

An Assessment of Rural Information and Communication Systems for Agricultural Resource Development: A Case Study of Vihiga County, Western Kenya

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Abstract

The application and use of ICT as a modern tool to retrieve, process, preserve and disseminate accurate timely available agricultural and environmental information, have become vital in the planning, management and development for agricultural and crop production in both urban and rural areas in Kenya. This study assessed the structure of agricultural and environmental information systems in Vihiga County, Western Kenya for rural planning and management of better agriculture and crop production. The main specific objectives of the study were to: assess the existing agricultural and environmental information systems; examine and find out obstacles to effective use of agricultural and environmental information systems and to propose agricultural and environmental information system model (AEIS) for effective information use and application for planning and management for sustainable development. The study used participatory approach and questionnaires to collect data from a sample of 1,228 people, representing a total population of about 2369 residence. Additional data were gathered from libraries, county health centres, and government offices including field observations. Quantitative data were analyzed and processed using Statistical Package for Social Sciences (SPSS). Various hypotheses and analytical testing tools like chi-square and multiple regression analysis were employed where appropriate. The study revealed that there was substantial agricultural and environmental information in the area, but accessibility to it was a problem due to inadequate channels for disseminating it to the users. Major obstacles to effective access agricultural and environmental information, were due to: lack of ICTs education, national information policy, government funding, communication, rural electrification, and illiteracy due to poor reading skills, among other problems. The study recommends that effective modern agricultural and environmental information channels be established by the government of Kenya, which would enable residence (users) to have access to agricultural and environmental information to make informed decisions hence boost agricultural and crop production in the study area and the country at large. That since this is gray area of study, further research be carried.

Key Words: ICTs, Agricultural and Environmental Information Systems Rural Development, Sustainable Development, Dissemination of Agricultural Information, Food security.

Introduction

Agricultural and Environmental Information Systems have become vital in the development of agricultural crop production in many rural areas including even urban areas to the extent that it is hardly possible for any meaningful development to be realized without reliable and timely information. The aim and objectives of this study was to assess the use of ICT as a tool for effective

utilization in planning and management of Agricultural and Environment Information in Kenya including the structure of the existing information systems and to propose the establishment of a modern Environment Information system to support the rapidly growing interest for application of modern information and technology. Environmental Information system in this study is the computerized collection, storage and manipulation dissemination of

environmental data. Agricultural and environmental data in this context pertains to specific agricultural and environmental problem. Data on such areas as geology, soil type, agricultural production, rainfall, elevation, vegetation and land use, among others, could be included in agricultural and environmental data-base to be examined in the study area.

Kenya is an agricultural country and thus, agriculture is the main stay of the economy. However, about two thirds of the country is semi-arid and rain fed agriculture is confined to the remaining one third of the country. Appropriate utilization and conservation of land resources for agricultural development must be found in order to achieve the sustainable rural development as indicated in the National Development Plans. This situation calls for a re-evaluation of the existing rural resource information as well as the strategies and programmes for procuring and using that information. It is a recognized fact that policy decision makers, land administrators, and farmers make significant use of spatial data on daily basis. Information on agricultural resources is thus a prime requisite for making decisions related to rural environment, land and resources management. Information win reduce to the barest minimum and uncertainty by helping to identify and analyse agricultural problems.

The study focused on identifying the process in Agricultural and Environmental sector, their relations with the stake holders, and the problems and contradictions of these processes in relation to the National Information Policy on establishing ICT with the aim of generating solutions.

Despite various efforts, such as use of improved seeds, agricultural chemicals, including pesticides and fertilizers, irrigation and so on which have increased in use of order to improve agricultural production, majority of rural people have remained untouched by these changes. Indeed in many instances, while statistics

shows general improvements in the standards of living, pockets of poverty continue to overwhelm rural communities. Demand for food has increased while the level of technology to improve food production and security has not improved significantly in many areas. The major cause of the problems mentioned above lies in the appropriate packaging and dissemination of agricultural information, which would go a long way towards increasing agricultural production.

