USERS' AWARENESS AND SATISFACTION WITH THE BIODIVERSITY INFORMATION IN DAR ES SALAAM, IRINGA AND MOROGORO REGIONS.

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Abstract

This article examines the users' awareness and satisfaction with biodiversity information that was being provided by their respective information systems. The study was conducted among biodiversity databases user communities in Tanga, Morogoro, Dar es Salaam and Coast regions of Tanzania. Mixed research design was used in which techniques such as questionnaires, observation, interviews and focus groups' discussions were employed to collect both qualitative and quantitative data. The key findings indicate that the majority of the respondents were not aware of the existence of biodiversity information in their institutions. The respondents who seemed to be aware of its existence opined that biodiversity information which was being dispensed by their information systems was relevant but not updated and adequate for planning and decision-making. The article incorporates some recommendations on how the situation may be improved to enhance access and use of the biodiversity information in Tanzania.

INTRODUCTION

Tanzania has been facing a number of threats to its biodiversity. These include, among others: loss of habitats as a result of rapid growth of rural and urban populations which engage in agriculture, grazing, mining and logging; unplanned human and livestock migrations, leading to widespread deforestation and overgrazing; and lack of inventories of biodiversity resources in protected areas, hence little knowledge of their biodiversity potential. Turnhout and Boonman-Berson (2011) observed that the generation of biodiversity knowledge is constrained by two major problems: reliability of data and its usability because they are not globally available, digitized and inscribed in standard databases.

In an effort to address some of the above-mentioned problems in Tanzania, a national biodiversity action plan was established and sought, among other things, to collect information on status of biodiversity, activities and processes which are likely to have adverse impacts on biodiversity conservation and sustenance. Consequently, biodiversity information centers and databases at institutional and regional levels were established to promote acquisition, storage and dissemination of biodiversity information. Similarly, attempts are underway to improve availability, accessibility and exchange of information pertaining to sustainable utilization of biodiversity resources. The University of Dar es Salaam did not lag behind as it developed an online local content database on biodiversity, in 1998. The database contains different abstracts giving rich information on biodiversity obtained from journal articles, books or chapters from

books, research reports, including theses and dissertations. Since then, database was being updated whenever resources allowed. The aim of the database is to serve as a resource centre in biodiversity and environmental conservation to alleviate the problems which could be solved based on reliable information. Apart from higher learning institutions and other governmental agencies, non-governmental organizations have also been generating and collecting biodiversity information so that it may be used for research, planning and decision-making. Hence, the establishment of the databanks, electronic databases, information centers and libraries that contain biodiversity information to cater for the needs of the users notably researchers, academicians, policy and decision-makers.

The University of Dar es Salaam Library is one of the few East African institutions that were involved in the implementation of the Biodiversity Project funded by UNDP and executed by FAO in early 1990s. During the execution of the project, the UDSM Library identified the users and generators of biodiversity information, sources of biodiversity materials in the regions of Tanga, Morogoro, Dar es Salaam and Coast, and created and maintained a CDS/ISIS-based biodiversity database in Tanzania. The main function of the Biodiversity Database was to provide an up-to-date, relevant and adequate information on the conservation of biodiversity and ensure its access to students, researchers, scientists, practitioners and policy makers in Tanzania. From late 1996 to year 2000, the database was accessed at least by forty (40) users per day. However, a recent survey revealed that the database was being used by an average of two users per day, a scenario that created concern among its managers. In view of the above, there was a need to study awareness, and perceptions of the users on information that was being dispensed by the biodiversity information systems countrywide. It was due to this reason that this study investigated the users' awareness and satisfaction with the biodiversity information in higher learning institutions, government departments and research institutions in the eastern zone of Tanzania.

The Objectives of the Study

The General Objective of the Study

The general objective of this study was to determine the users' awareness and satisfaction with the biodiversity information, with a view to identifying the factors that constrain effective access and use of the biodiversity information systems in some selected institutions and regions in Tanzania. Specifically the study aimed at the following:

- Determining the extent to which the users were aware of the existence of the biodiversity information at their institutions;
- Determining accessibility of information in the biodiversity information systems;
- Determine the users' satisfaction with the information that was being dispensed in the existing information systems; and
- Recommending ways on how to improve access and use of the biodiversity information systems.

Research Questions

The research questions which guided this research were as follows:

1. To what extent are the users aware of the existence of the biodiversity information at their institutions?

2. To what extent is the biodiversity information accessible in the existing systems?
3. To what extent are the users satisfied with the biodiversity information in the existing information systems;
4. What recommendations do the users suggest in order to improve biodiversity information access and use in Tanzania?

LITERATURE REVIEW

Literature indicates that biodiversity is one of the main issues of the 21st century (Wilson, 2000; Bowker, 2005). The term biological diversity or "biodiversity" emerged about twenty years ago and describes the variety and variability of life on Earth. The concept encompasses all forms of terrestrial and aquatic plants, animals and micro organisms, their genetic materials and the ecosystem of which they are part. Biodiversity is usually divided into three main groups: genetic diversity, species diversity and ecosystem diversity.

