

Information and Agricultural Development in Tanzania: a critique

Unless agricultural research and extension institutions are transformed and infrastructural constraints removed, information will continue to play a marginal role in the process of agricultural transformation in Tanzania.

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INTRODUCTION

Does information bring about agricultural development and change? This paper is a critical evaluation of the relationship between the flow of information and the pace and process of agricultural change and development in rural Tanzania. Various studies (Cash, 2001; Raju, 2000; Opere, 1977; Rogers and Shoemaker, 1971; Rogers, 1969; Rogers, 1962) argue that there is a potential positive relationship between the increased flow of information and agricultural development and change in any social system. Among the major assumptions in the social sciences are that an increase in the flow of information will lead to positive changes in the agricultural sector. This study questions and critically examines this underlying premise by drawing from the experiences of the agricultural development process in Tanzania. At the theoretical level the paper examines the adequacy of the diffusion of innovation model from which the hypothesis of the positive relationship between information and agricultural development is deduced. It highlights the major weakness of the applicability of this model in explaining and predicting the process of agricultural change and development in a developing country like Tanzania. Drawing from an extensive literature review and empirical findings, the paper makes some policy recommendations.

Information is an interdisciplinary concept. Consequently, there is very limited consensus among researchers and scholars across disciplines as to the precise definition of the concept of information. And even within disciplines scholars and practitioners differ on the precise definition of information. Yet the precise definition of concepts is at the very foundation of the knowledge development process in any academic discipline. Apostle and Raymond (1997: 9) discussing the concept of information had this to say:

The term information is habitually used to signify knowledge, the process of becoming informed, and the carrier of human communication, as well as to refer to data, facts and different types of information such as bibliographies, statistical or research results.

The employment of the term in other than library contexts covers the functions of generic structures, current news relating to political, economic, and sporting events, and technical/scientific data within a particular discipline.

This definition is a very broad one although the authors note that in the original Latin root information was defined specifically as a process to communicate or something to be communicated to someone.

In the literature agricultural development is defined simply as an aggregate increase in agricultural output. However, beyond that simple definition there is little agreement. For example, there is no consensus as to what are the objectives of agricultural development. Some emphasize increased production and productivity per se, while others argue that agricultural development should improve the livelihoods of the rural people. Still others observe that agricultural development entails equitable access to resources, markets and technical assistance.

HISTORY OF AGRICULTURAL DEVELOPMENT IN TANZANIA

A literature review (Omogegbee, 1998; Dey and Ubels, 1990; Mukhopadhyay, 1994) indicates that in many developing countries agriculture is regarded as the engine of development. In Tanzania agriculture accounts for about 50 percent of GDP and 85 percent of exports and employs 82 percent of the workforce. No wonder politicians call it the 'backbone' of the economy. Agricultural development measured in terms of increases in production and productivity is often brought about by the adoption of new technologies. The ability to adopt these new technologies is a function of factors that are both internal and external to any social system. Therefore agricultural transformation plays a pivotal role in the overall process of national economic development. Specifically, agriculture is a significant factor in the improvement of the living conditions of the rural people and of farmers in particular. However, some studies have observed a negative or ambiguous impact of agricultural development on the livelihood of the majority of the rural people. For example, agricultural innovations that have led to increased production and productivity often tend to reinforce and enhance the unequal power relations between men and women in the families. Others have resulted in an increased workload for women in the households. Still others are reported to have increased the pace of social stratification in the rural areas.

The history of agricultural development in Tanzania provides some insights into the areas of concern for this study. During the colonial rule numerous agricultural changes took place including the introduction of cash crops, the establishment of research institutes to conduct research on a variety of crops and farming techniques, and training centres for agricultural field staff (Fuggles-Couchman, 1964). Emphasis was put on the provision of extension services, including advising farmers on better farming techniques. However, these extension services were mainly geared towards cash crop production and areas where agricultural production potentialities were greatest, ignoring areas of poor potential. As research in agriculture during this period over-emphasized cash crops, agriculture not only suffered from institutional incapacity but also from a lack of the kind of investment that would have ensured the sector's critical role.

Several methods of delivering extension services were introduced during the colonial period. For instance, *Mkulima wa Kisasa*, a monthly magazine launched in 1959, focused on publishing farmers' experiences, information on crop prices, and modern methods of cultivation and processing. Agricultural radio programmes started to be aired, while extension agents started to use films and posters for extension work. Other programmes included organized agricultural shows and competitions at different administrative levels.

