

2 The Information Component of Agricultural Research in Ghana

K. O. Darko-Ampem, BSc Dip Lib MInfSc MGLA

ABSTRACT

The place of agriculture in the overall national development of the country is underscored with a focus on the establishment of national centres for agricultural research. Problems of agriculture and food production in Sub-Saharan Africa, including Ghana, are highlighted and the need for strengthening local research into improved technology stressed. The present state of agricultural research in Ghana is outlined tracing the rather poor state of agricultural information services to foreign exchange constraint and inadequate allocation of local funds. It is concluded that information is the main input and output of every research endeavour and must be catered for in any viable and relevant agricultural research system. Recommendations include the appointment of an information professional on NARC; the inclusion of Agricultural Information Services and Systems in the Library School curriculum and the formation of an association for agricultural librarians; and the provision of adequate human and material resources to support agriculture.

KEYWORDS

Agriculture, Agricultural research, Information, Libraries, Ghana.

Agricultural research and national development

The fourth United Nations International Development Decade which examined the challenges and opportunities for the 1990s identified food and agriculture as one of the main priority aspects of development. And current issues of the global economic environment indicate a generally positive and in many cases irreplaceable, role of agriculture in helping economies overcome external shocks and providing a basis for recovery and sustained growth. According to a Food and Agriculture Organization (FAO) report:

With proper incentives and relatively small investment, agriculture can play a major

positive role at whatever stage of a country's economic cycle-growth, crisis, adjustment or recovery. Its inherent qualities enable it to act as a buffer to external shocks as well as an engine for economic recovery. (1)

While earlier development theory tended to stress the likelihood of a positive relationship between income inequality and growth, by the early 1970s quite the opposite perspective gained respectability. This 'basic needs' approach stressed the alleviation of poverty as a central concern of economic development. The emphasis on distribution in general, tends to benefit agriculture for it was in the rural areas that the majority of the poor were found.

Industrial and technical innovations may be transmitted and applied almost unchanged, undiluted and wholly to other countries outside their countries of origin. But this is not so with agriculture. Agricultural research and innovation is linked to the crops grown, the climate, the soils, the human and social factors and must be carried out in the countries which are to benefit from them; or in countries whose crops, climate and soil conditions are similar. Every country therefore needs its own research service that has the competence to modify and adapt new and improved technologies to its prevailing environment.

'Partners in Development', the report of the Pearson Commission on International Development, recommended greater support for research in developing countries that industrialized countries assist in the establishment of international, regional and national centres for scientific and technological research in developing countries... (2)

The Commission recommended specifically centres that concentrate upon food supply and tropical agriculture. Consequent upon this recommendation was the establishment of International Agricultural

*K.O. Darko-Ampem
UST Library
University of Science and Technology
Kumasi, Ghana*



Research Centres (IARCs), each dedicated to increasing food production in developing countries. The IARCs, staffed by experienced scientists drawn from a broad range of relevant disciplines, develop improved crop cultivars, maintain germ plasm (breeding stock) banks, evolve agricultural research methodologies and provide training facilities, all of which are available to agricultural scientists in developing countries.

Apart from being location specific in terms of soil, crops and climate, agriculture is also interdisciplinary at a number of levels - scientific, social and economic: it is much broader than the life sciences, intersecting social sciences, physical sciences and engineering. On this score, agricultural research institutes now generally agree that technologies intended for small farmers should be identified, designed and evaluated by the farmers themselves. The value of farmer participation in such research is also widely recognized, although the degree to which farmer involvement is encouraged and effectively used varies.

Experts assert that:

what farmers can bring to the dialogue is a wealth of knowledge and skills to deal with the environment's harsh constraints. The researchers' contribution is innovation and resources which provide the means to be taken seriously and the freedom to move away from the beaten path of traditional technologies (3)

The need for research into sustainable agricultural output

Sub-Saharan Africa (of which Ghana forms a part) is the only region in the world where per capital food production has declined over the past two decades. In most African countries calorie intake is below the minimum recommended nutritional standard. The demand for food is increasing while imported grain prices are rising. There is much need to increase food output.

