

Information needs of and services to small-scale vegetable farmers in Wareng, Uasin Gishu County, Kenya

Zipporah Rop
Library Department
Moi University, Eldoret, Kenya

Email: zippyrop@gmail.com

Abstract

Rationale of Study – Agriculture remains the most important economic activity in Kenya. Efficient and effective provision of information is essential to the success of agriculture. The aim of this study was to investigate the provision of information to small-scale vegetable farmers in Wareng Sub-County, Uasin Gishu County, Kenya with a view of establishing the challenges and proposing a model for effective and efficient information flow to the vegetable farmers in the county.

Methodology – The research used a case study approach. The population of the study comprised 75 small-scale vegetable farmers and 13 agricultural and extension officers in Wareng Sub-County. Data was collected through questionnaires and structured interviews as well as from secondary sources. The data was analysed using content analysis.

Findings – The study found that vegetable farmers lack timely information specific to their information needs. The existing information systems and services were inadequate in satisfying the information needs. Furthermore, the study established that access to information was hampered by inadequate information resources and services.

Implications – The findings of the study may be used to encourage the government to recognise the fact that information is an essential input for an effective agricultural system and as such contributes in a positive way to agricultural development. The findings, therefore, can be used to propose improvements to the existing information services, systems and channels in disseminating information to vegetable farmers.

Originality – This study was original in terms of its focus and geographical orientation. Small-scale vegetable farming in Kenya is an important socioeconomic activity which provides employment opportunities to many citizens yet very little is known about the information needs of the farmers.

Keywords

Small-scale vegetable farmers, agricultural information, Wareng Sub-County, Uasin Gishu County, Kenya

Citation: Rop, Z. (2018) Information needs of and services to small-scale vegetable farmers in Wareng, Uasin Gishu County, Kenya. *Regional Journal of Information and Knowledge Management*, 3 (1),1-14.

Published by the Regional Institute of Information and Knowledge Management
P.O. Box 24358 – 00100 – Nairobi, Kenya

1 Introduction

Kenya's agricultural system has undergone a tremendous evolution over the last eight decades. In the colonial era (1920-1963), commercial agriculture was limited to white settler farmers. With political independence in 1963, the policy focus was expanded to include the participation by indigenous Africans in commercial agriculture. Similarly, there was increased state control on the production and marketing of agricultural commodities. Specific measures and strategies for agricultural development have clearly been defined in various policy documents such as Sessional Paper No. 4 of 1981 (National Food policy); Sessional Paper No. 1 of 1986 (Economic Management for Renewed Growth); and Sessional Paper No. 1 of 1992 (Development and Employment in Kenya and the National Development Plans). In spite of a high and stable agricultural growth up to 1986, various problems relating to rigid policies, high control of the sector and changes in the economic environment external to Kenya began to impact on the performance of the agricultural sector.

According to the Sessional Paper No. 1 of 1986 (Economic Management for Renewed Growth), one of the core functions of the Ministry of Agriculture in Kenya is to collect, maintain and manage information on the agricultural sector and to provide agricultural extension services.

Most farmers agree that access to relevant information is essential to the success of farming and food production in general. The provision of the right and timely information improves crop yields; enhances economic growth; and encourages the adoption of new agricultural technologies. Successful agricultural extension services are anchored on the ability of the providers to put well-trained officers in the field and supply them with timely and useful information for onward transmission to the farmers. Such information services require an effective dissemination system to overcome the challenges jeopardising the transfer of information from the creator to the consumer. There is need to accelerate the information transfer with a view to reaching the user at the right time and in the appropriate form.