Up to the mid-1980s the post-independence government in Tanzania maintained and expanded colonial agricultural policies including those relating to agricultural extension services and research. Hyden (1980) argues that under the improvement approach the emphasis was on extension services designed to improve the peasants' methods of agricultural production through enhancing their knowledge and skills and to inform and advise them in practical ways. What this history has shown is that policy makers during the colonial and post-colonial periods accorded the provision of agricultural information to farmers a priority and considered it a central factor in improving agricultural production and productivity. This implies that access to information about a particular farm innovation was viewed as being just as important as the innovation itself. Hence access to information became one of the key determinants of agricultural change and development and agriculture was to depend on information for its efficient and effective functioning. During the first twenty years of independence the state played a crucial role in the development of the agricultural sector, as shown in the level of investment in agricultural research and extension institutions.

Beginning in the mid-1980s, Tanzania, like many other countries in sub-Saharan Africa, faced economic, social and political crises and upheavals. These crises led to an overall decline in government expenditure on agricultural research and extension. The restructuring of the agricultural sector based on conditions imposed by the

International Monetary Fund (IMF) and the World Bank and the consequent liberalization of the agricultural sector and the removal of state intervention undermined the place of agriculture in national development. This period was also characterized by the globalization of investment in agriculture. The growing intervention of international NGOs such as Farm Africa, Sasakawa Global 2000 and Oxfam epitomizes the globalization of Africa's agriculture. This dependence on foreign funding for research and development in agriculture has implications for the sustainability of the provision of agricultural information. The increased involvement of the private sector in the agricultural sector will further increase the information gap between the haves and the have-nots.

THEORETICAL ISSUES

The 'diffusion of innovation' model (Rogers, 1962; Rogers, 1969; Rogers and Shoemaker, 1971), a variety of modernization theory, has been the dominant conceptual and philosophical view that has guided research on development and change in agriculture world-wide. Furthermore, this theoretical framework has also influenced agricultural policies in the developing world. According to this model, as an innovation is introduced into any social system it is first adopted by a small but highly innovative group of farmers known as progressive farmers. In the rural areas this group is characterized by owning large farms, high levels of education and mobility with the outside world and frequently in contact with sources of information. The innovation then trickles down from progressive farmers to farmers with medium socio-economic status. Finally, innovation spreads throughout the social system until most farmers adopt it.

In the process of adoption, the various channels of communication such as mass media become important at different stages of the adoption process. For example, while the radio is very important at the awareness creation stage, the extension agent becomes a critical source of information during the adoption itself. The diffusion of innovation model has therefore had a major influence on the way information is disseminated to end-users like farmers. The basic argument in this model is that the dissemination of information leads to agricultural change and development through the adoption of new technologies or ideas, or improved farming practices. According to Monu (1982):

The dissemination of information is the basic sociological process leading to agricultural change and development through the adoption of new farming technology.

The assumption is that the traditional farming system has to be changed in order to bring about progress in the agricultural sector. A million-dollar question is why, in

countries such as Tanzania. the traditional farming system still dominates? For example, the hand hoe has been the dominant farming tool for the last 100 years. And in most rural areas agriculture is still nature-dependent despite the fact that both the colonial and post-independence governments made substantial efforts to diffuse new ideas or innovations into this sector. The question then becomes: what went wrong?

The history of agricultural development in Tanzania has shown that the diffusion of innovation model has had significant influence on agricultural policy formulation and implementation. However, despite its popularity this model has been criticized at different levels and on several grounds as an explanatory framework for the adoption or lack of adoption of agricultural innovations in developing countries, including Tanzania.

The model ignores structural constraints that affect agricultural development in these societies. Instead, it over-emphasizes the socio-demographic characteristics of farmers and sources of farm information as determinants of the adoption of agricultural innovations. For example, one of the structural factors that are neglected in this model is the role of the state. On the one hand state policies, including those on agricultural farm subsidies (e.g. subsidies on seeds and fertilizers), can influence the rate and patterns of adoption of innovations. This is a critical factor given that small farmers in Tanzania are constrained by limited resources, and access to capital. On the other hand, crisis in the state can lead to neglect of institutions that promote agricultural development.

