AGRICULTURAL POLICIES AND FOOD SECURITY OF SMALLHOLDER FARMERS IN ZAMBIA

Shiro KODAMAYA
Graduate School of Social Sciences, Hitotsubashi University

ABSTRACT This article explores the food security of Zambian small-scale farmers by reviewing government policies and programs in the 1990s and 2000s that affected farmer food security, with a particular focus on subsidized input transfer programs. Economic reforms to liberalize the economy in the 1990s, including liberalization of agricultural marketing, resulted in stagnation of maize production due to decreased use of fertilizer. Zambia implemented two subsidized input transfer programs in the 2000s, the Fertilizer Support Program and the Food Security Pack. These programs succeeded in increasing fertilizer use and maize output, but these increases incurred huge budgetary and administrative costs. As small-scale farmers grow maize and other crops that rely on rain-fed farming, their maize outputs are volatile, and subsidized input transfer can result in financing crop failure. Simplified maize balance sheets for 17 farming households were calculated based on field research at one suburban-area village. The majority of the sampled farmers recorded deficits on their maize balance sheets. They purchased maize with the revenues from output sales from dambo gardening and/or from petty vegetable sales.

Key Words: Food security; Small-scale farmers; Input transfer program; Fertilizer subsidies; Economic liberalization.

INTRODUCTION

This article explores food security issues in Zambia by reviewing the policies and programs of the Zambian government affecting food security with a focus on food security of smallholder farmers(1). We also provided food balance sheets for some farming households in one village in central Zambia.

1. Rural/urban food security

Food security and food availability can be considered at two different points. One is urban areas, where food crops are not produced and residents are principally not food producers(2). The other is rural areas, where the majority of residents are small-scale farmers who are both food-crop producers and food consumers.

Urban resident food security and that of rural residents who are not food self-sufficient depends on surplus food crops produced by farmers(3). Therefore, small-scale farm production can influence food security in two ways: 1) it influences small-scale farmers' household food self-sufficiency (whether they can produce a sufficient amount of food crops for their own consumption); and 2) it influences national food security (production of surplus food crops for urban residents and rural residents who are not food self-sufficient).

2. Food security and small-scale farmers

Small-scale farmer food security is dependent on their ability to produce sufficient amounts of food crops on their fields for their own consumption (subsistence production). Those farmers who do not produce enough for subsistence can purchase food from other farmers who have harvested a surplus(4). Food-insecure small-scale farmers suffer from inaccessibility of food, either because they cannot produce enough for themselves or because they cannot afford to buy or equitably exchange for it in markets. These are production-based entitlements. The sources of income to purchase food in the poorest households include off-farm work, sales of natural or processed products, and remittances (UN Millennium Project, 2005: 153). These are labor-based and trade-based entitlements.

A report of a food-security forum in southern Africa (FFSSA, 2004), which examined the scope of the region's economic development from different sectors, argued that agricultural smallholders are a suitable growth driver, with impacts on pro-poor growth, food security, and market expansion. Expanded cash crop production by smallholder farmers could contribute both to rural growth (through consumption, labor demand, etc.) and to household food security (e.g., through generating cash with which to buy food or inputs).

3. Food security, economic growth, and social protection

It is generally accepted that "food security" has three critical components: food availability, food access, and food use and utilization (FFSSA, 2004: 5). Policies aimed at improved food security must address these three components. Food security has been discussed from two different perspectives: social protection and economic growth or development. It is difficult to draw clear boundaries between social protection and growth-oriented activities. It is more productive to explore some of the synergies or linkages between the two (FFSSA, 2004).

A comprehensive view of food security, i.e., one that considers both food availability and food access, requires thinking toward a broader view of social protection. Social protection serves three functions: protection, prevention, and promotion (Ellis et al., 2009: 7). A broader view of social protection implies a response to the wider sources of the vulnerability, risk, and deprivation that poor people face. A more complete view of social protection intervention to support food security includes production (target inputs), employment (food for work), and trade (food-price interventions such as consumer subsidies) (FFSSA, 2004). According to Devereux's classification, production-based entitlement can be boosted by free input packs or fertilizer subsidies, labor-based entitlement by food-for-work or cash-for-work opportunities, and trade-based entitlement by food-price stabilization (Ellis et al., 2009: 6).

4. Destitute or extreme poor

Food security differs depending on the differing needs of the people/groups who are vulnerable to food insecurity. These people/groups are classified according to demographic categories, social categories (female-headed households, people with disabilities, etc.), or geographic categories (remote rural populations, etc.) (FFSSA, 2004).

People living in extreme poverty are sometimes defined as those who are unable to secure enough food even if all household income were spent on food (Ellis et al., 2009: 26–27). The destitute comprise households who live in extreme poverty and experience unusually high vulnerability to hunger. The Kalomo scheme in Zambia introduced the notion that the destitute constitute about 10% of that country's population. The Kalomo scheme stated that 10% of households have per capita food consumption under 1,400 Kcal per day and that most lacked able-bodied labor (Ellis et al., 2009: 27). Destitution is regarded as a criterion determining eligibility for social transfers(5).

5. Input transfers or subsidized inputs: response to low yields and output due to low input use

As noted above, input transfers or subsidized inputs are social protection mechanisms or interventions to boost production-based entitlements. This approach is concerned with tackling vulnerability by raising yields and outputs in agriculture via the use of improved inputs, crop diversity, and enhanced cultivation practices (Ellis et al., 2009: 63). The vulnerability addressed here is the inability of poor small-scale farmers to produce enough to satisfy their family's food consumption needs (Ellis et al., 2009: 33). A social protection response to this vulnerability is input transfers whereby seeds, root materials (cassava, seed potatoes) and fertilizers can be transferred.

Input transfers or subsidized inputs are social protection or development policy(6). Some scholars and practitioners argue in favor of using input subsidies as a way of stimulating increased agricultural productivity growth, but others argue that input subsidies can be used as an instrument for achieving welfare goals (Morris et al., 2007: 113). Morris et al. (2007), seeking good fertilizer use practice in Africa, called the latter "fertilizer aid," suggesting that its proponents contend that fertilizer subsidies provide a less costly way to ensure food security at the household level than do alternative approaches (such as importing food commercially or distributing food aid). A UN Millennium Project Report proposed "fertilizer safety nets" or "fertilizer-for-work" programs targeted at the chronically food-insecure (UN Millennium Project, 2005: 119). Morris et al. (2007) argued that the economic case for fertilizer aid rests on a number of assumptions and contended that well-functioning markets (for food and fertilizer) are one important condition.

The prescriptions for structural adjustment that donors have imposed on Africa have led to the elimination of fertilizer subsidies. However, fertilizer subsidies are now attracting renewed attention in Africa. Some World Bank publications have acknowledged that economic reforms in the 1980s and 1990s resulted in significant reductions in overall levels of fertilizer use and increased food insecurity among many rural households (Morris et al., 2007: 4). Recently, there has been considerable debate about the desirability of using fertilizer subsidies to achieve not only economic growth targets but also welfare goals. Some economists have admitted the political appeal of fertilizer subsidies, and they have realistically recognized that some African countries implemented fertilizer subsidies for their political popularity (Morris et al., 2007: 102).

