Agricultural Policy Analysis Studies in Tanzania: A Historical and Thematic Perspective with Implications on Future Policy Research for Crop Production and Marketing

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Abstract

This paper reviews studies which have addressed agricultural policy research in relation to Tanzania during and after economic structural adjustment, with some cross reference for studies within Africa and globally. The studies are reviewed to cover: factor markets; product markets; and macro-economic management in relation to impacts on agriculture performance. The review establishes that in the factor markets more studies have been done to address productivity improving inputs, especially inorganic fertilizer compared to other inputs such as financing and credit for agriculture. Based on the findings, further areas for future research are proposed. Five sub-themes are presented: subsidy, returns to investment, land markets, trade, and inter-sectoral linkages. The study concludes by observing that despite all the studies, there is little evidence that policymaking in Tanzania is informed by policy research. Alternatively stated, policy makers do not seek guidance from research to make decisions. The review also establishes that most of local researchers use analytical methods which have limited capacity to provide robust policy recommendations that are backed by clear analytical rigour. Capacity building of young professionals is therefore recommended to improve their competence to become agricultural policy analysts with impact on agricultural policy processes.

Key Words: Tanzania, Agriculture, policy research, factor market, product market

Background

Lindert (1991) defines agricultural policy as "all agricultural initiatives affecting the real income of persons in the agricultural sector, including policies not explicitly intended for agriculture." The policy process continuously involves different stakeholders who exert influence in different forms to change the policy environment in their favourable. The government strives to lead policy processes by influencing changes in the agricultural sector such that both equity and efficiency are enhanced through various policy instruments. This demands a tough balancing act as competing groups struggle to influence public policy so that it works for them in terms of more resources, more benefits, reduced cost, and fewer restrictions. This provides room for unbiased policy research to inform policy makers and affected parties the likely impacts of policies before they are formulated (ex-ante policy analysis research) and after they have been formulated and implemented (ex-post policy analysis research).

The terms policy analysis and policy analysis research are closely related, and both are guided by similar principles as they analyse the effect of changes in policy instruments on specific sectors of the population. However, a policy analyst tends to be closer to decision makers (often hired for a specific purpose) than a policy-oriented researcher who is expected to maintain an unbiased stand. Nonetheless, the findings of a policy analyst who ignores their clients' interests may be disregarded while a

policy researcher who does not place analytical results in the public arena may fail to influence public policy (Weimer and Vining, 1992).

Timmer (1991) outlines issues which have historically been the subject of policy analysis in agriculture. These include: the role of the state in agricultural development, exports, rural infrastructure; policy instruments for stimulating investments in agriculture; the nexus between equity and efficiency; farmers' organizations; prices; food policy; land tenure and; and agricultural labour markets, to list a few. This paper reviews studies on Tanzania which reflect these issues and the implications for agricultural development, particularly focusing on achieving Millennium Development Goal (MDG) number one, which addresses eradicating extreme poverty and hunger. Based on the review, policy gaps are identified to guide agricultural policy research in future.

Development Policy Perspectives

Global institutions, such as the World Bank, the International Monetary Fund and donor countries, play an important role in shaping the development policies of developing countries such as Tanzania. Since the 1980s, there has been a wave across Least Developed Countries (LDC) to undergo structural adjustment in order to qualify for much-needed credit to finance development. Such reforms were guided by five tenets that were articulated by Williamson (1990) as the "Washington Consensus." They include: (i) trade liberalization, (ii) deregulation, (iii) privatization, (iv) financial liberalization, and (v) debt crisis management. Soon after beginning implementation of these policies, negative effects were experienced across many African countries, particularly in terms of reduced funding for social services and rigid rules in the global and local trade arenas. Many countries in Asia achieved the green revolution milestone by ignoring "some" of the neoclassical principles propagated by the World Bank and IMF on which the Washington Consensus was based (Gore, 2000).

During the last twenty years, there has been a reversal of some aspects of the structural adjustment recommendations, which had previously been expected to turn around stagnation, stimulate economic growth, and reduce suffering. It is now widely acknowledged that markets are not all that matters to promote equitable and sustained economic development. Broad (2004) presents an analysis of the shift in the debate over the Washington Consensus in his article, "The Washington Consensus meets the Global Backlash: Shifting Debates and Policies." Öniş and Şenses (2005) draw attention to the failure of the post-Washington Consensus (PWC), as reflected in the current policy practice, which provides a sufficiently broad framework for dealing with key and pressing development issues, such as income distribution, poverty, and self-sustained growth. There is now agreement that trade and markets are good, but they cannot be left to operate without government mediation; history and recent crises in the food and financial markets bear testimony to this. Consequently, the pendulum has now swung from excessive economic liberalization to accepting that the government is a key player for national development, assuming broader roles in planning and coordination. Consequently, privatization of public enterprises and services has become more cautious. Targeted social and economic services are now widely accepted as rational economic policies. Public-private partnerships are promoted as viable alternatives to exclusive government financing and implementation of development programs. These changes have shaped the agenda for agricultural policy research at the global and national levels in many developing countries, including Tanzania.

Relevance of Agricultural Policy Analysis in Tanzania

Since independence in 1961, mainland Tanzania has remained an agrarian economy. Due to ongoing structural changes, the role of agriculture has declined as other sectors (tourism, mining, and services) have increased their contributions to the gross domestic product (GDP) and exports. Nonetheless, agriculture remains the most important sector. The latest Bank of Tanzania annual report for 2010/2011 (p. 2) shows that agriculture (including hunting

and forestry but excluding fishing) accounted for 24.3% of the GDP compared to 17.9% for trade, repairs, hotels, and restaurants, 10% for manufacturing, and 23.9% for other services. The crop sector dominates, accounting for 74.5% of agriculture's share of the GDP. Mining and tourism, which are rated as the fastest growing sector in the economy, accounted for only 2.6% and over 15% of the GDP respectively during 2010/11, but they currently lead in foreign exchange earnings (Kweka, *et al.* 2003). The role of agriculture is even more pronounced in terms of employment, accounting for over 70% of overall employment and over 90% of the rural labour force. Agriculture also produces over 80% of the food consumed locally.