The colonial era dismantled community indigenous institutions and brought centralized decisionmaking and coercive implementation of policies. Local people did not participate in the making of decisions that affected their lives. However, political independence did not significantly change the colonial models. Instead the top-down approach was perpetuated. Decisions continued to be made at the capitals, and packaged by "experts" for the rural people. Government programmes, NGOs, the International Development Agencies all used similar approaches to define rural development projects. The intended beneficiaries were not consulted. As a result most agricultural development projects continued to fail (Mody, 1991).

Failures of top-down initiated projects have been a dramatic eye-opener in areas of agricultural development. The adverse impacts are that many people in rural areas are economically and ecologically worse off today than they were 20 years ago. There is therefore an urgent need to introduce sustainable rural resource development in order to reverse the catastrophic trends. This study believes that participation, applying Participatory Rural Appraisal (PRA) by indigenous beneficiaries in any project is fundamental. Thus, locally serviceable approaches are more likely to succeed unlike complicated and expensive imported ones.

Theoretical Framework

After UN Conference on Environment and Development (UNCED), widely known as the Earth Summit, which was held in Rio de Janeiro in 1992, 'sustainable development'

became a fashionable phrase in our daily conversations within the member states. This was an indication within the member states that awareness of environmental crises such as a global warming, acid rain, depletion of the ozone layer were becoming a danger to the mankind. According to World Commission on Environment and Development (1987), sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs (WECD), 1987, P.63). A sustainable society is one that can persist over generations, one that is for seeing enough, flexible enough, and wise enough not to undermine either its physical or its social systems of supports. A new environmental and social dimension of development, one that is for seeing enough, flexible enough, and wise enough not to undermine either its physical or its social systems of supports. A new environmental and social dimension of development, referred to as 'sustainable development', emerged in the 1980s. The first formal definition of sustainable development is found in our common future, where it is defined as 'a process that fulfills present human needs without endangering the opportunities of future generations to fulfill their needs

This study was based on the premise of the importance of information and communication technologies (ICTs) in the area of sustainable development as highlighted in the Rio Earth Summit of 1992 (UNEP, 1992) which was convened to address worldwide interest in sustainable development. Agenda 21, prepared frameworks for bringing governments and NGOs, business and universities into a joint effort to resolve the issues that prevent the practice of sustainable development.

Given the inherently complex nature of the sustainability concept, it is important that planners and policy-makers are increasingly faced with the problem of

finding appropriate and tools like ICT for planning (Quaddus and Siddique, 2001). Chapter 40 of the UNSD Agenda 21 identifies the need to bridge the data gap and improve information availability for decision-making purposes (UN, 2001). This was also enhanced by the framework of United Nations ICT Task Force (2003) which was established to promote economic and social development and bring about a real change in the lives of the people of the member states where Kenya is included.

It calls for the production of usable information, the established of standards and methods, the development of documentation and the strengthening of electronic capabilities. It also recommends research into hardware, software and other aspects of information technology as an important means for implementation of these programme areas. Studies have shown that technological innovations such as knowledge-based decision support tools may play a critical role in the process sustainable development goals. This study is based on the premises that ICT is well integrated as a tool, it can be used effectively and be utilized in the planning and management in the natural resources.

Recognizing fact that that technology is a critical ingredient in sustainable development planning, this paper proposes and presents an innovative position support tool within the ICT framework in assisting sustainable development. Environmental information for planning and management an important component of sustainable development and the creative approach needed to support development in rural areas in Kenya.

The importance of information and information technologies for decision-making in the area of sustainable development is the topic of chapter 40 of UNsd Agenda 21 on sustainable development in developing countries UNEP (1992). The perquisites for the proper and sustainable use of natural resources are the collection, management, processing and

dissemination of information to extension advisors, planners, administrators and policy makers who deal with the issues involved in the development of the nation. Innovative and efficient information and computing technologies thus, allow the systematic collection and timely sharing of information across regions, especially in urban-rural areas in aiding sustainability in terms of ecological-land, water, air, and biodiversity and human inputs-economic, social, educational and political (Philips and Andriantats and Andrigianina).