2 Statement of the problem

Agriculture has been described as the engine for economic growth and improved livelihoods in Africa (Diao, Hazell, Resnick and Thurlo, 2007; World Bank, 2006). More than 50 percent of the population in Africa lives in rural areas and depends on rural activities for their livelihood (Ballantyne, 2005). Kenya's Ministry of Agriculture's strategic plan for 2008-2012 recognised the important role extension services play in agricultural productivity by facilitating the sharing of knowledge, technologies, agricultural information and also

linking the farmer to other actors in the other economic sectors. The extension service is, therefore, one of the critical change agents required in the transformation of subsistence farming to modern, commercial agriculture. Thus, extension services improve the access to information which is essential in agricultural production. Improved flow of information through effective dissemination of agricultural information would lead to better and more efficient agricultural activities which would in turn lead to increased agricultural production (Aina, 2004). This information should embrace the totality of the value chain from the farm to the market. Today, users of agricultural information in Kenya are increasing by the day. These users, who are largely farmers, depend on information generated by the Ministry of Agriculture and its research institutions to cater for their information needs.

Wareng is one of the rural sub-counties whose socioeconomic growth relies heavily on small-holder farmers. Whereas it is possible to ascertain the quality and reach of information services offered to commercial farmers, very little is known about information services given to small-holder farmers. No studies known to the author have delved into assessing the type of information services and resources small-holder farmers in Wareng Sub-County access or how they meet the information needs of these

farmers. In the absence of such data, it is not possible to plan or deploy an effective information service to the farmers.

3 Objectives of the study

This study examined agricultural information systems and services in Wareng Sub-County with a view to suggesting improvements in terms of the content as well as delivery channels and techniques. The specific objectives of the study were to identify the information needs of small-scale vegetable farmers in Wareng Sub-County; determine the sources of information available to the farmers; assess the effectiveness of extension services in the dissemination of information to the farmers; analyse the communication channels through which agricultural information is disseminated to the farmers; assess the accessibility and usefulness of the information channels, sources, services and systems that provide information to vegetable farmers; identify the factors that hinder accessibility to agricultural information by the farmers; and suggest ways of improving communication of agricultural information to small-scale vegetable farmers in Wareng Sub-County.

4 Literature review

Grubben *et al.* (2014) explain that compared to tropical Asia, the vegetable sector in Africa is lagging behind as a result of weak research, breeding, training and extension services, an

insufficient seed distribution network and low purchasing power. Many policy makers ignore the nutritional and economic value of vegetables. Although traditional cultural practices are well suited to the prevailing subsistence agriculture, they cannot cope with the growing demand for vegetables for the urban markets. In countries like Ethiopia, Kenya, Tanzania and Senegal, high-tech vegetable production for export to Europe and the Arabian Peninsula or for the small supermarket segment in the regional big cities has been supported with ample donor funding. However, exports represent only a very small part of the total vegetable production (Grubben *et al.*, 2014).

Information is regarded as a crucial resource and an important commodity for development. It is a basic necessity and brings success in life, including farming activities. In fact, Mchombu (2006) asserts that every person needs information for decision making. In agriculture, the information shared among farming stakeholders enhances productivity and brings about agricultural development. Manda (2002) argues that information is an important resource which brings productivity for farmers and effectiveness in farming communities. Vegetable farmers need information which can aid decision making, planning and sustained growth as well as improved livelihoods.

Odini (1997) opines that the kind of information system and services available in Kenya are neither effective nor efficient. He attributes this to various factors such as the prevalence of information services which have been designed without a proper analysis of the information needs of users; high levels of illiteracy; and language barriers. Odini (2005) suggests that this situation calls for an intervention by information professionals who should encourage the use of information by carrying out in-depth studies to determine information needs of the various users. Ozowa (1995) lamented that African governments have failed to integrate agricultural information delivery or dissemination with other development programmes to address the numerous related problems that face small-scale farmers.