Many social protection programs recently introduced in sub-Saharan Africa are

centered on the delivery of free or subsidized inputs to poor farmers[7]. Both Zambia and Malawi have re-established national fertilizer subsidies, thus going against neo-liberal wisdom with respect to the benefits of free markets[8]. In addition to national fertilizer subsidies (the Fertilizer Support Program), Zambia has an input package scheme (the Food Security Pack) specifically aimed at farmers who are too poor to purchase fertilizer, even at subsidized prices.

6. Irrigation

Input subsidies for rain-fed agriculture require complementary circumstances to reduce vulnerability, particularly because the amount and pattern of rainfall must be favorable for crop growth and maturation. When events are not so favorable, input subsidies are an expensive way to fund crop failure (Ellis et al., 2009). As Morris et al. (2007) stated, the economic case for "fertilizer aid" rests on a number of key assumptions.

Input subsidies have a checkered history as a means of raising rural incomes and lowering rural vulnerability. In the Asian Green Revolution, input subsidies were regarded as making a significant contribution to sustained yield growth, but experience in Africa was mixed. One explanation for the differences in performance may be the lack of irrigation development in African input subsidy schemes. Sustained yield growth has not materialized in Africa because increased use of improved seeds and fertilizer results in crop failure under the unstable and unpredictable conditions of rain-fed agriculture. In a region such as sub-Saharan Africa where droughts are prevalent, irrigation could be a key factor in enhancing food security.

FOOD SECURITY SITUATION IN ZAMBIA

The 1999–2002 Zambian dietary energy supply was estimated at 1,900 Kcal per person per day, which is below the recommended per capita level of daily caloric availability, 2,100 Kcal, and slightly above the minimum intake level, 1,800 Kcal[9] (Benson, 2004). Zambian National Food Balance Sheets[10] (Table 1) assume that staple foods represent 70% of the total diet, which is assumed to be 2,030 Kcal per person per day. In the Balance Sheets, staple foods are represented by food crops including cereals (maize, sorghum and millet, wheat, and rice) and tubers (cassava, sweet potatoes, and Irish potatoes). Bananas and yams are not important as food crops in Zambia. Although wheat is grown by large-scale commercial farmers, other crops are mainly grown by small-scale farmers.

Maize is the Predominant Food Crop

Maize is the most important food crop (and cash crop) in Zambia[11]. It is predominant in terms of both production and consumption. Maize accounted for 76% of the total value of smallholder crop production in 1990/91, while cassava was 10%, and all other crops were under 3% (Jayne et al., 2007: 4).

Maize accounts for 60% of the national calorie consumption and serves as the

Table 1. Zambia National Food Balance Sheets

(thousand tonnes)

	2002/2003 (deficit year)			2009/2010 (surplus year)			
	Maize	Wheat	Rice	Maize	Wheat	Rice	Cassava
Availability in Zambia (A) (a1+a2)	626.0	77.0	7.0	1950.8	260.0	42.0	
Carryover from the last season as at May 1 (a1)	20.0	2.0	1.0	62.0	65.0	0.2	
Production (a2)	606.0	75.0	6.0	1888.8	195.0	41.9	1151.7
National requirement (B) (demand in Zambia) (b1+b2+b3+b4+b5)	1201.0	117.0	18.0	1747.5	210.0	54.1	687.0
Food consumption (for human) (b1)	1011.0	111.0	17.0	1263.1			
Reserve (b2)	15.0	0.0	1.0	110.0			
Industrial use (stock feed, breweries) (b3)	100.0	0.0	0.0	20.0			
Seeds (b4)	10.0	0.0	0.0	114.4			
Export (informal cross border trade) (b5)	10.0	0.0	0.0	60.0			
Balance (A–B)	–575.0	–40.0	–11.0	203.3	50.0	–12.1	464.6

Source: Zambia, CSO (Central Statistical Office) 2009. The Monthly, May, 74: 12.

staple diet in urban areas and most rural areas in Zambia (Dorosh et al., 2010: 184–185). Among five major cereal crops (maize, sorghum, millets, wheat, and rice), maize accounted for 85% of amount consumed in 2002/2003. National consumption of maize in 2009/2010 (1,747,500 tonnes) was more than twice that of cassava (687,000 tonnes), which is the second most important food crop (Table 1). Cassava, the nation's second largest source of calories, accounts for roughly 15% of national calorie consumption (Dorosh et al., 2010: 185).

After Independence in 1964, maize consumption increased as urbanization proceeded in the 1960s and 1970s. Per capita consumption of maize rose from 145 to 170 kg per annum between the 1970s and the late 1980s (Mungoma & Mwambula, 1996). Due to economic stagnation in the 1980s and 1990s, the pace of urbanization slowed, and some Copperbelt towns experienced de-urbanization. In the 2000s, the urbanization process resumed, and Zambia was again becoming increasingly urban. However, this time, a reverse trend toward declining dependence on maize as an urban staple food was seen. Results of surveys conducted in 2007 and 2008 indicated that maize was no longer the dominant staple food in urban Zambia except among the poor (Mason & Jayne, 2009).

POLICY CHANGES AFFECTING FOOD SECURITY

Over the last four decades, Zambia's political economy has undergone five distinct policy regimes (Thurlow & Wobst, 2004):

(1) The period of a market economy and multi-party political system from independence in 1964 to the early 1970s. As a political regime, this period corresponds to the First Republic.
(2) The period of a state-controlled economy and single-party political system from the early 1970s to the mid-1980s.
(3) The period of economic transition during the second half of the 1980s. The government attempted to conduct IMF–World Bank-sponsored structural adjustment programs, but abandoned them following political unrest.
(4) The return to a multi-party political system and the introduction of neo-liberal policies in the 1990s.
    • After the 1991 multi-party election, President Chiluba and the Movement for Multi-party Democracy (MMD) came to power.
    • The government implemented economic liberalization and de-regulation policies such as the privatization of state enterprises and liberalization of agricultural markets and trade.
    • The trade balance for cereals recorded a deficit for all years in the 1990s.
    • Economic stagnation continued with the deterioration of formal sector employment due to economic liberalization. The mean annual economic growth rate for the 1990s was a mere 1%.
(5) The period of the "New Deal" under President Mwanawasa's government from 2001 to 2008.
    • "New Deal" administration seeks to fight poverty and corruption.
    • President Mwanawasa stresses the importance of agriculture in his vision of agriculture-centered development.
    • Economic liberalization policies were somewhat modified, with more emphasis on poverty reduction.
    • The economy recovered and grew, thanks to increased copper production after privatization of the copper industry in 2000, surging copper prices in the world market since 2004, and cancellations of external debt in 2005[12]. The Zambian economy has recorded growth since 1999, with over 5% annual growth for four consecutive years from 2003 to 2006.

