The contribution of subsistence farming to food security in South Africa

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Abstract

Poor households access their food from the market, subsistence production and transfers from public programmes or other households. In the past rural households produced most of their own food, but 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. Food expenditures can account for as much as 60–80% of total household income for low-income households in some parts of sub-Saharan Africa. Subsistence/smallholder agriculture can play an important role in reducing the vulnerability of rural and urban food-insecure households, improving livelihoods, and helping to mitigate high food price inflation. 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 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. 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 inputs and invest in infrastructure, thereby improving food security.

Keywords: Subsistence farming; livelihoods; agro-food markets; farm inputs; food security

1. Introduction

Increased subsistence production has the potential to improve the food security of poor households in both rural and urban areas by increasing food supply, and by reducing dependence on purchasing food in a context of high

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food price inflation. This article discusses the contribution of availability of, and access to, improved farm inputs for subsistence/smallholder farmers in order to improve household food production. The article reviews experience from sub-Saharan Africa and, where possible, Southern Africa in order to establish:

- To what extent do people produce their own food and how much does this add to their current levels of food security/livelihood? What scope is there to improve this situation and how could it be achieved?
- Would subsistence production increase the value of food available? In other words, would people get more for their money by producing their own food? What information is available to answer this question?
- Is low external input sustainable agriculture (LEISA) a valuable approach for production for own consumption in marginal areas, with the possibility of expanding to produce saleable surplus?

The article concludes by making recommendations for the development of effective support mechanisms for increased subsistence production, including estimates of the likely cost.

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 (Ruel *et al*., 1998). These sources are also referred to as entitlements categories: production, exchange (barter or purchase) and transfers (Sen, 1982). Historically, rural households produced most of their own food, whereas urban households purchased most of their food (Ruel *et al*., 1998). 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 income of low-income households (Ruel *et al*., 1998).

In most of sub-Saharan Africa, food insecurity affects the urban poor more severely 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 (Ruel *et al*., 1998; Frayne & Pendleton, 2009). In urban areas, two crucial components affecting household food security are the ability to earn cash income, and prices of food (Ruel *et al*., 1998). The efficiency of 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 most 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 (Ellis & Mdoe, 2003; Chapman & Tripp, 2004) shows that, on average, half of 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 upper income groups than for the lowest income groups. The poorest households were therefore more reliant on agriculture; a reliance which decreased as non-farm activities increased.

In a study of 11 Latin American countries, Reardon *et al*. (2001) found that 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. Subsistence agriculture should therefore 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. Such households may be more interested in lower food prices than in investments to increase subsistence production. However, surpluses from off-farm income may provide farmers with the financial security that would enable greater on-farm innovation. This is largely dependent 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) thus subsistence production of food is still a major component of livelihoods 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 (World Bank, 2007; CAADP, 2009). Peasant farmers have the potential to play an important role in reducing sub-Saharan Africa's food deficit. Subsistence production and/or smallholder production can increase food supplies and thus cushion households from food price shocks, thereby improving household food security.

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 access to food. Some earlier researchers gave marginal and fragmented attention to issues of food consumption and nutritional intake. 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 result in 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, moved the debate from 'food availability decline' to 'entitlements failure'. 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 is thus determined by how developed institutions are and how well

institutions function (Dorward *et al*., 2005). Recent developments in agro-food value chains that affect smallholder farmers in South Africa highlight the importance of agro-food markets in food security.

3.1 Some evidence from South African agricultural markets

There are typically three most common marketing destinations for smallholder farmers, namely fresh produce markets, informal markets and supermarket chains.[2]

The Johannesburg Fresh Produce Market (JFPM) is the largest fresh produce market in Southern Africa and an important outlet for smallholders from Limpopo and elsewhere. The JFPM board has been active in expanding access to its trading facility to smallholders as well as informal traders. The JFPM is conducting targeted extension officer training programmes to enable them to better transmit market information (such as prices, packaging, quality, storage and delivery times, market agents, etc.) to farmers in localities as far as 300km away. It regularly runs open days during which small farmers and informal traders tours the JFPM facilities to better understand the workings of fresh produce markets and how they can benefit. More recently, the JFPM has worked together with selected municipalities (e.g. Vhembe District Municipality) to build decentralised pack-houses and grading point facilities in order to better integrate small and emerging farmers into large 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 the 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 being children. Fifty-six percent 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 as well as some indigenous varieties. However, most of the fruits sold in the market have been bought in relatively larger volumes from large-scale

[2] *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).*

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 2005/2006 Income and Expenditure Survey (IES) (Stats SA, 2007) reveals just how severe this phenomenon is: for grain products, 92% of rural black households report that they make most of their purchases in chain stores or other formal sector retailers.[3] 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 compete against the pricing of these large retailers. While the implications for consumers may appear to be positive, the consequences for smallholder farmers are, on the whole, more negative than positive. The claim that consumers have benefited from the proliferation of supermarkets is contentious. Over the period covered by the survey, South African consumers have experienced at least two rounds of rapid food price inflation. A case could be made that the pervasiveness of supermarkets has aggravated food price inflation rather than attenuated it.

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[3] *Unfortunately, the design of the 2005/06 Statistics South Africa Income and Expenditure Survey does not enable an estimate of what share of expenditure takes place in particular types of outlet, merely the share of households which generally purchase particular types of items at particular types of outlet.*

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, 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) distinguish between two major types of supermarkets: 1) large supermarket chains that serve mainly high-income groups; and 2) decentralised supermarket 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.

