

Book Review

Mesghinna, Woldezion (2016). *How Sub-Saharan Africa Can Achieve Food Security and Ascend Its Economy to the Initial Stages of Light Industrialization*. Indianapolis, IN: Dog Ear Publishing. 881 pp. \$86.00 US. ISBN 978-1-4575-3963-3. Hardback.

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Food is a basic human need and a fundamental human right. However, despite rapid technological and developmental advancements over the years, as well as the preparation of countless action plans and development pledges by international agencies, non-governmental organizations (NGOs), global summits and conferences, individuals, and governmental agencies, food security – generally understood as a situation in which all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active healthy life – remains a great and pressing concern in many countries. According to various international and global agencies, institutions, and organizations, including, amongst others, the World Bank and the Food and Agriculture Organization (FAO), nearly 1 billion people around the world – predominantly in Asia and Africa – are currently suffering from starvation and malnutrition.

While food security remains a global issue, one of the most affected regions is sub-Saharan Africa (SSA), which has long been synonymous with hunger, food aid, and haunting images of starving children with emaciated bodies. Notably, Africa has the highest prevalence of undernourishment in the world, and the continent also has the world's greatest levels of severe food insecurity, affecting 27.4% of the population – nearly four times that of any other region. Annually, tens of millions of children across SSA suffer from stunting and wasting, and children under the age of five are 14 times more likely to die than those in developed countries. Ominously, in light of the region's projected population growth rate, alongside its stagnant increase in agricultural production, the number of people within the region burdened by extreme poverty, malnutrition, and hunger is expected to significantly rise in the coming years.

Paradoxically, however, while it continues to spend tens of billions of dollars annually on food imports, Africa possesses the potential not only to feed itself, but also to be a major food supplier for the rest of the world. According to numerous analyses, the continent has approximately 600 million hectares of uncultivated arable land, constituting roughly 60 percent of the global total.

It is in this context that Woldezion Mesghinna presents *How Sub-Saharan Africa Can Achieve Food Security and Ascend Its Economy to the Initial Stages of Light Industrialization* (2016, Dog Ear Publishing). Consisting of 881 total pages that comprise 21 chapters neatly divided into three broad unified sections, Mesghinna's monumental treatise aims to provide a step-by-step approach, primarily based on science and engineering outlines, to achieving food security and fostering economic growth and diversification in SSA.

The book begins by outlining the underlying problems leading to food insecurity and develops plans for how some constraints may be overcome. According to Mesghinna, although the reasons for production of low crop yields are multifaceted and complex, the principal causes of extremely low crop yields in SSA arise from a mix of both natural and man-made causes. Specifically, the main cause of low crop yields is lack of adequate moisture necessary for vigorous crop growth and production, and a lack of crop requirements not related to moisture, including farm inputs and appropriate modern farming practices. In addition to natural and man-made factors, Mesghinna discusses the rapid population growth of SSA, which outpaces the capacity of rural farmers to produce sufficient food for their own households and their respective countries' populations.

How to move forward? Mesghinna acknowledges the need to reduce rapid population growth, offering several recommendations, including providing females with greater access to education and with easy, affordable access to family planning and birth control. In addition, he discusses how, traditionally, the approach to solving food insecurity has involved using any one or a combination of the following: the development of large-scale multi-farm irrigation systems, as opposed to improvement of small farm-specific systems; government investment in a green revolution; and the provision of farm chemicals and selected seeds to small rural farmers at subsidized cost. Although this approach – which the author terms as “the old ways of doing things” – retains some positive merits and benefits, it is associated with significant execution and operational costs that have largely been ineffective, and is deemed generally inappropriate for SSA.

Instead, Mesghinna suggests that overcoming constraints to achieving increased crop yields and agricultural production in SSA requires the introduction and widespread implementation of science-based agricultural methods coupled with improved and pertinent technological practices. Contrary to accepted wisdom and general assumptions, Mesghinna illustrates, through an assessment of the climate, soil, water, and natural resource conditions of SSA at the macro level, that the region, in fact, possesses favorable conditions to grow a wide range of crops for food, feed, fiber, spices, and medicines.