The crisis in the Tanzanian state since the mid-1980s has led to limited investment in agricultural research and extension. The removal of government subsidies on farm inputs also had a negative impact on agricultural development and change; however, trade liberalization improved the marketing of crops.

Other structural factors impeding developments in agriculture include an underdeveloped transportation sector and weak research and extension institutions and policies on what crops are to be researched. Extension policies, and the availability of and access to this critical service are very important. Equally important are pricing and marketing facilities and policies, as they influence the profit margins for farmers. In the diffusion of innovation model, these factors are not given any weight in explaining the adoption or lack of adoption of agricultural innovations. The only important factor taken into consideration is the characteristics of the farmers.

The point about profit margins is related to the second criticism often directed at the diffusion of innovation model, which is its assumption that farmers do not make rational choices in deciding whether or not to adopt an innovation. Various studies (Monu; 1982; Gehart, 1975; Von Rotenhan, 1968) have shown that farmers' decisions to adopt or not adopt are often based on cost-benefit analysis and available resources.

According to Monu (1982):

The assumption that the acquisition of knowledge is the basic process of agricultural modernization

EBUSINESS TO CHANGE THE LIVES OF TANZANIAN FARMERS

In Tanzania, a pioneering project seeks to empower farmers and strengthen rural economies through e-business. With support from the International Institute for Communication and Development (IICD), the Business Information Services (BIS) Project aims to position itself as a reliable source of information of 'business value' to farmers and small and medium-scale enterprises in the rural areas. The Project intends to harness information and communication technologies (ICTs) to narrow the digital divide between urban and rural areas where for example mobile phones – that people in town take for granted – are scarce or non-existent.

Business Information Services, which began in 2001, believes that by linking technology to development, farmers can be empowered and rural economies strengthened. With telecommunications access improving, the use of ICTs to break down barriers in market information and international trade can actually improve farmers' lives. ICTs – telephones, computers, the Internet and e-business – have emerged as prominent and increasingly viable elements of development. The business information system can also be used to enhance forecasts of product trends and help small-scale farmers to timely switch crops, thereby improving the lives of millions of Tanzanian peasants.

The Project aims to relay timely and accurate price information that will enable producers to make rational decisions based on ascertained market opportunities concerning when to sell, what to sell, where to sell and at what prices. The Project entails information on sources, prices and availability of farm inputs such as fertilisers, seeds, pesticides and extension services. This will help farmers to improve their livelihoods by reducing production costs as a result of buying inputs from the right source at the right price. As information collection and dissemination hubs, the Project has currently established a network of three district offices in Arusha, Mbeya and Ruvuma. More nodes at Iringa, Dodoma and Morogoro are in the pipeline.

Source: <http://www.iconnect-online.org/>.

UGANDAN WOMEN FARMERS GO HI-TECH

Ugandan women are becoming better farmers thanks to an interactive CD-ROM. The CD gives advice about ways to improve yields from crops and livestock, how to market what they produce and helps the women think about new products they can make and sell. Since it was introduced the CD has been a huge success and has helped to dramatically improve the living standards of those who have used it.

Source: UNESCO Observatory on the Information Society newsletter, 5 July 2002. *Original source:* http://news.bbc.co.uk/1/hi/english/sci/tech/newsid_2078000/2078444.stm.

may lead to overemphasis on the factors of ignorance and unwillingness and disregard the factor inability. For the farmers to adopt or not to adopt must be able to acquire the inputs, recover the expenditure and make profit from the innovation.

Empirical findings by Gehart (1975) and Von Rotenhan (1968) do not support the myth that farmers are conservative and resistant to change. These studies demonstrated that the small-farmers are dynamic and respond to socio-economic opportunities, although they also observed that the goals of the households, resources and factors of production available influence farmers' responses to innovations.

The diffusion of innovation model has also been criticized for paying limited attention to conflict at the household level. For example, although women dominate agricultural activities in developing countries, they are often not the targets of extension information. The target is often the heads of households, who are men. Thus the gender division of labour limits women's access to information in the families and the emerging social stratification in the rural areas limits the trickling down of information from innovative farmers to the rest of the farmers. The model therefore pays little or no attention to the way political and power relations at different levels influence the pace of agricultural change and development.