By contrast, localised supermarket chains often rely on small-scale farmers in close proximity to supply the fresh produce needs of their customers. Louw *et al*. (2007) report on the case 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 this outlet'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. Recent interviews with the manager indicate the numbers of smallholders participating in this arrangement fluctuates over time. 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. Spar initially provided interest-free loans and training programmes to ensure the supply of better quality produce, but this no longer seems to be the case.

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 co-ordinated efforts to: 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 pursuing farming activities for home consumption. This is even more important in South Africa against the backdrop of food price differentials between urban and rural households. 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. with 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 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, Malawi, Zambia and Mozambique have provided this kind of 'smart' subsidy. The commonly cited example is the Malawi 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 (2004/2005) to after its inception (2005/2006 & 2006/2007) are indicated for different crops in Table 1.

Table 1: Crop productivity in Malawi, 2004/05–2006/07

Crop	Yield (mt/ha)		
	2004/2005	2005/2006	2006/2007
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

Table 1 shows 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), 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,[4] 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 stakeholder said 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 well-being. Rural households subjectively ranked their

[4] *One of the authors of this paper participated in a FANRPAN Workshop in Malawi where the AISP was launched. The workshop was followed by interviews/discussions with some stakeholders in Malawi, mainly based around Lilongwe.*

economic well-being to have improved by 8% between 2004 and 2007. 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 poorer households (Dorward *et al*., 2008).

The 2008 World Development Report (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 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 (Von Braun *et al*., 1993; Maxwell 1994). 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 (Von Braun *et al*., 1993; Smit *et al*., 1994). 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): 1) those who produce mainly for the urban market; 2) those producing largely for home consumption and self-sufficiency rather than for the market; 3) those farming for food security, supplementing purchased food with subsistence production (i.e. purchasing the majority of their food); and 4) those for whom farming is the only means to access food.

In most urban areas of SSA, the most common group is farming for household 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 reliance on cash to feed 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. Such farmer organisations would be important in view of the huge shortcomings of agricultural extension services 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; and
- 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 (Reardon *et al*., 1996; Gill 2002; Rockefeller Foundation 2006; Southgate & Graham, 2006; Smale *et al*., 2009). 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). 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, government programmes to assist households with access to inputs should be sustainable, i.e. planned in a way that households are able to generate enough cash to continue to acquire these inputs beyond an initial period of government support. Appropriate inputs for sustainably intensifying agricultural production include fertiliser, animal traction, organic inputs, water and soil conservation technologies.

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. In addition the agricultural sector is highly dualistic: comprising a highly capitalised commercial sector and subsistence sector, mostly found in the former homeland areas (May & Carter, 2009). Agriculture contributes less than 3% of GDP and 7.2% of formal employment, but downstream linkages increases its contribution to 15% of GDP. The largest provinces in terms of commercial farms is the Western Cape, Kwa-Zulu Natal and Free State, but Gauteng is larger than Free State in terms of gross farming income. In contrast, the contribution of the subsistence sector to economy and to poverty alleviation is not well studied. While the country is self-sufficient in food production, this has been accompanied by considerable levels of household food insecurity. Reliable statistics of a national average proportion of households which are vulnerable to food insecurity and/or suffer from food poverty is still a question of debate.[5] 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

[5] *Tim Hart (2009) discusses in detail the proportions of food-insecure people in South Africa based on different data sets.*

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.[6] 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, there are no credible, long-term national data that establish the contribution of the subsistence/smallholder agricultural sector 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, farmers stopped cultivating communal lands because they could not afford the necessary inputs, and some of the institutions which used to 'drive' agriculture during the homeland era collapsed (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.

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

[6] *Aliber (2009) offers a more detailed analysis of participation in agriculture by black households in South Africa.*

other, more remunerative, economic activities' (Aliber, 2005:91). According the most recent NIDS report, 4.6% of the adult population participated in agricultural production, with Kwa-Zulu Natal accounting for about 60% of the total number of subsistence producers (May & Carter, 2009). The majority of the subsistence producers were found to be in the rural areas and about 300 000 from urban areas (formal and informal). Furthermore, females account for 58% of the subsistence farmers.

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; and
- 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 Shackleton *et al*., 2001; Dovie *et al*., 2003; Seti, 2003; Baiphethi, 2004; Kundhlande *et al*., 2004; Hart & Vorster, 2007). 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 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*. (2003) found that the net direct-use value of arable crops was estimated at US$443.40 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 abundant 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 small/subsistence farmers. The latter are generally situated in remote rural areas of the former homelands where, despite government intervention in some instances, infrastructure and support services remain inadequate.

In response to some of the challenges faced by the small/subsistence farmers, there is consensus that support and appropriate technologies requiring low inputs would significantly improve the take-up of subsistence production (Tripp, 2006; Dorward *et al*., 2008; World Bank, 2007; CAADP, 2009). Examples of some of these 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 (Botha *et al*., 2003; Baiphethi, 2004). Furthermore, the uptake of farming by poor households will significantly reduce their dependence on purchasing food from the market and thus release some 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. Looking at food security as being first and foremost a problem of access to food, subsistence food production is the best readily available route to entitlement; directly to the food producers and indirectly by driving down food prices. This will reduce the dependence and burden of acquiring food from the market, 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 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 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 important to improve household food security. This will reduce dependence on market purchases, especially among the rural poor, as they can exploit natural resources for food or to 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, thus reducing the pressure to generate income. 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 achieve 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. The development and/or improvements to bolster subsistence agriculture require substantial or improved investments and support into research and development, extension, other agricultural services (access to credit, markets, skills and/or "re-skilling"), etc.

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