Understanding biodiversity is among the most challenging intellectual and scientific puzzles facing mankind today. Nearly every economic sector around the planet has an impact on biodiversity or its conservation status. Improving information is the key to start unraveling the challenges. Biodiversity data and information are necessary to support well-informed decision-making, yet information critical to such decisions are not readily available partly because they are scattered, outdated, or irrelevant. They suggest as future work, need to investigate the usefulness of biodiversity information by the target users, a phenomenon that necessitates this study.

Also, literature shows that users of biodiversity data and information may be divided into three categories: national level decision-makers, international policy analysts and the biological community. These groupings can be further categorised into national institutions, international institutions, and scientific communities. These throw light on type of users that are to be surveyed in this study.

Tanzania is a country that has a lot of biodiversity which is an essential source for food and medicines, as well as ecosystem services such as water availability, soil protection and climate regulation. Her regional variation in habitats and species can best be described in terms of bio-geographical divisions (phytochoria) or ecological zones (UNDP/UNEP/GEF: 2001). She has a vast array of biodiversity as well as Africa has the richest and most diverse flora. It is due to these reasons that the Government of Tanzania is committed to certain procedures and actions in connection with the Convention on Biological Diversity, in addition to its own domestic regulations and laws regarding the conservation of the natural environment. The greatest remaining threat to the natural forest is posed by the expansion of agriculture into high biodiversity value forest areas.

Tanzania has made a lot of efforts in protecting its biodiversity resources. Total area protected (all categories) 37, 428km2; number and status of species (high plants) 10,008; threatened species, 235; mammals, 316; threatened, 42; and breeding birds, 229 (Earth Trends, 2003). Its coastal zone harbors high biodiversity and an abundance of natural resources. These ecosystems play a major role in supporting local people, providing a source of food, cash and energy. Tanzania's unique biodiversity is also endangered. Changes in land use to

accommodate the food needs of a growing population are the cause of habitat loss (ETFRN, 2010).

Globally, there is an international organization that focuses on making scientific data on biodiversity available via the internet using web services known as the Global Biodiversity Information Facility (GBIF). The data are provided by many institutions from around the world and its mission is to facilitate free and open access to biodiversity data worldwide to underpin sustainable development. This further demonstrates that National biodiversity information systems need to be studied from time to time to ensure that they do not contribute outdated and irrelevant data to the Global Biodiversity Information Facility.

RESEARCH METHODOLOGY

This study employed Mixed Methods approach in which survey method was applied as well as data collection techniques such as interviews, questionnaires, observations and documentary reviews. Questionnaires were the major instruments for data collection because of their suitability to this kind of research. This method was supplemented by interviews wherever need arose. Brochures, fliers and other relevant documentary information about the institutions were also used to collect information.

Sample Size and Sampling Techniques

Purposive sampling was used in this research because researchers intended to obtain data from people who had full or some knowledge of biodiversity resources from the sampled institutions. This type of sampling was convenient for capturing knowledge, attitudes and practice of the personnel working in the sampled institutions, or those who were using information resources such as researchers and students in the institutions. Four biodiversity related institutions were purposively picked out from each of the three regions. A total of Ninety-eight(98) users and managers of information systems were either served with the questionnaires or interviewed. The institutions at which this study was undertaken, with their respective regions shown in brackets, were as follows: Ardhi University, College of Natural Sciences of the University of Dar es Salaam, World Wildlife Foundation, and the Ministry of Natural Resources and Tourism (Dar es Salaam Region); Sokoine University of Agriculture, Mzumbe University, Tanzania Forestry Research Institute, Tanzania Forest Conservation Group (Morogoro Region); and Mkwawa University College of Education, Tumaini University Iringa College, CONCERN-Iringa, and Iringa Regional Library (Iringa Region). Table 1 shows the sample size proposed for the study and the actual number of the respondents.

Data Analysis Techniques

Data collected were analyzed both quantitatively and qualitatively. The Microsoft Excel was used to process and analyze quantitative data to obtain frequencies and percentages which were in turn presented using tables, pie charts and a bar graph. Qualitative data were analyzed using content analysis.

RESEARCH FINDINGS

Respondents involved in the Study

The respondents initially projected to participate in the study were 120. However, only 98(82%) of them responded by either returning the questionnaires or being interviewed. Table I presents the number of respondents according to their gender.

Table 1: Respondents by Region

SN	REGION	MALE	FEMALE	TOTAL
1	DAR ES SALAAM	27	19	46
2	MOROGORO	15	10	25
3	IRINGA	16	11	27
4	GRAND TOTAL	58	40	98

Source: Field data, 2012.

Respondents' Distribution by Educational Level and Gender

In the course of analysis, the researchers decided to establish information on the respondents' educational levels. Table 2 presents the educational levels of the respondents.