Methodology

The study focused on Vihiga County, Western Kenya to assess as how an Urban Centre influences the generation and dissemination of information on agricultural and environmental issues in the area. The aim was also to reveal the degree of variation of information systems between urban and rural areas, and in particular the influence of distance decay on the information systems and delivery in study area.

Primary method of collection data involved a series of field surveys and government libraries, district and documentation centres in search for the relevant information in the subject. Identification of interviewing variables was accomplished by interviewers with the key government informants. NGOs and CBOs officials within the Country and Sub-Counties.

The general approach of the study was the collection of data on application of ICTs in the study area. The study sought to deal with questions of adequacy and comprehensiveness of information on community groups involved in environment matters. The interviews focused on issues related to the preparation and implementation of ICTs and consultative processes and their relation to development and perceived achievement of development. The interviews were directed at government Libraries, Information and Documentation Centres and individual within the community.

The data collection covered both rural and urban areas in the County. Thus, the question varied from one village to the other depending on the information required. This study relied heavily on secondary data collection and analysis on the growth patterns and performance of the Kenyan economy during the review period. In particular the following materials were reviewed:

- ¿ National Development Plans and Regional Development in Information in Kenya.
- ¿ Sectoral policies, plans and Acts of parliament in Information in Kenya.
- ¿ Acts of Parliament on Kenya National Library Services and County Information Documentation Centres Reports.
- ¿ ICT policy Framework papers Government Reports and research materials and books on the development of information in Kenya among others.

Findings and Discussions

The data collected, for analyses were coded, stored, retrieved and analyzed using Statistical Package for social Sciences (SPSS). Using SPSS descriptive statistics including frequencies and percentages were used to present preliminary results. Logistic Regression Model was used to rest all the two research hypotheses. The results are displayed in figure:

Table 1: Logistic Regression Model for Information Services Received by Households from Existing Information Sources (Government and other sources)

Variable	B	S.E	Wald	Df	Sig	R	Exp(B)
BIAHII (DIDCs) =District Information & Documentation Centres	.4220	.1805	5.4643		.0194	.0571	.5251
BIIII (LRC) =Learning Resource Centres	.2726	.1897	2.0656	1	.1507	.0079	1.3134
BIIV (KLNS) = Kenya National Library Services	.3081	.1884	2.6736	1	.1020	.0252	1.3608
BIV (ARC) = Archives	.1182	.1913	.3818	1	.5366	.0000	1.1255
BIA VII (CBIS) = COMPUTER-Based Information Systems.	-.4163	.1925	4.6778	1	.0306	-.0502	.6595
BIA VIII (MM) = Mass Media	.0528	.1719	.0867	1	.7684	.0000	1.0542
Constant	-2.5306	.3776	48.5389	1	.0000		

Chi-Square- Model prediction=81.31% DF=6Sig=0.0008

The major goal of the study was to provide information for proper planning and management of these resources. This paper summarizes the objectives, research questions of the findings; discusses the key research findings through the present research; and proposes the establishment of an “Environmental Information System Model for Effective utilization in environmental Planning and Management for sustainable Development”. It provides some recommendations and suggests the way forward.

Socio-Economic, Demographic and Sustainable Development

While addressing the issues of socio-economic and demographic characteristics in the study area, the study findings indicated that the average house hold of the survey consisted of seven people, in the family visited. Of this households, nearly half had no formal employment or income other than agricultural as subsistence. Agricultural production provided a greater amount of the total income occurring from every household. The main income generating activities which existed in the study area were, among others: crop production, poultry production, transport (Mainly BodaBoda), mining activities, posho milling and retailing. Data analyzed from the distribution of house hold heads showed that there was a predominance male-headed household (64%). This can be attributed to a number of factors, for example, there was little migration by men in the study area to urban centres to look for jobs. The sample indicated that the majority of the respondents (71.7%) were aged between 18 and 57 years. Being the majority users of the existing information, they were the most active group within the community in the area.

