State University & Overseas Development Institute. 2008. *Evaluation of the 2006/7 Agricultural Input Subsidy Programme, Malawi*. Final Report. Undertaken for the Malawi Ministry of Agriculture and Food Security. Accessed 25/01/2009 <http://www.future-agricultures.org/pdf%20files/MalawiAISPFinalReport31March.pdf>

## *The contribution of subsistence farming to food security in South Africa*

---

Southgate, D. & Graham, D. 2006. *Growing green: The challenge of sustainable agricultural development in Sub-Saharan Africa*. London: International Policy Press

Statistics South Africa (Stats SA)., 2007. *Income and Expenditure Survey 2005/06*. Pretoria: Statistics South Africa.

Tripp, R. 2006. *Is low external input technology contributing to sustainable agricultural development?* ODI Natural Resources Perspectives 102. London: Overseas Development Institute

Von Braun, J., McComb, J., Fred-Mensah, B. & Padya-Lorch, R. 1993. *Urban food insecurity and malnutrition in developing countries: Trends, policies and research implications*. Washington DC: International Food Policy Research Institute

Webb, P. & Thorne-Lyman, A. 2006. *Entitlement Failure from a Food Quality Perspective: The Life and Death Role of Vitamins and Minerals in a Humanitarian Crises*. United Nations University- World Institute for Development Economics Research (UNU-WIDER) Research Paper 2006/140. Helsinki, Finland: UNU-WIDER

Webb, P., Coates, J., Frongillo, E. A., Rogers, B., Swindale, A & Bilinsky, P., 2006. Measuring household food insecurity: Why it's so important and yet so difficult to do *The Journal of Nutrition*, 136(5): 1404S–1408S

World Bank. 2007. *World Development Report 2008 Overview: Agriculture for development*. Washington DC.: International Bank for Reconstruction and Development/World Bank