Considering the important role of agriculture, the sector has been affected by many policies which have been implemented over time in order to achieve different goals. For example, there is an ongoing contest whether to cease irrigated agricultural production completely in the Great Ruaha basin (Usangu plains) in favour of ecological preservation of the Ihefu wetland, and to preserve water for energy production downstream at Mtera and Kidatu (Kadigi, 2003, 5 and 15). Recommendations for a sustainable future of this ecosystem require policy decisions that are informed by rigorous research on both policy and ecosystems. These examples highlight the importance of agricultural policy research. From a political economy perspective, most analysts divide the timeline of the policy landscape for Tanzania into four distinct periods; (i) before independence; (ii) post-independence (1961 – 1967; Post-Arusha Declaration or the socialist era (1967 – 1984); (iii) Structural adjustment era (1986 – 2000) and (iv) post-Structural Adjustment Era (2000 – present). This review focuses on the economic reform and post-reform era (1986-present), examining policies for their impact on poverty and food security while also identifying policy information gaps that require further research.

Policy changes: SAP and Post SAP

The Structural Adjustment Programme (SAP) covers the period from 1986 - 2000, when two Economic reform programme (ERP I and ERP II) was implemented. The first ERP was introduced in 1986, followed by the second ERP (1989 – 1994). By 1994 all effective direct and indirect agricultural subsidies had been phased out. The 1990s are known for institutional reforms, also implemented as part of SAP. Many policies and institutional changes were introduced or revised during this time (1990–2000), including the following: the Cooperative Act (1991, 2003); land policy (1995); agricultural and livestock policy (1997); Land Acts approved (1999) and revised in 2003; the National Vision 2025 adopted (1997) to guide economic transformation so that Tanzania will attain middle income status by 2025; the National Strategy for Growth and Poverty Reduction – MKUKUTA I was developed (2001) followed by implementation of phase 1 (2005–2010) and Phase II (2011 - 2015); the Agricultural Sector Development Strategy (ASDS) was adopted in 2001, and phase one of the Agricultural Development Programme (ASDP) was implemented (2005–2010) followed by phase two (2011–2014); Agricultural Census was conducted at a five year interval (2002, 2007) while KILIMO KWANZA was adopted in 2008 promoting public private partnership to support agricultural transformation. Tanzania signed the Comprehensive Development Program (CAADP) COMPACT in 2009, followed by launching the Tanzania Agricultural and Food Security Financing Plan (TAFSIP) in 2011, as an instrument for implementing the CAADP COMPACT. Other relevant policy changes during this time include (i) the Maputo agreement, which Tanzania signed in (2003) under the African Union (AU), to foster accelerated agricultural growth and transformation; (ii) restoration of the transport subsidy on fertilizer (2003); and (iii) extending the subsidy for seed and pesticides (2005). All these changes have had corresponding institutional changes with different effects on agricultural production, marketing, and livelihoods.

The first generation of reforms up to 1994 were designed to increase economic liberalization, whereas the second generation of reforms (since 2003) were adopted to reverse declining food production trends, as illustrated by maize and

rice, prompting the government to restore a partial transport subsidy in 2003 (Isinika and Msuya, 2010). More recent agricultural policy developments involve implementation of the second phase of the MKUKUTA II (2011–2018) and ASDP II (2011–2015). Tanzania has also revived the five-year development plans, which had been abandoned since the 1980s. The current plan (2012–2016) is one of three plans, designed to steer the nation toward realizing the national vision, 2025. The plan targets five priority areas to accelerate economic growth; (i) infrastructure development, agricultural transformation, industrial development, human capital and skills development, and (v) improving services (tourism, trade, financial services)

The current five-year plan has projects for agriculture sector growth to increase growth from 3.5% in 2011 to 6.2% by 2016, of which the crop sub-sector is projected to grow from 3.5% to 5.9% over the same period. These projected levels of growth are expected to be achieved based on a number of assumptions and investment plans, including implementing new plans under ASDP financing according to TAFSIP, and implementation of the Southern Agricultural Growth Corridor of Tanzania (SAGCOT). In the course of implementing these programs, policy research will play an important role in order to provide ex-ante analysis regarding the interplay between large-scale and small-scale farmers so that productivity and production improvements as well as poverty reduction and welfare improvements are achieved and sustained. What will be the most efficient institutional arrangements for this to happen? What will be the effect of the production of large-scale farmers on local food supply and prices? What are the implications for smallholder farmers and consumers? How will these new initiatives affect land markets and land tenure? Many other research issues will emerge as the five-year plan, SAGCOT and other development initiatives are rolled out for implementation. The range of agricultural research policy issues covered during the SAP and post-SAP period (1995–2012 are discussed in the next section.

Productivity Improvement

Agricultural policies during the SAP and post-SAP period were consistent with economic reforms and structural adjustment. Policy research topics therefore followed suit. Skarstein (2005) analyses the impact of economic liberalization, looking for indicators of any impacts of the policy changes on agricultural growth (1985–1998). The study establish that, following economic reforms, land and labour productivity, per capita production, and total production of grains stagnated, particularly for maize and rice. Skarstein concludes that while fluctuations in rainfall could not significantly account for the decline in production, both total fertilizer consumption and the intensity of fertilizer use at the farm level continued to decrease from the 1990s as the use of fertilizer shifted from the leading maize producing regions to tobacco production in Tabora and other regions (World Bank 2000). Meanwhile, the ratio of maize-producer price to input prices declined, leading to the reduction in real returns per person-day and the profitability of food crops.