The model has also been rightly criticized because it is based on western experiences and emphasizes the role of the communication process with information as the major component in the adoption of innovations. Critics observe that in societies such as Tanzania the role that information can play in the process of agricultural development is greatly constrained. This is because a majority of the people are illiterate, access to mass media is limited, the social and economic infrastructure is completely underdeveloped and interpersonal communication is the dominant means of communication. Several studies (Rosenberg and Otsyina, 1999; Ngware, 1996;

Feldman, 1995; Mwaipopo-Ako, 1995) have shown that exposure and access to sources of information are influenced by many factors other than the socio-demographic characteristics of farmers. These include constraints within the extension services, research priorities, modes of information dissemination and, above all, cultural norms such as that observed by Rosenberg and Otsyina (1999) that limit contact between extension agents and women farmers.

The diffusion of innovation model has also been questioned for its apparent Eurocentrism. The assumption embedded in this model is that everything 'traditional' (i.e. non-western) has to be changed because it blocks progress in agriculture. Critics of this approach argue that modernization does not necessarily imply abandoning traditional beliefs and way of doing things. A great deal can be learnt from indigenous local knowledge that has accumulated over the years and passed from one generation to another. Whatever farmers do must have a reason and before any attempt is made to change it, the old, 'traditional' ways have to be understood in terms of their rationale, strengths and weaknesses. Changes that are superimposed from above cannot be easily accepted and adopted, especially when they concern sensitive issue like farming, on which the entire well-being and welfare of rural families depends.

In a nutshell then, the theoretical framework from which the hypothesis of a positive relationship between information and agricultural development or change is deduced has a number of flaws, as elaborated above. Overemphasis on socio-psychological states and individual characteristics as barriers to agricultural development tends to overlook the important role played by the economic and political structures within which societies are situated. Thus, the structural and historical constraints accounting for the behaviour patterns of farmers in the developing countries are not taken into consideration. Instead, the farmer's traditional farming attitudes are branded as conservative and backward and blamed for the lack of advances in agriculture.

INFORMATION AND AGRICULTURAL CHANGE IN TANZANIA

What has been the impact of information on agricultural development and change in Tanzania? Why has agriculture in Tanzania remained basically stagnant for the last 100 years despite the efforts that have been made to provide information? One explanation for the 'technology application gap' in agriculture is the attitude of farmers toward new technology – that is, conservative and resistant to change, giving rise to the notion that 'traditional' agriculture is static rather than dynamic. Secondly, inadequate support systems for farmers, including lack of extension, credit for agricultural inputs, etc. Thirdly, inadequate understanding of the socio-economic

organization of farmers on the part of scientists who are developing innovations. Although previous studies argue that information has a positive impact on agricultural change and development, in Tanzania this proposition is supported neither by empirical findings nor by any theoretical analysis. In other words, unlike their counterparts in developed countries, the majority of farmers in Tanzania do not necessarily make critical agricultural decisions on the basis of scientific and technical information. For information to make any significant contribution to the process of agricultural development in Tanzania certain critical constraints that hinder agricultural development must first and foremost be addressed.

The flow of information into rural areas is and will remain insignificant unless the underlying causes of the lack of progress in agriculture are addressed. The concept of the information society might be relevant for the so-called post-industrial societies where information is a critical element, but does not seem to be relevant in societies such as Tanzania. In post-industrial societies technical and scientific information and its dissemination have a great role than in agricultural or industrial systems. But Tanzania is neither a post-industrial nor an industrial society. Since it is not an information society by any stretch of the imagination, information cannot presumably play that qualitatively significant role in the overall development process, including agricultural development. One study on the impact of the flow of agricultural information on gender inequality in Arumeru district revealed that there is limited use and access to various sources of agricultural information among farmers. The sources of agricultural information that are most often used are peer farmers, the radio and spouses (in order of importance). Sources that are used only occasionally include extension agents, village leaders and magazines and newspapers.

The information that flows into rural areas is often not relevant to the specific needs of local farmers. The process of information generation does not allow for the generation of relevant information for the farmers. An example is the neglect, by research institutes and extension agents, of crops that are vital for food security. Instead, emphasis is placed on cash crops for export purposes. Currently, the private sector funding crop research policies emphasizes crops with export potential. Information needs are location-specific and include information on the prices of a particular crop. The institutions that have been established for the generation and dissemination of information to farmers are not capable of delivering adequate and relevant services. As there is limited funding from the government, Tanzanian research institutions are donor-dependent; but donors may have different research agendas from local agricultural research institutes. Donor-driven agricultural research programmes may thus not only be unsustainable, but also not in the best interest of the government and farmers.

