



Public Agricultural Spending and Growth in Ghana: Spending More, Smarter

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BACKGROUND

In 2014, African heads of state reaffirmed their commitment to the Comprehensive African Agricultural Development Program (CAADP) through the adoption of the Malabo Declaration (AU 2014). The declaration included commitments to reduce hunger and poverty, boost intra-regional trade, enhance resilience to climate variability, and, in line with the Maputo Declaration a decade earlier, to continue allocating to agriculture at least 10 percent of government expenditure.

Despite this long-standing spending commitment, Ghana's agricultural budget share has remained well below 10 percent during the last decade. Depending on accounting principles followed, estimates range from 1 to 2 percent (CAGD 2016), 2 to 4 percent (FAO 2014) or 6 to 8 percent (MoFA 2017a). Given strong evidence that agricultural spending in developing countries yields significant returns (Mogues et al. 2015), Ghana's relatively weak agricultural performance during the period from 2007 to 2017 may be linked to low levels of spending. At 4.3 percent per annum, agricultural GDP growth has only been half that realized in the non-agricultural sectors (MoF 2018). This weak agricultural growth has also not benefited the poor. Rural poverty has increased in recent years, especially in northern Ghana (GSS 2018).

While budgetary allocations to agriculture matter, the quality of spending is as important (Akroyd and Smith 2007). In this regard, concerns have been raised about the decline in allocations to agricultural research, knowledge transfer, and infrastructure in favor of spending on routine operations (FAO 2014; World Bank 2017). Ideally, sector budgets should maintain a healthy balance between investments in a sector's capacity to grow, e.g., infrastructure or farmers' knowledge, and expenditures that are fully consumed in the same period, e.g., operational expenses or subsidies (Benin & Tiburcio 2018; Mogues et al. 2015).

Following Ghana's unfavorable assessment in the African Agricultural Transformation Scorecard (AATS),

which was launched by the African Union (AU) in 2018, and in light of policy developments, budgetary trends, and socioeconomic outcomes, Ghana's development partners called for an increase in funding allocated to the agriculture sector at the national Joint Sector Review for Agriculture in June 2019. They further called for improvements in the effectiveness of agricultural spending, with the distortionary effects of large-scale subsidy programs highlighted as a specific concern.

A recent study led by IFPRI's Ghana Strategy Support Program (GSSP) and FAO's Monitoring and Analyzing Food and Agricultural Policies (MAFAP) project considers these issues further (Aragie et al. 2019). Specifically, using an economywide model of the Ghanaian economy, the researchers examined how changes in the level and composition of public agricultural expenditure affect socioeconomic outcomes in the short and medium term in Ghana. This note highlights selected key study findings.¹

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AGRICULTURE AT THE CENTER

In recognition of the development challenges that plague rural Ghana, the current government has identified agricultural development as the backbone of its development strategy (McDonnell 2018). Substantial financial commitments have been made through key policy interventions such as Planting for Food and Jobs (PFJ) and the Infrastructure for Poverty Eradication Program (IPEP). PFJ provides productivity-enhancing input subsidies and improved extension services to farmers, supports agro-processing activities, and aims to create jobs in, *inter alia*, maize, rice, soybean, sorghum, cassava, and vegetable value chains over the period from 2017 to 2021 (MoFA 2017b). IPEP, in turn,

¹ This Policy Note is a synopsis of IFPRI Discussion Paper 01852 "[Strategic Public Spending: Scenarios and Lessons for Ghana.](#)"

addresses the infrastructure investment deficit—estimated at around US\$30 billion (MoF 2018)—in areas such as transport, water and sanitation, and energy.

Alongside other initiatives such as One-District-One-Factory (1D1F), Planting for Export and Rural Development (PERD), and Rearing for Food and Jobs (RFJ), the current portfolio of agriculture-specific or agriculture-supportive policies present a holistic, broad-based, decentralized, and agriculture-led development vision for Ghana. However, these are ambitious programs in terms of their scope and funding requirements. Budget constraints may ultimately require prioritization of some activities or investments over others, which may have important implications for outcomes. Aragie et al. demonstrate this using extension services and input subsidies as case studies.