Wiig *et al.* (2001) use a CGE model to simulate the effects of structural adjustment policies, such as the removal of agro-chemicals subsidies on exports. The study establishes, a negative impact on economic growth, and hence on national efforts to reduce poverty. They conclude however that the combined effects of all SAP measures resulted in economic growth, raising the GDP from 1.8% to 2.8%. This study is important from a methodological point of view. Similar studies are necessary to determine whether structural change occurred in Tanzania in response to policies and programmes currently being implemented by the government and the private sector.

The recent experience of Malawi in relation to agricultural subsidy provisions has been hailed by some as a unique success story (Dorward and Chirwa, 2011). The authors reviewed the Malawian government subsidy programme for fertilizer and seed for the period 2005/09–2008/09. A number of lessons were derived from their analysis. First, the focus on staples

resulted in a high response leading to food self-sufficiency at the local and national levels. Second, administering the subsidy required robust entitlement systems for effective targeting and the development of cost effective input supply systems for delivery of small quantities of subsidized inputs to a large number of dispersed farmers. But, government subsidies may crowd out private sectors services, hence sustainability of service provision. Xu *et al.* (2009) analyze the potential crowding in and crowding out effects of input subsidy programs in Zambia. Their findings demonstrate the importance of subsidy program design. They conclude that poorly targeted fertilizer subsidy programmes may not only fail to increase overall fertilizer use but also may induce a decline in use due to crowding out private retailers.

The policy instruments for transferring income to agricultural producers should therefore be designed to be socially optimal. All these studies have important policy implications for input studies in Tanzania, where the design of the inputs subsidy has constantly changed since their re-introduction in 2003. Future studies should address problems related to targeting, cheating, and crowding out. The reviewed studies also present useful examples of modelling various aspects of subsidy provision. Problems of administering the Tanzanian subsidy programme and its effect on private sector service provision have been difficult. The lessons from Malawi, Zambia, and other countries provide a good starting point for policy makers and policy researchers devise a feasible institutional framework for subsidy delivery in Tanzania.

Grepperud and Wiig (1999) used a CGE model to compare the impact of two policy options (fertilizer subsidies and maize market liberalization) on economic growth in Tanzania. They concluded that if fertilizer consumption continues at current rates, both agricultural growth and the economy would decline. They argue in favour of fertilizer subsidies, emphasizing the need for higher future consumption of fertilizer to sustain economic growth. These findings at the macro level were supported by farm-level studies. Hawassi *et al.,* (1997) as well as others established that the complete removal of subsidies in 1994 reduced fertilizer use, with subsequent reduction in maize output at the farm level and the national aggregate supply. The study further concludes that farmers do not use fertilizer efficiently because their marginal productivity is lower than the price ratio for fertilizer to maize. Msuya *et al.,* (2008) also present findings showing that the productivity of smallholders is low and highly variable because of several socio-economic factors, which include low input availability and high input prices. Abdulai and Huffman (2005) discuss the fact that low productivity and inefficiency among smallholders persists despite the presence of improved technologies being available (on the shelf), even when some of these have been shown to be profitable. Factors that influence fertilizer use include proximity to other farmers, low level of education, poor access to credit, and poor extension services. They recommend that the government should play a mediating role as a developmental state by providing quality public goods (infrastructure, extension services, and research), strengthening regulation for efficient supply of inputs, facilitating the empowerment of farmers for better bargaining power in markets, and improving access in factor and product markets as well as access to technologies and other services.

In contrast, Shetto *et al* (2007) based on a regional comparison of subsidy programs in East Africa, argued that fertilizer subsidies could be an inefficient way to improve smallholder livelihood, proposing instead a review of taxation and improving marketing efficiency by upgrading rural roads to reduce marketing costs. Their argument to remove subsidies differs from recommendations by other researchers as discussed earlier. Due and Gladwin (1991) conclude that providing a subsidy, infrastructure, and education should significantly improve and sustain both production and livelihoods. It has been argued that producer subsidies are the most efficient way to increase agricultural production and income. Grepperud and Wiig (1999) also conclude that subsidies provide a better

policy instrument for the environment because they encourage intensive land use including combining fertilizer and manure as a better alternative for sustainable soil management. Consistently, most of the authors [e.g. Grepperud and Wiig (1999); Hawassi *et al.* (1997); Msuya *et al.* (2008) emphasize that high agricultural growth can only be sustained by increasing the future consumption of fertilizer, and subsidies can kick-start the uptake by smallholders. Other inputs such as pesticides, farm tools, and equipment are not adequately covered by policy research in Tanzania.

Gaps for further research in relation to subsidies have been identified. Ranking high is the need to establish alternative institutional arrangements for reducing inefficiency in subsidy administration (Shetto *et al.,* (2007). This entails identifying necessary conditions for competitive fertilizer marketing, including institutional options for collective bargaining and economies of scale in the procurement of inputs. Understanding the distributional effects of fertilizer administration is also important. The long-term implication of input subsidies is another area for future research. For how long should the subsidies continue? At what level? Where should they apply? What are the implications of various options for equity and efficiency?