I. Economic Liberalization and Liberalization of Agricultural Marketing in the 1990s

Through the 1991 multi-party election, President Chiluba and the MMD came to power. The Chiluba–MMD administration embarked on economic liberalization and deregulation policies through IMF–World Bank-sponsored structural adjustment programs. Although the structural adjustment program was conceived in 1985, its implementation deepened only after 1991 (Noyoo, 2008: 71). In the first few years of MMD rule, public goodwill, coupled with significant aid from donors, enabled the implementation of a sweeping program of reform. More than 250 parastatals, representing around 85% of the Zambian economy, were listed for privatization (Larmer & Fraser, 2007: 616).

Historically, Zambia's governments have intervened in the maize markets. During the period of the Second Republic, a marketing board called the Namboard and cooperatives provided a guaranteed market, purchasing maize at a fixed pan-

territorial price (Dorosh et al., 2010: 186). In other words, the government operated a policy of "pan-territorial" and "pan-seasonal" pricing that entailed uniform prices throughout the country and through the year (Simatele, 2006).

Largely because of the financial unsustainability of maize meal subsidies and a slump in copper revenues, the Zambian government became increasingly dependent on external lenders, thereby losing control over agricultural policies (Jayne et al., 2007: 6). Following the 1991 elections, the government embarked on agricultural policy reforms as part of the structural adjustment program. The main change in agricultural policy was liberalization of the maize price and marketing. This action was motivated by budget concerns and not by the need to promote agriculture or reduce rural poverty (McPherson, 2004: 314).

Although the Zambian government liberalized agricultural marketing with regard to agricultural inputs in 1992–1994, the government continued its involvement in marketing through various programs such as the Agricultural Credit Management Program (ACMP) in the 1994/95 and 1996/97 seasons, the Credit Management Transition in the 1997/98 season, and the Agro-Support Program of the Food Reserve Agency from 1998/99 to 2001[13]. These programs performed dismally and could not be sustained. For instance, ACMP was failing due to problems of high administrative costs, low credit recovery, and corruption. The credit recovery of ACMP was equal to less than 10% of total disbursements (McPherson, 2004: 323–324; World Bank, 2010: 8).

II. Poverty Reduction and Modification of Liberalization Policies in the 2000s

A change in policy emphasis occurred during President Mwanawasa's government, and the policy slogan was the "New Deal." As mentioned above, President Mwanawasa, who was elected in 2001, modified President Chiluba's neo-liberal policies of liberalization, privatization, and de-regulation and emphasized poverty reduction and good governance. By the late 1990s, donors relaxed the condition that loans to the government should be linked to specific policy changes (Jayne et al., 2007: 6). In the 2000s, the Poverty Reduction Strategy Paper (PRSP), which was supposed to be formulated by the Zambian government in partnership with stakeholders and donors rather than dictated by donors, has become the guiding development strategy and plan.

President Mwanawasa emphasized the importance of agriculture. In January 2002 just after being sworn in as the Republican president, Mwanawasa promised that he would reverse the decline in agricultural production. He also announced a six-point plan to stimulate agricultural growth in his opening speech at the National Assembly in February 2002. The six-point plan included establishing a crop marketing authority, strengthening the input delivery system, and re-introducing co-operatives and farmers' associations (Zambia, 2002b).

PRSP 2002–2004 set the principal interventions in agricultural sector including "Targeted Support System for Food Security Established," whose objective was to "promote the use of low-input and conservation farming technologies." Thus, at the start of the PRSP, the government plan was to encourage low-input agriculture utilizing conservation farming rather than providing inputs such as fertilizer

(Zambia, MFNP, 2002: 60).

PRSP 2002–2004 emphasized the importance of food security in terms of household food production and a reliable food base (Zambia, MFNP, 2002: 90). National Agricultural Policy 2004–2015 sets five priority objectives, the first of which is "to ensure national and household food security through all-year-round production and post-harvest management of adequate supplies of basic foodstuffs at competitive costs" (Zambia, 2004: 6). The Fifth National Development Plan 2006–2010 (Zambia, 2006), quoting NAP 2004–2015, sets the same five priorities as those set in the NAP.

The Mwanawasa administration modified the Chiluba administration's liberalization of agricultural marketing by extending government involvement in maize marketing and re-introducing fertilizer subsidies.

The government expanded the role of the Food Reserve Agency (FRA) by making it a *de facto* marketing board. After dismantling Namboard in 1989, the government established the FRA in 1995 to maintain security stocks. In 1997, the FRA took over the function of input distribution, which was not among the roles prescribed by the FRA Act of 1995. The FRA continued to play the role of importing fertilizer and distributing supplies to smallholder farmers for 5 years until 2002, when the Fertilizer Support Program was launched (World Bank, 2010: 8). Whereas the FRA had handled roughly 22% of the country's domestically marketed maize since 1997, in 2003, it purchased roughly 34% (Jayne et al., 2007: 6). In 2006, a presidential election year, the FRA purchased 400 thousand tonnes of maize and become overwhelmingly the largest trader in the market (Dorosh et al., 2010). The government also set floor prices for crops including maize.

III. Programs to Address Low Yields and Output Due to Low Input Use:
(1) National Fertilizer Subsidies—The Fertilizer Support Program

In 2002, the Government of Zambia initiated the Fertilizer Support Program (FISP)[14], which was aimed at improving viable resource access by poor smallholder farmers organized in cooperatives to agricultural inputs (FFSSA, n.d.). Instead of providing fertilizer through agricultural credit, which was a common input distribution formula in both the Kaunda-UNIP government and the Chiluba government, FISP was to subsidize fertilizer purchases by farmers groups. The government recognized that a new program was needed to improve the very poor rates of credit recovery that had plagued government's efforts at input marketing (World Bank, 2010: 9). Unlike previous input marketing programs, FISP sought to disengage government from credit provision. It was designed to distribute one hectare of maize input packs at subsidized prices on a direct cost-sharing basis. FISP inputs were to be accessed only through approved farmer cooperatives and other farmer groups[15]. The beneficiary of FISP could not concurrently benefit from the Food Security Pack (World Bank, 2010: 11).

Contrary to initial plans for FISP to be a temporary program, it has been continued up to today (year 2009/2010), and some operations have been expanded. Initially, FISP was run for three years, and beneficiary farmers were eligible to receive support for two consecutive years only at a subsidy level of 25%. How-

ever, as shown in Tables 2 & 3, FISP continued distributing 46,000 to 84,000 tonnes of fertilizer each year to beneficiaries totaling 120,000 to more than 290,000, and the subsidy level increased to 50% and 60%. Of 427,000 farmers who acquired fertilizer in 2008/2009, more than 192,000 farmers purchased 55,000 tonnes of subsidized fertilizers through FISP, whereas 260,000 farmers purchased 58,000 tonnes of fertilizers at a commercial base (FSRP/ACF and MACO/Policy and Planning Department, 2010). In 2009/2010, 292,662 FISP beneficiaries purchased 69,100 tonnes of fertilizer, compared with 350,935 farmers who purchased 94,028 tonnes of fertilizers through commercial purchases. Thus, FISP contributed 40% to 50% of fertilizer distribution[16].