Table 2: Percentage Distribution of Heads of Household by Age Groups

Variable	Frequency	Percent (%)
Age in Years		
Below 18	53	4.8
18-22	238	21.6
23-27	217	19.7
28-32	168	15.2
33-37	107	9.7
38-42	119	10.8
43-47	76	6.9
53-57	28	2.5
Over 58	36	3.3
Total	1102	100

(n=1102)

Gerickle (1998) in a similar study, contents that some of the significant socio-economic features of rural communities in most developing countries are, poverty and underdevelopment, landlessness, food insecurity and high population growth. For example, approximately 40% of rural households in South Africa live below the minimum subsistence level. Only 10% of household income is derived from domestic food production. It further revealed that Women-who comprise about 60% to 80% of the rural population or rural farmers, - are often constrained in participating in agricultural development due to lack of education.

Existing Information Systems and Information Needs of the Community

The objective of the study was to assess the impact of ICT as a tool in order to establish its effectiveness in utilization and management of environmental information in area with special reference to rural communities. The study was interested to track down the flow of information provided by the existing Information Systems (Public, Special, College and school libraries, Information centres, DIDs, Archives, Mass Media, Computer-based, Information (IT), etc.) and its effect to the users in the community as to whether

they were getting or not getting the type of information they needed for use in their daily life.

Rating of various types of Users of Information

In the analysis, it was revealed that the flow of information from the existing sources of information and its effect on the residents by rating was very poor. In testing the hypotheses, using Logistic Regression Model, the results from the respondents (81.31%) indicated that the information received from the existing sources was poor. There was overwhelming evidence that there was no provision for sustainability of the existing information systems by the Kenyan Government in the study area.

It was also found that the sources of Information usually consulted were among other: public academic, institutional, school and colleges libraries, achieves, DIDs, Barazas, women gatherings, indigenous knowledge, but none from modern ICTs, since the later were not available in the interior rural save for only a few in the urban areas.

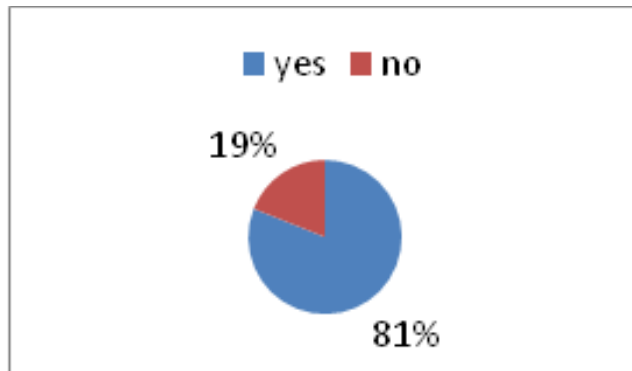


Figure1: Rating Information Services Received from Government, NGOs and other Sources in the Area of Study

Note: This pie chart displays the same information presented and approved by Hypothesis Test 1 in Table 1.

The Hypothesis Testing of Information services received by households from the existing sources were as follows:

Ha = There is no significant relationship between the information received and the existing information needs in rural areas.

Ho = There is significant relationship between the information received and the existing information needs in rural areas in Kenya.

This hypothesis examined the information services received by households in the study region from the government and other sources like, NGOs, church services, public Barazas, funeral meetings, mass media etc. It examined six variables of which two emerged to be significant as shown in table3.