In the course of seeking information, there is the concept of an information need. Ojiambo (1993) defines an information need as a value judgment that a group has a problem that can be solved. The value judgment exists due to differences in need requirements by individuals or groups. One farmer may regard information as vital and another may not. The recognition of need is, therefore, one's judgment. A need can only be discovered. Information is, therefore, sought to meet a need. A broad range of control approaches is open to the farmer. Each approach has its own set of implications for the

kind of information that should be available (Midmore, 2005). For instance, integrated pest management requires the farmer to be knowledgeable about the identity and role of beneficial insects and other biological control agents; the potential disadvantages of pesticide use and abuse; and a wide range of cultural and crop sanitation practices that reduce pest incidences (Wellings, 2007). Farmers may also require information on the nature of the soil suitable for vegetable farming and also the rainfall patterns that favour vegetables. These and other information requirements depend on access to comprehensive support services as well as the ability to identify and diagnose pests to allow the farmers to make immediate decisions about control. The information that supports farm pest management decision making should be easily accessible. In vegetable growing, pesticides are major control agents. These are frequently supplied by organisations such as cooperatives or sales agents for major pesticide companies and are often applied as calendar prophylactic treatments. In such cases, one frequently observes a spill-over effect for pesticide application on food crops grown for home consumption (Arusei, 2000).

Vegetables are grown in Wareng Sub-County to supplement maize, wheat and livestock products. The vegetables include kales (*sukuma wiki*), cabbages, carrots, tomatoes, onions, peas

and other traditional vegetables like black night (*isochek*), spider leaves (*isagek*), as well as pumpkin leaves and fruits. The cultivation of vegetables has become increasingly important because of the rapid growth of towns and urban centres in Wareng Sub-County and by extension the larger Uasin Gishu County. Most of the people in the urban centres require regular vegetable supplies from the market.

In most countries such as Kenya, there is an acute shortage of adequately trained plant protection specialists; a lack of well-organised plant protection service; and generally poor linkages between agricultural research, extension agents and farmers. This lack of guidance presents severe problems for farmers in particular when it comes to chemical control (Mengech and Saxena, 1995). Pesticides are not applied maliciously to poison the environment or people. Nonetheless, producers must live with the consequences of their agricultural practices more closely than most sectors in the society. Most recently, food safety has focused the public attention on pesticide use in vegetables. It is therefore, necessary that producers, regulators, and researchers respond to consumer concerns through effective consumer education and approaches that are environmentally and socially acceptable.

Smallholder farmers in Kenya seldom feel the impact of agricultural innovations because they

have no access to such vital information due to ineffective information dissemination systems. The information provided is exclusively focused on policy makers and researchers. Scanty attention is paid to the information needs of the smallholder farmers who are the targeted beneficiaries of the policy decisions.

5 Research methodology

This research used a case study approach. Qualitative techniques were used to answer questions about the information needs of vegetable farmers, the sources of information they accessed, the preferred media of getting information and the markets available. Data was collected using questionnaires and structured interviews as well as secondary sources. The population of the study comprised of small-scale vegetable farmers in Wareng Sub-County. There were 300 farmers from three locations. In each location, 30 vegetable farmers were selected totalling to 90 respondents. 15 agricultural officers were also purposively selected for the study. Out of the 105 targeted population, 88 responded, comprising 75 vegetable farmers and 13 agricultural officers and extension officers in the Sub-County. The data was analysed using content analysis which grouped it thematically and coded it. This enabled the explanation, understanding and interpretation of the people and situations under investigation. The idea

behind this was to examine the meaningful and symbolic content of qualitative data as observed by Lewins *et al.* (2005). The data is presented in the form of text, tables, figures, graphs and percentages.

6 Findings and discussion

The findings are based on the objectives of the study as shown below.

Information needs of small-scale vegetable farmers in Wareng Sub-County

The study revealed that the information needs of small-scale vegetable farmers are closely linked with their day to day activities of farming. The farmers need information on where and how to access regular support services relating to unusual problems that are difficult to diagnose during routine plant health control. They also require information on how to access agricultural inputs such as quality seeds, fertilisers or pesticides. The study also revealed that the farmers need information on markets and prices for their produce. The other needs expressed by farmers include information on soil and weather conditions; relevant innovations and technologies including irrigation practices and better farming methods; access to credit facilities and loans from small and medium enterprises (SMEs), local banks and cooperative societies; post-harvest and storage of vegetables; as well as transportation facilities including cold storage to facilitate

freshness of products for export. Table 1 summarises the information needs of the small-scale vegetable farmers in Wareng Sub-County based on the responses of the agricultural officers. This is the information the farmers seek from them.

