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POLICY BRIEF:

System-Wide Approaches to Promote Sustainable Agri-Food System Productivity Growth in Africa

Based on the Vuna report "Integrating climate- and market-smartness into strategies for sustainable productivity growth of African agri-food systems" by Michigan State University authors Nicholas J. Sitko and Thom S. Jayne, June 2017.

Key Points from report

Soil degradation is seriously impeding agricultural growth and resilience to climate variability

Land degradation is a massive and growing problem associated with rising rural population densities and land pressures. Degraded land is less productive, less responsive to fertilizer, and more vulnerable to climate shocks. Reversing land degradation trends will require innovative strategies to produce and distribute organic matter at scale to smallholder farming areas.

Public support for agricultural R&D and bi-directional extension reform is essential for agricultural growth in the context of climate change

While past investments in public R&D and extension programs in Africa have produced mixed results, the region is unlikely to achieve sustainable agricultural intensification without substantially greater public resources devoted to such activities, though they will need to perform more effectively than in the past.

A holistic approach to sustainable agricultural intensification will include policies to provide incentives for farmers to intensify:

Facilitating secure land rental markets will encourage farmers, especially women farmers, to make long-term investments on their land. The removal of export bans, checkpoint taxes, and other regional trade barriers will support also support investments in sustainable farm productivity.

Introduction

African food systems are changing rapidly in response to rapid population growth and urbanisation. Agricultural strategies and policies would be more effective if they anticipate the effects of these forces, rather than simply react to them. A proactive approach is particularly important for policies intended to promote climate-smart and resilient food systems.

The Sustainable Productivity of Agri-food systems framework (SPA) is designed to provide policy-makers with tools for anticipating how agri-food systems are changing, and the implications of this for climate change policy. This framework draws together concepts from the dominant development paradigms currently guiding agriculture and climate change policy, namely "climate smart agriculture" (CSA) and "market smart development" (MS) into a forward looking model that is attentive to the opportunities and constraints created by Africa's rapidly changing populations and economies.

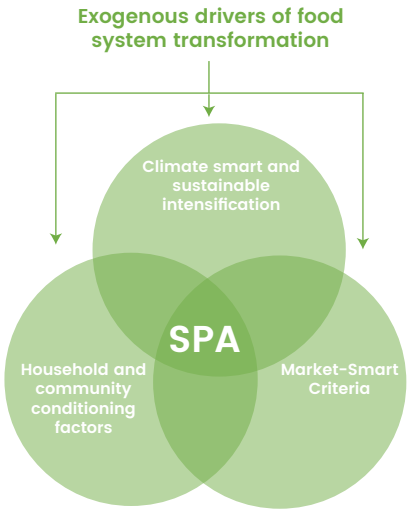

Figure 1: SPA Framework

As shown in Figure 1, the SPA framework draws attention to the intersection of (i) CSA practices on farm and the system-wide incentives needed to encourage them; (ii) policies and programs that support well-functioning markets that farmers and food system actors can rely on during times of climate stress; and (iii) household and community conditioning factors that influence adoption of farm-level CSA practices or engagement with markets. These include land size, family size, income level, soil quality, and market access conditions. For example, households with very limited land may feel unable to fallow their land or plant cover crops if it prevents them from growing sufficient staple food to feed their families. Finally, the SPA framework draws particular attention to the ways in which these three elements will evolve as African populations grow and become more urban.

An intervention meets the criteria of the SPA framework when it: 1) contributes to long-term productivity growth and stability of the entire agri-food system; 2) strengthens the operation of markets and opens up new opportunities for investment by farmers and others in the agri-food system; and 3) criteria 1 and 2 hold for a sufficient number of households or farmland area to have a meaningful impact on the agri-food system.

Soil degradation and the social trap

Maintaining soil fertility and reversing land degradation are major challenges that African policy makers must contend to sustainably enhance agri-food system productivity and climate resilience, especially in the regions increasingly densely populated rural areas.

Almost 25% of Africa's rural population currently resides on land that is categorised as "degrading". Between 2000 and 2010, the number of rural Africans living on degrading agricultural land (DAL) increased from 114 million to 157 million people – a 35% increase. The major increase in populations on DAL is highly correlated with rural population density.