Table 3: Suggestions from Residents on how to improve the Dissemination of Environmental Information in the area

Suggestions	Frequency	Percent
Improve infrastructure	20	7.2
Extent information services to rural areas	27	9.7
Equip libraries in learning institutions	51	18.3
Increase DIDC	93	33.3
Facilitate funds to sustain centers with trained persons	16	5.7
Use of available Institution and Barazas	17	6.0
Use of local administration and Barazas	20	7.2
Pass information via media	15	5.4
Positive reading habits	20	7.2
Total	279	100

N=279

The model showed that the variables understudy, (90.31%) of information received in the region from the government and other sources were poor and was not sustained due to lack of poor infrastructure. Other variables in the region but emerged to be significant were Learning Resources Centres (LRCs), Libraries, Archives and Mass Media. Of these, radio, for instance, could have been underrated because they are the most common news providers in rural areas.

Table: Model of Information Services Received from Households from Existing Information Sources (Government and other sources) in the Study Area. Logistic Regression Model Chi-Square-Model prediction=90.31% df=6 sig=0.0008

Information Provision in the area provided by Existing Information Centres

The study sought to find out where the residents obtained their information needs in the study area. A total sample of 279 was interviewed the information needs of the residents in the study area and their main

sources of information were to be established. In the questionnaire, the respondents were asked to indicate where they obtained their information from (for example, on land use, soils, crop production, natural resources, climate/weather, Farming, livestock health, water, etc. among others). This is so because agriculture is the mainstay of the district economy where over 90% of the population living in rural areas depends directly or indirectly on agriculture as subsistence.

The results as shown in the table indicated that the majority of the residents obtained get information from among others, the following sources: Land use: (Extension officers 62(22.2%); Baraza's 50 (17.9%), Agricultural Shows 12.5% (n=55), Reading Materials 9.7% (n=27) and Mass Media 37.6% (n=195). The result shows that the Mass Media was the leading source of information followed by: Land use 105 (37.6%), Natural Resources 35.8%(n=100), Soils 25.4% (n=71) and Crop production 12.2% (n=34) Results are displayed in table 4.

Table 4: Sources where residents obtain information

	Variable	Extension Officers (%)	Baraza	AGRIC Show (%)	Reading Materials (%)	Mass media (%)	Total
	Information on:						
i)	Land use	62(22.2)	50(17.9)	35(12.5)	27(9.7)	105(37.6)	279(100)
i)	Soils	71(25.4)	15(5.4)	71(25.4)	51(18.3)	71(25.4)	279(100)
ii)	Natural resources	78(28.0)	25(9.0)	53(18.6)	24(8.6)	100(35.8)	279(100)
v)	Climate/weather	55(19.7)	17(6.1)	40(14.3)	42(15.8)	125(44.8)	279(100)
V)	Land registration	72(25.8)	54(19.4)	31(11.1)	85(30.5)	37(13.3)	279(100)
Vi)	Mixed farming	72(25.8)	1(18.3)	67(24.0)	-	34(12.2)	279(100)
vii)	L/stock health	99(35.5)	56(20.1)	53(19.0)	1(0.4)	19(6.8)	279(100)
viii)	Health and sanitation	26(9.3)	95(34.1)	69(24.7)	-	89(31.9)	279(100)

N=279

Information Communication and Technologies (ICTs) for Sustainable Development

In this study, the role of information in rural development was rated as average (45.7%) as displayed in Table. However, 265 and 28.3% of the sample reported that the contribution of information in rural development was good and poor respectively.

Table 5: Information Services provided by the Existing Information Systems

Variable	Good (%)	Average (%)	Poor (%)	Total (%)
Kenya National Library Services	245(23.5)	189(17.2)	664(59.3)	1102(100)
District Information and Documentation Centres	212(19.3)	224(20.3)	666(60.4)	1102(100)
School and College Libraries	310(29.2)	324(29.4)	468(42.4)	1102(100)
Computer-based Information Systems	162(15.4)	204(18.5)	736(67.1)	1102(100)
Archives and Special Libraries	89(8.1)	129(11.7)	384(80.2)	1102(100)

N=1102

All these perceptions were below 50% (n=50) hence accounts for the low levels of development indicators in the region. The 71.1% (n=71.1) of the respondents who appreciated the role of information rural development, were mainly farmers who enjoyed the services of extension officers, information officer and NGOs in the region.