Studies that are reviewed here, as well as others not presented in this study, clearly point to the need for combining inorganic and organic fertilizer with other soil and water management techniques as the most sustainable way of improving agricultural productivity. Future studies should focus on providing a better understanding of the biophysical and socio-economic factors within smallholder systems for better targeting of soil fertility interventions and other technologies, such as the efficient utilization of irrigation water, conservation farming, and promoting alternatives for non-farm employment. The government is already taking action in relation to each aspect recommended for improvement, as discussed above, yet agricultural transformation is not occurring as anticipated. Policy research could shed light on the critical levels of investment and the minimum timeframe for irreversible change to be achieved. Institutional arrangements for subsidy administration is another area that stands to benefit from policy research, particularly for designing a robust institutional framework that minimizes cost and stands the test of time.

Investment in Agricultural Services

Investment in agricultural research and extension to improve productivity or reduce the cost of production are justified by a public good argument because of market failure. Compared to studies of countries, not many studies have been done in Africa to assess the rate of return on such investments. Such studies (ex-ante and ex-post) have been done to guide policy makers on appropriate levels of investment for productivity improvement. Isinika *et al* (1998) estimate returns to crop research and extension in Tanzania from 1961 and 1992. An internal rate of return (32.3%) is computed for crop research, but the rate for extension falls below 5%, which is explained by multiple non-extension roles imposed on extension agents. The study concludes that there is need for more investment in research and extension services. Minten *et al.* (2007) explore the constraints on agricultural productivity in rice in Madagascar, paying particular attention to differences across regions and income levels. Among other findings, they concluded that research and interventions aimed at reducing cost and price volatility within the fertilizer supply chain would help to improve access in more remote regions. Meanwhile, Alenea *et al.* (2009) assessed efficiency-equity trade-offs and the scope for resource reallocation in Nigeria. The results suggest that introducing poverty dimension does not significantly shift the priority setting. However, reallocating resources from cash crops and livestock to the major staples, especially maize, millet, soybean, sorghum, and cowpeas, maximizes research benefits for the poor.

Shiferaw *et al.* (2008) illustrated the need for increased participation of the private sector to enhance technology adoption of technology by alleviating constraints on seed access. The study used a double-hurdle model to show that

while the farmer-to-farmer transfer of new seeds plays an important role in improving access to new seeds, it would not be sufficient to spread the varieties widely and quickly because many farmers have no or limited access to quality or improved seed. The authors point the urgent need to strengthen leveraging rural institutions to remedy pervasive market failure in input and output markets where there is limited market infrastructure. Conradie *et al.* (2008) bring the perspective of measuring district level factor productivity in agriculture for the Western Cape Province in South Africa in the interval 1952–2002. They establish that districts with extensive animal rearing have negative growth in productivity, whereas districts that export irrigated fruits, chickens, and pigs have achieved rapid positive growth, which is linked directly to technological change. Districts with a predominance of field crops and vineyards lie in between. These findings have implications for Tanzania, where resources for agricultural development are allocated by district through DADPs. Similar policy research can be applied.

One obvious gap in this area is the paucity of studies addressing the returns to investments for research, extension, and other services both at the project/program level and at the aggregate national or district level. Recommendations to increase resources have often been made based on general trends rather than objective research-based analysis. About 75% of the ASDP budget is designated for local government authorities (LGAs). For the financial year 2011/12, such funds amounted to 86,752,001 TZS, equivalent to 59.5% of the funds designated for ASDP implementation. What are the returns from these resources? Another issue that requires analysis is the coordination of resource allocation between the public and private sectors in order to maximize coverage and impact. The studies reviewed here provide a range of topical issues and analytical options for such analyses.

Irrigation

There is a limited number of policy-relevant research covering water resources and irrigation. Kadigi (2003) presents findings on the relative value of water for different uses in the Great Ruaha basin within the Usangu plains. The choice between irrigation and hydro-electrical power (HEP) generation for the national grid is analyzed using a livelihood framework and regression analysis. The study concludes that while the economic value of water utilization for paddy irrigation is lower than the corresponding values for HEP, the opportunity cost of foregoing rice production would have negative implications for the national supply of rice and negative effects on the livelihoods of many actors along the rice value chain. Kashaigili *et al.* (n.d.) reviewed the constraints and potential for efficient intersectoral water allocations. They recommend using the combined variants of water allocation devices to meet the needs of different stakeholders.

Traditional irrigation systems such as vinyungu, as practices in many parts of the Southern Highlands have been blamed for impeding the flow of water within the Ruaha river basin, consequently affecting HEP generation. Mwakalila (n.d.) also argues that the mismanagement of irrigation systems leads to significant water and soil loss. Reducing such losses implies, irrigation water would serve more farmers. Soil fertility loss would also be reduced, hence improving productivity. However, the vinyungu production system is also very important for providing cash income and food security contributing up to 40% of household income.

Other factor markets

Land is a basic resource for agriculture, whose sustainability and productivity is highly influenced by the land management system. The arguments for and against titling customary to attract more investments are ambivalent (Rivoz, 2005). Omura (2008) argues, however, that security of tenure in relation to investment is context specific. Policy makers should therefore take into account the local context when financing land titling or land transfers programs. In the case of Tanzania, this phenomenon is illustrated by Daley (2005) who discusses the dynamism of African land tenure based on a case study of Kinyanambo village in the Mafinga district, Iringa region. Using an historical perspective,

the paper traced land tenure changes that lead to land commoditization due to changing perceptions, following villagization in 1974 and market liberalization in 1984. The emergence of land markets is accelerating the process of land commoditization and individualization. There are similar perceptions in relation to land that is proposed for SAGCOT. Villagers and land activists have become suspicions and cautious, fearing that village land under customary ownership may be the target for allocation to large-scale investors, reminiscent of the ujamaa villagization experience. Procedures for land acquisition and transfer under the SAGCOT program need to be informed and monitored to avoid or minimize conflicts arising from overlapping claims on land. Because land titling requires significant national resources, the process should therefore be sequenced, beginning with areas where land markets have reached a pre-determined critical level of development. Policy research can contribute in determining such critical criteria.