Table 1: Types of agricultural information needs

Agricultural Information	Frequency	Percent
Project monitoring and evaluation (assessments by agricultural officers of specific projects)	1	7.7
Crop husbandry	5	38.5
Diversify in production	2	15.4
Value addition	1	7.7
Soil conservation	1	7.7
Pest and disease management	2	7.7
Technical packages	1	15.4
Total	13	100.0

Source: Research data

From the table above, the majority (38.5%) of the respondents seek information on crop husbandry while information on diversity in production and technical support each were sought by 15.4% of the respondents. Information on value addition, soil conservation and pest and disease management were sought by 7.7% of the respondents.

Sources of information available to small-scale vegetable farmers in Wareng Sub-County

Vegetable farmers in Wareng Sub-County rely on oral channels of information transmission from neighbours, friends, relatives and fellow

farmers. Another important source of information is FM radio broadcasts using local languages. Extension officers also play a big role in the dissemination of agricultural information to farmers. This is achieved through field days, *barazas* (community meetings organised by area administrators such as chiefs), agricultural seminars and workshops, and trainings which are conducted by extension officers during farm visits. The agricultural officers also play an important role in the provision of information. They step down information from research organisations, technical handbooks supplied by the government, agricultural journals, workshops, seminars and trainings. The agricultural officers also obtain information from the worldwide web and online agricultural databases; newsletters and regular reports from networks such as Kenya Agricultural Information Networks (KAINET). Some farmers also utilise ICTs such as mobile phones to search, access, or share relevant information.

Effectiveness of extension services in the dissemination of information to vegetable farmers

The findings of the study revealed that extension services are essentially used in the dissemination of information through forums such as farm visits, field days, demonstration days, exhibitions during agricultural shows, and personal visits. The frequency with which the

agricultural extension officers and the farmers interact is an indicator of the effectiveness of extension officers in the dissemination of agricultural information. Additionally, the adoption of new technologies by vegetable farmers especially in irrigation using the money-maker peddling machine is popular with farmers. The improvement in vegetable yields or output shows that information dissemination is effective.

Communication channels through which agricultural information is disseminated

The findings revealed that the farmers preferred oral channels of communication with agricultural extension officers and amongst themselves. The other preferred channels included mass media such as radio, television and print media (journal publications, reports, and newsletters). Other farmers utilised ICTs such as mobile phones, electronic databases and the Internet. It was established that demonstration activities such as field days and agricultural shows are powerful platforms of communication where the farmers do not only hear but also witness demonstrations of how to use the tools, pesticides and fertilisers. These findings concur with Jallo (2007) who reported that community radio broadcasts on livestock husbandry and crop farming enabled farmers to improve their productivity and reduce poverty in East Africa.

Accessibility and usefulness of information channels, sources, services and systems that provide information to vegetable farmers

The study revealed that the information sources, channels, services and systems were found to be useful to vegetable farmers in satisfying their information needs. On the one hand, mass media such as the FM radio channels were readily accessible to the farmers at relatively low costs. On the other hand, ICTs were accessible to most farmers but they had to spend money on airtime and Internet bundles. The effective use of ICTs also required requisite skills which some farmers did not have. Other accessible sources of information include agricultural extension officers who disseminate information and conduct demonstrations. The study also found that no assessment of information needs or development of an efficient and effective information network system has been conducted. Therefore, the government, through the Ministry of Agriculture, should conduct an assessment of the agricultural information needs and resources and make appropriate recommendations. The study also found out that there was no subscription to scientific journals for the agricultural officers and the farmers to be able to access current information. There is need to create current awareness services to sensitise farmers on new information technologies and innovations.

There was also need to compile a directory of agricultural information services and an evaluation of ongoing information programmes in the Sub-County.

