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E. E Msuya and A. C. Isinika

Sokoine University of Agriculture

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12 Addressing Food Self-sufficiency in Tanzania: a Balancing Act of Policy Coordination

AIDA C. ISINIKA¹ AND ELIBARIKI E. MSUYA²

¹*Institute of Continuing Education, Sokoine University of Agriculture, Morogoro, Tanzania;* ²*Department of Agricultural Economics and Agribusiness, Sokoine University of Agriculture, Morogoro, Tanzania*

After Structural Adjustment (1986–1994), Tanzania moved from an era of heavy state involvement in agriculture to full liberalization, when all direct and indirect subsidies were removed (Isinika, 2003; Rune, 2005). There are others who argue that economic liberalization in Tanzania, as is the case in some other African countries, was never complete, being partial due to emphasis on price liberalization, uncoordinated timing and sequencing, lack of local commitment and ownership, and weak institutional capacity (Kherallah *et al.*, 2000; Cooksey, 2003). Pressure for economic liberalization came from bilateral and multilateral donors, led by the International Monetary Fund (IMF) and the World Bank, who used different techniques, including withdrawal of donor funds, which lead to a significant decline in foreign aid (Havnevik *et al.*, 1988). Economic reforms were considered necessary to liberate the private sector and to get prices right so that they would reflect relative scarcities of resources for more effective allocation to achieve static efficiency. Many African countries were forced to agree with SAP prescriptions because they were desperately in need of foreign exchange to service outstanding debts. It was assumed that government withdrawal from market operations would enable farmers to respond to factor and product price signals, leading to innovation, specialization and accumulation (Rune, 2005).

The reform process continued during the 1990s, when Tanzania, like many other African countries, undertook more extensive reforms designed to turn around declining growth rates and reverse balance of payment deficits. In agriculture the reforms aimed to eliminate bias against the sector by removing price controls, deregulation of agricultural markets (which had been achieved by 1990) and closure of state-owned monopolies, which was completed in 2007 (Isinika, 2009). In 2001, Tanzania developed an Agricultural

Sector Development Strategy (ASDS), which defined the role of the state to be policy making, regulation and provision of public goods. The use of subsidies as policy instruments was ruled out (Rune, 2005), only to be reversed a few years later.

While some initially hailed withdrawal of the state from market operations as a move in the right direction and that economic transformation was on course (IMF, 1986, 1995; World Bank, 1992), there are many other studies, however, which portray a different picture. A simulation analysis based on poverty reduction rates for the period 1992–2002 shows that growth rates attained until then were not enough to meet the Millennium Development Goals (MDGs) (Demombynes and Hoogeveen, 2004). Analysis of the post-Structural Adjustment Programmes (SAP) period up to 2000 shows that the outcome of the reforms fell short of expectations for agriculture in general but especially in relation to food production, forcing some countries, including Ghana, Malawi, Nigeria and Tanzania, to undergo policy reversal on fertilizer subsidies. Several countries also restored other forms of government intervention in the input sector (Kherallah *et al.*, 2000).

Thus the policy and institutional environment of the new millennium (post 2000) represents a relatively liberalized agricultural sector with some level of government intervention. Despite a strong push from international finance institutions, urging many African governments to pursue a hands-off policy in markets, it is common knowledge that many governments intervene in their food and agriculture sectors in a variety of ways, using subsidies, taxes, credit, price stabilization programmes and expenditure programmes to provide incentives or to achieve income transfer for equity or to stimulate economic development (Stiglitz, 1987; Giovanni and McCalla, 1995). It is none the less correctly argued that such interventions should be carefully managed to minimize efficiency loss.

This calls for a careful balancing act so that, in addition to promoting policies that optimize static efficiency in resource allocation, the policies also enhance dynamic efficiency, such that technical progress and growth of land and labour productivity moves on a path of dynamic efficiency in the long term (Uma Lele, 1989; Rune, 2005). On this basis, careful phasing of subsidies over time has been recommended for India and Pakistan, in order to discourage inefficient use of fertilizer, water and electricity, and reverse escalating government spending (Vaidyanathan, 2000). In addition, the literature suggests that the marginal opportunity cost of spending on subsidy or government transfer programmes is more likely greater than unity, to the tune of up to 50% higher (Alson and Hurd, 1990).

For poor countries such as Tanzania, the option to restore subsidies is a tough one, considering that there are many competing ends to use the same scarce resources (health, education, roads, etc.). Economic liberalization policies should therefore aim at achieving efficiency by maximizing returns, equity for distribution of income and food security. Realizing these policy objectives may be limited by supply constraints (resources, technology, relative prices and management), demand constraints (population, income, taste and relative prices) and world prices constraints through export and import (Monke and Pearson, 1989). Hence, governments may from time to time be required to make trade-offs between efficiency, income distribution and food security using different policy instruments.

This paper examines the performance of food production and productivity in Tanzania since 2000, in relation to post-SAP policies. This discussion assumes that individual households in Tanzania strive to achieve food security through own production as well as purchases from the market. Meanwhile, the government strives to meet national food self-sufficiency of main staples (maize, rice and cassava) from local production, implying that individual farmers must produce a surplus, which is then marketed efficiently so that everybody can access sufficient and good-quality food at all times at affordable prices. Any change in the policy environment changes the opportunity set and hence the choices individuals make, which in turn shapes the aggregate performance of economies over time (North, 1993). It is in this context that the analysis in this paper looks at the performance of food production and marketing, at the micro and macro levels, during the post-SAP period in Tanzania, as influenced by preceding and prevailing policies and institutions, in particular focusing on the magnitude and direction of change. The discussion is guided by several questions: is there any change happening in food production? What is driving that change? Can the change be sustained? What is the role of supporting institutions, markets and governance in directing this change?

Reinforcing the Market Reforms

The timeline in Tanzania shows that while the thrust of the economic reforms during the 1980s was on markets – to get the prices right – the focus during the 1990s shifted to institutions. Tanzania, like many other African countries, followed the bandwagon of institutional reforms to consolidate market reforms that began in 1986. Specific for agriculture, there was a land policy in 1995 (Shauri, 1995; Kaduma, 2005), followed by the land laws of 1991, which became operational in 2001, with amendments in 2003. Although the president still holds all land in trust on behalf of the people of Tanzania, the new policy recognizes that land has intrinsic value, and hence can be marketed (URT, 1994; Shauri, 1995; Kaduma, 2005), which represents a major departure from the socialist past. In 1997, the agricultural policy was approved, recognizing the private sector as a key player for agricultural transformation, especially in relation to input supply, value addition and service delivery (Yoshida, 2005).

Considering the need for a sector-wide approach, Tanzania undertook further analysis of agriculture to determine how to foster accelerated sector transformation for wealth creation and poverty reduction. This was preceded by macro-level poverty reduction strategies, and followed by the ASDS, completed in 2001. The ASDS was designed to conform and contribute to the National Strategy of Growth and Poverty Reduction – more commonly known as MKUKUTA,¹ which has set targets in three clusters for: (i) achieving growth and poverty reduction; (ii) improving the quality of life and social wellbeing; and (iii) good governance. The ASDS is operationalized through

¹ MKUKUTA is the Kiswahili acronym of Mpango wa Kukuza Uchumi na Kuondoa Umaskini, which is equivalent to National Strategy for Growth and Poverty Reduction (NSGPR).

ASDS purpose: to stimulate and facilitate agricultural sector growth and reduce rural poverty.
 ASDS strategic objectives:
 (i) Create enabling and favourable environment to improve agricultural productivity and profitability; and
 (ii) Increase farm income to reduce rural poverty and ensure household food security.

ASDS is in line with the Comprehensive Africa Agriculture Development Program (CAADP) and Millennium Development Goals (MDGs).

ASDP Phase one: 5 years (2005–2010)
 ASDP Phase two: being developed (2011–2014)

Seventy-five per cent of funding goes to local component for LGA to finance District Agricultural Development Programmes (DADPs).
 Twenty-five per cent of funding for national component (Ministries).
 Uses basket funding from government (75.6%), donors (21.7%) and farmers (2.6%).
 Coordination and funding of research and extension services designed to improve and involve more stakeholder participation in co-funding and decision making.

Fig. 12.1. Salient features of the ASDS and ASDP.

the Agricultural Sector Development Programme (ASDP), which requires coordination between five agricultural sector lead ministries² as well as Local Government Authorities (LGAs). These are responsible for coordinating programme implementation at the local level.

In relation to food security, the ASDS aims to support regions and LGAs (districts, wards and villages) to plan and implement effective District Agricultural Development Programmes, such that they meet food security needs of vulnerable groups through assured input provision, training for skills upgrading, regular monitoring and strengthening the capacity of smallholder farmers and service providers to organize and have a strong voice in markets as well as other local institutions that affect their livelihoods (URT, 2001, 2005). These institutional reforms were expected to change the incentive structure in accordance with North (1993), which would in turn induce a change in choices available to actors in agriculture, hence translating into different technical measures and changes in farm practice, and hence improvement in farm productivity and production (Gibson and Knoontz, 1998).

However, as institutional reforms proceeded, the experience of many African countries on food production and productivity during the post-SAP period did not live up to such expectations. In Tanzania, analysis of data for the period 1986–2000 shows that while total output of main staples may have been increasing, productivity, however, was declining, especially for maize and rice (Kherallah *et al.*, 2000; Isinika *et al.*, 2005). Rice was hailed by the World Bank as the fastest-growing crop during the 1990s (World Bank, 1994), but

² The five agricultural sector lead ministries are: Ministry of Agriculture, Food Security and Cooperatives (MAFSCO), Ministry of Livestock Development and Fisheries (MLF), Ministry of Water and Irrigation (MWI), Prime Minister's Office – Ministry of Regional Administration Local Government (PO-MRALG). The exact name of the ministry may change from time to time but basic functions generally remain the same.

Table 12.1. Labour productivity in major food grains. (Adapted from: Rune, 2005.)

Period	Maize			
	Labour productivity	Kg/capita of total population	Five major food crops ^a	
1976–1986	-0.66	+0.25	+1.08	+0.66
1985–1998	-1.99	-2.35	+1.35	-1.80

^aFive major food crops include; maize, rice, wheat, sorghum and millet. They accounted for 59.7% of food tonnage (1995/96–1997/98).

such production growth came from area expansion (Isinika *et al.*, 2003; Rune, 2005). Productivity declined for both land and labour, and for all major food staples. Rune (2005) noted that per capita maize productivity (land and labour), and even agricultural gross domestic product (GDP), actually fell by 2.5% in the interval 1986–1998, while the trend growth rate of maize production declined by 1.1%. The analysis by Rune shows further that maize productivity performance post-SAP was worse than before structural adjustment was introduced (Table 12.1), contrary to earlier positive prognosis (Delgado *et al.*, 1999).