Through the implementation of enhanced farming practices and technology, the crop and agricultural production of small rural farmers moves from subsistence to surplus. Although this is a notable step in and of itself, ensuring that SSA is able to achieve long-term sustainable agricultural production is dependent also on achieving diversified sustainable economic development. The achievement of diversified sustainable economic development is fundamental to the transition or “evolution” of an economy from agrarian-based to one that is based on other additional economic sectors, such as manufacturing, services, and energy development, amongst others. Thus, long-term sustainable development and food security entails not only the implementation of methods and practices to achieve increased crop and agricultural production, but also on dynamic multi-sector economic systems and educational reform.

Mesghinna astutely points out that improved crop yields and agricultural productivity will lead to food surpluses, declines in food prices, and pressure on farm profits, which

may ultimately drive small farmers out of business. Since a substantial percentage of SSA's population depends on farming and agricultural for livelihood, this development could lead to a massive loss of incomes, displacement, and unemployment (especially since many workers lack the skills sought by employers outside the agricultural sector). Accordingly, he describes how any systematic effort to promote the widespread adoption of holistic reengineered agricultural production methods in rural SSA must also include establishing programs to foster the diversification of rural economies to generate new employment opportunities for potentially displaced farmers and farm workers.

While the first section of the book, consisting of chapters 1 to 4, focuses on identifying the primary barriers to achieving food security and discusses plans and strategies for overcoming the constraints and promoting surplus agricultural production, the rest of the book addresses the more technical and elaborate moisture and non-moisture requirements of crops. In part two, constituting chapters 5 to 14, Mesghinna focuses on the topic of maintaining adequate crop soil moisture by discussing a range of reengineered rainfed crop production methods (RRCP) designed to facilitate maximum use of direct rainfall and local water sources to increase on-farm soil moisture and thereby the resulting crop yields. For example, chapter 6 discusses the methodologies for analyzing factors affecting hydrologic processes and estimating surface runoff generation and peak flood flows for rural watersheds, while chapters 8 and 9 are dedicated to the investigation, design, and construction methodologies of small and medium earthen dams.

Subsequently, the third section, comprising chapters 15 through 21, addresses a range of non-water-related practices that farmers may adopt, including restoring degraded or depleted soils, controlling weeds, pests, and diseases, seed selection, and integrated management of watershed resources. For example, in chapter 17, which specifically addresses the threat posed by insects and pests, the author presents nine separate strategies that do not involve expensive (and often harmful) chemical insecticides to control pests and combat insects. Importantly, while these sections are highly technical and scientific, they are supported by step-by-step examples, detailed solutions, clear designs and formulas, numerous illustrations, and helpful appendices that will prove indispensable in the application of the recommended methods and strategies.

Although the book is comprehensive and extremely detailed, it is slightly surprising that Mesghinna does not offer a deeper discussion of the socio-political and entitlement (e.g. Sen) dynamics of food security and hunger. Increasingly, food security and hunger have been understood as political creations which must be ended by, if not involve, political means. As well, although the discussion of rural development authorities (RDAs), essentially a governmental body dedicated to rural development and which serves as the "boots on the ground" for implementing food security and socio-economic developmental programs, is useful and relevant, it may have been strengthened by incorporating the use of a case study or exemplary model. It is true, as Mesghinna points out, that each country may have a different form or structure of RDA; however, a case study or exemplary model would have illuminated salient points and strengthened the author's claims, and seems pertinent, particularly since the success of many of the author's recommendations is largely and directly dependent on the performance of RDAs. Overall,

however, these are very minor criticisms for a text that makes such an important contribution to the food security and broader development discussion and knowledge base.

Ultimately, Mesghinna's work is thought-provoking and highly impressive. It is well-written, replete with detail, comprehensive, and offers a fresh approach – albeit based on decades of international experience, considerable study, and extensive analysis – to further understand and help address a long standing regional and global issue. Although it is a large book focusing on a complex, multidimensional issue, it is presented in an easy-to-read style, and its general structure, in that it is sub-divided into three cohesive sections, makes it very user-friendly and allows for it to be used in a variety of ways. It will be of great interest to Africans and Africa observers, as well as those generally interested in the topics of food security and development. Furthermore, the book will serve as a key resource and valuable guide for rural engineers, development agencies and individuals, various governmental institutions related to agricultural and water-resources development, technical and vocational programs and students, agricultural and nonagricultural extension agents, and farmers and agricultural workers as a reference manual and handbook.