A similar study survey like the one under study was carried out in Borno state, Nigeria. It was found that the success the rural development programmes rest squarely on the availability and use of quality information by rural development workers and rural people. Proper planning and implementation of rural development programme required the use of quality information at all levels (Camble, 1994).

This study which is based in the frame work that ICTs of UN ICT Task Force are diverse set of technological tools and resources used for creating, storing, managing and communicating information conforms with the agencies such as the FAO,WHO,UNDP and UNHCR which have provided lots of development information in both printed and audio-visual format to the developing countries which state among others that: "Information is the lifeblood of the organization.

It Links the district to its environment, and it is the oil that lubricates the internal operations. Consequently, information must be managed just as any other valuable resource is managed. Information has several key characteristics that is important for managers to understand and recognize. These include the relevance, quality, richness, quantity, timeless and accessibility of information. Additionally, information, or access to information, has symbolic value in any organization (HABITAT, 1993).

It should be appreciated that information gathered, reported, analyzed, accepted, stored, retrieved, and used. The system of information management must ensure that the right quantity, timeless, and relevance of internal and external information is provided to decision-authority centres. Hence, information is a key input in the decision making process. Information communication and technologies enable organizations would not be possible without advanced information technology". Thus, the interplay between information communication and technologies, and organizational design is key to the strategic success of organizations.

Obstacles to Effective Information Provision in the Study Area

In addressing the question on how, to establish the obstacles to effective

environmental information systems in the study area, the data analysis showed that there were quite a number of factors contributing to inadequacies of information for development in the area. It was found that the problems of the residents in the area were still related to accessibility and availability of information and how it is disseminated. Among these factors were: Inadequate of information policy and infrastructure (63.2%), inadequate information systems 55.4% (n=55.4) poor reading habits (55.1%); and inadequate modern information technology (IT) 49.9% (n=49.9).

Table 6: The Factors Contributing to Inadequacies of Information for Rural Development in the Area of Study

	Yes		No		Total
	No	%	No	%	%
Inadequate modern information technology	549	49.8	553	553	1102(100)
Poor reading habits	607	55.1	495	495	1102(100)
Inadequate libs./archives/information centres	610	55.4	492	492	1102(100)
Inadequate of information policy infrastructure	696	63.2	405	36.8	1102(100)

N=1102

Lack of information policy infrastructure accounted for 63.2% (n=63.2) of information deficiency in the region, followed by libraries, archives and information centres 55.4% (n=55.4) and poor reading habits 55.1% (n=55.1). The results of this survey can be justified on the ground that the study area is situated in the rural area.

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Table 3.5: Factors Contributing to Inadequate Information in the study area are further supported by testing hypothesis two (2) below.

Hypothetically, the study tested the problem of inadequacy of information needs in order to approve as to whether it was a major shortcoming in influencing social economic and sustainable development in the study area as follows:

$H_a =$ *Inadequate Information Needs is not a major shortcoming in Influencing Economic and Sustainable Development in Rural Areas in Kenya.*

$H_o =$ *Inadequate Information Needs is a major shortcoming in Influencing Economic and Sustainable Development in Rural Areas in Kenya.*

This hypothesis examined indecencies of information needs and sought to prove if it was a major shortcoming in influencing economic development in the study area. In doing so, it examined nine variables. The model revealed that the variables in the study explained 72.60% (n=72.60) of contribution of information in rural development and was significant at 1%. This hypothesis was therefore accepted. The table presents the findings.

