
Improvement Of Nutrition In Africa Through The Application Of Science, Technology And Sociology

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Abstract

The improvement of nutrition in Africa through the application of science, technology and sociology has long been accepted that eating is more a biological act since sociology of food and nutrition shares some of the some subject matter as rural sociology and medical sociology it also encompasses the areas left untouched by these two fields. In fact, food is frequently taken for granted as an element in a variety of scholars in sociology. Most sociologists have shown little interest in the sociology of food. Most sociological theorists have either allude to or made explicit reference to the human need for food and social activities that attempt to meet that need. From the study it also revealed that we should broaden and deepen political support for agricultural science. It is also evident from the study that we should mobilize increased and susdtainable funding for higher education in science, technology and sociology of food. We should also improve the coping strategies of farmers in response to environmental variability and climatic change.

Introduction

The Problems of Food and Nutrition in African

The report summarized here describes the situation as a deteriorating human tragedy with protein-energy malnutrition (PEM), that is, children weighing less than 80% of standard weight for age, affecting about 30% of children under five years of age. Fifteen countries show areas with PEM prevalence over 50%. PEM is also manifested in starvation caused by drought, social conflict, and other factors. Apart from reducing work out put, PEM in pregnant and lactating women leads to low birth weight in infants and poor growth in children. PEM of the deficiency type was reported in all the African countries, but obesity is now attaining a significant level in a number of countries. Next to PEM , and of equal magnitude, is anaemia, with a prevalence rate of 30% to 50% in pregnant women and lactating mothers, and 20% to 30% in children under five years. Iodine deficiency Disorders (IDD) and Vitamin A deficiency, apart from retard ding growth and causing blindness, respectively, also worsen the effect of PEM and anaemia, and increase mortality and morbidity. Only eight African countries, mainly Islands, are unaffected by IDD, while vitamin A deficiency has been reported in 22 countries (Sherry, 2002).

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Other relevant areas include: high infant mortality rates, high maternal death rates, poor environment and water supply, fast-growing urban and general populations, deteriorating agriculture, increasing food imports, poor food quality, inequitable land policies, and lack of agricultural inputs (seed, fertilizer, insecticide, and other chemicals) (John, 2004).

Energy availability compared to requirements has always been on the low side, but between 1978 and 1979 energy production declined by 4% and remained about the same until 1985, when it began to rise. Several factors such as land tenure and land use, seasonal variation, human labor and skills for garniture, low farm inputs, lack of farm security, and communication underlying the poor food production are discussed, 30% annual increases in population as compared to a mean annual food production increase of 2% increase the food deficit much more. Although there have been successful Community projects, none are large enough to counter the present trend for low food availability among most African Communities (Ekong, 2003).

The Challenges of African Agriculture

Africa is continent rich in natural and human resources. Africa is a land full of promise and potential, where more than 900 million people live and work and raise their families-two-thirds of them in small towns and villages scattered throughout rain forests, deserts, and immense grasslands that stretch from coast to coast. Yet it is also a place where, because of famine, disease and growing populations, almost 200 million people are under nourished and 33 million children go to sleep malnourished and hungry every night (Williams, 2004).

How can the best of science, technology and sociology be harnessed to help Africa increase its agricultural productivity, profitability and sustainability, thereby contributing to improve food security for all? How, precisely, can we produce higher crop yields and more nutritious foods from thinning soils, making food both affordable and accessible to increase number of people ? What are the large social-economic and political condition necessary for the effective use of science, technology and sociology in both the public and private sectors ?

To answer these question, united Nations Secretary-General Kofi Annan requested that the inter Academy Council (IAC) engage leading scientific, economic, and technological experts from around the world- but primarily from Africa to identify how best to realize the promise and potential of African Agriculture. This report is the result written by the IAC panel on Agricultural productivity in Africa, it details a number of concrete steps that the scientific community-working closely with farmers, governments and industry-can take to avert the risk of famine and relieve human suffering for millions of Africans in the years ahead. The focus of this report is on embracing science, Technology and sociology of food not simply to produce a substantial increase in agricultural productivity, but also to ensure that the families of

Africa become food secure and obtain the full range of nutrients that they need every day (IFPRI, 2004)