In related studies, Petracco and Pender (2009) evaluate the impact of land tenure titling on access to credit in Uganda. They concluded that land tenure is more important than title in determining access to credit for rural households. They use longitudinal household data to provide micro-level evidence linking plot level transfer right and perceptions of expropriation threats and the desire for capital accumulation. They concluded that insecurity regarding transfer right is a major limitation on efficiency and growth, pushing farmers backwards towards subsistence production as they operate within a short planning horizon. This contradicts ongoing governmental efforts to promote the commercialization of agriculture. Other efforts to promote agricultural commercialization can be put to similar tests that are adapted for differences in land tenure systems and incentive schemes.

Does tenure security enhance investments? A number of researchers have addressed formalization and individualization of land within East Africa. Bruce *et al.,* (1994) reiterates the robustness and dynamism of traditional and informal African land rights. The authors argue further that the cost of titling may be quite high, and it may not produce the presumed benefits; namely; improved access to credit, incentives for investment, and land improvement. The study proposes that cheaper alternatives to land titling are required to facilitate granting land rights to African farmers in times of growing land tenure changes. Deininger and Ali (2008) investigate overlapping land rights and agricultural investments in Uganda. Using a fixed-effects linear probability household model, they tested whether such programs exogenously provided lower levels of tenure security, thus creating disincentives for long- and short-term land-related investment. They establish that full land ownership, compared to mere occupancy rights, has statistically significant and economically large effects on land investment and productivity. Whereas land registration reinforced the investment-enhancing effects of ownership on long-term investment, registration alone did not prompt higher levels of investment. Legal provisions to strengthen occupancy rights eliminated 50% - 60% of occupancy-related underinvestment. The authors conclude that the case for strengthening tenure security in African contexts may be much stronger than conventionally assumed. Furthermore, attempts to do so would have to be based on a clear understanding of existing tenure conditions rather than on an undifferentiated application of generic principles, such as "titling" or "registration."

Havnevik (2011) discusses recent developments involving large-scale acquisition of land by foreign and sometimes local investors. They raised the question "Is this an opportunity for new investments or land grabbing at the detriment of customary land owners?" Although opportunities exist for increasing investment in rural areas, creating jobs, and improving rural infrastructure and services, the risks in relation to asymmetry of information, lack of transparency, and skewed terms of contracts are very high. The authors caution against unwarranted optimism regarding the benefits of land sales. These sales have sometimes displaced rural communities, leading to conflict and suffering.

They recommended strong collective action at the local level, coupled with a dual approach to address prevailing and potential threats to land dispossession, while tapping into opportunities presented by evolving land markets. These key variables need to be considered by policy makers as they manage the evolution of land markets, which are moving quickly and deeply into rural areas. The studies presented in this section also provide modeling options for more rigorous analysis of land markets.

A number of studies addressed the problem of agriculture expanding into forest resources, especially prompted by favourable crop prices. Soini (2005) uses photo image interpretation and fragmentation analysis of land on the slopes of Kilimanjaro since 1961 to assess land use changes. The results reveal expansion into marginal land down the slope and intrusion into reserved forest land up the slope. Land fragmentation has led to farm intensification; but farming is under threat as a livelihood option because non-agricultural activities are assuming an increasingly important role consistent as farmers respond to diverse livelihood options and climate change. Bryceson (1996) calls such processes the de-agrarianization. However, many households face entry barriers into attractive non-farming activities that require more capital, knowledge, and skills. From a gender perspective, Dzodzi (2003) discusses the marginalization of women and their land rights prior to and following the passage of the revised land laws in 1999 (also presented below under labour markets). These issues require policy guidance as Tanzania heads towards more individualized land rights.

Recent government efforts in Tanzania towards the large scale titling and individualization of land are represented by the Property and Business Formalization Program, more commonly known by its Kiswahili acronym, MKURABITA. Ongoing efforts by NGOs and the government in selected regions (e.g., by CONCERN in Iringa and Mtwara) are also providing impetus towards formalizing customary land rights through titling. Such programs present initial ground for research. Previous land registration and titling initiatives, as in the case of the Land Management Programme (LAMP) in the Manyara and Singida districts, is another area for future research. Did such programs provide positive returns on investment?

Some research questions in relation to land grabbing and biofuels production include the following: What are the long term strategic issues and institutions for biofuel production? What is the long-term potential contribution of smallholders and communities to broad-based African development of large scale versus small scale biofuel production? Another area of concern relates to the ongoing and escalating conflicts between pastoralists and crop farmers. The dual land tenure system is prone to overlapping land rights, as demonstrated by Deininger and Ali (2008) in the case of Uganda, which fuels such conflict. As land markets continue to evolve, policy research can use the experience of other countries and institutional economic models to propose strategies for minimizing such conflicts.

Labour

Mduma and Wobst (2005) use household models and regression analysis to examine factors that determine rural labour supply in Tanzania. They establish that the educational level, land availability, and access to economic services and credit are the most important factors for a household to supply labour to the market. In a similar study using descriptive analysis for a labour market survey in Western Usambara, Mueller (2012) concludes that participation in rural labour markets is extensive because the rural poor cannot sustain their livelihoods as self-employed farmers. Mueller and other researchers recommend that any policy or strategy to reduce poverty must also focus on creating more and decent wage employment in rural areas.