A Declining Trend

Following the commencement of SAP policies in 1986, fertilizer use fell steeply after the removal of fertilizer subsidy, reaching only 63,000 tonnes in 1998/99, from a peak of over 100,000 in 1990 (World Bank, 2000; Isinika *et al.*, 2003). The proportion of farmers who used fertilizer fell from 27% in 1990/91 to only 10.5% in 1997/98. Maize farmers used rates below recommended levels (Hawasi *et al.*, 1999; Isinika and Mdoe, 2001) because of high prices and fertilizer not being available as reported by 47% and 27%, respectively, of the farm holding according to the Expanded Agricultural Survey (URT, 1998). Fertilizer prices increased up to the point where, in some parts of the country, correlation between the price of maize and fertilizer became negative (Bilame, 1996). In remote regions such as Ruvuma and Rukwa, use of inorganic fertilizer on maize became unprofitable, changing the spatial distribution of maize-producing areas in the country as regions in the central part of Tanzania (e.g. Dodoma) gained prominence due to their competitive advantage in marketing, being close to main consuming areas (Kherallah *et al.*, 2000; Isinika *et al.*, 2005). Similarly, regions in the north (such as Manyara and Arusha) resumed prominence in maize production due to their comparative advantage of natural fertility, such that maize can be produced using less fertilizer (Rune, 2005). Declining fertilizer use was reinforced further by soil fertility decline due to soil mining. Farmers responded by rolling back to subsistence production and diversification out of agriculture – that did not amount to specialization. While fertilizer use is the most documented input, the use of other inputs (improved seed and agro-chemicals) also fell. The persistent use of the hand

hoe by more than 60% of farming households also continued to be a limiting factor (URT, 2006)

The rate of innovation uptake is a function of several factors, including availability of technologies and the means by which farmers can access and use those technologies. Lack of credit has also been mentioned as a serious bottleneck to technology uptake among smallholder farmers. The weak link between farmers, extension services and research has also been blamed for low uptake of many agricultural innovations, especially in Africa, where both extensions and research services are very weak. In 1997 extension services in Tanzania were decentralized, relegating powers for planning and delivery of these services to LGAs, which fall under the Prime Minister's Office – Regional Administration and Local Government. The ministries responsible for agriculture and livestock development retained the mandate for policy making, advisory and technical backstopping when called upon to do so (Isinika, 2000, 2003). Within most LGAs, extension services were relegated to the back seat, receiving low priority on resource allocation and in technical upgrading of staff through training, which was compounded by staff attrition, the outcome of a freeze on staff recruitment since the early 1990s (Isinika, 2002) and decimation from HIV and AIDS (Arndt and Wobst, 2002). Thus agricultural extension and research increasingly comprised an ageing personnel, who had very low motivation due to a multitude of factors. All these changes, plus other institutional constraints, culminated in declining productivity of the main staple crops. Something had to be done to reverse the situation.

How did food markets behave? The immediate effect of economic liberalization was to increase the number of private traders, especially in the product market. According to Kherallah *et al.* (2000) the impacts of market reforms in several African countries such as Tanzania have included expansion of private traders, even where parastatal organizations are still active. However, further expansion is constrained by lack of credit and uncertainty about government commitment to the reform (Cooksey, 2003). Bigsten and Danielsson (1999) attribute such resistance to Nyerere,³ who they argue never fully supported the reforms, and he continued to have influence even after his retirement in 1985. It is consequently argued that the reforms were partial, emphasizing price liberalization. Timing and sequencing was not well coordinated; commitment and ownership was low and institutional capacity was weak. Cooksey (2003) none the less admits that maize market liberalization has been successful, and the availability of maize has kept pace with demand.

In general, the market impacts of the policy reforms have improved market integration as vertical linkages with traders and exporting firms have facilitated financing of crop purchased, especially for rice. None the less, the level of their investment in food markets has been low, with little evidence of specialization in service delivery (such as storage) to facilitate marketing. Transport is often a bargained-on-the-spot market. The analysis by Kherallah *et al.* (2000) for the

³ Julius Nyerere is the first president of Tanganyika, which gained independence in 1961. In 1964 Tanganyika formed a union government with Zanzibar to form Tanzania. Nyerere retired as president of Tanzania in 1985.

post-SAP period showed that markets, not only in Tanzania but in many African countries as well, remained risky, personalized and cash based. There were numerous traders but many of them lacked experience, and oversupply forced many of them to exit from distribution.

On a positive note, the reforms reduced inflation from over 30% during the early 1990s to single digit by 1999 (7.9%), declining further to 4.6% in 2001 (Ratasitara, 2004). But inflation has since crept back to double digit, being 12.2% in December 2009. Other positive impacts are: reduced fiscal burden, improved timing and delivery of inputs, and facilitated regional trade in food crops. There has also been some increase in farm prices but with reduced marketing margins, especially for food crops (Kherallah *et al.*, 2000). Isinika *et al.* (2005:210)⁴ also reported that 54% of the respondents considered maize prices to have improved since their households were formed, but the study found little evidence of market integration happening for food crops in general, except in well-connected areas. In the case of rice, however, the majority (58%) of respondents from the same study reported improved prices and market integration following upgrading of transport infrastructure, but profitability had decreased as input prices had gone up.

Policy Reversal

By the end of the last millennium (1990s), food production, especially on a per capita basis, was stagnant or declining. The market reforms did not induce smallholder farmers to specialize or to use improved technologies as envisaged. Nor did the reforms solve the underlying problems of credit availability and poor infrastructure for transportation, communication and irrigation, confirming the post-Washington Consensus that macroeconomic stability, trade liberalization and getting the price right is not enough (Stiglitz, 1998a,b). During the budget of 2003/04, the government announced the intention to restore subsidies for fertilizer. Maize and sorghum seed have also been subsidized since 2005 (Isinika, 2009). Tanzania joined several other African countries (Ghana, Malawi, Nigeria, Zambia) that have taken similar steps. In 2008 parliament passed the Fertilizer Act to provide for more effective regulation of the fertilizer industry, including promoting more effective private sector participation while ensuring quality and adherence to standards.⁵ Other countries, including Kenya and Zimbabwe, are also reported to exercise varying degrees of market intervention policies (Minot and Benson, 2009), such as marketing boards, development programmes and projects (Cooksey, 2003). There is agreement that the span of 10 or 15 years is probably too short for the first generation of reforms, focusing on prices, to have their full impacts felt through the economy, especially in Tanzania, where the economy is still at the pre-industrial stage.

⁴ This paper derives from the *Afrint I* microstudy for Tanzania, for cross-sectional data collected in August–September 2002.

⁵ http://www.bunge.go.tz/POLIS/BTS/general/GENERAL_FR.asp?fpkey. Accessed 20 December 2009.

By the Abuja declaration (2006), African policy makers resolved that member states should grant targeted subsidies in favour of the fertilizer sector (AU, 2006). Thus, the number of African countries resorting to restore subsidies is likely to increase. Subsidies are being justified, first, on efficiency grounds. It is argued that, following the decline of fertilizer use in many African countries after structural adjustment, subsidies can help farmers to reach optimum rates, such that additional farm income exceeds the cost of subsidy programmes. Second, on equity grounds, it is argued that subsidies may be the most effective way of reaching the poor (Minot and Benson, 2009). In Tanzania, the process of policy reversal seems to be continuing. In October 2009, the government passed a bill to establish a board, which will handle mixed crops – mainly food crops. This board is expected to play a role similar to the defunct General Agricultural Products Export Corporation (GAPEX), which collapsed during the 1980s, along with other agricultural parastatal organizations.

There are differing points of view on whether such policy reversal is the right or wrong move. Cooksey (2003) argues that patronage, cronyism and rent seeking, as well as the desire of governments to go back to the project mode, motivated the reversal. Meanwhile, others (Kherallah *et al.*, 2000) argue that what is needed is not state withdrawal from the market but an accountable and determined developmental state that walks a balanced line to pursue a portfolio of instruments which stimulate long-term dynamic growth while minimizing negative distributional impacts. For example, governments can use input and output price ratio as a policy instrument – not to be determined exclusively by the market. Other policy options could be construction of roads and irrigation infrastructure, storage facilities, providing cheap credit, supporting cooperatives and establishing other supporting institutions. In the next section, we look at how the production and productivity of food in Tanzania has performed, following policy reversal, which restored some direct intervention of the government in the market.

The Impact of Policy and Institutional Change

The period of policy reversal (post-2002) also covers a period when the government of Tanzania is expected to conform to and meet targets set by other regional and global frameworks to which Tanzania is a signatory. Under the Comprehensive Africa Agriculture Development Program, which is coordinated by the New Partnership for African Development, the target is to achieve 6% annual growth rate for agriculture. To achieve this, countries are expected to have reached at least 10% annual budgetary allocation by 2010. Agriculture is defined to include crops, livestock, forestry and fishing.⁶ The government strives to align national policies and strategies to the MDGs. In relation to food security it is MDG1 that is most relevant, whose aim is to reduce by half, between 1990 and 2015, the proportion of people living under extreme poverty (less than 1US\$/day). This goal forms an important component of the

⁶ www.africa.union.org

National Strategy for Growth and Poverty Reduction, where the target is to reduce the proportion of people living below basic needs from 38.6% in 1990 to 10.3% by 2015, and to reduce the proportion of people living below basic food needs from 21.6% in 1990 to 10.8% in 2015. Levels of achievement by the year 2000 were 35.7% and 18.7% respectively (Volker, 2005). Looking at how Tanzania has fared in terms of resource allocation from the public sector in support of agriculture, it is obvious that there is a need to leverage more resources from the private sector so that agricultural transformation and poverty reduction can happen at the intended pace, as envisaged.

Has Tanzania attracted more investment into agriculture from local and external sources? A study by ESRF (2008) notes that the current public financial support to agriculture is low compared to regionally and globally. In 2006/07 spending on agriculture as a share of total public spending was 2.4%, compared to 10% in transforming countries during the 1980s, when they experienced their agricultural growth spurt (World Bank, 2008 cited by ERSF, 2008). Isinika (2009) similarly reported low levels of spending, especially in real terms. Spending on agriculture as a share of agricultural GDP is equally low; being 1.6% in 2006, compared to 4% in other developing agriculture-based African countries, including Kenya and Uganda (4.1%), Malawi (7.4%), Zambia (8.3%) and Zimbabwe (9.3%).