Another study by Lwoga, Ngulube and Stilwell (2010) showed that ICTs including the Internet, mobile phones, emails, community radio, TV, tele-centres and computers are not fully utilised by farmers, especially in rural areas. This low usage is attributed to the high costs of ICT services, low literacy level, low income and limited number of service providers in rural areas. However, they pointed out that the use of low-cost and affordable ICTs for accessing agricultural information for informed farm-level decisions by rural farmers has not been assessed.

Factors that hinder accessibility to agricultural information by small-scale vegetable farmers in Wareng Sub-County

Farmers require information for their day-to-day activities. However, low literacy levels may hinder them from accessing timely and relevant information which would increase crop yields. The available printed information sources were largely available in English or Kiswahili. The farmers who were barely literate could not benefit from the literature. The findings also indicated that good information comes at a cost yet most farmers lacked the time for seeking information or could not afford the cost to

travel from their homes to agricultural offices to seek the information. Farmers are busy people with little time for themselves. Thus, distance, time and costs were obstacles the farmers face in trying to obtain information. The long distance between agricultural offices and the farmers in rural areas was also a hindrance in accessing information.

The inadequate information infrastructure in the Sub-County was also found to be an impediment in accessing agricultural information. Information centres and information resources were located in urban centres and towns such as Eldoret where Kenya National Library Services and District Information and Documentation Centres were based. The offices of the Ministry of Agriculture were also located in towns and divisional headquarters. The farmers who live and work in the rural areas could not afford travel expenses in search of information. Table 2 summarise the factors which hinder the effective use of agricultural information by small-scale vegetable farmers in Wareng Sub-County.

From the foregoing, the challenges facing vegetable farmers in accessing agricultural information include transport cost while travelling from their homes to agricultural offices which are located far from them.

Table 2: Challenges that hinder accessibility to agricultural information

Challenges	Frequency	Percent
Transport costs to information sources	4	5.3
Illiteracy of the farmers	10	13.3
Inaccessibility of the information	38	52.8
Long distance from information sources	12	16.0
Poor infrastructure	8	10.7
System	3	4.0
Total	75	100.0

Source: Research data

Another major challenge is the inaccessibility of the information vegetable farmers cited cases where the agricultural officers are not accessible to them whenever they visit. The other challenge is the long distances between officers and farmers. For instance, Kesses location is very wide making the farmers to live far from the officers. Kapseret agricultural divisional officers are located in town whereas the farmers live in rural areas. Chuiyat location farmers can be contacted at the Kesses divisional headquarters which is also far from the farmers. Poor road infrastructure makes them impassable during wet seasons when information on agriculture is highly demanded.

Ways of improving communication of agricultural information to small-scale vegetable farmers

It was established that information could empower farmers to improve farming activities. When accessed and used appropriately,

information can lead to economic development which can contribute to food security and improved health among farmers and consumers of vegetables. It was found that providers of information and policy makers should take appropriate measures to improve access to and use of information.

The many gaps that exist in the provision of information to vegetable farmers were directly linked to the poor understanding of their needs. The information systems and services available in Wareng Sub-County have been designed without a proper analysis of the needs of users. Meeting the information needs of various categories of farmers depends much on the help they received from agricultural extension officers based in the Sub-County. There is a need for the government to develop an agricultural information policy to guide the dissemination of agricultural information to the various categories of farmers.

To be able to provide information effectively to vegetable farmers, the following should be done:

- educate the farmers on the sources of information so as to empower them and reduce illiteracy and ignorance amongst them;
- conduct regular and frequent field days and seminars to enable the agricultural officers to disseminate information;

- develop or improve methodologies for documenting and disseminating information to farmers in rural areas;
- information providers such as extension officers should repackage information in formats suitable to the context of the farming community, for instance, using audio-visual technology;
- encourage agricultural extension officers and other government officers to conduct research on the information needs of the farming community;
- establish agricultural information centres in the entire Sub-County so as to collect information needs of farmers. This should be done, for instance, by setting up help desks at the market centres especially during market days;
- conduct awareness campaigns through publicity events, workshops, seminars and mass media to sensitise farmers on the importance of agricultural information; and
- encourage farmers to visit information centres and to regularly attend workshops and seminars to remain abreast with new information and emerging technologies.