Growth in food production, however, has depended primarily on increases in cultivated area at the expense of restorative bush fallows with the result that many tropical soils have become fragile, losing organic matter and nutrients quickly if exposed or cultivated intensely. Thus soil productivity is declining. Added to this are adverse weather, pest damages, crop diseases, and storage difficulties.

Solutions to these problems call for new or improved technologies and systems of land development and management that will permit increased productivity and prevent resource degradation. Research to produce such appropriate technologies needs to be intensified to address these

problems. We need increased attention and funding for research into the small scale sector of agriculture which produce about 90 percent of the food and employs 50-80 percent of the people.

Agricultural research in Ghana

For developing countries agriculture, the overall economic environment and policy developments in industrial countries assume a particular significance. Non-oil developing countries like Ghana typically rely on agriculture for 20 to 40 percent of their gross domestic product (GDP), 60 to 80 percent of their employment, and 50 to 70 percent of their total export earnings. At the same time developing countries offer the highest potential for demand-based agricultural development in a long-term world wide perspective. Thus the need for the structural adjustment programme, popularly called SAP, in the economies of third world nations.

Structural adjustment is described as a dynamic process which aims at establishing a viable relationship between the domestic and international economies and laying the foundations for sustainable growth. Priorities, explicit and implicit, are set in terms of sectorial growth, income distribution and food and export crop production. As such it has direct implications for the country's development objectives, as well as its international trade relations, sectorial objectives and food security.

Benefiting from more favourable weather conditions and economic circumstances in those countries determinedly carrying out policy reforms, Africa's agriculture has been reported to have performed relatively better in the 1980s. Ghana as one of the countries undertaking structural adjustments in its economy stands to gain from these policy reforms with over 70 percent of the population living in the rural areas and the country depending on agriculture for its sustenance.

Given that the agricultural sector is the most important for foreign exchange generation in many low-income economies, the stimulation of agricultural production is required at an early stage in the reform programme. A report by the FAO on the implications of structural adjustment and economic development indicates that:

a strong agricultural performance is often fundamental to economic recovery and the adjustment process. While agriculture has been negatively affected by the economic crises during the 1980s, it has also been the most resilient economic sector in the adjustment

economic sector in the adjustment period. The agrarian societies of many developing countries continue to depend on agriculture for employment, income, food and foreign exchange earnings. (1)

Agricultural research in Ghana has been led by the Institutes of the Council for Scientific and Industrial Research (CSIR) and the three Faculties of Agriculture in the universities of Ghana. Research in maize breeding has been undertaken since 1956 with the objective of obtaining new varieties with increased yield potential and higher nutritional value. Studies on several husbandry practices include optimum time of planting, spacing, weed control, and pest control. Investigations on fertilizer requirements on Ghanaian soils date back to the early fifties and food storage studies were first started in 1962 by the Crop Research Institute of the CSIR.

In the subdiscipline of crop science for example, research into food crops apart from maize include rice, plantain, yam, cassava and cocoyam. Tree crop production research covers crops like cocoa, coffee, cola, sheanut and oil palm. The Cocoa Research Institute of Ghana conducts research into all but the last of these tree crops; while the Oil Palm Research Institute of the CSIR is charged with research into oil palm production.

Of the country's three universities, the University of Science and Technology (UST) Kumasi is the best endowed in terms of resources for scientific and technological research. The Faculty of Agriculture was established in 1953 and is organized into the Department of Agricultural Economics and Farm Management, Agricultural Engineering, Animal Science, Crop Science, and Horticulture. Research in the Crop Science Department centres around its four sections: Arable Crops, Plantation Crops, Plant Protection, and Soil Science. The Department has a long standing collaboration with the International Institute of Tropical Agriculture (IITA), Ibadan in the screening and assessment of cassava and cowpea cultivars in terms of their resistance to pests and diseases, and their suitability for the prevailing environmental conditions in the humid forest zone of Ghana. The Plantation Crops section is engaged in the study of the source-sink relationships in plantain. Soil research activities are in the areas of maintenance of soil fertility, soil conservation and appropriate tillage practices.

