

## COMMENTARY

### RESEARCH CHALLENGES IN AGRICULTURE AND RURAL DEVELOPMENT IN KENYA

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## Research challenges in Agriculture and Rural Development in Kenya

Agriculture contributes about one third (33%) of the total economic output and provides the bulk of employment opportunities (60%) in most African countries where the majority of the total population (70-80%) live in the rural areas [1]. These agricultural communities engage in activities linked to various crops, livestock, fisheries and forestry as a way of life. Therefore, agriculture is not only important for economic growth, but is also a major determinant of both inclusive and equitable development. Its development is fundamental to reducing poverty and hunger. However, there are many factors working against increased agricultural production in many developing countries. Within the different countries, there are challenges linked to inadequate budgetary allocations to agriculture, infrastructural bottlenecks (for example, poor transportation networks, limited and unreliable energy supplies, poorly developed water distribution systems, inadequate storage facilities and so on), inappropriate legal and policy framework, slow uptake of agricultural technologies (hence low productivity), and (more recently) climate change issues [2].

In addition, there are external challenges to agricultural growth in many developing countries. For example, international trade agreements such as the Agreement on Agriculture (AoA) under World Trade Organization (WTO) appears to favour farmers in developed countries through public budget support, for example, in form of production and export subsidies [3]. Domestic support to agricultural producers in the developed countries depresses world agricultural commodity prices thereby outcompeting producers from developing countries. Agricultural production is also under the new threat, global warming, and many farmers particularly in many developing countries are already unable to cope. The changing dietary and culinary preferences that tend to assume increasingly western diets in many developing countries is another cause of concern, especially in reinforcing fiscal hardships to support expanding rather untenable food import bills.

In sub-Saharan Africa (SSA), about 265 million people (32% of the population) suffer from chronic hunger and over 70% of the Africa's extremely poor and undernourished population largely live in the rural areas. Furthermore, about 100 million people were added to the global list of the chronically hungry as a result of the (2007/2008) economic crisis that was characterized by high food and fuel price spikes [4]. In Kenya, for example, over 43% of the population is food insecure and 46% (majority dwells in the rural areas) live below the absolute poverty line (two dollars per day) [5].

Further, less than 20% of land is suitable for agriculture yet an estimated 80% of Kenya's 42 million people derive their livelihood from agriculture. Agriculture accounts for about two thirds (65%) of Kenya's total exports and provides a huge share (70%) of informal employment in the rural areas. The horticultural sub-sector contributes 33% of the agricultural total output and 38% of export earnings, followed by the tea industry [6].

Between 1960 and 1980, Kenya's agricultural sector growth averaged 6% and was allocated about 13% of the national budget. This was in recognition of the crucial

importance of agriculture as a leading sector in poverty reduction and employment creation, especially in rural areas and in promoting food security. The agricultural sector needs to grow at an average rate of 7% per year. The major challenges facing the agricultural sector include: (i) low productivity of many crops; (ii) under-exploited land for agricultural production; (iii) markets that are affected by inefficient supply chains; and (iv) low levels of value addition [2].

Research can play a leading role in tackling these challenges. Increasing agricultural productivity and food security will require new and improved technologies and their broad adoption by farmers. Research institutions and universities are the main channels through which these productivity-enhancing developments will occur. Specifically, research should be directed at increasing the productivity of systems for such commodities as crops, livestock and fisheries. In addition, research can be directed towards enhancing the efficiency and effectiveness of markets and related institutions. Also important is value addition of agricultural produce including, but not limited to, post-harvest processing, storage and natural resource management and utilization. Agricultural productivity is particularly threatened by climate variability. Adaptive research could immensely help farmers to overcome the new challenges posed by climate change.