The government of Zambia and the World Bank gave contrasting assessments of the impact of FISP on increased maize production[17]. The Zambian Ministry of Agriculture and Co-operatives (MACO) estimates that increased maize output for 2009/2010 could be attributed to several factors: increased fertilizer use (25–30% increase), the expectation of increased maize prices (10–28%), and increased use of hybrid maize seed (about 3%); the largest factor was deemed to be the weather (38–62%) (FSRP/ACF and MACO/Policy and Planning Department, 2010)[18]. Thus, the majority of the increase in yield was attributed by MACO to fertilizer and weather. Therefore, by promoting increased input use, FISP has contributed to increased use of fertilizer and hybrid maize seed, which, in turn, could lead to increased maize output.

One important point missing from the Zambian government's assessment was that a combination of fertilizer subsidies and good weather resulted in a bumper harvest of maize in 2009/2010. Considering factors that contributed to the growth of maize production from 2009 to 2010 can be misleading because increased

Table 2. Number of Beneficiaries in Fertilizer Support Programme (FISP) and Food Security Pack (FoSP)

thousand (number of benefisheries)

	FISP	FoSP	Total
2000/2001		60	60
2001/2002		135	135
2002/2003	120	140.4	140.4
2003/2004	150	145	295
2004/2005	115	24.9	139.9
2005/2006	125	31.8	156.8
2006/2007	210	22.5	232.5
2007/2008	125		
2008/2009	192.86	3.95	196.81
2009/2010	292.66	10.8	303.46

Source: World Bank 2010. Online. *Zambia: Impact Assessment of the Fertilizer Support Program: Analysis of Effectiveness and Efficiency.* Report No. 54864-ZM, In World Bank. http://wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2010/07/16 (Accessed on January 10, 2011).
Ellis, F., S. Devereux, & P. White 2009. *Social Protection in Africa.* Edward Elgar, Cheltenham, UK & Northampton, MA, USA.

Table 3. Amount of Fertilizer Distributed in Fertilizer Support Programme (FISP) and Food Security Pack (FoSP)

(tonnes)

	FISP	FoSP	Total
2000/2001			
2001/2002			
2002/2003	48,000		
2003/2004	60,000		
2004/2005	46,000		
2005/2006	50,000		
2006/2007	84,000		
2007/2008	50,000		
2008/2009	55,114	725	55,839
2009/2010	69,100	1,762	70,862

Source: World Bank 2010. Online. *Zambia: Impact Assessment of the Fertilizer Support Program: Analysis of Effectiveness and Efficiency.* Report No. 54864-ZM, In World Bank. http://wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2010/07/16 (Accessed on January 10, 2011).

For 2002/2003 to 2007/2008 figures are planned number, while those for 2008/2009 and 2009/2010 are amount actually distributed.

fertilizer use leads to a 25–30% increase in maize output only if other factors are equal. Increased fertilizer use enhanced by subsidies would have resulted in decreased maize output if the weather had been unfavorable (drought or flood). Input subsidies can be a way of funding crop failure when events such as weather are not so favorable.

A review of the FISP (ZACF, 2009), led by senior civil servants in the Ministries of the Zambian government, noted a number of concerns about FISP past performance, which include:

- Beneficiary targeting (inaccurate targeting and selection);
- Impact on household and national food security (due to weak monitoring mechanisms, not easy to measure the FISP impact);
- [Negative] effect on private sector investment and participation (a limited number of fertilizer companies have been able to participate);
- [Concerns on] the program's long-term sustainability;
- Policy inconsistencies (especially with regards to level of subsidy and farmer graduation) (ZACF, 2009: 6; Gould, 2010: 136).

Morris et al. (2007), a World Bank publication, assessed the Zambian Fertilizer Support Program by quoting an assessment study using data from the 2002/03 cropping season. The study illustrated three weak points of FISP: (1) beneficiaries of FISP had higher incomes and cultivated larger lands than non-beneficiary farmers, making it likely that FISP crowded out the private sector; (2) FISP beneficiary farmers used fertilizers less efficiently than did those farmers who purchased fertilizer; and (3) spending on FISP fertilizer produced negative returns (Morris et al., 2007: 117–118).

A World Bank assessment report on the impact of the program was critical of

the high, and growing, costs of the Program and found that the cost of FISP pack was higher than prices charged by district-level retail shops (World Bank, 2010). According to the World Bank report, although the Program has had a positive impact on total input use, the impact on maize production was limited. The study report estimates that the 2007/2008 FISP produced 82,000 to 146,000 incremental tonnes of maize, which is about two-thirds less than the MACO's estimate of a 375,000 tonnes increase[19].

The World Bank assessment report argues that the cost of FISP was generally competitive when used to support food security in outlying areas, but not when used for commercial markets or for export (World Bank, 2010: 42, 52). The report contends that the objectives of FISP should be clearly defined as to whether the program should emphasize the promotion of agricultural growth or livelihood security. If the objective is growth, then targeting should focus on farmers with good market access and capacity to grow a maize surplus. If the program is to be more about livelihood support, then selection criteria should focus on farmers' poverty status (World Bank, 2010: 62).

One of the factors behind the limited impact of FISP was the late delivery of inputs. In the 2007/2008 season, 69% of the sampled farmers did not get their inputs until after the start of the rains (World Bank, 2010). Another factor contributing to the limited impact was that the actual amount of inputs received was less than that of inputs distributed. The finding of a survey revealed that smallholders reported receiving considerably less fertilizer from Fertilizer Support Program than Fertilizer Support Program reported having distributed directly to smallholders. Furthermore, many farmers did not get what they expected (World Bank, 2010).

IV. Policies and Programs to Address Low Yields and Output Due to Low Input Use: (2) Providing Free Inputs for Vulnerable Small Farmers—The Food Security Pack

Whereas FISP is a plan to sell subsidized fertilizer to small-scale farmers, the Food Security Pack (FoSP) program provides the poorest small-scale farmers with free inputs in the form of an input package. FoSP was implemented in 2000/2001 through the lead implementing agency, the Program against Malnutrition (PAM). PAM, a national food security NGO established in 1992, distributes farm input packs to beneficiaries utilizing a network of district-based NGOs. Originally planned to last 3 years, FoSP is still running after 9 years, although at a greatly reduced scale. The objectives of FoSP are (1) to provide a basic level of farm input to households that have lost the ability to source such inputs themselves, (2) to encourage crop diversification, and (3) to promote conservation-farming practices (Ellis et al., 2009).

In accordance with objective (2) above, the input pack received by beneficiaries was supposed to constitute 0.75 hectare (ha) of inputs, comprising 0.25 ha cereal seed, 0.25 ha pulse seed, and 0.25 ha cassava/sweet potato tubers, as well as fertilizer. However, this pack has never been delivered in its entirety. In the 2005/06 season, most beneficiaries received only maize seed and fertilizer (Ellis et al., 2009). Thus, the objective of crop diversification did not fully materialize.

While implementing FoSP, objective (3), conservation farming, was not the center of activities. Consequently, FoSP enhanced maize cultivation with fertilizer use rather than encouraging crop diversification and conservation farming.