The relationship between land degradation and population density in rural Africa reflects a "social trap" that millions of small-scale African farmers find themselves in. For many low-income African farmers, decisions about the allocation of land, labour, and capital are made in the context of meeting immediate food and livelihoods needs. These rational decisions, however, often prevent them from making long-term investments in their farm that would maintain soil fertility over time.

As soil quality declines, it becomes less productive and increasingly vulnerable to climate shocks, because degraded soils lack sufficient soil organic matter to retain moisture and become less responsive to inorganic fertilisers.

Breaking the social trap is, therefore, of paramount importance for making African agri-food systems productive and resilient in the context of climate change. As the effects of rapid population growth and urbanisation continue to unfold, the menu of activities and actions currently being promoted as 'climate smart' will be increasingly insufficient or unprofitable for farmers to adopt unless serious efforts to restore soil quality across tens of millions of hectares of agricultural land are initiated.

How will changing demographic and socio-economic conditions in Africa affect the agri-food system?

Population growth and its effect on labour prices:
Anticipating the direction of labour price movements relative to land and capital can help agricultural research and extension systems identify the sorts of farm and soil management practices that are likely to be adopted. In regions where non-farm opportunities bid up labour prices, including peri-urban agricultural regions, labour intensive practices that are often promoted as climate smart, such as basin digging or some soil erosion controls, are unlikely to gain much traction.

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Population growth and land prices:
Rapid population growth has increased the demand for finite arable land and raised land prices, especially in high-potential areas close to cities with good access to markets. As a consequence of shifting factor prices, farming patterns will likely become more capital intensive in favourable agricultural areas.

Growth of medium-scale farms:
While small-scale farms will continue to be an important source of food, the livelihoods of small-scale farmers are likely to become increasingly diversified and reliant on non-farm income sources. At the same time, agricultural surpluses, particularly for low value staple grains, and incomes are becoming progressively more concentrated on larger farms. Agri-food system resilience will, therefore, become more a function of the performance of markets for land, labour, and finance, and income growth in the off-farm sectors of African economies. Although self-provisioning of food for consumption is likely to remain important for millions of rural farm households, the labour force in most African countries is rapidly diversifying into off-farm income earning activities, which are nevertheless highly influenced by agricultural productivity growth.

Increasingly scarce energy and water:
As Africa's population booms, the pressure on Africa's water and energy resources will intensify further. As of 2004, 76% of all people living in Africa relied on biomass for cooking fuel. Without considerable improvements in energy availability and generation, the effects of widespread deforestation on African carbon emissions is likely to off-set any climate-smart improvements achieved through changes in farming practices.

How can policy-makers and development partners respond?

The SPA framework suggests that addressing the challenges posed to African agri-food systems by climate change requires greater focus on the interplay between farm level decision-making and system-wide incentives. To this end we identify five recommended policy actions:

Substantially increase investments in public agricultural research and participatory extension services:
Increasingly, the binding constraint to achieving sustained productivity growth is an inability to provide farmers with "best practices" that can be sustainably adopted given low-income farmers' resource constraints. Building African R&D capacity requires sustained investments in people, facilities, lab equipment, budgets for field trials, and other recurrent costs. Because the benefits of most agricultural R&D investments accrue broadly and cannot be captured by firms investing in them, there is a strong role for sustained support for public R&D.

Yet, spending on R&D alone is likely insufficient to have a meaningful impact on productivity outcomes. Extension systems also need to be reformed. To cope with the socio-economic and agro-ecological diversity of farm systems in Africa, R&D must be integrated with a participatory extension model that enables a bi-directional flow of information out to farmers and back into agricultural research stations about how farmers are and are not adapting new technologies and practices to fit their circumstances.