In Tanzania, the ASDS is facing a financing gap, being funded at less than 50% of the original plan since its commencement in 2005. Future financing for ASDP looks equally grim, facing a gap of up to 52.5% of the government commitment over the life of the programme up to 2015 (ESRF, 2008; Isinika, 2009). Funding from development partners, who are expected to cover 21.7% of the ASDP cost, has been equally lagging and is actually under threat, as some donors opt to switch from the initial sector-wide funding framework back to the programme/project mode. In principle, public funding is expected to leverage private sector investment from local and external sources, such that in the medium and long run the private sector drives agricultural transformation, but this is not happening at a desirable rate.

[AU 1] **Table 12.2.** Public spending in agriculture-based countries. (Adapted from: World Bank, 2008.)

Category of spending	Agriculture-based countries		Transforming countries		Urbanized countries		Tanzania	
	1980	2004	1980	2004	1980	2004	2004	2006
Public spending on agriculture as a share of total spending (%)	6.9	4	14.3	7	8.1	2.7	2.3	1.9
Public spending on agriculture as a share of total GDP (%)	3.7	4	10.2	10.6	16.9	21.1	1.4	1.3
Share of GDP in agriculture (%)	28.8	28.9	24.4	15.6	14.4	10.2	26.1	25.9

In order to attract more private sector investment therefore, in 1997, the government established the Tanzania Investment Centre under the Investment Act, to unify and streamline investment incentives (Pigato, 2000). Although Tanzania is listed among African countries which have attracted a fair share of foreign direct investment (FDI), such investments have generally gone to extractive industries and tourism, which have limited backward linkages compared to agriculture (Volker, 2005; Msuya, 2007). In agriculture, most investments have gone into traditional cash crops rather than food crops. Although the government has set up incentive packages including tax holidays,⁷ economic processing zones and privatization,⁸ investments into agriculture have been hampered by weak physical infrastructure (transportation, communication and energy), low quality of labour, accentuated by deteriorating education and health, and lack of back-up services for enterprises. Other factors, also found in other African countries, are corruption, lack of access to global markets, lack of access to finance, high cost of doing business, excessive taxation and weak tax regulatory framework and policy uncertainty (Asiedu, 2003; Garbe-Madhin, 2006).

In the case of Tanzania, it has been argued that the current combined levels of public and private investments are too low compared to Asian countries during the 1970s, at the height of their Green Revolution, where expenditure on agriculture was up to 20% of government spending, on average, in some countries (ESRF, 2008). Some African countries have exceeded their 10% commitment to meet the Maputo Declaration but Tanzania is lagging behind. By 2008 Tanzania had reached only 6.2%, rising to 7.1% in 2008/09 and promising to reach the 10% target in the next budget (2010/11). Despite the shortfall, the current level of government commitment to support agriculture represents an improvement compared to the past. The challenge remains – can these trends be sustained?

An assessment of the first generation of reforms has been summarized by Kherallah *et al.* (2000) as having reduced the fiscal burden, increased competition and improved timing and delivery of inputs in accessible areas. But the reforms did not overcome the underlying problems of credit. The authors go on to suggest that there is a need to address other reasons for the low level of fertilizer use in Africa, including the low volume of imports resulting in high cost, insurance and freight cost of fertilizer, high distribution costs due to poor infrastructure and low population density, low levels of irrigation at less than 5% of the planted area, and lack of credit. In the next section, we assess how these challenges have been addressed in Tanzania, during the post-SAP period and how the interactive effect of markets, institutional and governance reforms

⁷ In many cases the tax holidays have been assessed to be generous and costly for African countries (Pigato, 2000).

⁸ The privatization parastatals began in 1992 as part of economic reforms. By 2007, when the process was completed, 270 companies had been disposed through divesture or disposal of non-core assets. Out of 28 agricultural companies, 21 were privatized to Tanzania nationals, while 7 went to foreigners (Isinika, 2009).

have played out in terms of input and service delivery and their ultimate impact on productivity, production and food security at the household level and self-sufficiency at the aggregate national level.

Access to and Use of Resources

Land use and land tenure

Land is a key input into any agricultural production process in Tanzania. While land that is available to smallholder farmers has not changed since the early 1990s, utilization has increased significantly, imposing pressure on land. This is consistent with findings from the *Afrint* panel study (Ashimogo *et al.*, 2003; Msuya, 2009), where data from Iringa and Morogoro regions show that the average area under maize decreased by 13%, from 1.033 ha/household in 2002 to 0.874 ha/household in 2008 (Fig. 12.1). On the other hand, area under rice decreased by 5%, from 1.02 ha/household in 2002 to 0.92 ha/household in 2008. The same applies to cassava, where the area was 0.267 ha/household, on average, in 2002, falling to 0.22 ha/household in 2008, representing a 17% decline. Considering the population growth and competing use of land, the trend towards land scarcity should be expected to increase. Whether this trend will encourage more agricultural intensification remains uncertain due to partial implementation of the Land Act no. 5 of 1999.

The Land Act no.5, which governs the administration and management of village land, requires all villages to be mapped and titled before villages can issue customary titles within their boundaries. Since 2003, when the land laws became operational, only a few villages have been demarcated and mapped in most regions, and even less have title deeds (Kaduma, 2005; Ashimogo, 2008). This has encouraged encroachment into village land by serious and speculative investors. There are some investors who have been invited by local governments to

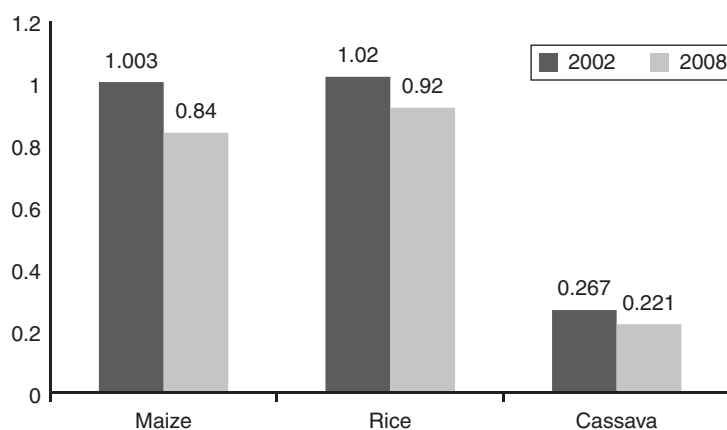


Fig. 12.2. Average area under crops (ha/household). (Adapted from: Msuya, 2009.)

invest in the production and processing of biofuels, as happened recently in Rukwa region (Kiwele, 2009). Other investors have been invited to participate in food production. For instance, Saudi Arabia has requested to acquire 500,000 hectares of land to produce food for exporting to their country. The Food and Agriculture Organization of the United Nations (FAO), among others, has warned developing countries of the dangers of such land-grabbing (Braun and Meinzen-Dick, 2009). It is evident that, as competition for land intensifies, the land tenure system is not robust enough to ensure availability of land for food self-sufficiency.

Tools and implements

The absence of key productive assets such as draught animals and implements has been identified as another major constraint for agricultural productivity (Winters *et al.*, 2004). In Tanzania, the hand hoe is the most dominant agricultural tool, used by the majority of smallholders for cultivation and weeding, accounting for 56% of the planted area, followed by oxen (32%). Tractors account for only about 4%, while 8% of the planted area falls under no till. Animal-drawn technology (ADT) use is most common in Shinyanga region, where about 65.4% of the planted area was cultivated using ADT. Use of oxen or donkeys is low in Morogoro (9%) and moderate in Iringa (35.6%), but hand cultivation is common in both regions, being used by over 60% of the households. Data for *Afrint II*, which was collected in 2008, shows little improvement (Msuya, 2009). About 75% of the maize farmers used the hand hoe during the most recent harvest, while 22% used ox ploughs and only 3% used tractors. More respondents (96%) used the hand hoe in Morogoro, compared to 59% in Iringa. In the case of rice production, 81% of the farmers used hand hoes, while 19% used tractors, while all farmers who planted cassava used hand hoes. There was high and significant positive correlation between households that practised lowland irrigated rice and use of tractors for land preparation (Msuya, 2009).

The hand hoe and use of other tedious and taxing farm processes have been blamed for luring rural youths away from farming. Consequently, the farming population is fairly old. The average age of respondents from *Afrint II* was 45 years (Msuya, 2009), having only 5 years of schooling. While the years of schooling have not changed compared to a similar study 5 years earlier (Ashimogo *et al.*, 2003), the average age has increased by 3 years, which is consistent with the observation that younger people often do not choose to engage in farming.

The government has expressed the desire to replace the hand hoe with more modern technology, especially for land preparation. Tools for weeding, especially in rice production, are also being promoted. Under the ASDP, district councils have been encouraged to increase the number of power tillers available to farmers, who can buy them in groups or as individuals. Groups can pay 20% of the value to receive an 80% grant from the District Agricultural Investment Fund. The challenge is how to manage a group facility that requires regular maintenance and care. Past experiences under the Ujamaa regime

provide many examples of failed efforts of group ownership and management of facilities. The policy of giving priority to groups to acquire jointly owned tools may require re-evaluation before implementation goes too far.

Transport and communication infrastructure

As noted earlier, private investments in agriculture or any other sector are attracted by low cost, which is a function of good transport and communication infrastructure. Data from TANROADS⁹ show that the length of trunk and regional roads that are considered to be in good condition has improved from 4081 km in 2002 to 14,764 km in 2005, representing 14% and 51% of all trunk and regional roads for the two periods respectively. Conversely, roads considered to be in a poor condition are reported to have decreased from 14,052 km (49%) in 2002 to 6440 km (22%) in 2006. None the less, lack of suitable infrastructure remains a major limiting factor to development in Tanzania. It has been reported that Tanzania dropped four notches as a favoured destination for foreign direct investment largely due to poor infrastructure and low education of the labour force (*Daily News Tanzania*, 2009). Funds allocated for road maintenance reached a peak in 2002/03 but have declined since then, in both nominal and real terms. Funds for railways and harbours also declined between 2002 and 2006 (Isinika, 2009). Although market access, which is strongly influenced by the condition of rural roads, remains a limiting factor, more respondents of the *Afrint II* micro-study indicate that market access has improved in 2008 compared to 2002 (Msuya, 2009). The proportion of respondents reporting carrying luggage on head loads decreased from 51% to 41%, while those using bicycles increased from 40% in 2002 to 57% in 2008. An insignificant proportion of respondents used donkeys or motorized transportation (Isinika *et al.*, 2005; Msuya, 2009). These data are consistent with most of the farmers selling their crops at the farm gate or within-village markets.