The original concept was to attain a beneficiary level of 200,000 households each year. However, as shown in Table 2, having reached 145,000 by 2003/04, actual beneficiary numbers fell precipitously, averaging only 18,800 between 2004/2005 and 2009/2010 (Ellis et al., 2009). The amount of fertilizer distributed was also limited to only 725 tonnes in 2008/2009 and 1,762 tonnes in 2009/2010.

FoSP targets "vulnerable but viable" farm households, meaning that they are vulnerable according to certain criteria, but have sufficient able-bodied labor to take advantage of the inputs package delivered (Ellis et al., 2009). The criteria for beneficiary selection have two tiers. The primary criteria are:

- Access to land, but cultivating less than one hectare;
- Adequate labor;
- Not in gainful employment.

The second-tier criteria include female-headed households, housing orphans, child-headed households, terminally ill heads of households, households with disabled members, households with unemployed youth, and the elderly (Ellis et al., 2009). Beneficiary lists are first created by village headmen and then reviewed by Community Welfare Assistance Committees (CWACs) or Area Food Security Committees (AFSCs). This method is prone to inclusion and exclusion errors owing to elite capture (Ellis et al., 2009: 48). A substantial number of FoSPs have been allocated on a patronage bias, which diverts resources away from intended beneficiaries (Ellis et al., 2009).

As shown in Table 3, the number of beneficiaries decreased from 145,000 in 2003/04 to fewer than 25,000 in 2004/2005 and fewer than 4,000 in 2008/09. In addition to the reduced number of beneficiaries, FoSP has suffered from such problems as unpredictable and often late funding, the unit delivery-cost problems due to the limited number of packs available (around 230 packs per District), and insufficient funding (Ellis et al., 2009).

Ellis et al. 2009 highlighted several FoSP problems as policy lessons: impact and outcome failures due to short term, unstable, and unpredictable funding, and too many and poorly integrated targets and objectives. (FoSP did not monitor outcomes; hence, no evidence base exists.) (Ellis et al., 2009).

V. Irrigation Policies

To improve the food security of small-scale farmers, it is necessary to overcome unstable production of rainfed farming and to increase productivity by utilizing fertilizer. The development of small-scale irrigation can help solve annual fluctuations in food production that result from dependence on erratic rainfall. Irrigation contributes to overcoming problems arising from unstable rainfed agriculture and price fluctuations in the free market.

Zambian government policies and development plans emphasize the exploitation of water resources to develop irrigation to achieve food security and a reduction in poverty. The PRSP of 2002–2004 stated that the expansion of irrigation would

not only improve food security but would also help reduce poverty[20] (Zambia, MFNP, 2002: 91). The Fifth National Development Plan (FNDP) sets a target of doubling the acreage under irrigation to 200,000 ha by 2010 (Zambia, 2006: 49). The National Irrigation Plan (NIP), formulated in 2005, proposes a strategy for efficient and sustainable exploitation of water resources by promoting irrigation. As an intervention to improve the policy and legal environment, the NIP proposes a reduction in energy and irrigation equipment costs and improved incentives for investing in irrigation[21].

According to the Food and Agriculture Organization (FAO) of the United Nations, about 100,000 ha were estimated to be under so-called traditional irrigation in 1992[22]. These wetlands and *dambo*s (low-lying, shallow wetlands) in traditional areas of land tenure have been used for rice, fruit, and vegetable production.

Several programs have promoted small-scale irrigation and were supported by the government, non-governmental organizations (NGOs), and donors.

FOOD CROP PRODUCTION TRENDS: MAIZE PRODUCTION

The area planted for maize ranged from 510,000 to 760,000 hectares in the 1990s and the 2000s. An area of 600,000 hectares is larger than the area planted for cassava (400,000 ha), and much larger than the area planted for four other crops combined: sorghum (30,000–50,000 ha), millet (40,000–90,000 ha), rice (10,000 ha), and wheat (10,000 ha). The predominance of maize is clearly seen, but acreage under rice and wheat are on the increase after the introduction of economic liberalization.

The overall reduction in subsidies to support maize production and consumption in the early 1990s caused important shifts in cropping patterns. The pattern up to the early 2000s represented a diversification away from maize. Over the 12-year period between the 1990/91 and 2002/03 seasons, the maize share of total smallholder crop output declined from 76% to 55%, whereas the cassava share rose from 10% to 26% (Jayne et al., 2007: 6). Although maize production has declined greatly from former levels in the 1980s (Fig. 1), this decline has been offset by increased production of other crops, most notably cassava, groundnuts, horticulture, and animal products (Jayne et al., 2007). One of the factors behind the shift was the increased fertilizer prices arising from economic liberalization, which encouraged farmers to plant crops such as cassava, sorghum, millet, and sweet potatoes, which are less demanding of chemical fertilizers[23] (Simatele, 2006: 8).

The second half of the 2000s showed a different pattern. The planted area of maize increased from 2004/05 to 2009/10, whereas the planted area of sorghum/millet declined, and that of cassava stagnated. Thus, the pattern showed a reverse trend compared with the 1990s when maize area decreased and cassava increased. The government policies to enhance maize production, including fertilizer subsidies (the fertilizer support program) and maize price support by the FRA, might have contributed to the reversal in production trends.

Impressive growth in production was achieved in the 1990s for cassava, sweet potatoes, groundnuts, and cotton (Jayne et al., 2007). Cassava, sweet potato, and

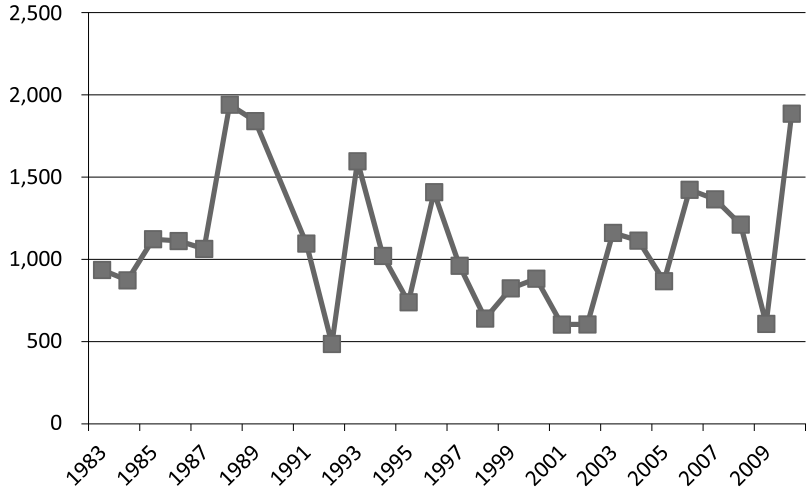

Fig. 1. Zambia Maize Production Trend.
Source: Dorosh, P.A., S. Dradri & S. Haggblade 2010. Regional trade and food security: recent evidence from Zambia. In (A. Sarris & J. Morrison, eds.) *Food Security in Africa*, pp. 188–189. FAO & Edward Elgar, Cheltenham, UK & Northampton, MA, USA.
Zambia, CSO n.d. Ministry of Agriculture, Food and Fisheries, 1989/90. *Agricultural Statistics Bulletin*, Central Statistical Office, Lusaka.
*Year 2010 indicates 2009/2010 agricultural season.

groundnut productivity all benefited from the introduction of improved varieties in the 1990s.