7 Conclusion

The study examined the provision of information to small-scale farmers in Wareng

Sub-County with a view to proposing a model for improved access to information. From the foregoing, the author concludes that the small-scale vegetable farmers in Wareng Sub-County have specific and unique information needs which are essential for success in their socioeconomic activities. It was evident from the findings that the government and other information service providers have not made adequate efforts to identify or clarify the needs as a first step in meeting them. Furthermore, several factors hamper the effective access to and use of available information services, resources and channels. The factors relate to inadequate resources, infrastructure and literacy levels. These challenges affect the farmers' capacity to produce and market their farm commodities effectively which ultimately limits their quality of life. Addressing the challenges would have a positive ripple effect on the production and marketing of the farm produce thereby resulting in improved individual livelihood and communal wellbeing.

8 Recommendations

The Government of Kenya should formulate an agricultural information policy to integrate an information network involving personnel (policy makers, information specialists, researchers and extension officers, among others); ICT hard and software; data and practices aimed at supporting efficient and effective agricultural

decision making. The government should recognise that information is an essential input for an effective agricultural system and, as such, contributes in a positive way to agricultural development. In light of the above, the author proposes the following recommendations with a view to improving the provision of information services to small-scale vegetable farmers in Wareng Sub-County:

Increase the number of extension officers

Wareng Sub-County has many small-scale vegetable farmers compared to the number of agricultural officers. Therefore, it is recommended that more extension officers should be posted to the Sub-County. This will enable frequent and effective interactions between the farmers and the extension officers. The agricultural extension officers should also consider using the other channels of communication such as videos, mobile cinemas and films to disseminate information.

Proximity of agricultural officers

Accessibility and use of agricultural information by small-scale vegetable farmers was adversely affected by distance the farmers have to cover so as to reach agricultural officers' offices for help. The findings of the study indicated that the farmers incurred significant costs in order to access information. These costs hinder the farmers' ability to access the required information. The findings also showed that the

farmers had to walk long distances to the agricultural offices hence reducing their time in the farms. The Ministry of Agriculture should, therefore, establish offices closer to the farmers and post extension officers to them. This will minimise the costs and enhance the farmers' access to relevant information in a timely manner.

Establishment of information centres

This study recommends that the Ministry of Agriculture should establish more information centres and also improve the existing ones. The Kenya National Library Service in Eldoret town should introduce mobile libraries to take agricultural information closest to the farmers. The collection in the library should also be enhanced to include essential resources on agriculture.

Linkages with agricultural research institutions

There were weak linkages between the farmers and agricultural research institutions. It is therefore recommended that agriculture-based research institutions such as Kenya Agricultural and Livestock Research Organisation (KALRO) and Kenya Seed Company, among others, should disseminate their research findings and new innovations to farmers through regular open field and demonstration days. Published materials such as handbooks, magazines, journals, booklets, brochures and leaflets should also be made available to the farmers

through the information centres and libraries. This would enhance the awareness of the farmers of emerging issues, tools and techniques pertinent to farming.

Packaging and repackaging of agricultural information

The findings of the study indicated that most small-scale farmers are semi-illiterate and would prefer communication in Kiswahili and/or vernacular languages because only a small number of them understand English. In view of this, the study recommends that information producers should package and repackage information in these languages. Extension officers should also use these languages when providing services. Where need be, translators should be used to disseminate information to the farmers in languages they understand best.

Facilitation of agricultural extension officers

There was only one vehicle in every division assigned to agricultural department at the time of data collection. The vehicles were old and not able to withstand the bad roads during the wet season hence limiting the movement of the officers. It is recommended that the Ministry of Agriculture should provide the officers with good vehicles or motor cycles to enable them to visit the farmers in all seasons. The vehicles that were grounded should also be repaired to enable the extension officers to reach the farmers conveniently.