MODEL AND SIMULATION DESIGN

The research involved calibrating a recursive-dynamic Computable General Equilibrium (CGE) model customized for rural investment and policy analysis to a 2015 Social Accounting Matrix (SAM) for Ghana. The model includes a separate investment module which translates public agricultural expenditure into agricultural productivity changes. This transforms the generic CGE framework from one where agricultural productivity changes are modeled as exogenous shocks to one where productivity changes are endogenously linked to the level and composition of the budget.

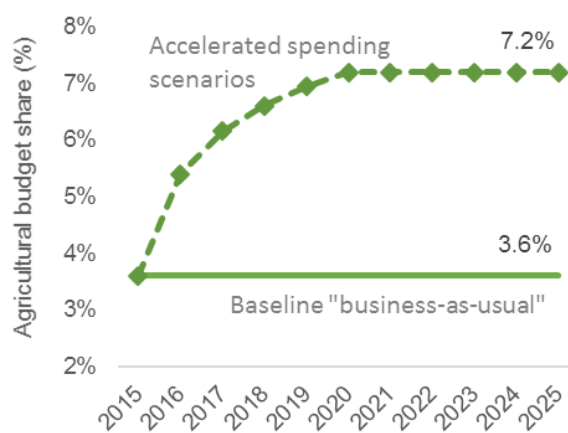
The investment module is calibrated with program evaluation data and information on government program costs. Importantly, the module assumes that different types of spending, e.g., on rural roads, research, extension services, or input subsidies, affect agricultural subsectors differently and have different returns to investments. This permits evaluation of complementarities and trade-offs between different levels and types of spending. The general equilibrium framework further allows for the analysis of both direct and indirect (spillover) effects, as well as financing considerations for alternative spending regimes.

Several scenarios are explored. A baseline scenario assumes a “business-as-usual” development trajectory under the existing set of policies and spending trajectories. This means the agricultural budget share remains constant at 3.6 percent over the 2015 to 2025 simulation period (Figure 1) and there is almost no change in the budget allocation across extension services, input subsidies, and other areas of investment (Figure 2). Since the agricultural budget continues to grow as it has in recent years, it almost doubles from around GHC 590 million to GHC 1.1 billion by 2025.

Two hypothetical “accelerated agricultural spending scenarios” are then modeled for comparison against the baseline. In these, additional funding is allocated to the agricultural sector and financed

through government borrowing, such that the agricultural budget share doubles to 7.2 percent within five years and remains constant thereafter (Figure 1). Under an “extension scenario”, half of the increase in the agricultural budget is allocated to extension services, while the other half is allocated to remaining expenditure categories using baseline shares. Similarly, under a “subsidy scenario,” half of the increase in the agricultural budget is allocated to input subsidies.

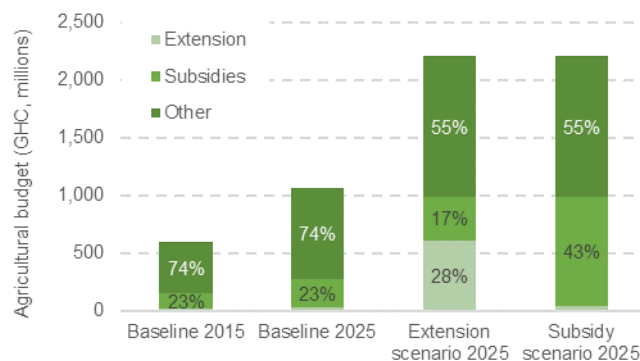
Figure 1. Simulated agricultural budget share



Source: Adapted from Aragie et al. (2019)

By design, the two accelerated spending scenarios are similar in terms of overall budget envelope—the budget grows to GHC 2.2 billion by 2025—but distinct in terms of their evolving budget compositions and coverage rates. Under the extension scenario, 28 percent of the budget is allocated to extension services by 2025, compared to only 3 percent in the baseline scenario (Figure 2). This leads to an almost six-fold increase in the share of households receiving extension services during the 2015 to 2025 period. Likewise, under the subsidy scenario, the allocation to input subsidies reaches 43 percent by 2025 compared to 23 percent in the baseline. This is associated with a four-fold increase in the cropped area that benefits from the supply of subsidized farm inputs.