AGRICULTURE AND FOOD SECURITY IN VILLAGE C

I. Agriculture of the Village C

The case study area is a village in Chibombo District of Zambia's Central Province. The village studied (hereafter called "Village C") was established in the mid-1970s. The land where the village is located was previously covered with forest, and the area was gradually cleared for villages as people migrated in and settled in the area. Village C included approximately 120 households by the mid-1990s[24]. It is located close to the tarmac road connecting Lusaka (the capital) and Kabwe (the capital of the Central Province). The location of the village is good in terms of accessibility to major urban centers; it is about 90 km from Lusaka, 40 km from Kabwe, and about 260 km from the Copperbelt towns. The agriculture of the village has benefited from its good location and accessibility to urban markets, which is one of the factors enhancing the commercialization of village C agriculture. The village is located in a Trust Land area, where customary law, including a communal land tenure system, is predominant.

In village C, many farmers combine rainfed farming in the uplands with irrigation farming in *dambo* (wetlands), with the latter conducted mainly in the dry season. Irrigated farming can contribute to food security in two ways. One

is that growing maize and other food crops in irrigated *dambo* gardens leads to increased food production for home consumption. The other is income generation. Growing cash crops in irrigated fields leads to increased income from sales of the crops, with which food can be purchased.

II. Maize Balance Sheets in Village C

Maize balance sheets were generated for some farmers based on field research conducted in August 2009. This was a limited and simplified trial because it considered only maize as the food crop. In village C, food crops such as sweet potatoes and sorghum are quite common, whereas crops such as rice, cassava, and Irish potatoes are rarely grown, and no wheat is cultivated. Table 4 shows the maize balance sheets of the 17 farmers interviewed. The farmers did not constitute a randomly selected representative sample, but were selected specifically to show different types of farming households.

Requirements of maize for home consumption were calculated assuming that 200 kg of maize is required for an adult per year. Requirements based on this calculation and requirements reported by the respondents were used. The third column "Maize requirement (estimate)" shows the annual amount (kg) of maize required for home consumption calculated on the basis of 200 kg per person. The fourth column "Reported Maize requirement" shows the amount of maize the respondents reported as necessary for 1 year.

As can be observed from Table 4, the calculated requirements and reported requirements of maize matched for 10 of the 16 households studied (information on maize requirement for one household is not available).

Because upland maize production fluctuated from year to year, the maize balance sheets also changed annually. The majority of the households studied recorded a deficit in maize for 2008/09 and 2007/08. None of the households recorded a surplus maize production in both seasons of 2008/09 and 2007/08. Nationally, maize production in 2007/2008 was fair at 1.2 million tonnes, whereas the production in 2008/2009 was very poor at 606,000 tonnes. But with regard to the farmers interviewed in village C, there were not much difference for the mean maize harvests for each season, with the average for 2008/2009 was 706 kg per household, while that for 2007/2008 was 738 kg. In 2008/2009 season they had too much rain which damaged some crops. In village C, almost all of the households studied recorded a deficit in maize for both seasons (maize from *dambo* was not included). This reflects changes in village C agriculture in which the importance of maize production at the uplands decreased, whereas production from *dambo* gardens and petty trade such as vegetable selling gained importance.

Those households growing vegetables in *dambo* gardens purchased maize with revenues from vegetable sales to fill the gap in the maize balance sheet (household No. 11 in Table 4). Some farmers grew winter maize (dry-season maize) in *dambo* with irrigation (households 1, 2, 4, 15, 16, and 17), and this was a new development begun in 2000. Green maize from *dambo* can be sold at higher prices than rainfed upland maize sold in May or June. Household No. 17 is a case in point. The household sold 3,500 kg of maize harvested from the uplands at 3.5

Table 4. Maize Production and Consumption of Some Farmers in Village C, Zambia 2008/2009

No.	No. of household member	Adult equivalent	Maize requirement (estimate)	Reported maize requirement	2008/09 Maize harvest (kg)	2007/08 Maize harvest (kg)	2008/09 Maize balance 1	2008/09 Maize balance 2	2007/08 Maize balance 1	2007/08 Maize balance 2	Maize sales or purchase	Maize production in dambo	Sales of vegetable (kwacha)	Vegetable sales at tarmac road (kwacha)	Remarks
1	8	5.5	1,100	1,800	600	250	−500	−1,200	−850	−1,550	−400	Yes	3 mill.	0.4 m/month	
2	7	4.5	900	1,000	400	600	−500	−600	−300	−400		Yes. 100 kg?	240,000	Yes	Widow
3	5	4	800		100	250	−700		−550			No	1.66 mil		Vegetable sales used for school fees of secondary at 1.275 m
4	8	5	1,000	1,000	400	3,000	−600		2,000		2,000	Yes	1.35 mil	Yes	Maize sales K1.4 m
5	6	6	1,200	1,000	500	0	−500	−700	−1,000	−1,200		No	0	No	Remittances from children in Lusaka and Copperbelt
6	7	6	1,200	600	500	50	−100	−700	−550	−1,150			0	50,000/day	
7	3	2.5	500	1,500	0	50	−500		−450						Widow. Husband's Pension. Three children in towns
8	7	6	1,200	1,000	150	500	−850	−1,050	−500	−700	purchased maize	No	No sale in 2,008	0.1 m to 0.15 m/ month	Remittances from a daughter in a town
9	5	3.5	700	600	500	300	−100	−200	−300	−400			0.32 mil or more	0.1m a month	Cash revenue from ox-cart
10	4	4	800	500	650	2,350	150	−150	1,850	1,550	1,000	No	No sale in 2,008		
11	7	5	1,000	750	200	500	−550	−800	−250	−500	−400	Yes	1.4 mil		Purchased maize with vegetable sales from dambo
12	20	15.5	2,300	2,000	1,500	750	−500	−800	−1,250	−1,550	bought		0.54 mil	no	
13	11	9	1,800	1,800	100	900	−1,700		−900		bought		0.35 mil		
14	8	7	1,400	350	0	250	−350	−1,400	−100	−1,150	bought				Sells fish
15	5	3.5	700	630	450	540	−170	−250	−90	−160	bought 270 kg sold 200 unit green maize	harvested 210 unit green maize	1.45 mil		
16	11	7.5	1,500	1,350	450	750	−900	−1,050	−600	−750	bought 180 kg in 2,008	consumed 20 units green maize	855,000		Trade of maize and tomatoes. Two children at grade 9
17	10	7.5	1,500	1,700	5,500	1,500	3,800	4,000	−200	0	sold 3,500 kg at 3.5 m kwacha	sold 448 unit green maize at K.4.48 m in 2,008	K2.3 m of tomatoes plus impwa sold		

Source: Survey by author.

million kwacha, whereas sales of green maize from *dambo* fetched 4.48 million kwacha. Green maize from *dambo* is mainly for sale, but can be consumed as an additional food to supplement home consumption (household No. 16).