Widespread Food Insecurity Exist Throughout Africa

Food security means far more than having sufficient food to meet human needs on a national basis. In fact, food security often has less to do with food availability than with access to food. Access is a hugely elusive and complex problem, a problem complicated not only by low family incomes, but also by lack of roads and the distribution infrastructure needed to move food swiftly from place to place. Other important factors include access to safe drinking water, primary health care and environmental hygiene-all of which play a key role in maintaining good health and reducing the intestinal infections that can negate the benefits of a nutritious diet. More than 60 percent of malnourished Africans live in Eastern Africa, with more than half of the population in the Congo Democratic Republic and Mozambique affected. Similarly, Angola, Cameroon, Ethiopia, Kenya, Tanzania and Zambia show Malnutrition prevalence rates between 40 and 50 percent.

On the other hand, west African as a whole has countered the trend in the rest of the continent, with its malnutrition falling dramatically in recent years. This good news shows that with a concerted effort, movement away from hunger and an inadequate diet is possible. The nations that have made the progress are Benin, Ghana and Nigeria. Nigeria's prevalence rate is low, but because of its large population, the country nevertheless accounts for 22 percent of the food impoverished poor in west and central Africa (Hemando, 2003).

The IAC Panel envisions African future where increased agricultural productivity, improved food security and an enhanced sustainability of agro ecosystem can be achieved. Agricultural research and development investments are among the most crucial determinants of agricultural productivity. The near stagnant economies in parts of Africa are, to a larger extent, a reflection of a stagnant agriculture. Science, technology and sociology of food can directly contribute to food security not only by the introduction of improved crops and cropping practices, labour-saving technologies, and better communications, but also through an improved quality of food storage, processing, packaging and marketing (Benson, 2004).

African agriculture has a unique set of features that make it very different from Asia, where the green revolution has had a pervasive impact. These include.

- * Lack of a dominant farming system on which food security largely depend;
- * Predominance of rain fed agriculture as opposed to irrigated agriculture;
- * Heterogeneity and diversity of farming systems and the importance of livestock;
- * Key roles of women in agriculture and in ensuring household food security;

Lack of functioning competitive markets

- * Under investment in agricultural R& D and infrastructure;
- * Dominance of weathered soils of poor inherent fertility;

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- * Lack of conducive economic and political enabling environments;
- * Large and growing impact of human health on agriculture;
- * Low and stagnant labour productivity and minimal mechanization;
- * Predominance of customary land tenure.

In contrast to Asia-where irrigated rice wheat systems predominate and thus where improved rice and wheat varieties could make a major difference the diverse African situation implies that no single magic *technological bullet* is available for radically improving African harnessing science, technology, and seismology of food to meet human needs. As a consequence, more investment in a wider range of agricultural research and development will be required in Africa than was the case in Asia (Williams,2004)

African farmers pursue a wide range of farming systems that vary both across and within the major agro-ecological zones of Africa. Agro-ecological zones are land regions sharing similar combinations of soil, landform and climatic characteristics. The particular parameters used in the definition of these zones focus attention on the climatic and soil-related requirements of crops and on the management systems under which the crops are grown. A farming system is a population of crop and livestock enterprises that share similar patterns of farm activities and household livelihoods, including their degree of crop-livestock integration and their sales. Unlike other regions of the world where food production and food security are based primarily on a limited number of farming systems, in Africa these depend on a multiple farming system in a wide array of different agro-ecological zones. Diversity is the norm in African Farming system throughout the continent. At the level of the individual farm unit, farmers diversify further, typically growing 10 or more crops. Seventeen distinct farming systems are identified in Africa: Maize-mixed, cereal/root crop mixed, root crop, agro-pastoral millet/sorghum highland temperate mixed, pastoral, commercial-large-holder and small-holder, coastal artisanal fishing, irrigated, rice/trees crop, sparse agriculture (arid), urban based, highland mixed, and rainfed mixed. Most of these African farming systems are characterized by weathered soils of low inherent fertility and high fragility, by a declining soil fertility due to population growth and a minimal use of external inputs, and by highly variable rainfall-especially in the drier rainfed systems. For the foreseeable future, multiplied farming systems must become more productive to generate the increases in food necessary to feed the hungry in Africa (IFPRI, 2004).