Use ICT in disseminating information

The ICT infrastructure in Wareng Sub-County was inadequate. Consequently, the farmers did not adequately use ICTs to access, use or share information. The Ministry of Agriculture and other policy makers should invest in ICT services to facilitate quick access to agricultural information by the farmers. Enhanced ICT infrastructure would encourage the farmers and other players to use emerging technology to seek and use timely information. Access to such information can promote local entrepreneurship among farmers who would then be able to connect to international markets to sell their vegetables. The farmers can also use the ICTs to connect to financial services such as loans from SMEs and banks. ICTs may also be used as platforms for interactive conversations between the farmers and experts to share useful information in a cost-effective manner.

9 References

- Adomi, E. E., Ogbomo, M. O., & Inoni, O. E. (2003). Gender factor in crop farmers' access to agricultural information in rural areas of Delta State, Nigeria. *Library Review*, 52(8), 388-393
- Aker, J. C. (2011). Dial "A" for agriculture: a review of information and communication technologies for agricultural extension in developing countries. *Agricultural Economics*, 42(6), 631-647.
- Aina, L. O. (2004). Towards improving information access by semi and non-literate groups in Africa: A need for

- empirical studies of their information-seeking and retrieval patterns.
ProLISSA: Progress in Library and Information Science in Southern Africa, 11-20.
- Arusei, E.J. (2000) The awareness of farmers on the dangers associated with the use and application of farm chemicals on wheat and maize, M.Phil Thesis unpublished.
- Ballantyne, P. (2005). Accessing and managing agricultural information. *INASP Newsletter*.
- Diao, X., Hazell, P. B., Resnick, D., & Thurlow, J. (2007). *The role of agriculture in development: Implications for Sub-Saharan Africa* (Vol. 153). Intl Food Policy Res Inst.
- Grubben, G., Klaver, W., Nono-Womdim, R., Everaarts, A., Fondio, L., Nugteren, J. A., & Corrado, M. (2014). Vegetables to combat the hidden hunger in Africa. *Chronica Horticulturae*, 54, 9.
- Jallov, B. (2007). An impact & sustainability assessment of three community radios with the EACMP. *Swedish International Development Cooperation Agency*, 1-55.
- Kenya Agricultural Research Institute (KARI), 2000. www.kari.org.
- Manda, P. A. (2002). Information and agricultural development in Tanzania: a critique. *Information Development*, 18(3), 181-190.
- Mchombu, K., & Cadbury, N. (2006). Libraries, literacy and poverty reduction: a key to African development.
- Ministry of Finance and Planning Uasin Gishu District Development Plan 2002-2008, Government Press.
- Ministry of Planning and National Development, National Development Plan 2002-2008, Government Press.
- Ministry of Planning and National Development, Sessional Paper No.1 (1986) Economic management for renewed growth, Government Press, Nairobi.
- Ministry of Planning and National Development, Sessional Paper No.2 (1992) Development and Employment in Kenya, Government Press, Nairobi
- National Development Plan 2002 – 2008 (2002), Effective management for sustainable economic growth and poverty reduction, GOK
- Niedzwiedzka, B. (2003), <http://www.informatik.uni.trier.de>.
- Odini, C. (1993). Trends in information needs and use research. *Library Review*, 42(7).
- Odini, C. (2005). Information seeking and communication behaviour of Kenya railways engineers. *University of Dar es Salaam Library Journal*, 7(2), 98-111.
- Stilwell, C. (2010). Understanding indigenous knowledge: Bridging the knowledge gap through a knowledge creation model for agricultural development. *South African Journal of Information Management*, 12(1), 1-8.
- Ozowa, V. N. (1995). The nature of agricultural information needs of small scale farmers in Africa: the Nigerian example. *Quarterly Bulletin of IAALD (IAALD)*.
- Wilson, T. D. (1999). Models in information behaviour research. *Journal of documentation*, 55(3), 249-270.