Beegle (2003) investigates farm labour as it relates to gender and HIV/AIDS, exploring how prime age adult mortality affects the time allocation of household members. The study establishes that while some activities are temporarily scaled down following a male death,

households did not shift towards subsistence or reduce diversification. This finding however runs contrary to other studies that have linked HIV-related death of husbands or parents, to increased poverty and suffering of surviving family members. Wobst (2001) used a CGE model to find that the age structure of labour is shifting towards more child labour, implying that experience and human capital accumulation are declining due to HIV/AIDS. This calls for skill upgrading for a large segment of the rural population in order to achieve the intended rate of economic growth. When husbands die from AIDS or even when they migrate to urban areas to look for jobs, their widows or wives suffer from lack of cash and physical support around the house (Lugala, 1995).

Financial markets and resources

Financial services, credit in particular, is another topic that is addressed by many researchers. Massawe (1994) uses descriptive analysis to assess the performance of seasonal credit for borrowers of agricultural loans. The study concludes that credit programs have not reached poor farmers as intended. Moreover, the performance of the credit programs was below expected levels because the socio-economic conditions of borrowing households were ignored during the program design. Thus micro-finance assumes an important role for them as well as for other agricultural SMEs that engage in input provision, produce marketing, and processing. However, gender-blind provision of micro-credit causes substantial efficiency losses in society. The temporal implications of micro-finance are demonstrated by Islam (2011) in the case of Bangladesh. As more resources are directed to beneficiaries through micro-credit, policy research is necessary to optimize the use of credit.

Kimuyu (1999) examines credit obtained from micro-finance services for rural communities within coffee growing areas in Kenya and Tanzania. The study finds that a large number of households now participate in credit transactions through coffee marketing organizations, but they also engage in Rotating Savings and Credit Associations (ROSCAs). The study concludes that participation in such organizations is driven by consumption more than by investment needs. Piprek (2008) discusses linkages between formal and financial institutions using the case of the CRDB Bank in Tanzania, which was at the time the fifth largest bank in the country. Under corporate social responsibility, the bank took steps to link with SACCOS, supplying cost effective financial services to rural areas. Such efforts require willingness, commitment, and a long-term vision from the management of formal institutions. However, the government can encourage more banks to undertake similar initiatives through policy guidance and follow-up measures.

Foreign Direct Investment (FDI)

Foreign direct investment (FDI) has been an important source for investment in many countries. The academic literature on FDI inflows to agriculture in Tanzania is limited. A study by the Economic and Social Research Foundation (ESRF, 2008) noted that investment and financial support for agriculture by public financial institutions is currently low compared to that offered by other regional and global institutions. Moreover, Msuya (2008) indicate that such investments are generally directed at extractive industries and tourism, but these sectors have limited backward linkages compared to agriculture. In agriculture, most investments have gone into traditional cash crops instead of food crops. The government has set up incentive packages through tax holidays for economic processing zones (EPZ) and though privatization of public enterprises. Investments in agriculture have also been hampered by weak physical infrastructure (transportation, communication, and energy) and the low quality of labour. These are accentuated by deteriorating levels of education and health, and inadequate or missing back-up services for enterprises. Additional factors, which also exist in other African countries, are corruption, lack of access to global markets, lack of access to finance, high cost of doing business, excessive taxation, a weak tax regulatory framework, and policy uncertainty (Asiedu, 2003).

Nonetheless, in the recent past, there has been

evidence of more foreign investors showing interest in agriculture for large-scale production of food under the Southern Agricultural Growth Corridor of Tanzania (SAGCOT) and for the production of biofuels. Such large-scale investments have been controversial because of land grabbing and limited evidence on their effective to create jobs as promised. Several issues are still on the table for discussion; For instance; what will happen if investors withdraw following discovery of second-generation technologies for biofuel production, which do not require agricultural feed stock?" This and other related questions are relevant for future policy research.

Product Markets

Issues for field crops

Many studies address problems arising from market distortions caused by non-tariff barriers (NTB) and partial implementation of the reforms. Other researchers, however, attribute economic under-performance of the reforms to an extreme hands-off policy by the government during the reform period (1986–2000), despite evidence regarding the imperfect nature of local and global markets. Karugia *et al.* (2009) discuss distortions and welfare losses due to NTB in East Africa. They concluded that a 50% reduction in NTB would improve social welfare in the region, whereas eliminating the barriers and streamlining administration would lead to greater gains. Based on the experience of WTO and other trade organizations, studies have looked at NTB, identifying characteristics of successful approaches for reducing or eliminating such barriers, but little progress has been made. They recommend that raising awareness and improving transparency are necessary, along with subjecting all NTB to WTO-compliance review and establishing a system for settling disputes

Delgado *et al.* (2004) tests the assumption of tradability of major food staples over the period 1983–1998 using regression analysis of monthly market prices for major food crops. The study establishes that rice is largely a tradable good that is influenced by world prices. However, local rice prices are also correlated with domestic production because of the dominance of inland producing areas. This provides a high degree of natural protection against fluctuations in global prices. Meanwhile, maize behaves as a tradable good in well-connected markets and as a non-tradable good in isolated markets. These studies reiterate the importance of rural roads for enhancing market integration and recommend continuing market-mediated structural reforms until spatial marketing margins have been reduced to reasonable levels. Investment in road infrastructure for better integration of the maize market has been recommended.