Science, Technology and Sociological Strategies

A production ecological approach can identify problems and the potential solutions for increasing agricultural productivity in priority farming systems. Science and sociological strategies do more than simply breed new crops for farmers to use. Science and technology of food are also needed to understand what is happening in the field, making it possible to remedy the problems that arise. For each of the four priority farming systems selected by the IAC panel, there are many technological

opportunities for enhancing productivity and profitability on an environmentally sustainable basis. A production ecological approach examines the factors defining, limiting and reducing crop yield, as well as those that interrupt the distribution of foods after they have been grown.

This approach allows for a comprehensive identification and prioritizing of agro-ecological constraints, thereby identifying the most promising technological opportunities for improvement (Fredfard, 2005).

These opportunities can be categorized according to their effects on four classes of factors:

1. Growth and yield defining factors (genetic potential, climate and weather): High yielding varieties of many different crops are commonly grown throughout world. These varieties have been the key to a dramatic increase in yield. In the past, for example, high – yield wheat and rice formed the heart of the green revolution in Asia.
2. Growth and yield limiting factors (water availability, plant nutrition, soil fertility and labour): crop growth and yield are limited by poor plant nutrition and uncertain water availability during the growing cycle. Depletion of soil fertility, in fact is a major biophysical cause of the low per capital food production in Africa. This loss of nutrients can be countered by the application of appropriate fertilizers.
3. Growth and yield reducing factors (weeds, pests, diseases and pollutants): pests, diseases and weeds are a huge problem in nearly all farming systems around the world. Africa is not different cassava mosaic disease, for example, can completely destroy a crop in heavily infected areas. Whereas the possibilities for chemical control of pests and diseases are restricted because of limited availability and cost of pesticides, farmers find resistant varieties of plants to be a powerful tool whenever the appropriate varieties are available.
4. Post-Harvest losses that reduce the distribution of foods to the marketplace: Much of the food produced in Africa is lost in post – harvest processes. Some studies report staggering losses, ranging in some countries from 10 to 100 percent. Sweet potato, plantain, tomatoes, bananas and citrus fruit, for example, often perish before reaching the market. A reduction of this wastage would benefit growers and consumers alike.

Science, Technology and Sociological Pilot Programmes Should Be Introduced Where The Following Components Of The Production – Processing – Marketing – Consumption Chain Can Be Developed In A Participatory Mode

1. An assessment of indigenous technology option relevant to improvement of productivity and food security.
2. An assessment of market potentials and constraints for existing and prospective commodities in the farming systems.

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3. An assessment of the scope for the following new technology options to enhance productivity and food security.
 - ❖ Integrated nutrient and soil fertility enhancement;
 - ❖ Integrated pest management ;
 - ❖ Small – scale water harvesting and efficient and economic use through micro-irrigation systems of delivery of water and nutrients;
 - ❖ Biotechnological applications like improved genetic strains (including genetically modified organisms where relevant), bio – fertilizers and bio-pesticides ;
 - ❖ Use of improved farm implements and appropriate mechanization for increasing labour productivity, reducing drudgery and ensuring timely farm operations;
 - ❖ Introduction of appropriated post – harvest processing, storage and marketing techniques,
 - ❖ Promotion of non – farm employment through the introduction of technology options for adding economic value to primary products and through agribusiness enterprises based on micro – credit;
 - ❖ An in formation and communication programme to provide location – specific information relating to meteorological, management and marketing factors and to promote genetic, quality and trade literacy among small – holder rural farm families;
 - ❖ Establishment of farmer field schools for integrated pest, disease and weed management; integrated water and fertility management; and other aspects of production and post harvest technology based on the principle of learning – by – doing;
 - ❖ Promotion of institutional structures like co-operatives and self-help groups that can confer the power of scale to small – holders at the production and post – harvest phases of farm operations.

For each pilot programme, explore the scope for other institutional innovations such as:

1. Promotion of a participatory knowledge quadrangle coalition led by small – holders and involving them with universities, national agricultural research institutions and extension agencies to explore new modes of partnership.
2. Identification of candidates for African centres of agriculture research excellence (ACARE) that would serve the interests of small – holders.
3. Stimulation of public – private partnerships that would address priority constrains that cannot be alleviated by independent activities and that are aimed at building trust and synergies.
4. Identification of the constraints at the national, regional, continental and global levels that can prevent the realization of the promise and potential of the participatory science, technology and sociological pilot programmes to improve agricultural productivity and food security at the local level.