After a decade of stagnation during the 1990s, investments and human resource capacity in public agricultural R&D averaged more than 20 percent growth in SSA during 2001–2008. In 2008, the region spent US\$ 1.7 billion on agricultural R&D (in 2005 purchasing power parity dollars) or US\$ 0.8 billion (in 2005 constant US dollars) and employed more than 12,000 full-time equivalent (FTE) agricultural researchers. Kenya was ranked 3<sup>rd</sup> in sub-Saharan Africa in terms of Agricultural R&D spending levels and 4<sup>th</sup> in terms of staffing - behind South Africa, Nigeria and Ethiopia [7].

The 2003 Maputo Declaration required that all African Union (AU) member countries increase agricultural investments to at least 10% of their national budget. To gauge the progress toward this target, the Comprehensive Africa Agricultural Development Programme (CAADP) under the New Partnership for Africa's Development (NEPAD) agreed to monitor agricultural expenditures, setting a 6% yearly target for growth in agriculture in countries where agriculture plays a dominant role [8]. Increasing budgetary allocation as well as its absorption capacity in the agricultural sector in Kenya is still a troubling concern.

Agricultural research in Kenya is mainly carried out by Kenya Agricultural Research Institute (KARI) established through an act of parliament in 1986 to promote the pursuit of food security through improved productivity and environmental conservation. KARI conducts research on food crops, mainly cereals and legumes and to a lesser extent on horticultural and industrial crops, livestock and range management, land and water management, and socio-economics. KARI is mandated to carry out research in most agricultural disciplines and commodities except forestry (responsibility of Kenya Forestry Research Institute (KEFRI)) and fisheries (responsibility of Kenya Marine and Fisheries Research Institute [KEMFRI]). Tea and coffee research are, respectively, undertaken by the Kenya Tea Research Foundation

(KTRF) and Coffee Research Foundation (CRF) while research on sugar is carried out by Kenya Sugar Research Foundation (KESREF). There are also a number of academic institutions with small research capacities and limited mandates. The Kenya Institute for Public Policy Research and Analysis (KIPPRA) and Tegemeo Institute of Egerton University also conduct research into policy related to the agricultural sector. However, public policy research on agriculture requires to be improved. Nonetheless, KARI accounts for roughly half of the researchers and spending on agricultural R&D in Kenya while the other government agencies account for about a quarter of total public agricultural R&D expenditures and capacity. Even so, continued advanced training in the agricultural sector should remain a priority especially in new frontier areas such as value chain analysis, international trade, biotechnology and natural resource management given threats such as climate change.

The private sector, mostly multinational companies, is also involved in agricultural research. Examples are Del Monte Company (pineapples); and Brooke Bond (tea) all running their own agricultural research programmes. Major national companies engaging in agricultural research include East African Breweries Ltd (EABL) for barley and sorghum; Kenya Seed Company which produces different types of seeds mainly cereals, pastures and vegetables. Though not directly undertaking agricultural research, Agricultural Development Corporation (ADC) supports research through production and supply of quality seed, technological transfers and training in sustainable and affordable manner.

From the foregoing, as expected the private sector research is usually for commercial purposes and not for subsistence food production. As the country embraces more innovative ways of transforming its agricultural sector to be more commercially oriented, more research will be required for value chain management including identifying and addressing systemic inefficiencies and improving post-harvest handling in order to reduce or eliminate food insecurity. There is need to re-orient agricultural R&D towards increased food production to reduce food insecurity, alleviate the high cost of living and for exports [9].

Societies are dynamic and diverse. There are always unobservable changes in the way individuals (and their plurality – families and communities) respond to the different social and economic challenges and opportunities. Farmers and traders will abandon less profitable enterprises for more promising opportunities (whether on- or off-farm). This includes understanding emerging crops and livestock. Furthermore, there is need to understand the aspirations of the youth and their perceptions about the future of agriculture. The youth do not want to be told what to do but they could be guided through systems of incentives to decide which agricultural activities to engage in. This is where research can contribute. Moreover, there is need for research that is trans-boundary in order to provide insights into what is happening at regional and international levels. Such research could inform debate about competitiveness, technology choices and policy making. However, more research capacity (training and retaining, finance, other support infrastructure) is needed for this to occur and to be sustained.

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