Table 7Logistic Regression Model for Inadequate Information Needs as a major shortcoming in Influencing Economic and Sustainable Development in the Study area

Variable	B	S.E	Wald	df	Sig	R	Exp(B)
B4B11-9IP)= Information on Population Control	.2761	.0584	22.3704	1	.0000	.1240	1.3180
B5I-(MMM)= Mass Media (Newspapers, TV, Radio).	.0461	.0571	.6521	1	.4194	.0000	1.0472
B5II-(LIB)- Libraries (Public, Academic, Special, College, Schools).	.7972	.0626	9.9315	1	.0016	.0774	1.2180
B5III-(EW)=Extension Workers	.2328	.0637	13.3554	1	.0003	.0926	1.2622
B5V-(PW)= Public Barazas, Women Groups)	.0628	.0599	1.1009	1	.1941	.0000	1.0648
B9II-(DIDCs) = District Information & Documentation Centres	.0464	.0554	.7020	1	.4021	.0000	1.0475
B9III-(LR)= Literacy &PoorReading	-.0896	.0528	2.8820	1	.0896	-.0258	.9143
B9IV-(LTQ)= Trained &	-.1024	.0510	4.0354	1	.1446	-.0392	.9027
B5IV-(INS) Institutions, such as NGOs.	-.0404	.0672	.3625	1	.5471	.0000	.9604
Constant	-1.0155	.4003	9.4350	1	.0112		

Chi-Square= Model Prediction=72.60%

df=9 sig=0.000

The study also relieved that in the absence of widely available voice protocols, text-based protocols remain the most widely used Internet application in the study area. In Shinyalu division, Language barriers and illiteracy were identified as common obstacles to internet access. Emerging from the above observation, there is need to especially equip persons who will work with the varied rural communities, with various skills. One such skill is Information Communication and Technology, especially agricultural information seeking skills. Thus, according to Stilwel (1991:128), there is recognition of the primary role of communication skills in proposal curricula or recommendation for the training of rural information workers as outlined in the recommendations in chapter five of this study. The absence of a national information policy was seen as a major shortcoming in the establishment and implementation of modern information

systems, (ICTs). It is imperative that modern information systems should be provided in the Kenya National Strategic Development Plan.

Level of Rural Development in Relation to Level of Information System in the Study Area

In assessing the level of rural development in relation to level of environmental information systems in the study area, it was found that the majority of the respondents obtained their information from: extension officers 22.2% (n=22.2); Barazas 17.9% (n=179), Agricultural shows 12.5% (n=12.5); Libraries, DIDCs and other information centres 9.7% (N=9.7), and the mass media 37.6% (n=37.6). The mass media emerged as a leading source of information. This analysis enabled the study to establish that the information gathered helped to respond to the user's needs and hence answered the questions such: Who needed the information?; What information?; For

what purpose (why)?; How is the information sought?

When it was needed? And where the information is required? This assessment is in an agreement with this study's conceptual framework of information systems carried elsewhere by researchers in the subject matter. The majority of the respondents interviewed 60% (n=60) lived within the distance of 10 Km from mbale town. This situation revealed the degree of variation in information systems between urban and interior areas, and in particular the influence of distance decay on the information systems and delivery in the study area.

Conclusion

The general objective of the study was partly to assess the impact if ICT as a tool and to determine and establish its effectiveness in utilization and management of environmental Information in Kenya. Based on the foregoing, this paper focuses on how ICT, a public sector organization and how it could effectively utilize its tools and innovations in order to create an effective framework for mobilization of information resources to enhance environmental management in Kenya. The results indicated whereasa lot of information existed in the study area, there was limited access to it by the local community (90%), save only (10%). The study also found out that information channels were inadequate (72.60%) making information dissemination poor. Major obstacles to effectively utilization of the available information sources in the study area are included among others: lack of awareness of pat of the users, lack of government national information policy, inadequate government funding hence poor infrastructure (roads, electricity, trained personnel etc.) Lack of modern ICT, education and training.

The paper recommends that ICT as a modern tool should be established and integrated in all governmental planning sectors. It should be a tool for effective utilization and use Management of

Environment Information channels should be established to ensure more access to information and all stakeholders including government representatives, NGOs, private sector groups, CBOs in the local community be involved in information provision and delivery.

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