A large percentage of rural people are illiterate and village life has not changed fundamentally and qualitatively over the past 40 years since independence. Rural areas in Tanzania are characterized by inadequate social and economic infrastructures. The low levels of literacy constrain the understanding of information provided. However, developments in technology like the use of video and television can reach wider audiences and convey information to people who are illiterate, although the understanding of the contents may still be problematic among people who do not have any formal education. Equally important is the fact that these facilities are beyond the reach of many people in the rural areas. Even when they are available in a resource centre, only a few will attend. Women are too busy and have little time and men will probably spend their leisure time somewhere else. Only the youth would probably attend the shows. Therefore, issues relating to the appropriateness of different communication media and how they should be used in different cultural settings are significant and must be taken into consideration in disseminating agricultural information.

The growing information-gap, the so-called digital-divide, between rural and urban areas leads to further marginalization of the rural communities. Coupled with this are long-standing government and private sector investment policies that seem to favour urban areas. This implies that more resources are diverted to new technologies for the urbanites while little is spent in the traditional sectors such as extension services for the rural communities.

Empirical studies (Rosenberg and Otsyina, 1999; Mwaipopo-Ako, 1995; Staudt, 1978) have consistently reported the ineffectiveness of the extension services in Tanzania. Among the reasons advanced are the inadequate number of extension agents to cover wide geographic areas (up to three villages per extension agent), extension workers are not motivated, etc. In essence this means that there is no linkage between the users and producers of information. Mwaipopo-Ako (1995) has reported the ineffectiveness of agricultural extension in improving women's productivity in Tanzania. The major reason given is the nature of the patriarchal system and the ensuing division of labour that enables men to have direct access to extension information while only limited efforts are made towards meeting the information needs of women farmers. Others (Rosenberg and Otsyina, 1999; Staudt, 1978) have observed that, extension services being a male-dominated field, interaction between female farmers and male agents is constrained by cultural norms that impose restrictions on interaction between men and women who are not related. Heavy workloads inside and outside the household also limit the chances of women benefiting from mass media programmes, including agricultural radio programmes. A heavy workload also limits the ability of women to visit centres of information generally. This implies that social stratification along gender and class lines

is likely to be reinforced by the increased flow of information into the rural areas unless deliberate efforts are made to counteract this problem. The provision of information can lead to increased social stratification as opportunities for access and use of information are restricted and thus act as a major source of deprivation.

There is no coherent agricultural policy in Tanzania to address the underlying factors that block the development of the agricultural sector in a coordinated way for information to make a viable contribution. Currently, developments and changes taking place in agriculture in Tanzania tend to be ad hoc, although policy makers, researchers and farmers understand the need for increased productivity and production. In summary, the environment in which information can make a significant contribution to agricultural development in Tanzania is lacking. The argument that information can play a significant role in the process of agricultural transformation in Tanzania is not supported with data or by any theoretical analysis. This implies that there is limited dependence on information for agricultural development in Tanzania, unlike in the developed countries.

THE ROLE OF THE LIBRARY IN THE PROVISION OF AGRICULTURAL INFORMATION IN TANZANIA

What role can the library play in providing agricultural information in Tanzania? Can it play a positive role if information itself seems to have only a potential impact? The literature does not indicate that libraries in Tanzania play any significant role as sources of information for the rural people. In Tanzania there is no single library that specializes in providing information for the rural communities. The public library system was probably given the mandate to provide library services to the rural people. With the reorganization of local government that role has probably been shifted to the local governments. Furthermore, public libraries are located in regional headquarters towns, thus the target group is still the urban communities and not the rural people per se. But public libraries in Tanzania, whether under Tanzania Library Services Board or under the local governments, face a daunting problem in attempting to provide information to the rural areas.