For households 1, 2, 4, 6, 8, and 9, women were engaged in the petty trade of selling vegetables at roadside market stalls near the village. Revenues from the vegetable sales were used to buy maize to supplement maize production. Some households sold vegetables and green maize from *dambo* at roadside stalls and used the revenue to finance their children's secondary school fees (household number 3). While primary education (up to grade 7) is free, education at secondary schools is costly for poor farmers.

Households 5 and 8 (probably 7, too) were dependent on the remittances of their children who lived in urban areas. Since their maize balance sheets recorded deficits it was likely that they bought food with the money of remittances.

CONCLUSION

The concept of food security has been expanded so that not only food availability but also food access and food utilization have become key issues. Providing vulnerable people with regular social transfer at a national scale has become a policy agenda in Africa. New calls to reintroduce fertilizer subsidies as a way of promoting fertilizer use, improving food security, and stimulating the development of input markets have been made in agricultural and rural development circles.

In the context of these new developments, the Zambia government implemented new programs in the 2000s that affected food security including input transfer or fertilizer subsidies to small-scale farmers. FISP and FoSP have had a positive impact on maize production and have contributed to improvements in small-scale farmers' food security. However, the weak point of the Zambian input transfer program was the cost involved. There is room for improvement in terms of efficiency, target selection, and compatibility between objectives and methods.

The vulnerability of rain-fed agriculture for small-scale farmers due to rainfall fluctuations must be addressed for input-transfer programs to be effective. Even if subsidized or free inputs are provided to small-scale farmers, their effect on production and food security fail to materialize when drought or floods damage crops. Irrigation development can be promoted to tackle this problem.

NOTES

(1) "Smallholder farmer "and "small-scale farmer" are used interchangeably.
(2) Urban farming was one of the survival strategies of the urban residents in the 1980s and 1990s when the Zambian economy was in crisis and employment opportunities were limited.
(3) The Zambian agricultural sector has a dual structure and is composed of about 800,000 small-scale farms, where subsistence production is predominant, and about 2,000 large-scale commercial farms. Large-scale commercial farms produce such food crops as wheat and maize, and harvests are sold to markets.

(4) It mast be be noted that selling of food crops to markets is not confined to those farmers who have harvested a surplus over home consumption. Some small-scale farmers sell some of their output, even when it is not surplus, to get money for goods and services such as education and health (Simatele, 2006: 26).
(5) Social transfers are methods in which social protection can be delivered to its intended beneficiaries. There are several categories of social transfers, such as cash transfers, food transfers, inputs transfers, and assets transfers (Ellis et al., 2009: 9–10).
(6) A clear distinction between the two is difficult, as an infinite number of intermediate possibilities exist between the two. "Input transfers" are mainly used in the social protection literature, while "subsidized inputs" (especially fertilizers) have been an important topic of development policy studies for Africa. However, both input transfers and subsidized inputs are studied in social protection and development policy (Ellis et al., 2009: 7, 10–11).
(7) These include The Input Subsidy Program (from 2005/2006 and a successor to the Target Input Program and Starter Pack) in Malawi, Input Trade Fairs in Mozambique (since 2003), and the Fertilizer Support Program and the Food Security Pack of Zambia.
(8) Morris et al. 2007, evaluating the Malawi and Zambia programs, argues that they succeeded in increasing fertilizer use and maize production, whereas the shortcomings are high fiscal and administrative costs and leakage of fertilizer to wealthier farmers (p. 118).
(9) The US Department of Agriculture recommends 2,100 Kcal/person/day to meet minimum calorie requirements (Benson, 2004: 1–2).
(10) The National Food Balance Sheets, which give the national supply and demand for staple crops in a given marketing year, were first used in Zambia during 1993/94 agricultural market season. The current Zambian National Food Balance Sheets have some limitations such as a lack of information on seasonal variation, and differences in diet consumed by different population groups (FEWSNET et al., 2004: 5).
(11) Maize is also the most important cash crop (or the most commercialized of the food crops) for the majority of smallholder farmers. The historical context of eastern and southern Africa requires an understanding of maize as a political crop. The controlled marketing system of maize was viewed as a vehicle to redress the neglect of smallholder agriculture. Governments were to be responsible for ensuring cheap food for the urban populations (Jayne et al., 2007: 3).
(12) Zambia's external debt declined from US $7.1 billion in 2004 to US $0.5 billion in 2006, with 92.5% of its debt cancelled.
(13) Pletcher 2000 argues that maize output markets were liberalized more quickly and thoroughly than maize input markets for five reasons; among them were the following: the perceived risks of maize market liberalization were lower; the private sector stood to gain from maize market liberalization; and agricultural business associations supported maize market liberalization. Pletcher also argues that continued government support for inputs is not only justified by a redistributive argument but also supported by traders, bankers, and others who benefited from the government policy.
(14) Both the Fertilizer Support Program and the Food Security Pack are abbreviated FSP. To avoid confusion, the former is abbreviated FISP and the latter FoSP.
(15) FISP guidelines state that eligible cooperatives and farmer groups must have certain characteristics including having written by-laws to manage their funds, having an executive committee, being duly registered, and having no outstanding loans (World Bank, 2010: 10).
(16) 45% for the number of farmers who acquired fertilizers and 48% for the amount of fertilizer acquired by smallholder farmers in 2008/2009, whereas the corresponding

figures for 2009/2010 were 50% and 41%, respectively (World Bank, 2010).

(17) Factors leading to the bumper harvest of 2009/2010 were widely debated in Zambia. Many in government attributed the production increase to the fertilizer subsidy program and the state's efforts to raise maize prices. Others argued that contributing factors were the adoption of conservation farming, and still others attributed it to favorable weather (Burke et al., 2010).

(18) Burke et al. (2010) estimated that weather conditions contributed 47% of the maize yield growth, whereas 25% came from increased fertilizer use, and 23% from area expansion. The remaining 5% can be attributed to hybrid seed use and improved management.

(19) Poor targeting was another shortcoming identified by the World Bank.

(20) The perception that poverty is caused by the dependence on rainfed agriculture is shared by Zambia's major donors. For instance, a paper by a joint initiative of major donors on pro-poor growth contended that crop production was negatively affected by the severe droughts of 1992 and 1995, which could explain much of the increase in poverty that occurred between 1991 and 1996 (Thurlow & Wobst, 2004: 31–32).

(21) It is recommended that during the first 2–3 years of the NIP, duty and VAT on basic irrigation equipment be reduced, and customs and excise duty for irrigation equipment also be reduced.

(22) Daka (2006) also shows an FAO AQUASTAT estimate for 2003: 155,912 ha of land in Zambia is irrigated, of which an area of 100,000 ha was *dambo*s used by small-scale farmers to grow vegetables.

(23) The production of cotton (a cash crop) also expanded during the period. The severe droughts Zambia experienced in the 1990s were also a factor contributing to the expansion of cassava, sorghum, and millet, which are more drought resistant (Simatele, 2006: 8).

(24) At the time of 2010 Population Census, the village had 150 households and a population of about 1,350 (information by the villagers).

