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**Development in Africa and Agricultural Innovation**

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**Juma, Calestous. (2011). *The New Harvest: Agricultural Innovation In Africa*. Oxford University Press, 267 pp. \$19.95 (US)**

On the world stage, Africa is a diverse continent of contrasts and misconceptions. Juma is a well-qualified author with roots in Kenya and significant experience, including as professor of practice of international development at the Harvard University John F. Kennedy School of Government and director of the Science, Technology, and Globalization Project. Juma is widely recognized for his practical work on sustainable development.

Juma's book, *The New Harvest: Agricultural Innovation in Africa* is a refreshingly practical perspective on agricultural development on the African continent focused through cooperation by Africa's Regional Economic Communities (REC's). The book is optimistic, yet recognizes the enormity and urgency facing African agricultural development. Rather than lamenting setbacks and sluggish results, Juma details successful examples of development, including countries in the Common Market for Eastern and Southern Africa (COMESA) and Southern African Development Community (SEDC). The book chapters sequentially address elements of African agricultural development—the growing economy; advances in science, technology, and engineering; agricultural innovation systems; enabling infrastructure; human capacity; entrepreneurship; and governing innovation. In the final chapter, Juma outlines regional approaches for fostering agricultural innovation. He adds helpful appendices for REC's and decisions from the 2010 COMESA Summit on Science and Technology for Development.

Juma argues convincingly that agricultural development is the cornerstone to African economic stability and security.

He chides that African agricultural development policies should concentrate on food security—defined as “sufficiency, reliability, quality, safety, timeliness, and other aspects of food necessary for healthy and thriving populations” (p. 1) Juma uses Malawi's controversial President Bingu wa Mutharika (1934–2012) as a model of the entrepreneurial leadership needed to alleviate food security problems. In 2005, Malawi's people were in dire need. Over one-half of the population lived on less than one dollar a day, a third lacked access to clean water, and a quarter of the population was food insecure. Through a well-thought out, but initially unpopular, plan, the Malawian government imported improved seeds and fertilizer for distribution to farmers at subsidized prices. By closely monitoring the program, explaining the plan and its public benefits, and increased training for farmers, wa Mutharika's program increased 2006–2009 production to allow export of maize to its neighbors. Juma argues that scientific and technical knowledge, innovation, and entrepreneurial leadership are essential for agricultural development.

Juma examines the opportunities offered by an increased pool of scientific and technical knowledge and the importance of local innovations and indigenous knowledge. Although most African countries lag in the use of current technology, they can learn from others' experience and choose the appropriate technologies to create their own innovations for development. Juma notes that “advocates of scientific and technical research in developing countries have found champions in the platforms of nanotechnology, biotechnology, information and communication technology (ICT), and geographic information system (GIS)” (p.24). In preparing to use these platforms, he argues that successfully emerging

countries have invested in basic infrastructure, nurtured the development of small and medium-sized enterprises, and funded higher education and vocational institutions to build human capacity.

Innovation systems are integral to African agricultural development. Juma contends that stronger linkages must be forged among producers, schools, training centers and universities. He grants that ITC and the use of mobile phones has greatly expanded and holds promise for practical development. Interconnected geographic clusters are effective linkage systems. Juma concludes that, “groups that are closer physically, culturally, and socially are more likely to trust one another, exchange information and assets, and enter into complex cooperative production, processing, financing, marketing, and export arrangements” (p. 82). In addition, studies suggest that synergies of market-based and knowledge-based interactions strengthen interactions between public and private sectors.

Juma recognizes that stronger infrastructure—transportation, irrigation, energy, water, and telecommunications—is essential to advance agricultural development. Juma contends that investing in increasing numbers of farm-to-market roads to connect rural areas to markets is more effective than investing in super highways. Infrastructure development creates rural employment. Juma reports that increasing infrastructure by 1% in an emerging country “can add 1% to the country’s GDP” (p. 85) and concludes that “one strategic way to achieve this goal is to link technical training institutions and universities to large-scale infrastructure projects” (p. 113)—a lesson some developed countries seem to have forgotten.

Juma opines that human capacity building is crucial to agricultural development. He notes that the current focus

of African education systems fails to teach students to maximize opportunities within their own communities. Consequently, systems encourage urban migration, leaving a vacuum in agricultural knowledge, food production, and sustainability. This causes African nations to miss the “chance to increase agricultural productivity, self-sufficiency, and human resources among their populations” (p.114). Juma suggests tackling gender equality, in that 80% of African producers are women, yet only 69% receive extension visits. Juma proposes practical strategies for early school-based agricultural education, community-based experiential agricultural education, and innovation in higher education with entrepreneurial skills coupled with the global private sector. Juma strikes a chord advocating practical reforms connecting policy with practice and sensible long-term capacity building.

Juma reasons that entrepreneurship is an effective way to stimulate rural development without the use of foreign aid. Juma posits that an improved seed industry holds promise for compensatory productivity. Value-added food processing is also a critical link for entrepreneurial activities. Drawing from work in India, Juma concludes that African regional trading blocs must become increasingly widespread to nurture entrepreneurship and value chains.

Juma advocates improving governance of innovation to facilitate agricultural development. Reprimanding leaders, he states, “In 2010, no African head of state or government had a chief scientific advisor” (p. 176). Furthermore, African countries do not have policies that channel emerging technologies into solutions for developmental problems. Juma rebukes policies that rely on generic strategies for poverty mitigation without considering all economic growth factors. Conversely, the

African Union and the New Partnership for Africa's Development created a policymaking African Panel on Modern Biotechnology to advise the AU regarding technology, science, and innovation. Juma reiterates that RECs are the best hope to develop policies and programs necessary to create larger regional markets.

Solving Africa's complex agricultural development issues is no small task, but Juma takes seven basic elements and reduces them into manageable policies with roadmaps drawn from other countries' successes. Juma recognizes that agricultural development has transformed into a knowledge-based entrepreneurial enterprise in a place-bound sector. Education and an entrepreneurial spirit will accelerate an Africa that is in need of empowerment.

Juma acknowledges that, "It is not possible to cover the full range of

agricultural activities in one volume" (p. xxiii). Hence, he leaves a challenge to agricultural educators and integrators to put into practice new platforms and innovations. As reviewers, we recommend *The New Harvest: Agricultural Innovation in Africa* to the AIAEE membership.

### Reference

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