Communication by mobile phones is also emerging as an important means of transmitting information into rural areas, especially on marketing. The mobile phone sector has shown significant growth, while the fixed line sector, a monopoly of the state-owned Tanzania Telecommunications Company Limited Company, has remained stagnant since 2000. Mobile telephone penetration currently stands at 30%, growing by 10% in the interval 2006–2009, and destined to grow even faster. Estimates show that a 10% increase in penetration will lead to a 1.2% rise in per capita GDP. Platforms such as Nuru SMS are emerging. This will provide an opportunity for information-sharing for various purposes, including marketing, health and technology, similar to Sokoni SMS of Kenya. Other specific uses for agriculture include making more

⁹ TANROADS is a government agency that has the mandate to undertake regular maintenance of all regional and trunk roads. TANROADS is represented in every region. Local government authorities are responsible for maintaining the district and village roads.

efficient crop forecasts and more accurate surveys of commodity and input demand. This new development is expected to open up uncharted opportunities for farmers and traders in agriculture. In Tanzania only 34% of the mobile phone lines are currently used for business, compared to 85% in Egypt and 89% in South Africa.¹⁰

Irrigation infrastructure

Water is the most limiting factor for food crop production in Tanzania, since agriculture is largely rain fed. Only 2.7% of the total planted land was irrigated during 2002/03, translating to 211,872ha on the mainland, of which 77% was irrigated during the long rains and the remainder during the short rains. The number of smallholders practising irrigation was about 240,721, having changed little compared to 1995/6. However, Morogoro and Kigoma regions had experienced significant increase in the number of irrigating farmers, while Dodoma and Manyara experienced the most decline. Comparing with data from the *Afrint* micro-studies (Ashimogo *et al.*, 2003; Msuya, 2009), it seems that the area under irrigation has decreased since 2002. About 48% and 7% of the respondents from Iringa and Morogoro respectively reported to have irrigated at least 25% of their maize farm during 2002, compared to only 10% of the maize farmers in 2008. In the case of rice, however, the farmers who practised irrigated lowland rice production increased from 1% in 2002 to 16% in 2008. However, only 1% among them grew more than one crop per year (Msuya, 2009). Considering the current threat posed by climate change, as a result of which some regions of Tanzania are expected to have subnormal rains while others expect to get above-normal rains (Agrawala *et al.*, 2003), developing irrigation is strategically important. After 2 years of implementation, the ASDP review reported that the area under irrigation had increased by 25,000 ha (0.9%), from 264,000 to 289,000 ha from 2006 to 2008 (Mlaki, 2008), representing a 36% increase (from 211,872ha in 2002). None the less, this new level represents less than 4% of the total planted land.

Services

Besides inputs, tools and implements, farmers also need quality services (extension, research, information, business development, marketing and others) in order to optimize technology use as well as market opportunities. Farmers also need to be involved in planning for their development at various levels so that their input contributes to making the services relevant for them. However, there has been failure in general to integrate research and extension as complementary services, especially at the district level. Districts have been slow to widen the

¹⁰ <http://www.telecomsmarketresearch.com/reseach/TMAAAQUQ-Tanzania> (accessed 2 December 2009).

scope of service providers by inviting other non-state service providers (private sector, non-governmental organizations (NGOs) and community-based organizations) to participate in service provision through competitive bidding, as required under the ASDP (Ashimogo, 2008; Development Associates, 2008; Matee *et al.*, 2008; Mlaki, 2008). It requires a mindset transformation among local government staff so that they perceive non-state service providers as complementing the limited capacity of the government services rather than public extension staff. The current number of village extension agents represents only 22.4% of the requirement (Isinika, 2009). The government has set up a crash programme to train 3000 additional agricultural technical staff (at certificate and diploma level) within 3 years (2009–2011), who will be hired by local government authorities. This would increase the number of beneficiaries who access agricultural extension services from the current 35% to 45% (Ashimogo, 2008). Meanwhile, studies have consistently shown that traders, input suppliers and neighbours are the most common source of production and marketing information among farmers (Isinika and Mdoe, 2001; Ashimogo, 2008).

Availability of financial services has been another limiting factor. Since 1994, the government established a revolving agricultural input trust fund to fill the vacuum following the collapse of cooperatives during the 1970s and failed attempts to revive them during the 1980s. However, the fund has not lived up to its expectation.

Available data shows that between 2002 and 2006 only 1130 loans were issued, being less than 200 loans per year, and the beneficiaries have often been well-connected government and political leaders as well as business owners (Isinika, 2009). Other avenues for smallholder farmers to access credit have included Savings and Credit Cooperative Societies (SACCOS), various microfinance institutions, the presidential empowerment fund, local government support project fund and banks. However, lending from commercial banks has not specifically targeted agriculture (Fig. 12.2). Moreover, interest rates remain too high at (15–22%) for most agricultural investments to benefit.

The tax regime and inflation have also had their toll on agriculture. At one time the sector faced 55 taxes, compared to 7 in Zambia, 4 in South Africa and 25 in Morocco (Ashimogo, 2008). The government has removed a number of taxes that undermined agriculture. In addition, there are some agricultural activities which have been zero-rated for Value Added Tax (VAT).¹¹ These include all unprocessed agricultural produce (but not for local market), industries producing agricultural inputs (fertilizer, fishing gear, pesticides) and VAT rebate for small agricultural exporters (through cooperative unions or associations). Most smallholder farmers, however, cannot benefit from VAT rebate since they are not registered (URT, 2007). Further reforms are necessary to liberate the sector, because the tax burden remains relatively high. It has been reported that, despite the tax reforms, agriculture pays 17 times more tax than industry (5% compared to 0.3%). A 10% reduction in taxes to agriculture would raise annual economic growth rate by 0.43% (URT, 2007). Inflation is another

¹¹ In accordance with the VAT Act of 1997.

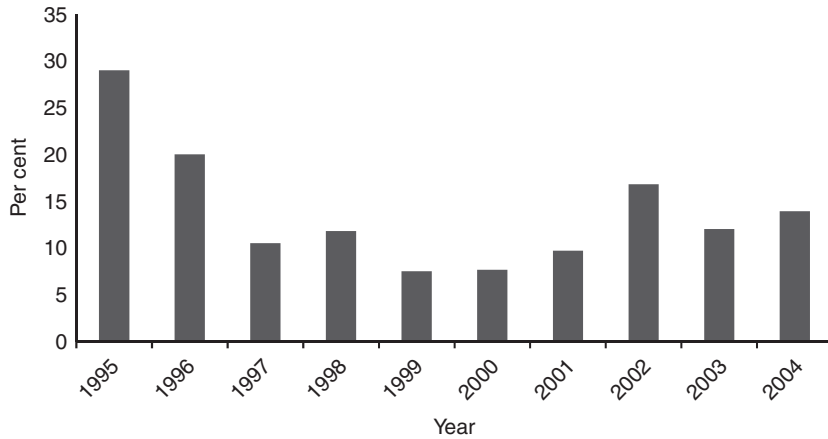


Fig. 12.3. Commercial banks lending to agriculture (1995–2004). (Adapted from: Machude and Nkini, 2005, cited by Ashimogo, 2008.)

vice that must be addressed. Until 2003, inflation had been successfully reduced to below 5%, from an all-time high above 30% during the 1980s and early 1990s. From 2005, inflation began creeping up, reaching 14.8% in June 2008, influenced by rising food and fuel prices globally but also due to increasing borrowing by the government. Although inflation since declined to around 10.3% in 2009, it rose again to 12.2% by December of the same year. Moreover, this level is too high for healthy economic development. In addition, rising food staple prices have the potential to choke off growth from demand-side linkages (Delgado *et al.*, 1999).

Fertilizer use and other inputs

In Tanzania, the percentage of households using inorganic fertilizer remains very low but is improving in the case of maize. Currently only 9 kg are used per hectare, compared to 27 kg in Malawi, 53 kg in South Africa, 16 kg for SADC and 279 kg in China (URT and TBC, 2009). Although the supply of fertilizer has increased since 2004, following government's deliberate efforts to enhance fertilizer use by restoring the subsidy, supply still lies in the range of 50–80% of what is required (Fig. 12.3).

Results from the *Afrint II* micro-study (Msuya, 2009) show that about 21% of the sampled farmers used artificial fertilizer for maize production during the most recent season, representing an improvement from 2002, especially in Iringa region, where significantly more respondents (16%) indicated the amount of fertilizer used has increased, probably reflecting the effect of the fertilizer subsidy programme introduced by the government since 2002/03. The fertilizer subsidy has increased tenfold in the last 5 years (since 2005). In the case of rice, not much has changed since 2002, as 88% reported not using any artificial

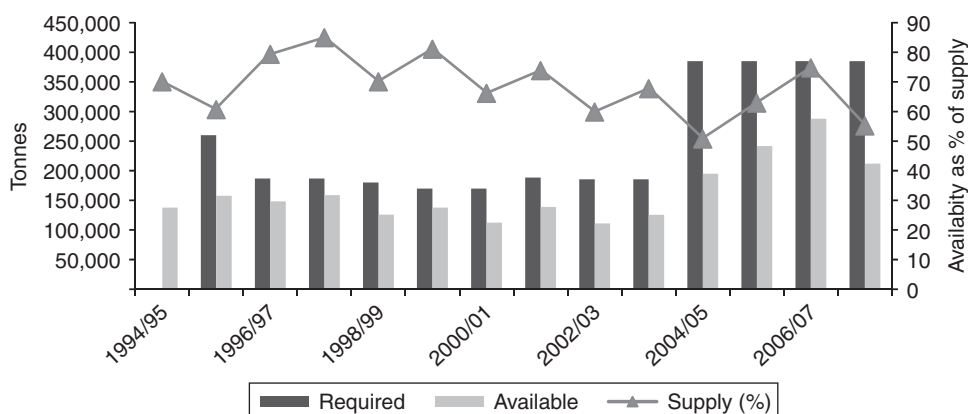


Fig. 12.4. Supply and availability of fertilizer (mainland Tanzania), 1995–2008. Adapted from: Ministry of Agriculture and Food Security (unpublished data).

fertilizer during both periods. No artificial fertilizer was used for cassava production, but manure use increased from 19% in 2002 to 25% in 2008 (Msuya, 2009).