Connect the power of sound macro-economic management to climate-smart programs:
Macro-economic stability and low inflation levels are essential for pushing down commercial lending rates and encouraging private investment of all types, including farmer adoption of cash inputs and practices. Investments in farm intensification are critical for increasing market volumes and improving input and output market performance. Improved market performance in turn raises farmers' incentives to adopt climate-smart technologies and practices, in a virtuous cycle. Market smartness implies a sound enabling environment, both for macro and sectoral policies.
For millions of very small farm households, job growth in the non-farm economy are likely to be of even greater importance. As the non-farm economy grows, wage opportunities are created. As non-farm wages rise, low-income farm households can progressively diversify their activities into more remunerative non-farm livelihoods that tend to provide more effective protection from climate vagaries than subsistence agriculture. Even most informal sector non-farm jobs tend to provide greater returns to labour than small-scale semi-subsistence farming. For many farmers faced with limited land access and increasingly degraded and unproductive soils, diversification into off-farm jobs has been shown to be the most likely path out of poverty.

Use subsidies to support the development of markets for organic matter:
Rising evidence suggests that increased levels of organic matter will help farmers to use mineral fertilisers more efficiently, profitably and sustainably. Current crop response to fertilisers on smallholder plots is often constrained by soil problems that can be relieved by organic composting, liming and other soil amendment inputs. Therefore, governments can consider using subsidies to develop markets for the harvesting and manufacture of organic composts from tree farming and from urban areas (e.g., livestock production yards, sawdust from mills, food wastes from urban markets) to be supplied to farmers either through commercial markets or through input subsidy programmes.

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Composting industries are not widely developed in Africa, hence public subsidy programmes would need to both induce demand from farmers and create incentives for industries to develop organic matter supply chains. Closing the loops between food production and consumption through innovative subsidies will be of increasing importance for sustainable productivity growth as population expansion places mounting pressure on resource availability.

Develop policy frameworks to legitimise emergent land rental markets:
Despite a lack of policy support, rural land markets in Africa are developing organically in response to population pressures. Evidence on these markets suggest that the outcomes are largely beneficial from both a welfare and efficiency standpoint. Land markets provide capital for households to exit unprofitable farming and enter the non-farm economy. This is critical for limiting destitution migration. For households that remain in farming, land securitisation formalisation provides incentives to intensify agricultural production through tenure security. However, because of their often clandestine nature, participation in land markets imposes unnecessary transactions costs on participants. Moreover, land tenure systems that create uncertainty about personal property rights reduce the degree of long-term soil-augmenting investments made on such land.
Ministries of Agriculture and Land may consider promoting the functioning of agricultural land rentals. Functional rental markets can encourage longer-term leases of land, which can limit incentives for short-term soil mining by renters, while providing income to those renting out land, who are often poor households devoting most of their labour to off-farm activities.

Improve labour market flexibility and foreign direct investment policies, coupled with a social safety net fund:
Labour market policies can profoundly influence the capacity of agri-food systems to achieve SPA outcomes. Improving the capacity of labour markets to respond to natural disasters and to incentivise more sustainable land use is a matter of improving labour market flexibility and capital entry and exit. Yet labour market flexibility brings with it risks of widespread unemployment during periods of economic decline. Social safety net funds could be considered in tandem with labour market and foreign direct investment policy reforms. In many countries, these funds can be developed using tax revenue on major commodity exports, such as copper, gold, or natural gas. These funds would be built up during years of high prices and solid economic performance and drawn down through cash transfers during period of economic decline.

Staple food market policy reform:
Throughout the region, government staple food policies elevate the returns to the production of staple cereals compared to legumes and pulses. This has three important implications. First, the relatively low returns to legumes and pulses restrict the income of farmers who practice rotations. Second, when grown in mono-crop, staple cereals tend to expose large areas of soil surface to erosion, contributing to rapid erosion. Finally, for food deficit rural households, policies that push up staple food prices affect them as consumers rather than producers. Shifting the policy focus to support the cultivation of crops that raise soil fertility, such as bushy legumes is important to change the incentives to adopt these crops.

Conclusions

The enormity of the challenges to achieving productive, climate-smart and resilient food systems in the context of rapid population growth and climate change, and the importance of collective action to address them, underscores the pivotal role of effective public sector actions. Effectively addressing these challenges will come from a combination of approaches that provide the incentives for low-resource farmers to make long-term soil fertility-augmenting investments. This will come from more effective public investments that enable farmers to identify best practices under the wide range of micro-environments in the region and from more effective policies and programs that change incentives and opportunities at other stages of the system.

Acknowledgement

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