However, other factors tend to reduce the positive impact of improved roads. In a study on malfunctioning commodity markets in Tanzania, Ole Gjolberg *et al.* (2004) establish that two markets only one hour apart and connected by a good tarmac road had price differentials that were persistently high for prolonged periods, which reflect malfunctioning commodity markets, attributed to inadequate market information. They recommend contractual arrangements to improve spatial information processing, such as forward pricing and improved warehousing. But, that contract farming is not yet a dominant form of business in Africa. This institutional arrangement requires much improvement before it could be applied widely. There are many forms of contract farming, but the capacity of smallholder farmers to participate in informed negotiations is limited. There are no clear guidelines on how contracts should be managed, and the role of Local Government Authorities (LGAs) in the process is not well articulated. They recommend capacity building in order for farmers to take up farming as a business through contract farming. Recent developments indicate that both the government and the private sector agree that in future, cotton farming should take place under contract farming to improve quality and returns to farmers. Can this framework (contract farming) be a catalyst for developing an agrarian capitalist system? This is subject to ex-ante empirical research verification in future research.

Using co-integration and Granger multiple causality analysis, Kilima (2006) found

insignificant effects of trade reforms due to partial transmission of price shocks from the world market. This is attributed to cumbersome export procedures, quantitative restriction, internal taxes, and intensity of competition, and contingency trade remedies. The study recommends reducing the monopoly power of marketing organizations along with regulations that distort commodity prices. It has been established that information asymmetry forced farmers to sell their farm produce at prices lower than they could fetch in the absence of tariffs. Using an ARCH model, Nyange and Wobst (2007) address the impact of the Strategic Grain Reserve (SGR) on maize price volatility. They concluded that SGR procurement increased maize price in the production area, but lowered prices when stocks were released. Hence, SGR support to producers is only temporary during procurement.

Since maize prices in Tanzania are also influenced by trade and production in the region, promoting food trade and regional food security could be more effective for enhancing producer and consumers' welfare. A study by Ihle *et al.* (2009) estimates the spatial price transmission between Kenya and Tanzania using a Markov-switching vector autoregressive (MS-VAR) model that provides greater flexibility in modelling regime-dependent time series behaviour. Similar flexibility is also provided by Butler and Moser (2010), who present a promising alternative to switching regime models and other methods of assessing market integration. They conclude that policy changes at the national level may not be sufficient to address region-specific impediments to market integration

This review includes other studies that discuss various aspects of product markets, such as inter-sector linkages, the rise and fall of agricultural liberalization, agricultural supply chain management, the role of infrastructure, market liberalization and integration of grain markets, distortions to agricultural incentives, performance of warehouse receipt system for rice, and food security. In very general terms, all studies in this review come to very similar conclusions and recommendations as follows: (i) as the government retreated from direct market operations, a vacuum was left that was not filled by the private sector; (ii) markets without government mediation lead to unfair practices and even worse, may lead to market failure, (iii) government interventions in markets led to welfare losses for producers and consumers, (iv) the role and importance of non-farm employment is increasing in farming communities, and (v) investment in infrastructure is key in reducing marketing cost and improving market access, especially in remote areas.

Proposed agenda and themes for agricultural policy research

The review of published and unpublished studies discussed in this review clearly shows that there are many gaps that require agriculture policy research in order to inform and guide decision making and resource allocation. Under factor markets, research gaps have been identified in relation to subsidies, particularly the institutional framework for efficient administration of agricultural subsidies. Since any subsidy introduces inefficiency, the desire is to provide such subsidies at the lowest cost. The search for an institutional framework that achieves effective targeting and rationing has been difficult because of tendencies towards cheating, log-rolling, and other forms of market failure. Crowding out private sector service providers is also unhealthy for long-term development. Using institutional economic frameworks, policy research can be employed to compute welfare loss from current or proposed changes, identifying weak links and propose options to fix them.

Since subsidies inevitably introduce inefficiency, they should be time-constrained such that once objectives of introducing the subsidy has been achieved, then it would then be phased out. Another question is "What is the optimum time for agricultural subsidies to continue in the case of Tanzania?" Phasing out subsidies without strong research-based analysis would be difficult for both politicians and the public because subsidies are a political sacred cow. Politicians will always use the argument that

farmers in developed countries also receive substantial subsidies, which is true. It is up to policy research to demonstrate that for a poor country, such as Tanzania, the opportunity cost of resources allocated for subsidies is very high, which should emphasize the urgency for improving the administration and timing of subsidies. Understanding the equity impacts of subsidies is also important. For instance, political pressure has tended to advocate nation-wide administration of subsidies. For how long should regional targeting to high potential regions continue? While most studies on this topic have addressed subsidies for fertilizer and seed, in the case of Tanzania, substantial resources are allocated annually under DADPs as grants to support the development of irrigation infrastructure and for acquisition of farm tools (power tillers). At the national level, resources are allocated for research and extension. What are the returns from all these resources? The coordination of resource allocation between the public and private sectors also requires analysis to guide policy makers.

The fast evolution of land market dynamics is another area for policy research. Studies in Africa, particularly East Africa, clearly show that land titling alone does not enhance access to credit or increase investments in smallholder agriculture. However, in Tanzania, programs such as MKURABITA are implemented to secure landowner rights and to improve land owners' access to credit, and to attract more investments. The dual land tenure system in Tanzania is prone to overlapping land rights, which fuels conflicts. Lives and property are lost, and substantial resources are used for conflict resolutions. Under the East African Community (EAC), Tanzania has fought hard to keep land outside the agenda of the common market. However, land sales to the highest bidder are ongoing in many villages in Tanzania. Who is monitoring such sales, and what are the long-term implications for rural livelihoods? Does this trend represent unlocking a latent resource or is it a road to landless rural communities? Institutional research is also required to improve the efficiency of evolving land markets in order to avoid conflicts and minimize loss of property and life.