The use agrochemicals is much lower, being applied to only about 9% of the planted area in mainland Tanzania, and even lower for fungicides (2%) and herbicides (2%). However, insecticides are used more often (72% of the applied area) than fungicides (15%) and herbicides (13%) in mainland Tanzania. Iringa and Shinyanga regions had the highest planted area to which agrochemicals were applied, probably due to production of permanent cash crops (cotton and tobacco) (URT, 2006). From the *Afrint II* micro-study (Msuya, 2009), overall, 43% of the respondents used pesticides on maize during the most recent season (Table 12.3), being significantly higher in Iringa (73%) compared to Morogoro (3%), which has not changed since 2002, when corresponding figures were 72% and 3% respectively. Meanwhile, there seems to be marked increase in pesticide use for rice production. About 71% of the households who cultivated paddy rice applied pesticides in 2008 compared to less than 33% in 2002. Also one farmer used pesticides for cassava compared to none in 2002. This could indicate rising awareness and availability of this input or a rising trend of pests forcing farmers to look for solutions.

Use of improved seed represents only 7% of the demand (URT and TBC, 2009). Results from *Afrint II* (Msuya, 2009) reflect the continued dominance of traditional seed, which was used by 73% of the maize farmers, 95% of the

Table 12.3. Use of selected improved inputs.

	Fertilizer on maize	Improved maize seed	Pesticides on maize	Pesticides on rice
2002	16	12	<10	33
2008	21	27	43	71
% Change	7	15	>33	38

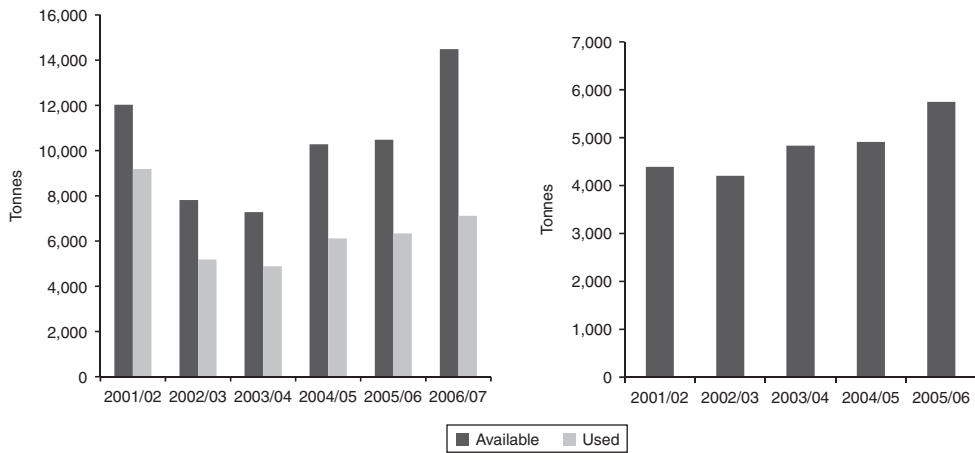


Fig. 12.5. Availability and use of improved seed (2001–2006). (a) All improved seed: quantity available and used; (b) quantity of improved maize seed used. Adapted from: Ministry of Agriculture and Food Security (unpublished data).

rice farmers and 20% of the farmers planting cassava. Conversely, only 27% of the respondents planted improved maize seed, being higher in Iringa (37%) than in Morogoro (13%). This represents an increase compared to 2002, when only 12% and 3% of the maize farmers in Iringa and Morogoro, respectively, used improved seed. The trend towards using more improved maize seed has been increasing since 2001/02 (Fig. 12.4), and it should be expected to accelerate further, since distribution of improved seed now also benefits from the transport subsidy, which was extended to cover seed as well since 2006/07.

The use of improved rice seed has also been increasing since 2004/05, but according to Msuya (2009) only one farmer out of 194 in Morogoro region¹² planted NERICA or NERICA descendants. During 2008, the majority of farmers (64%) acquired maize seed from their own stock; 12% obtained seed from neighbours; 21% bought from the market; and 3.2% got maize seed from NGOs. Likewise the main source of rice seed was own stock (76%), followed by other farmers (13%), marketplace (7%) and purchased from extension agents and NGOs (4%).

Production and Food Security Response at Macro Level

Crop production

Considering the policy and institutional environment, let's now look at how farmers have responded in terms of production of the main food crops. Maize is the main staple crop, followed by rice and cassava. Sorghum and millet are important in drier parts of the country. Maize is grown in all regions of mainland

¹² Only one and two farmers reported growing rice in Iringa during 2008 and 2002 respectively.

Tanzania but regions in the south (Iringa, Mbeya, Rukwa and Ruvuma – the big four) dominate, producing about 40% of the maize in 2005. Production of maize has been increasing very gradually since 2002/03, the combined effect of area expansion and yield increase (Fig. 12.5). The trend in Iringa mirrors the national aggregate, reflecting the impact of fertilizer subsidy and the impact of the big four regions on the national supply of maize. Effective from 2008, Morogoro and Kigoma regions have been added to regions that are focal for food production. It would be expected that the level of food production will improve to match the ambition of Kilimo Kwanza, such that Tanzania becomes a net exporter of maize to neighbouring countries (URT and TBC, 2009).

Rice, which is mainly produced in five regions (Morogoro, 19.7%; Shinyanga, 18.5%; Mwanza, 13.6%; Tabora, 10.2%; and Mbeya, 8.5% in 2002/03), has also shown increasing production, largely from area expansion. The yield of rice has not increased consistently for two consecutive years, reflecting annual variation of rainfall and the low level of improved technologies (seed, spacing, fertilizer), as discussed earlier. The average yield of rice in 2005/06 was 1.3 ts/ha, 34% lower than that obtained in 2001/02 (1.96 t/ha). The production trend for Morogoro region mirrors the national aggregate (Fig. 12.6), reflecting this region's influence, which produces about one-fifth of the rice national supply.

Cassava has similarly exhibited rising production since 2004 (Fig. 12.7), largely attributed to productivity gain. The area under cassava has changed very gradually, growing at 6% annually. Meanwhile, cassava yield has increased from 1.5 t/ha in 2002/03 to 2.1 t/ha in 2005/06, probably reflecting recovery from the devastating attack of cassava mosaic during the 1990s, the yield recovery being due to introduced varieties that are resistant to mosaic virus. The production and yield of sorghum has remained almost stable nationally since 2002/03,

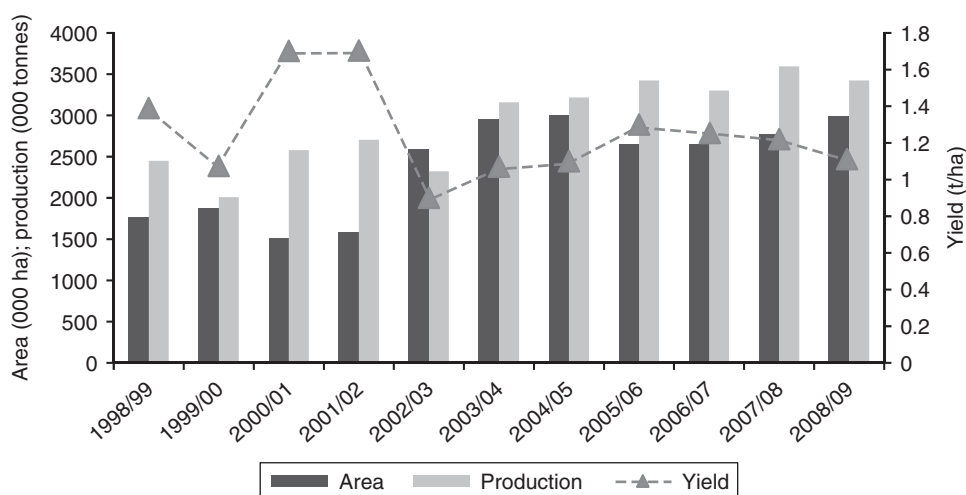


Fig. 12.6. Production and yield of maize in mainland Tanzania. Adapted from: World Food Program – Tanzania (unpublished data).

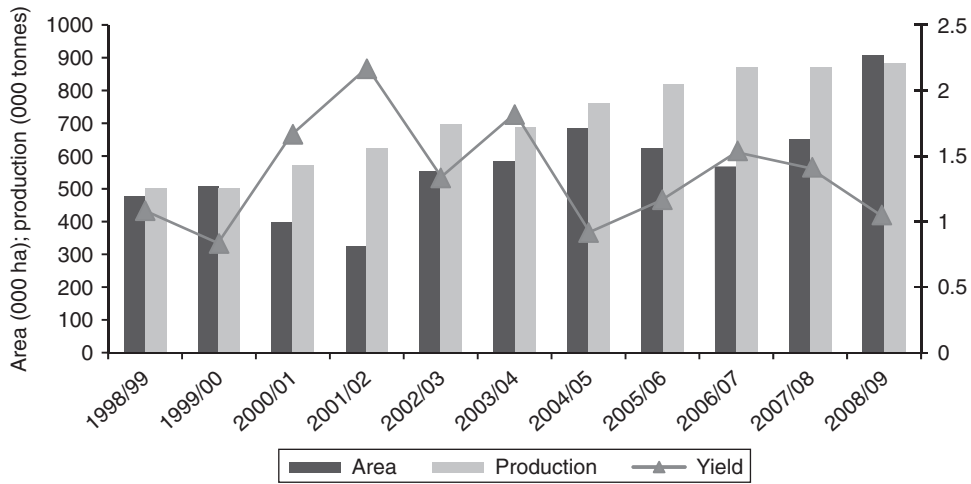


Fig. 12.7. Production and yield of rice in mainland Tanzania. Adapted from: World Food Program – Tanzania (unpublished data).