Policy Thrust and the Way Forward

1. The problem of food and nutrition in Africa has not been critically analyzed. Throughout the papers reviewed there was only a moderate contribution by Africa scientists. Therefore, the report recommends the introduction of new methods that will allow food and nutrition workers and other persons to have greater participation in assessing, analyzing, and reporting the situation, and in planning and implementing action programmes.
2. Education and advocacy should receive top priority all over the continent. It is not enough for one country to do it because competitive inter-country food and nutrition activities like advertising, smuggling, and the black market are enough to frustrate the efforts of any one country attempting it alone. Education should involve the whole community, starting at the primary schools through to the university level. However, since it is the responsibility of senior country officials and leaders, a special campaign needs to be mounted for the leaders. Education should touch all aspects of hunger and malnutrition.
3. Research and training requires immediate attention. Africa needs a few centers that can conduct standard food and nutrition research using up – to – date methods and equipment. Community and house hold level research should be encouraged to answer to day – to – day questions of problem – solving. According to the report five to ten new training units should set up in the five AFRONUS sub regions. Two have been started in sub region 1 (in Nariobi, with support from the German Gesellschaft furzusammenarbeit, and in Harari, with Netherlands government support), but more support is needed for both. In Benin another school is in the formative stage, with support from the Netherlands government. Possibilities of opening new schools in, for example, Zaire, Gambia, Nigeria, Mali, Algeria, Sudan, and Angola should be considered. National training centres that could be upgraded to sub-regional centres already exist in all sub-regions. It is recommended that research be combine with training in one institute.
4. Utilization of locally produced goods, particularly foods, farm inputs, and implements it and recommended strongly to encourage local workers. By limiting food import farmers in the productive areas (many rural) could be assured of a market for their produce.
5. Method if extending community services to the whole population in Africa should be developed through community research. Health service in 18 countries over less than 50% of the population and 11 countries cannot provide water to 25% of their population. The problems are similar for education and agricultural extension services. In several communities old, neglect traditional practices, such as irrigation and good – storage methods, are being revived and improved upon.
6. As a basic change of direction, the creation of a system of co-operation and support among food and nutrition workers is recommended to allow collaboration of thoughts and actions that will benefit the entire continent. Through this and other means, inter country food systems, policies,

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communication, etc. can be developed so that those less capable of producing food can rely on the more productive ones while developing non-food materials. It is strongly recommended that Africa should learn to look to its own resources to solve the basic problems of food and nutrition on the continent.

Conclusion

From the preceding analysis it could be concluded that interdisciplinary teams from the quadrangle of national agricultural research systems, universities, extension services and farmers organizations be constituted to prepare business plans for policy changes and research in each of the four priority farming systems described previously. Nothing succeeds like success, and hence the sites for the initial pilot programmes should be developed where there is a socio-economic, political, scientific and ecological environment conducive to the achievement of the goals of this programme. For each pilot programme a local farmers' advisory council, involving both men and women, should be constituted to assume ownership and under take monitoring and evaluation. Sociology of food and nutrition in Africa has languished until recently because of lack of interest by sociologists in the area of food. Sociology of food and nutrition's which is explanation and understanding of food production and purchase as well as nutrient intake and its consequences have contributed to the advancement of sociological works and theories. Put differently, actually the application of science, technology and sociology of food has really improved food and nutrition in Africa.

References

- Bradford, B. (2005). Land market programmes Usaid: The world bank assisted project the free Press.
- Benson, T. (2004). Assessing Africa's food and nutrition security Situation (2020) Africa conference brief 1, international food policy research institute, Washington DC.
- Ekong, E.E. (2003). *An introduction to rural sociology*, Nigeria: Dove education Publisher Ltd.
- Hemando, R. (2003). *Communication and democracy*, Uyo, Nigeria: kingsize publication
- IFPRI (2004). Assuming food and nutrition security in Africa 2020. Proc. of all - African conference 1-3 April 2004, Kampala, Uganda 260- 279.
- John, F. (2004). *Nutrition distance education policy*, makerere university, Uganda: university printing press.
- Sharry, A (2007). Vitamine A Assessment international atomic agency. Williams, A. M. (2004). *Sociology of food and nutrition*, Nigeria. Enugu: fourth Dimension publishers Ltd.