In the case of output markets, information gaps have been identified under trade and inter-sectoral linkages. In relation to trade, there is a need to devise institutional arrangements that minimize marketing inefficiency. Although research has demonstrated the negative effects of food export bans, policy makers require tangible alternatives to reverse this policy. Policy research can define and evaluate alternatives. In relation to trade, policy research can provide relevant information for improving Tanzania's position in WTO negotiations. Policy research can identify areas where there is room for Tanzania as a developing country to avoid costly actions or to leverage resources. Action policy-oriented research is also required to guide the transformation of extension services so that they adapt to the new focus towards value chain development. The role of non-farming income has been demonstrated to be an important and increasing role in rural areas. However, there are no policy studies to simulate the implications of this structural change in relation to agricultural labour, rural infrastructure, and rural services. Such simulation studies should relate to governmental plans for national transformation by 2025 via three five-year development plans.

Conclusion

The main objective of this study was to identify gaps from past policy research on Tanzania, while also drawing lessons based on experiences around the globe. From this review, many gaps have been identified for factor and product markets. Problems and issues, which have been addressed by existing agricultural policy research have been discussed, and the findings have been presented according to the prevailing political economy. The study establishes that there has been ongoing policy research to address pertinent problems and issues in Tanzania. These studies have been done by external and national researchers, and sometimes in collaboration. It would seem that most studies were driven by the researchers' interest to pursue a particular line of inquiry. There are cases, however, where researchers were commissioned to conduct specific studies

in order to provide guidance for policymaking. However, such studies tend to be sporadic, and their influence on agricultural policymaking could not be discerned. Moreover, most of these studies remain as gray literature, unpublished and often unused for policy making.

Under factor markets, the issues for which policy-oriented studies have been conducted include productivity improvement, and subsidies have captured the most attention. The most significant gaps identified concerns institutional problems that limit the efficiency and equity of subsidy delivery. Another area of concern is analyzing returns to investment in agricultural services, including research, extension, financial services, training, and others. The main gap in this regard is the paucity of studies that are specific to Tanzania. Considering the amount of resources currently directed at the district level, it is pertinent that such studies should be conducted periodically in order to guide resource allocation. Similar arguments can also be made for studies on financial markets, credit, labour, and foreign direct investment. The coverage on land tenure is somewhat wider, addressing issues that relate to the individualization of land tenure, land markets, and land conflicts, especially as they relate to the dual land tenure system existing in Tanzania. In the case of labour, studies on de-agrarianization and the feminization of agriculture are the most common issues at present; the growing population is likely to accelerate and even enhance such problems. Other inputs, including tools, equipment, and agrochemicals apart from fertilizer have been inadequately covered by policy research. In order to foster agricultural transformation as envisaged under the ASDP and the five-year development plan, policy researchers and others should in future identify information gaps that limit the optimal use of tools and equipment.

In product markets, the issues revolve around trade and marketing of agricultural products, inter-sectoral linkages, growth and poverty reduction. Here the main challenges which have captured the interest of policy researchers or their clients include the efficiency of trading agricultural produce, addressing the gap for services in agricultural output markets, the role of non-farming employment and income, and optimal investment in enabling infrastructure. There are very few studies on horticulture, and even fewer that are published. Some gaps in this area include non-trade barriers to entry, lack of clearly defined procedures and mechanisms to enforce them, and the lack of clear guidance and support mechanisms to evolve alternative institutional options for service delivery. For example, adopting contract farming and value chain development to fit within the DADP framework calls for action-research prior to wider up-scaling the strategies.

Based on the research gaps five themes are proposed to guide agricultural policy research in future. They include; (i) institution arrangements for efficient and equitable agricultural subsidy provision, (ii) returns to investments in public goods for agriculture (research, extension), (iii) the dynamics and facilitation for evolving land markets. These fall under factor markets. For product markets, the proposed themes include; (v) various aspects of trade, (vi) inter-sectoral linkages and structural change as well as other general studies, addressing how policy-research can impact and improve agricultural policy-making and outcomes. However, there appears to be a capacity gap in terms of analytical rigor and the ambition to publish policy-oriented studies to share with policy makers. Over 50% of the national or regional studies reviewed use methods that provided limited policy options for decision makers. This could be one reason that policy makers rarely seek assistance from policy researchers for information to help them to make various decisions. These findings force us to raise a number of critical questions. Does academic research play an important role in policymaking in Tanzania? The answer is generally negative. Focused group discussions with selected staff under the Department of Policy and Planning revealed that although their department has a mandate for policy analysis, in most cases they do not undertake such policy research. However, they are mainly responsible for coordinating policy research studies that are commissioned by the Ministry. They also

participate in the process of policy formulation and policy review. The study concludes that the studies reviewed here show little evidence that policymaking in Tanzania is informed by policy research. Alternatively stated, policy makers do not seek guidance from academic research to make decisions. Investigating this matter in Tanzania, it has been reported that there is low utilization of research output in Tanzania for policy decision making in the health, agriculture, and education sectors, attributing this lack to poor research policy.

Another related question is; "Do policy researchers provide practical solutions for policy makers?" there is a high tendency among local researchers to use descriptive analysis supported by tables, graphs, and figures. In contrast, foreign researchers tend to use quantitative analytical methods. In some cases the descriptive analyses lack analytical rigor to discern conclusive impacts of policy changes. Thus, policy makers might ignore them because the recommendations are too politically difficult to implement. This calls for capacity efforts to improve their analytical skills. Young researchers should be groomed to become policy educators by first developing clear and workable solutions to societal problems and then by looking for opportunities to communicate their findings to policy makers or other clients who are likely to use the results for policy engagement.

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