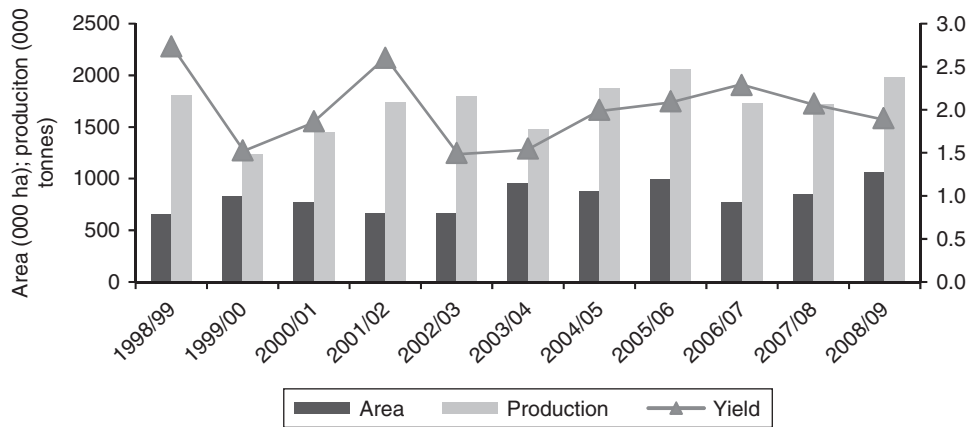


Fig. 12.8. Production and yield of cassava in mainland Tanzania. Adapted from: World Food Program – Tanzania (unpublished data).

but there has been a significant yield increase in Morogoro region (Msuya, 2009), where the lead research station for sorghum and millet is located. It is safe to assume that uptake of improved sorghum seed would be higher here.

Food self-sufficiency

Despite the observed gradual production increase, and in some cases a decline, production of the main food staple crops has, in general, kept pace or is slightly ahead of the population growth rate: 2.8% compared to growth of main staple

crops (6.4% for maize and 7.3% for rice). Overall, Tanzania is self-sufficient for maize during most years, which is the most important food crop, contributing about 31% of the food supply, according to crop estimates for 2005/06. Cassava comes second (19%), followed by potatoes (13%), and sorghum and rice rank fourth (7%) (URT, 2006).

Analysis of data for the period (1994/95–2007/08) shows that food self-sufficiency in Tanzania was achieved in 9 out of 14 years when the self-sufficiency ratio (SSR) was between 102% and 118%, with a gradual declining trend since 1996/97 until 2003/04, then gaining gradual momentum since then (Fig. 12.8). Pockets of food shortage continue to exist in about 8 regions (38%) and 37 districts (33%). During the 8-year period 2001/02–2007/08, the number of regions which experienced food deficit ranged between 5 and 14, while the number of districts was between 13 and 62, being lowest in 2002/03 and highest in 2003/04, which was a dry year. The north-eastern part of the country had also been hit hard by a severe drought during this year (2009), but the southern part of the country had a good crop, ameliorating the effect of the drought (Appendix 12.3).

Is this performance good enough to meet household food security needs and national self-sufficiency? Will this trend in production and productivity enable Tanzania live up to the ambition of being a net food exporter, as proclaimed under Kilimo Kwanza. While there are indications of a gradual improvement in the macro-production of all main food crops (maize, rice and cassava), the rate of production and productivity growth is not enough to meet set development targets. Let us now examine the response of smallholders farmers to the above-mentioned policy and institutional changes, drawing evidence from the *Afrint I* (Ashimogo *et al.*, 2003) and *Afrint II* studies (Msuya, 2009), specifically focusing on three major agriculture transformation constraints: (i) the subsistence nature of markets (measured in terms of percentage of marketed produce, whereby a high degree of subsistence exists if more than 50% of produce is for own consumption); (ii) transaction costs (defined as the total cost of transforming products through space, form and time, along with the costs of arranging

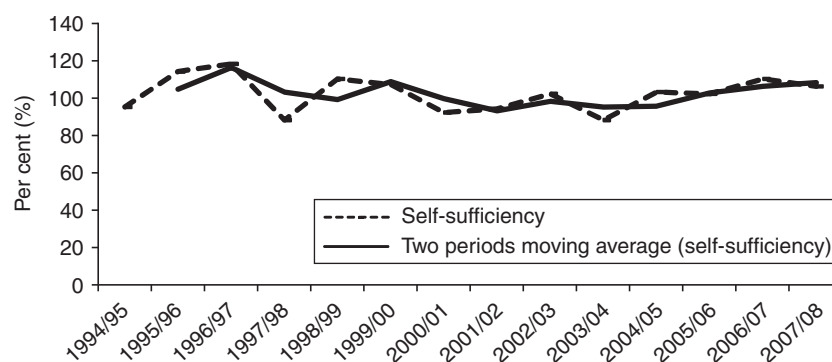


Fig. 12.9. Food self-sufficiency ratio in Tanzania (1995–2008). (Adapted from: URT (2006) and unpublished data.)

transactions in complete agricultural systems); and (iii) missing market (measured by limitations farmers face in accessing market institutions).

Subsistence nature of maize, rice and cassava markets

Participation of farmers in markets is necessary for structural transformation from subsistence agriculture to an economy based on specialization, exchange and technological innovation. For the *Afrint II* micro-study (Msuya, 2009), overall, 53% of total harvested maize was used for home consumption, while 38% was sold. Cassava, however, was produced mostly for subsistence. Although the proportion of households participating in cassava markets decreased from 21% in 2002 to only 8% in 2008, market participation had changed very little, involving 46% and 47% of the respondents over the two periods respectively, 85% selling at the farm gate and 10% at the village market. On the other hand, rice was mostly produced for the market. Fifty-five per cent of the harvested paddy was sold. The remainder was used for home consumption (35%), paying hired labour (5%) and others uses (5%). The percentage of paddy sold has also increased, from 49% in 2002 to 55% during the most recent season.

In the case of maize, 52% of the farmers sold maize following the most recent harvest, representing an increase relative to 2002 (Ashimogo *et al.*, 2003), but with regional differences. Actually, the proportion of households from Morogoro region selling maize has dropped from 49% in 2002 to 39% in 2008, but it has increased for Iringa, from 42% to 56% over the same interval. Meanwhile, the proportion of households participating in paddy trade has remained above 70% in the past three recent seasons. Compared to maize, paddy production was more commercially oriented. Of those who sold maize, less than 10% were net sellers. There was a positive and significant ($P > 0.001$) correlation between average per cent of staple food crops sold by households and total household income. Overall 60% of households indicated sale of food staples generated most cash in the course of last year, followed by sale of other food crops (13%) and micro-business (11%). Sale of food for cash income was more pronounced in Morogoro region, where 81% of respondents in Morogoro said sale of food staples was the major source of income, compared to 39% of household in Iringa, implying more options for diversification in Iringa, probably due to better accessibility for most of the villages within the sample. These findings differ from the conclusion by Kherallah *et al.* (2000), that reforms have been more beneficial to export crops.

As was the case for maize, paddy was mostly sold at the farm gate, as indicated by 77% of households that sold paddy. Fifty per cent sold paddy at the village market, while only 8% sold in markets outside the village. After harvesting, farmers collect and store the maize at home and sell it only when they need cash. Depending on the urgency of household cash needs, farmers would sell at any price just to cover the immediate cash needs. There are many factors constraining the participation of farmers in markets but the most important is poorly functioning markets, which squeeze them out (domestic and regional).

In theory, subsistence agriculture is seen as just an early stage of development, which will perish once Ricardo's comparative advantages are perceived and result in wealth-generating trade (Abele and Frohberg, 2003). This does not seem to be happening in Tanzania due to poorly functioning markets.

Transaction cost (institutions, infrastructure and information)

High transaction costs are another major problem facing farmers, often due to high transport costs along with limited market information, lack of product standards and low competitiveness of markets. According to Msuya *et al.* (2009), maize farmers receive about 53% of the final price when a sack of maize (100–120 kg) is sold within the same region and about 45% when it is sold across regions. What is wrong with this is that, first, high transport and handling costs are passed on to consumers, who pay high food prices. Secondly, there is no value added whatsoever along the chain. Limited market information and lack of product standards compound the transaction cost problem.

Limited flow of information also makes market coordination difficult and inefficient. For example, most farmers do not know the selling price before making production decisions. Information asymmetry between sellers and buyers creates room for dishonest traders to take advantage of farmers' lack of price information. If emerging SMS platforms for information sharing, as noted earlier, are encouraged and supported, this problem should decline as mobile phone technology reaches deeper into rural areas. The main source of price information for both traders and maize farmers includes friends and neighbours (Msuya *et al.*, 2009), similar to findings of another study 10 years earlier (Isinika and Mdoe, 2001). Cross-checking with many middlemen is another popular source of information for farmers, even though it is well known that middlemen often collude to offer lower prices to farmers. The public market information system is the least used means of price information because it is often unreliable and inaccessible (Msuya, 2009).

Sometimes, farmers opt to take their produce to markets directly to avoid being cheated by middlemen. Given the high cost of transport due to poor infrastructure, small amounts of produce to be sold and unreliable product markets, the whole exercise is largely inefficient. Meanwhile, the number of middlemen is still increasing, thus adding the squeeze on what the smallholders receive, and when they collude to offer low prices, they effectively operate as a private monopoly/monopsony, thereby nullifying the whole purpose of liberalization (Winters *et al.*, 2004). Farmers are also squeezed on account of quality, when traders do not pay a premium for quality improvement and farmers, in turn, do not invest to present the best-quality products in the market. In the case of the *Afrint II* study (Msuya, 2009), maize quality had minimal impact on the price offered by traders. About 60% of farmers indicated that traders did not pay a lower price for their produce as a result of postharvest quality deterioration. Only 6% of sampled farmers who sold maize indicated they received a lower price for most of their produce due to postharvest quality deterioration. Quality control by rewarding higher prices for better quality is an important incentive for

quality improvement. There was minimal quality differentiation in the case of cassava, as 25% of farmers indicated that traders paid a lower price for some produce due to postharvest quality deterioration. Paddy markets, however, were more differentiated by quality. Up to 43% of farmers received much lower prices from traders as a result of postharvest quality deterioration.

Lack of standards, which is quite prevalent in the maize marketing system in Tanzania, distorts the market in two ways. First, as one price is paid for different grades of maize, it removes the incentive for farmers to produce high-quality maize. Smallholders are undermined again, since most of the procurement at lower levels (village) uses volume measures (tins and buckets) instead of weight (kg). These findings differ from the assertion by Rweyemamu (2003), who argued that markets can assure product quality, hence there is no need for commodity boards to issue export permits or register growers, which creates market barriers. This would have nullified the proposed move by the government to establish another commodity board for mixed crops. It should be noted, however, that there are many other countries that maintain regulatory boards for different purposes. For example, the Farm Products Council of Canada has the mission to oversee the national supply and management of poultry and eggs and national promotion of research agencies to ensure an efficient system works in the balanced interest of stakeholders, from producers to consumers. Similar agricultural and marketing boards are also found in many other countries. Often, these boards are formed by stakeholders, to whom they are accountable, even though they may receive subsidies from the government.