As already observed, public libraries are located in urban settings far from the rural people. The possibility of all districts having libraries is at the moment remote. Even then, district libraries will still be far from most of the rural people. Mobile rural libraries could be a way out, but for the service to be effective and well managed it requires substantial amounts of resources in terms of manpower and finance. There is a lack of clear vision of role of the library in the process of transforming the rural sector. These libraries in their current state therefore cannot act as catalysts for agricultural change. Be-

cause of their geographic location and distance from the farmers, these libraries cannot disseminate agricultural information to farmers in timely fashion. Historically this has never been the primary objective of these libraries. The major objective of any library is to provide books to users. While on the one hand illiteracy poses a challenge to the effective use of libraries, since an illiterate clientele cannot read the documents that are available, on the other hand libraries can play an effective role in the eradication of illiteracy. This important role need not be over-emphasized and is well recognized even in developed countries. For example, Apostle and Raymond (1997: 20) argue that:

Libraries exercise a vital function in literacy education. They create public awareness for such campaigns and help with appropriate beginning reading texts and progress of daily readings of newspapers and fiction. By bringing literacy classes to libraries teachers can accustom their students to using them, and thus continue reinforcing newly acquired reading skills. Libraries are also a major resource for independent learners.

However, experience elsewhere in the developing world (Raju, 2000) has shown that a majority of rural people feel that libraries are of no use to them because they do not address their needs. This perception needs to be changed. In the new era of competition for limited resources librarians have to show that they are central to the needs of the rural people if they want to carve a niche and be relevant to agricultural development. It is thus important to create a positive image of the library to officials at local and district levels. Many officials do not see the library as a relevant or central organ in the process of agricultural change and development, yet such images have to change in order for the library to play a significant role. But as we struggle to change the 'clerical' image of librarians, the traditional position of the library as a reading place should not be discarded and lost completely.

If the role of the library is to change so that it becomes a more involved institution in the transformation of the rural areas the problem of the expertise and training of librarians has to be addressed. Can the type of training and levels of education librarians currently possess enable them to assess the information needs of farmers? If librarians were to be retrained would district councils be willing to foot the bill? Will the councillors see the need for retraining for librarians or employ librarians with high levels of qualifications?

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

This evaluation of the role of information in agricultural development in Tanzania has raised a number of impor-

tant issues from which some conclusions can be drawn.

Unless the institutional (e.g. agricultural research and extension under-funding) and some structural (e.g. marketing and transportation infrastructure constraints and gender inequality) limitations that hinder agricultural development are first or simultaneously addressed, information will continue to play a marginal role in the process of agricultural transformation. The transformation of these institutions and upgrading of the economic infrastructure is a precondition for information to make a noticeable impact on agricultural change in Tanzania. This will ensure the establishment of an organic link between agricultural research institutions, extension services and farmers. The information generated must also be relevant to the needs of the farmers and therefore it has to start with the assessment of the real information needs of farmers. The participation of farmers in the process of information generation and dissemination will require researchers and extension agents to shed their negative attitudes towards the farmers.

Information needs are location-specific. The application of models such as the diffusion of innovation model that have been found useful in western societies may not have similar explanatory and predictive power in the context of an African country like Tanzania.

Unless libraries play a more dynamic role in assessing the real information needs of farmers they will remain irrelevant institutions in the process of rural transformation. However, libraries can have an indirect bearing on agricultural development, for example, by supporting literacy programmes and the development of reading habits generally, rather than addressing the day-to-day information needs of the farmers. Even to realize these modest objectives rural libraries have to be established with the involvement of the local people through the district councils. This is especially important for countries like Tanzania where libraries at the district level are non-existent and their establishment very much depends on resource allocation by the district councils.

Globally, agriculture is increasingly becoming an information-dependent sector of the economy, especially in the developed world. Developments in information technology have made possible great strides in the generation and dissemination of agricultural information to farmers in these advanced societies. The ever-growing information gap (the so-called digital divide) between agriculture in the developed world and the developing countries will make our agricultural products less competitive in the global market. This in turn will have serious negative repercussions for our economic growth and development.

Although there are cases where information has played a viable role in the diffusion of agricultural innovation these success stories are far and few between. It will therefore be inappropriate to take such findings as the basis for major public policy guidelines on agricultural development in this country.