Figure 2. Simulated agricultural budget composition



Source: Adapted from Aragie et al. (2019)

KEY RESULTS

Agricultural GDP in the baseline scenario continues to grow as it has in recent years, averaging 3.5 percent per

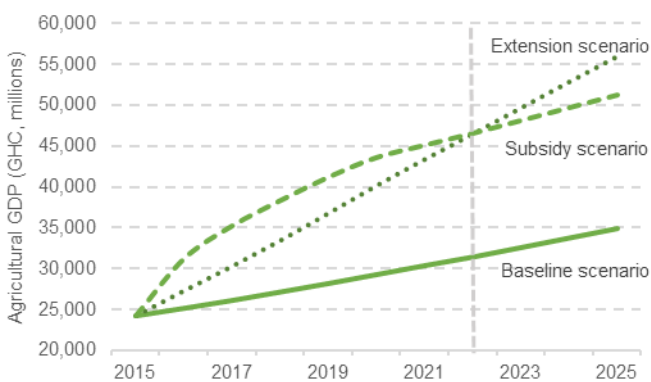
annum between 2015 and 2025. In contrast, accelerated agricultural spending raises agricultural GDP growth to 8.6 percent in the extension scenario and 7.6 percent in the subsidy scenario over the same period. Thus, for a given budget, the extension-oriented scenario outperforms the input subsidy-oriented scenario. However, this result varies by sub-period

The extension scenario starts yielding superior outcomes in terms of agricultural GDP roughly six years into the program.

(Figure 4). Between 2015 and 2020 when the agricultural budget expands rapidly, the subsidy scenario is associated with higher agricultural GDP and average annual growth

compared to the extension scenario (12.4 versus 10.5 percent). However, thereafter, agricultural growth under the subsidy scenario slows significantly as budget constraints prevent continued rapid expansion in the subsidy coverage rate. In the later years of the study period, the extension scenario outperforms the subsidy scenario (6.7 versus 3.1 percent). The extension scenario starts yielding superior outcomes in terms of agricultural GDP roughly 6 years into the program.

Figure 4. Agricultural GDP levels



Source: Adapted from Aragie et al. (2019)

National GDP (at market prices) expands at 5.6 percent per annum in the baseline scenario. This accelerates to 6.4 and 6.3 percent in the extension and subsidy scenarios, respectively, thus mirroring the results for agricultural GDP. Structurally, growth in the components of GDP, e.g., consumption, investment, or government expenditure, are not markedly different in the two sub-periods in the baseline. However, there are differences in the level and structure of growth in the two sub-periods under the accelerated growth scenarios. For example, private consumption growth under the subsidy scenario exceeds that under the extension scenario during the 2015 to 2020 period (7.1 versus 6.6 percent), but the extension scenario performs better during the 2021 to 2025 period (private consumption growth of 6.1 versus 5.0 percent).

As direct beneficiaries of agricultural policies, rural farm households gain more from accelerated spending in agriculture than do rural non-farm households, with

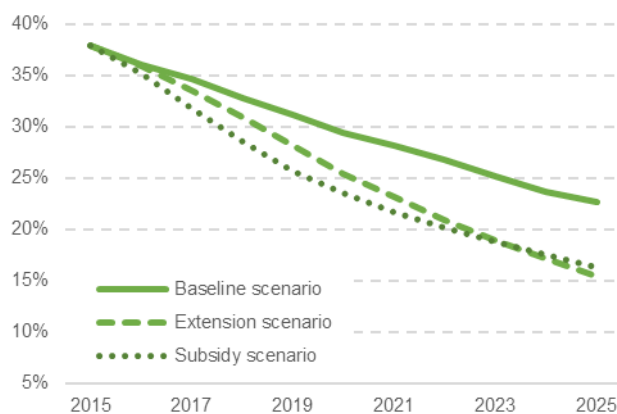
income gains of 4.2 percent in the extension scenario and 4.0 percent in the subsidy scenario. However, even greater income gains are enjoyed by poor urban households, who see their real incomes rise 4.6 and 4.2 percent in the extension and subsidy scenarios, respectively. This is because food prices decline substantially when agricultural productivity increases. Whereas lower prices may have mixed effects for farm households who are both producers and consumers of food, it holds significant benefits to urban poor households who spend much of their income on food. As with earlier results, income gains among poor rural and (especially) urban households are higher under the subsidy scenario compared to the extension scenario initially (2015 to 2020), but not later (2021 to 2025).