Missing markets

Missing and thin markets are common in many African countries due to problems of public good failure, access failure and transaction failure (Doward, 2005). In addition to problems of poor infrastructure alluded to earlier, missing or thin markets for credit, labour and information on potentially tradable commodities have been cited as constraints to market integration in Africa (Asharf *et al.*, 2008). High contract risks, lack of credit facilities, high price and unavailability of inputs in the staple food crops subsector are signs that input and credit markets are missing in the current market set-up. Price uncertainties remain very high in the maize market. Without contractual agreements farmers are not assured of next season's price and thus tend to produce just enough for subsistence.

For the *Afrint II* study (Msuya, 2009), only 3% of sampled farmers grew maize on the basis of a prearranged contract with private traders. None of the households that sold cassava had a prearranged contract with private traders, while less than 2% of the paddy farmers had contractual agreements with private traders. This is despite efforts by the government to promote and encourage this form of market arrangement as a solution to linking smallholder farmers to markets, while also working to improve farmers' collective voice

through cooperatives and improving the policy environment, as discussed earlier. While the contract-farming model involving smallholders has worked somehow for traditional cash crops (sugar, tea, sisal) and commodities that require central handling and/or processing (horticulture, dairy), it is yet to be developed for annual food crops such as maize and rice. The warehouse receipt system has been tested for rice and cashew nuts but the tendency of contracting parties to cheat (both farmers and traders) remains high, largely attributed to failure to enforce contracts. The warehouse receipt system law, which was enacted in 2008, has attempted to tighten such loopholes (Isinika, 2009). It remains to be seen if this will improve contract enforcement in farming as a model for smallholder farmers.

The number of farmers accessing credit is also low; a sign of missing credit markets, limiting in turn the use of inputs. Only 17% of farmers had obtained agricultural inputs on credit in the most recent season (Msuya, 2009), being higher than the national average of 3% in 2002 (URT, 2006). This is a result of eliminating support prices and grain marketing boards (under SAPs), together with a weak private sector. Informal lending institutions, which tend to have very high interest rates, have now become the major source of credit for both traders and farmers of major staple food crops. Even with the reintroduction of fertilizer subsidies in the Southern Highlands zone, farmers find it difficult to access inputs due to very high prices, pushing farmers further towards subsistence. In 2002, Morogoro region had twice the number of households categorized as very poor, compared to Iringa region (Ashimogo *et al.*, 2003). During 2008 the number of households categorized as very poor is almost the same for Iringa and Morogoro regions (Msuya, 2009), probably reflecting the higher dependency on purchased inputs for farmers in Iringa (see Fig. 12.9).

Although the implementation of SAPs increased competition and reduced marketing costs in many cases, its overall impact on farmers has, in general, been negative (Msuya *et al.*, 2009). According to Ponte (2002) and Gabre-Madhin

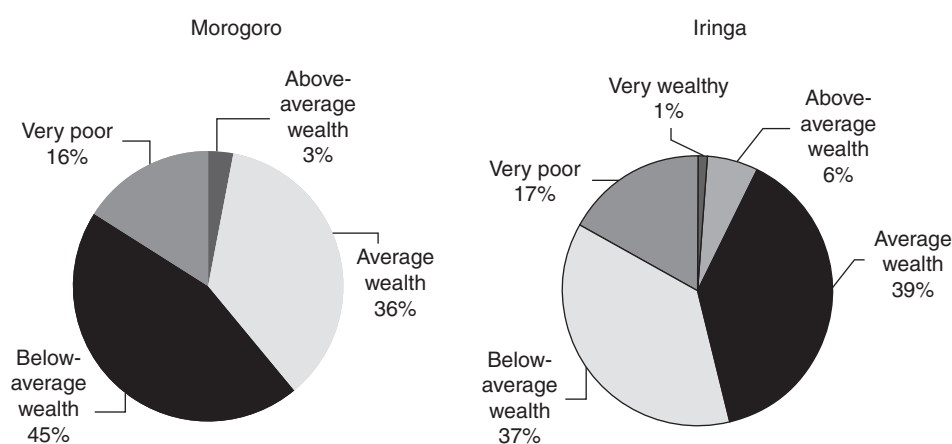


Fig.12.10. Wealth status of households with respect to assets ownership 2008. (Adapted from: Msuya, 2009.)

(2006), the gap left by the state in secondary distribution and credit provision has not been adequately compensated by the private sector, and both these markets, together with output markets, are altogether missing in many parts of sub-Saharan Africa, including Tanzania. The development of a wide range of private marketing institutions is important for smallholders to improve market access, which will then induce a stronger production response of food and other crops.

The Way Forward: Need for Balanced Reforms

For Tanzania to be a net exporter of food, her aggregate self-sufficiency ratio has to exceed 120% consistently over time, which has not been achieved since 1995. Moreover, per capita production of food has been declining. According to data from the FAO (FAOSTAT), by 1999 per capita food production in Tanzania stood at 108 tonnes, compared to 135 tonnes for Africa and 343 tonnes for the world as a whole. The percentage of irrigated land stood at 3.3%, compared to 3.8% for Africa and 18.3% for the world; intensity of fertilizer use was 5 kg/ha, compared to 12 kg/ha for Africa and 94 kg/ha for the world, and average daily per capita calories supply, at 1940, remains below the average for Africa and the world. While the growth rate of agriculture has improved, from less than 2% in 1997 and 1999 to around 4% since 2002 (see Fig. 12A.1 in Appendix 2), it remains below the target of 6% set by the Maputo Declaration (AU, 2006; Minde *et al.*, 2008). Since agriculture remains the largest sector in the economy, accounting for 24.6% of total GDP by 2007, poor performance of this sector also pulls down overall economic performance. If food production is to play a leading role in poverty reduction, therefore, more needs to be done to improve the performance of agriculture, especially food crops production, which is the largest subsector within agriculture (BOT, 2008).

The first generation of reforms in Tanzania had a strong focus on prices, but it has since been demonstrated that getting prices right is not enough; market development should remain on the reform agenda. For example, fertilizer prices are only one of several factors affecting use (Kherallah *et al.*, 2000; Rune, 2005; Minot and Benson, 2009). Well-functioning markets, defined by adequate infrastructure, functioning market institutions and better incentives, are vital for agricultural transformation to take place. According to Pingali (1997), for a smooth transformation of agriculture there should be long-term strategies, including investment in rural markets, transportation and communications infrastructure, to facilitate integration of the rural economy. Likewise, to complete the reforms, governments should, in addition, promote good governance and improve the state's capacity to monitor market development in order to encourage market participation and competition, and contract enforcement, as well as property governance, to avoid channelling investments to rent-seeking groups (Pingali, 1997). Other aspects of the reform should include encouraging farmers to diversify, with a focus on specialization, addressing problems of vulnerable groups in remote areas, where price transmission is often poor, and continuing to institute credible macroeconomic

policies. Equally important, governments should constantly monitor whether markets exist at all, especially to meet the needs of the poor. According to Winters *et al.* (2004), extreme adverse poverty shocks are often associated with the disappearance of markets, while strong poverty alleviation can arise when markets are created for previously untraded or unavailable goods or services.

With functioning markets in place, several benefits emerge, including rising investment in agriculture and subsequent farm growth, organizing farmers to strengthen their position in the markets to benefit from economies of scale, and improvements of other institutions such as policies that foster trade and reduce transaction costs. All these are expected to have a higher chance of producing desired results when markets are efficient. Currently, agricultural markets are undergoing rapid changes due to globalization, among other things. It is obvious from the preceding discussion that market institutions are the key missing link in government's efforts to transform agriculture. Building market institutions is a long-term strategy expected to reduce investment risk and decrease transaction costs for both farmers and traders by clarifying property rights, enforcing contracts, ensuring quality control and establishing rules of market conduct, among other legal concerns. While incentives and infrastructure components can be spearheaded by the public sector, building of market institutions is a role championed by the private sector. However, for smallholder farmers to benefit from such developments they need to be better organized.

Before liberalization (implementation of SAPs) smallholder farmers were mostly organized under cooperatives. The economic functions of these cooperatives included distribution of subsidized inputs on credit as well as bulking of farm produce. Primary cooperative societies were the main vehicles for assembling produce at the farm gate, while second-tier structures such as the cooperative unions were responsible for intermediate processing and marketing, usually to the parastatal marketing boards (for either export or domestic distribution). The cooperatives enforced quality standards and assured farmers of a market outlet and predictable prices (URT, 2005). However, after liberalization, cooperatives were mostly marginalized and completely abandoned in some parts due to mistrust by farmers regarding government motives and poor governance by managers (URT, 2005). This led to inefficient markets, which in turn forced farmers to act independently in production and marketing of produce, and eventually many cooperatives collapsed, having the most negative impact on the production and marketing of food crops. By improving marketing efficiency, marginal farmers can again participate in the market. Reducing fixed marketing costs or reducing farmer-specific marketing costs, especially for smallholders who are currently not participating in the market, will improve marketing efficiency.

For the *Afrint II* study (Msuya, 2009), only 17% of households (20% in Iringa and 14% in Morogoro) were members of farmer associations. Although the number of SACCOS has increased recently, they have little to do with staple food crops' production and marketing. Rising urbanization and growing consumer power exerts a growing influence on food production and marketing systems. On one hand, demand for processed convenient foods is rising,

creating new market opportunities for high-value products as well as staples. None the less, these developments impose new constraints to the conventional markets. Generally, changes in these markets create significant access challenges for farmers, including more stringent quality and standards, increased variability in prices and bulking difficulties, which limit regularity of supply of economic volumes by smallholders as well as resulting in increased transaction costs (Sautier and Biénabe, 2005). The future and prosperity of farmers thus depends largely on how they are organized to overcome such challenges. Given this reality, reorganizing smallholders is crucial for them to benefit from market institutions being developed by the private sector. Organizing traders who still play an important role in local markets is equally important. Social capital remains a significant barrier to entry in wholesale and external trade as well as in transportation. Markets are risky, personalized and cash based (Kherallah *et al.*, 2000).

According to Msuya (2007), integrated producer schemes designed to develop the capacities of smallholders through extensive provision of extension services and close monitoring of production and quality control are a better form of producer association, especially those focusing on specific value chains, compared to conventional and multipurpose cooperatives (which were mostly politically motivated). It has been observed that creation and development of market institutions is easier for crops whose farmers are well organized. Institutional innovations, such as contract farming, credit associations, group lending and the warehouse receipt systems, are being developed by different actors, including NGOs and development projects (Ashimogo, 2008).