REFERENCES

Benson, T. 2004. *Africa's Food and Nutrition Security Situation: Where Are We and How Did We Get Here?* International Food Policy Research Institute, Washington, D.C.

Burke, W.J., Jayne, T.S. & A. Chapoto 2010. *Factors Contributing to Zambia's 2010 Maize Harvest*. Food Security Research Project, Policy Synthesis Paper No. 42, September 2010.

Daka, A.E. 2006. *Experiences with Micro Agricultural Water Management Technologies: Zambia* (Report submitted to the International Water Management Institute, Southern Africa Sub-regional Office). Online. http://www.sarpn.org.za/documents/d0002066/Zambia_AWM_Report.pdf (Accessed on January 10, 2011).

Dorosh, P.A., S. Dradri & S. Haggblade 2010. Regional trade and food security: Recent evidence from Zambia. In (A. Sarris & J. Morrison, eds.) *Food Security in Africa*, pp. 182-220. FAO & Edward Elgar, Cheltenham & Northampton, MA.

Ellis, F., S. Devereux & P. White 2009. *Social Protection in Africa.* Edward Elgar, Cheltenham & Northampton, MA.

Famine Early Warning System Network (FEWSNET), Ministry of Agriculture and Cooperatives, Food Reserve Agency & Zambia National Farmers Union 2004. *Review of the Zambia National Food Balance Sheet: Final Report*. Lusaka.

FFSSA (Forum for Food Security in Southern Africa) 2004. *Achieving Food Security in Southern Africa: Policy Issues and Options*. FFSSA Synthesis Paper. Online. http://odi.org.uk/work/projects/03-food-security-forum/docs/ffssa_synthesis_consultation.pdf

(Accessed on January 10, 2011).
FFSSA (Forum for Food Security in Southern Africa) n.d. *Zambia Food Security Issues Paper*. FFSSA Country Issues Paper. Online. http://odi.org.uk/work/projects/03-food-security-forum/docs/zambiacipfinal.pdf (Accessed January 10, 2011).
FSRP/ACF and MACO/Policy and Planning Department 2010. *Analysis of the 2009/10 Maize Production Estimate from the Crop Forecast Survey* (Presentation at Mulungushi House, Lusaka). Online. Zambia Food Security Policy Presentation, *Zambia Food Security Research Project.* http://www.aec.msu.edu/fs2/zambia/presentations.htm (Accessed on January 10, 2011).
Gould, J. 2010. *Left Behind: Rural Zambia in the Third Republic*. Lembani Trust, Lusaka.
Jayne, T.S., J. Govereh, N. Mason, A. Chapoto & H. Haantuba 2007. *Trends in Agricultural and Rural Development Indicators in Zambia.* Food Security Research Project (FSRP) Working Paper no. 24, Lusaka. Online. http://www.aec.msu.edu/fs2/zambia/wp_24.pdf (Accessed on January 10, 2011).
Larmer, M. & A. Fraser 2007. Of Cabbages and King Cobra: Populist Politics and Zambia's 2006 Election. *African Affairs*, 106(425): 611-637.
Mason, N.M. & T. S. Jayne 2009. *Staple Food Consumption Patterns in Urban Zambia: Results from the 2007/2008 Urban Consumption Survey*. Food Security Research Project. Online. http://aec.msu.edu/fs2/zambia/index.htm (Accessed on January 10, 2011).
McPherson, M.F. 2004. The Role of agriculture and mining in sustaining growth and development in Zambia. In (C.B. Hill & M.F. McPherson, eds.) *Promoting and Sustaining Economic Reform in Zambia*, Harvard University Press, Cambridge and London.
Morris, M., V.A. Kelly, R.J. Kopicki & D. Byerlee 2007. *Fertilizer Use in African Agriculture: Lessons Learned and Good Practice Guidelines*. The World Bank, Washington, D.C.
Mungoma, C. & C. Mwambula 1996. Drought and low N in Zambia: The problems and a breeding strategy. In (G.O. Edmeades, M. Bänziger, H.R. Mickelson & C.B. Pena-Valdivia, eds.) *Developing Drought- and Low N-Tolerant Maize:* Proceedings of a Symposium, March 25-29, 1996, CIMMYT, El Batan, Mexico. CIMMYT (International Wheat and Maize Research Center) and UNDP (United Nations Development Program).
Noyoo, N. 2008. *Social Policy and Human Development in Zambia*. UNZA Press, University of Zambia, Lusaka, Zambia
Pletcher, J. 2000. The politics of liberalizing Zambia's maize markets. *World Development*, 28(1): 129-142.
Simatele, M.C.H. 2006. *Food Production in Zambia: The Impact of Selected Structural Adjustment Policies*. AERC Research Paper 159, African Economic Research Consortium, Nairobi. Online. http://www.aercafrica.org/documents/RP159.pdf (Accessed on January 10, 2011).
Thurlow, J. & P. Wobst 2004. *The Road to Pro-Poor Growth in Zambia: Past Lessons and Future Challenges*. Paper submitted to the DFID as part of the project "Operationalizing Pro-Poor Growth". Online. http://www.tips.org.za/node/781 (Accessed on January 10, 2011).
UN Millennium Project 2005. *Halving Hunger: It Can Be Done*. Task Force on Hunger. UNDP (United Nations Development Program). Earthscan, London.
World Bank 2010. *Zambia: Impact Assessment of the Fertilizer Support Program: Analysis of Effectiveness and Efficiency*. Report No. 54864-ZM World Bank, Africa Region. Online. http://wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2010/07/16 (Accessed on January 10, 2011).
Zambia, CSO (Central Statistical Office) 2009. The Monthly, May, 74: 12. Online. http://www.zamstats.gov.zm/media/vol_74_2009_the_monthly_may.pdf (Accessed on January 10, 2011).

Zambia, MACO (Ministry of Agriculture and Co-operatives) 2004. *National Agricultural Policy 2004-2015*. MACO, Lusaka.

———— 2005. *National Irrigation Plan (NIP)*. MACO, Lusaka.

Zambia, MAFF (Ministry of Agriculture, Food and Fisheries) n.d. *1989/90 Agricultural Statistics Bulletin*. Central Statistical Office, Lusaka.

Zambia, MFNP (Ministry of Finance and National Planning) 2002. *Zambia Poverty Reduction Strategy Paper 2002-2004*. MFNP, Lusaka.

Zambia, Republic of 2002. *Agriculture-centered Development: The New Deal Vision in Agriculture*. State House Press and Public Relations Unit, Lusaka.

———— 2006 *Fifth National Development Plan 2006-2010*. Lusaka.

Zambia Agricultural Consultative Forum 2009. *Report on Proposed Reform for the Zambian Fertilizer Support Programme*. Online. http://www.aec.msu.edu/fs2/zambia/FSP_Review_Report_feb_09.pdf (Accessed on January 10, 2011).

———— Accepted *January 10, 2011*

Author's Name and Address: Shiro, KODAMAYA, *Graduate School of Social Sciences, Hitotsubashi University, 2-1 Naka, Kunitachi, Tokyo 186-8601, JAPAN.*

E-mail: *S.Kodamaya@srv.cc.hit-u.ac.jp*