Government has pursued structural adjustment along the lines that give the agricultural sector the needed attention. The sector is the only one with deputy regional secretaries in all the ten regions of the country. The sector ministry has set

up a policy planning, monitoring and evaluation unit, primarily responsible for coordinating the efforts of all its various divisions towards the attainment of set goals. One product of its activities is the publication of statistical data on agriculture and forward estimates of crop and livestock production.

Quite recently a National Agricultural Research Committee (NARC) responsible for the formulation of agricultural research policies and planning has been inaugurated. The newspaper report stated among others:

... the policies formulated by NARC are expected... to minimize the incidence of irrelevant and costly research. Under the national agricultural research project a special research grant ... is to be given annually to the universities for financing agricultural research (4).

This stands out as the single most important stride towards recognizing the value of information at the policy level since the output of research is information. What is needed as a necessary complement is the strengthening of information handling capacities as well as extension services to pass on the results of research to the ultimate user - the farmer.

Agricultural information as the product of agricultural research

Agricultural information is a basic component of agricultural research and development. It is very important in the overall development process in developing countries because dissemination of research results is essential to bring about a change towards a more balanced economy. The range and diversity of the projects in agricultural information has included in addition to bibliographic systems: extension projects, non-bibliographic services, ongoing research, inventories, and management systems. For research and development (R&D) purposes, the production of information by the scientist and the handling of information by the information specialist should not be considered as distinct activities. The work of the information centre should not be considered outside the scientific domain.

Much effort in terms of agricultural information has gone into strengthening national capacity to control agricultural literature in concert with international cooperative systems, the prime example being the national Agricultural Information Systems (AGRIS) centres in conjunction with the FAO. The emerging pattern of each country being

responsible for and nominating its national agricultural focal point is an indication of efforts aimed at handling the growing scientific literature problems. The International Agricultural Research Centres (IARCs) set up under the auspices of the Consultative Group on International Agricultural Research (CGIAR) have been preeminent in providing special units to handle the dissemination of research results on specific crops. A good example has been the Cassava Information Centre at the Centro Internacional de Agricultura Tropical (CIAT), Cali, Columbia. That these centres together represent a repository of knowledge on information handling has been expressed many times over.

Writing on the problems of linking scientific research with the production system in Ghana, Antonio (5) claimed that the need to develop endogenous scientific and technological capabilities has been recognized and resources allocated for the establishment and maintenance of institutions charged with the task of carrying out scientific and technological research. The impact of these efforts on the economy is rather poor, he lamented, adding that obstacles to the generation and use of research results included a low demand for local R&D results, poor management and control of research institutions, inappropriate promotion criteria for research staff, and a lack of collaboration between universities and research institutions; especially in the area of postgraduate research. And yet another constraint is the low premium on the provision of information infrastructure - manpower, equipment, and materials.

He recommended, among others, the establishment of a National Technology Development Corporation whose functions will include the collection of research results from various research institutions with the sole aim of promoting the application of research results.

The range of literature which is of potential interest to the agriculturist is extremely wide. In many respects, agriculture, and for that matter any of its subdisciplines, may be regarded as a technology - an application of basic science especially the life sciences and aspects of chemistry. This poses a challenge to both the researcher who has to keep in touch with developments in the field and to the information worker who in the face of limited resources has to provide information that is just enough for the researcher.

The deduction is that agricultural research should be a team work done by scientific researchers on the one hand and information specialists on the other. The researcher plays the part of using existing information to investigate and offer solutions to the problems of food shortage and in the process generates more information. To keep the researcher from being 'lost in the flood of information he has helped to create' the information worker indicates to

him what is relevant and sufficient for his (researchers's) needs.

Agricultural Information Services in Ghana shares the same fate as Library Services at all levels in the country. The situation is one of underfunded, under-resourced and under-equipped libraries. In particular, the long-established specialist libraries, including those servicing agricultural research, are very low on holdings of current materials especially journals and are unable to provide efficient information services. This state of affairs affects their ability to effectively perform any of the tasks of agricultural research and its dissemination of information at all levels: drawing up policies, planning research, training research scientists for higher degrees in the universities, designing and executing appropriate (and non-replicative) research results to extension workers and farmers. This also affects researchers ability to write and publish scientific papers containing any reference to current work in Ghana or elsewhere.