Integrated producer schemes introduce a competitive environment by making prices a public good. In other words, contracts between the two parties will include price information, and such prices will be available to all farmers in the area as a benchmark for decision making. Given such interventions, smallholders will have certainty on prices. Secondly, farmers are motivated to improve product quality if they are rewarded with higher prices. As prices are certain, farmers can now concentrate on lowering transaction costs by achieving economies of scale. This becomes sustainable if smallholders are well organized. Establishment of wholesale markets (auctions) in major buying areas would probably create the same impact by making prices public. Therefore, efforts to foster integration and creation of strong bonds between smallholders and private sector actors within value/supply chains through integrated producer schemes can increase market participation and productivity and hence improve food security.

Conclusion

This discussion set out to assess the impact of policy and institutional reforms for agricultural transformation in Tanzania. Tanzania, like many other African countries, was forced to accept donor prescription for economic reforms during 1986, in order to address declining economic trends in all sectors of the economy. Expectations were raised that the economic downturn would be

reversed if recommendations were followed according to the Washington consensus – focusing on macroeconomic stability, market liberalization and getting prices right. Many of the prescriptions for African countries have borrowed heavily from the Asian experience, despite many contextual and temporal differences, such as the effect of globalization.

The first generation of economic reforms were followed by institutional reforms during the 1990s, which covered a number of aspects, including land reforms, local government reforms, tax reforms and other institutional reforms. Specific to agriculture, the government developed a sector strategy (ASDS) and programme (ASDP) to guide transformation. While these reforms brought partial success to realign macroeconomic stability during the 1990s, empirical evidence points that the gains are not strong enough to bring about significant transformation as expected.

The immediate aftermath of the reforms was to increase the participation of actors from the private sector. In agriculture these actors sought opportunities in the provision of inputs (fertilizer, pesticides and farm implements). There have also been improvements in credit availability. However, the grace period did not last long. As soon as all direct and indirect subsidies were removed in 1994, the country experienced a declining trend in the production and productivity of food production. Use of purchased inputs declined, coinciding with reduced opportunities for farming as pressure on land increased, creating room for further soil fertility decline due to soil mining. Investments in agriculture were not increasing at the expected rate, thus limiting the follow on of public goods (roads, irrigation, research, extension, etc.) and private goods (value addition, communication, transport, etc.). It is now evident that, while some success was recorded, the reforms were not enough to unlock prevailing problems of thin, weakly integrated and missing markets for credit, inputs and outputs. The reforms could also not respond in the time of price volatility emanating from globalization since the 1990s. Critics have blamed such failure on half-hearted partial adoption of the reforms. Others point to inadequate time for the full impact of the reforms to play out.

Considering the gravity of the declining production threat, something had to be done. The government of Tanzania joined several other African countries to reverse earlier hands-off policies. First, a partial transport subsidy has been restored for fertilizer and improved seed since 2001. Secondly, marketing boards have been retained and more are being formed to oversee coordination of key subsectors within agriculture. Proponents of market reforms lament that such reversal is motivated by the rent-seeking interests of a few at the expense of economic efficiency. There is a counterargument, however, that hands-off is not an optimum solution. What is required is a developmental state that will pursue market mediation in a balanced manner so that private sector participation is supported and enhanced by providing a conducive policy and institutional environment, and necessary public goods and services. This essentially calls for a balancing act to ensure sustainable dynamic growth of agriculture and hence the economy.

Evidence from the post-2000 data shows that, following the policy reversal, something positive is happening. There is improvement in agricultural input availability; some gains are seen in production and productivity, especially for

maize, and food self-sufficiency remains marginally stable. There is a rising trend of credit availability and use; some gains are observed for area under irrigation and there are government efforts to increase investments into agriculture, including leveraging resources from the private sector. The analysis shows, however, that the trend rates of all these changes are still too weak to bring about visible sector-wide transformation and sustained dynamic growth.

For these reasons, some recommendations are made in order to sustain the positive gains that have been attained thus far. Considering the importance of food production for poverty reduction, efforts to support agriculture should also focus on supporting food production. Partial reforms have been blamed for the weak results observed until now. It has therefore been recommended that continuing efforts on the reforms should foster long-term dynamic growth so that actors benefit from improving access to technologies along with improving capital goods, economies of scale and competition induced by fully functioning markets.

To overcome the limitations of subsistence production, characterized by autarchy, it is recommended that government should pursue complementary policies, which target small farmers to accumulate assets that will enable them to benefit from opportunities availed by the ongoing economic and institutional reforms. Essentially, efforts should be directed at improving market coordination, including reducing the cost of coordination, enforcement of contracts, enhancing collective action and reducing the risk of all actors in the market. As concluded by Garbe-Madhin (2006):

the potential for harnessing markets for smallholder agricultural development depends on both market development and addressing challenges of scale, location, assets and power. Building institutions requires tailoring to a country context and product nature, capturing linkages between institutions rather than a piece-meal approach.

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Appendix 1

Table 12A.1. National food security statuses. Adapted from: URT, 2006 and unpublished data.

Measure of food security status	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	Average
National level (SSR%)	94	102	88	103	102	110	106	101
Number of food-deficit regions	6	4	14	6	10	5	5	7
Number of food-deficit districts	15	13	62	41	41	50	–	37

Appendix 2

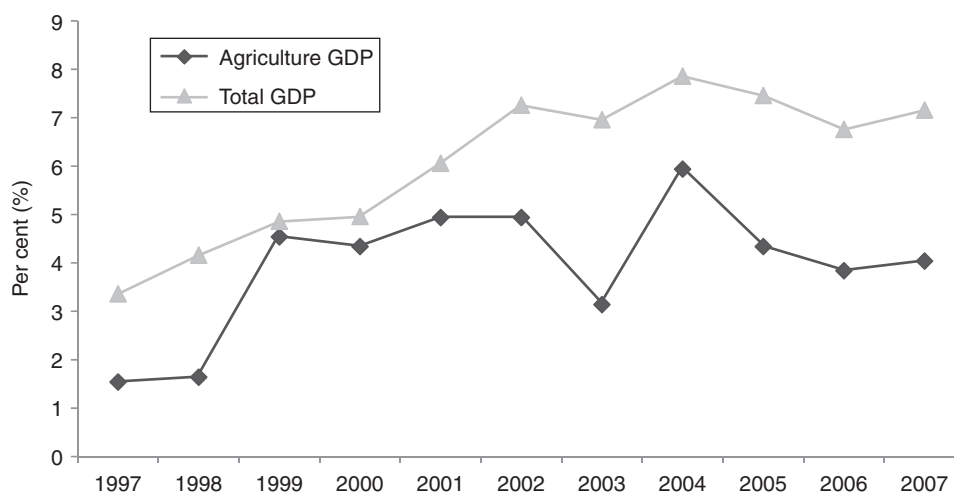
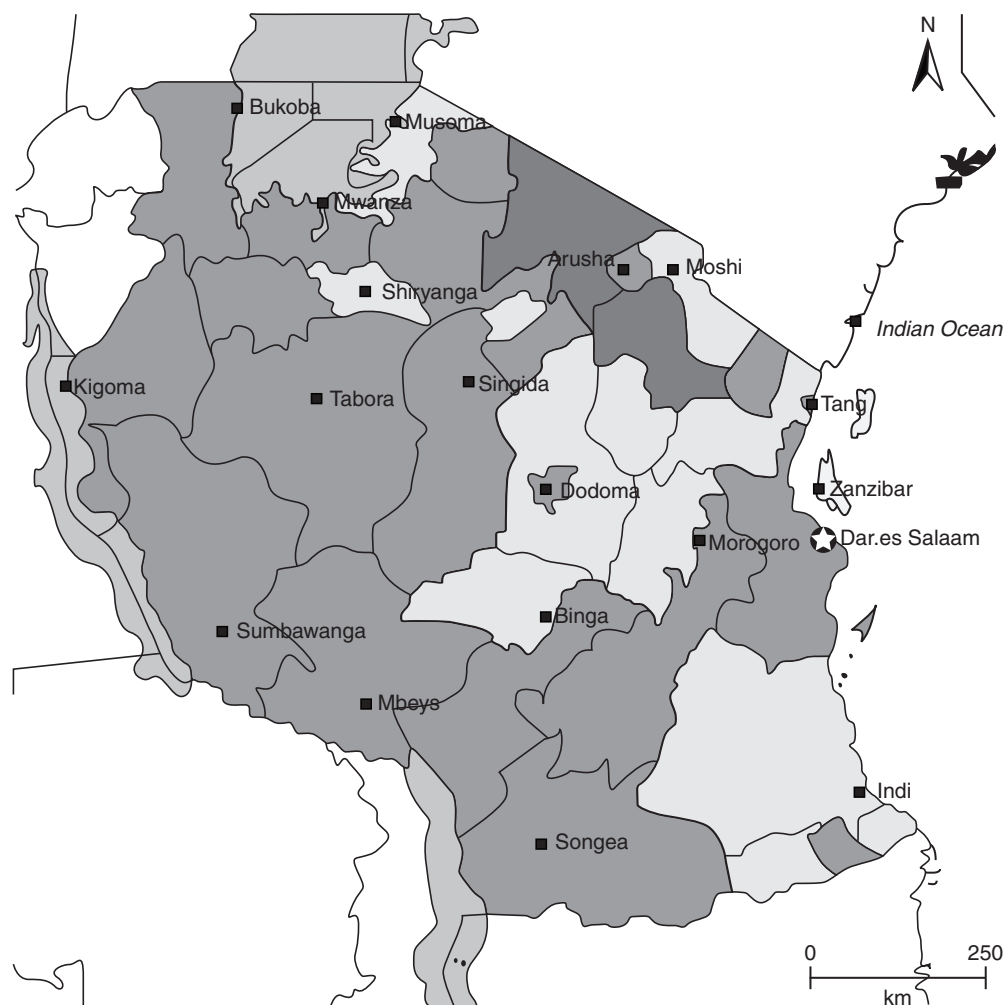


Fig.12A.1. Agricultural and total GDP growth rate. (Adapted from: BOT, 2008.)

Appendix 3



Food insecurity severity scale

- Generally food secure
- Moderately food insecure
- Highly food insecure
- [AU 2] ■ Extremely food insecure
- Famine

Fig.12A.2. Tanzania food security outlook: October 2009–March 2010. (Adapted from: Famine Early Warning Network System Network FEWSNET, September 2009.)

Author Query:

[Au1]: Table 2.3 citation is not provided in text. Please check

[Au2]: Famine location is not there in the map. Please check