The household income results suggest that targeted agricultural interventions remain an effective measure for reducing poverty in both rural and urban settings. Figure 5 plots changes in rural poverty. Even under the baseline scenario,

Targeted agricultural interventions remain an effective measure for reducing poverty, both in rural farm and poor urban settings.

where GDP grows at 5.6 percent against a population growth rate of 2.3 percent, Ghana can anticipate rural poverty to decline from 38 percent in 2015 to 23 percent in 2025. However, the pace at which poverty falls increases under the accelerated spending scenarios, with rural poverty rates falling to 17 and 18 percent in the extension and subsidy scenarios, respectively. The rate of poverty reduction is higher under the subsidy scenario during the 2015 to 2020 period, but not during the 2021 to 2025 period.

Figure 5. Rural poverty headcount rate



Source: Adapted from Aragie et al. (2019)

DISCUSSION AND CONCLUDING REMARKS

The results highlight a common sustainability challenge of subsidy programs. Output growth under smallholder input subsidy programs is primarily associated with new beneficiaries being brought into the program and being converted from low-yield producers using traditional inputs to high-yield producers using modern

(subsidized) inputs. When budget constraints prevent continued expansion of subsidy coverage, existing beneficiaries will still be able to maintain high crop yields through continued access to modern inputs, but there will be no further growth in their yields or output. Since no new beneficiaries are added, there will be no further growth originating from the conversion of additional low-yield farmers into high-yield ones.

Under the extension scenario, farming knowledge does not deteriorate quickly and the cost of maintaining or building on existing knowledge is relatively low. This leaves a greater share of public resources under this scenario to expand coverage and reach new beneficiaries, even when the budget is constrained. This results in the extension scenario being more sustainable than the subsidy scenario in the longer run.

These results do not suggest that subsidy programs should be abandoned; on the contrary, there are many arguments in their favor. They represent a useful tool for rapidly raising yields and boosting growth, especially in settings where input use is low, and households are resource-constrained. However, more emphasis is needed on increasing the sustainability of these programs. For example, returns to fertilizer subsidies can be increased by helping farmers raise fertilizer use efficiency, e.g., through extension services focused on improving soil fertility or promotion of modern seed use; or through efforts made to ensure that farmers continue using fertilizer when they graduate from the program. However, subsidy programs should also not come at the expense of other important investments,

such as in extension, research, or rural infrastructure, all of which tend to provide more sustainable returns in the longer term. The ideal is to have a balanced public agricultural investment portfolio.

In summary, Aragie et al. demonstrate how economywide modeling frameworks can provide a complete and consistent method for planning and analyzing complex policy interventions. Their results show that it is not only the level of agricultural spending that matters, but also the composition of spending. Policymakers, when faced with budget constraints, must acknowledge trade-offs and be aware of the implications of their

Economywide models are suited to analysis of complex policy interventions. This research demonstrates that both the level and composition of agricultural spending matter.

policy prioritization decisions. More generally, policies and investment plans should move from long “wish lists” to strategic documents that identify priorities within a reasonable budget envelope.

The analysis by Aragie et al. can certainly be improved. Better information from agricultural budgets, program costs, and impact evaluations will help refine the investment module. Also, assumptions about policy design and impact channels can be refined. In this regard, additional modeling of input subsidies provided through the Planting for Food and Jobs (PFJ) initiative will be particularly useful to these debates.

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