The extent of the current situation is highlighted by a World Bank report which states:

Urgent action by the Ghana government to budget adequate foreign exchange funds to allow the institutes to maintain their subscriptions and acquisition of scientific journals and books (6)

The report further asserts that the problem is one of assessing all factors contributing to the current poor state of agricultural information provision; those that depend on foreign exchange and those that require policy makers and management to budget adequate local funds. The on-going rehabilitation of the scientific and technological information network under GHASTINET (Ghana National Scientific and Technology information Network) has nine sectoral nodes, one of which belongs to Agriculture. The agricultural sector of GHASTINET called GAINS (Ghana Agricultural Information Network) is proposed to link up the Ministry of Agriculture Library in Accra with libraries of institutions somewhat connected with agricultural research. Prominent among these institutions libraries of institutions somewhat connected with agricultural research. Prominent among these institutions libraries are those in the three universities (University of Cape Coast, University of Ghana, and the University of Science and Technology), the libraries of the faculties of agriculture in the three Universities, the Institute of Renewable Natural Resources, the three Agricultural Research Stations (ARS) of the University of Ghana, the seven Agricultural Institutes of the CSIR responsible for Animal, Crops, Soil, Water, Food, Aquatic Biology and Oil Palm, the

Cocoa Research Institute, the Forest Research Institute, and the Ghana Atomic Energy Commission.

GAINS is to be managed by a technical committee and will be essentially a machinery for cooperation among the participating institutions. The Ministry of Agriculture library will be the national node of GAINS. The Library and information management system is identified as one facility which must be rehabilitated to make an early and greatest impact on research in the country.

Conclusion and Recommendations

Institutionalized research focusing on problem-solving activities appears as a potential solution for increasing food production in the world, particularly Africa. It is however the common belief that there can be no science without the necessary communications associated with it as information is the main input and output of research. As part of the agricultural research process, relevant information should be packaged in the most appropriate form for the end user - the farmer who in most cases is illiterate. This is where the social dimension of the research process is called into play because the users of agricultural research findings include the policy maker, the practitioner, the research community, as well as the farmer. For the last group of users the extension officer is the essential link. Information is thus an indispensable means that through the process of communication interconnects the elements of the scientific research system to make it work as a system, and not a heap of unconnected and disorganized parts.

Nowhere is access to such information more crucial and the lack of it more critical than in agriculture on which Ghana depends for more than 50% of its export earnings (mainly from cocoa), and for staple food supply to its 17 million population. The on-going restructuring of the agricultural sector of the economy along with the national agricultural information system is a sign of hope since international donors underscore the need for strengthening national agricultural systems.

Recommendations

1. The composition of the National Agricultural Research Committee (NARC) must necessarily include an information professional to ensure that the information sector is not left out of any policy decisions that will affect Agricultural research.
2. Agricultural Information Sources and Systems could be offered as an elective course at the Library School in Legon. This is to adequately prepare professional staff

for this specialist area of information work. The interests and professional development of this group could be catered for through the formation of an Association of Agricultural Information Workers affiliated to the Ghana Library Association and the International Association of Agricultural Librarians and Documentalists.

3. Adequate human and material resources in support of agriculture in all its various facets should be provided by government since the economic and social development of Ghana and the African region depend to a very large extent on this sector.

REFERENCES

1. *Food and Agriculture Organisation. The state of food and agriculture, 1990. (FAO Agriculture series; No.23) Rome: FAO, 1991*
2. *International Development Research Centre. A decade of learning: Agriculture, Food and Nutrition Sciences Division; the first ten years. Ottawa: IDRC, 1981*
3. *International Development Research Centre. Coming fullcircle; farmer's participation in the development of technology, Ottawa, Ontario: IDRC, 1984*
4. *Peoples Daily Graphic. National Agricultural Committee Inaugurated. Accra: Peoples Daily Graphic. Issue No. 12672 of Thursday August 22nd 1991. p.1, p.9, Editorial.*