Recommendations

1. To enhance the effectiveness of libraries in the rural areas libraries need to focus on providing information that is useful in dealing with the day to day agricultural problems of the majority of the rural people. The traditional role of the public library as we know it in the West will not be of great relevance at this particular historical juncture in Tanzania. The rural library becomes an information centre rather than a traditional library. The district councils are the ones that have to establish rural libraries with the support of the central government and professional bodies like the Tanzania Library Services Board to ensure that professional standards are maintained. The notion that all the libraries have to start from the urban centres has to be debunked. The services have to start from the village.
2. The participation of farmers in the different stages of the generation and diffusion of new ideas that can transform the rural area is critical if these innovations are to be accepted and adopted. This will ensure that contents of the information packages are relevant and methods of dissemination appropriate to a specific cultural setting.
3. In order for a theoretical framework to have explanatory power it has to integrate the structural and individual level determinants of agricultural change and development in developing societies like Tanzania. Studies based on such a theoretical framework can then have a major impact on the formulation and implementation of policies that in turn can have a real impact on the livelihoods of the rural people in such societies.

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Abstract

Provides a critical evaluation of the relationship between the flow of information and the pace and process of agricultural change and development in rural Tanzania. Examines the adequacy of the diffusion of innovation model from which the hypothesis of the positive relationship between information and agricultural development is deduced. Highlights the major weakness of the applicability of this model in explaining and predicting the process of agricultural change and development in a developing country like Tanzania. Drawing from an extensive literature review and empirical findings, the paper makes some policy recommendations.

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MORE ON AGRICULTURAL INFORMATION IN TANZANIA

Researchers' perspectives on agricultural libraries as information sources in Tanzania.

F. W. Dulle, M. J. F. Lwehabura, R. T. Mulimila, D. S. Matovelo. *Library Review*, 50 (3 and 4) 2001, p.187–192. tbls. refs.

Reports results based on a study aimed at assessing the capability of agricultural libraries in meeting researchers' information needs, finding out means used by researchers to cope with the scarcity of scientific information and based on study findings, gives some recommendations on how to improve agricultural library services in Tanzania.

The extension triad approach in disseminating agricultural information to extension workers: some experiences from the Southern Highlands Dairy Development Project, Tanzania.

F. W. Dulle. *Journal of Information Science*, 26 (2) 2000, p.121–128. il. tbls. refs.

Reports on the results of a questionnaire survey to investigate the information seeking pattern of extension workers and the ways in which the Southern Highlands Dairy Development Project, in Tanzania, disseminates information to such workers, as well as the extent to which it addresses some of the common problems reported to hinder the extension services in developing countries. Data from the 49 questionnaire survey responses (69.7 per cent response rate), returned by dairy extension supervisors and field extension workers within the Project area, were analyzed. The use of personal sources, attendance at professional meetings, seminars, short courses and conferences and the reading of newspapers were found to be the three main information sources consulted by the respondents, while contact with researchers and the use of agricultural libraries were very unpopular. The Project extension services proved superior in comparison to the traditional extension services. It is recommended that the Project, in collaboration with the Government and farmer groups, launches an alternative organization to pursue activities run by the Project before it comes to an end.

Access to gender and development information by rural women in Tanzania.

E. Kiondo. *Innovation*, (19) Dec 1999, p.18–27. refs.

Contribution to a special issue devoted in part to women and information in African contexts. Discusses a study conducted to investigate the problem of lack of access to information by the majority of rural women in most developing countries, focussing on the rural areas of 3 districts of Tanga region in Tanzania. Patriarchal gender relations in most rural societies are responsible for the observed patterns of inequality between the gender groups. Disregard of gender issues in rural production and social activities and non-consideration of these issues in rural development projects and programmes compound the problem of unequal access to resources and benefits of development including the problem of unequal access to information for development. Using a descriptive survey methodology, examines the infrastructure of rural information and how rural women access gender and development information. Women are disadvantaged in information access; identifies the main barriers and weakness in the rural information delivery system. Makes recommendations to improve accessibility of information by rural women.

Networking agricultural libraries in Tanzania: possible applications of information technology.

F. W. Dulle. *Information Technology for Development*, 8 (3) 1999, p.163–168. refs.

Discusses the state of agricultural libraries in Tanzania and the potential for electronic communications in disseminating agricultural information. Poor communication between the Sokoine National Agricultural Library and its partner libraries within the country is cited as one of the reasons for inferior information services to library users. Due to the low level of information technology development and financial constraints facing the country, the establishment of an electronic network based on low cost communications technology and the information technology infrastructure in place is recommended to link agricultural libraries.

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