Table 2: Respondents' Distribution by Educational Level by Region and Gender

SN	REGIONS	. DIPLOMA		BACHELOR'S DEGREE		MASTER'S		PhD.	
		M	F	M	F	M	F	M	F
1	DAR ES SALAAM	13	7	10	2	4	1	5	4
2	MOROGORO	6	4	3	3	3	2	3	1
3	IRINGA	8	4	7	5	2	1	0	0
4	TOTAL	27	15	20	10	9	4	8	5

Source: Field data, 2012

Table 2 indicates that 42(43%) respondents were diploma holders, 30(31%) were bachelor's degree holders, 13(13%) were master's degree and PhD holders each. Gender-wise, the male respondents 64(65%) outnumbered the females 34(35%).

Respondents' Distribution by Age

The respondents' age was another aspect which this study decided to analyze. The results indicated that 45 (56%) respondents, were of the age range of between 26 and 35 years. This was followed by 25 (31%) respondents of the age range of between 36 and 45 years. 13% were between 46 and 60 years. 87% of the respondents were relatively young individuals within the age range of 26 to 45 years.

Awareness of the Existence of the Biodiversity Information

This aspect intended to explore the extent to which the respondents were aware of the existence of the biodiversity information at their institutions; how they got to know the existence of the biodiversity information in the centres they visited; and the type of information which existed in the information centres they used.

Awareness of the Existence of the Biodiversity Information at the Institutions

Findings show that 59(60%) of the respondents were not aware of existence of biodiversity information in their institutions, while 39(40) said they were aware. This is a significant number and suggests that something must be done to scale up the access and use of biodiversity information if biodiversity conservation is to be realized.

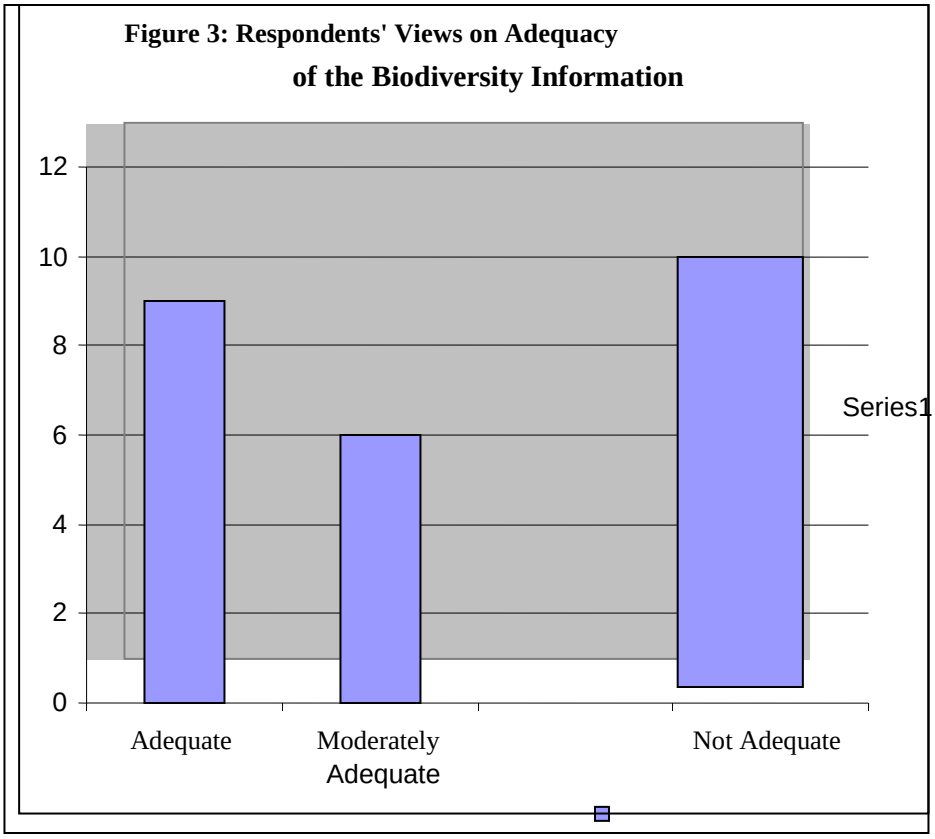
Knowledge of the Existence of the Biodiversity Information and its Sources

For those who acknowledged being aware of the existence of biodiversity information in their institutions; 39 respondents which represent 40% of the total sample of respondents, reported to know the existence of the biodiversity information through the library services. Additionally, the respondents who acknowledged being aware of the existence of biodiversity information, indicated that library was the major source they used to access the information. This suggests that marketing strategies, like using brochures, use of posters and the use of library websites are not commonly used by institutions to create awareness among users of biodiversity information. Moreover, other forms and sources of information like organized and specialized biodiversity information databases do not exist among the sampled institutions. Even at the Ministry of Natural Resource and tourism, where a database known as NAFOBEDA exists, the database is not fully developed and organized properly for easy retrieval, because (according to their response) there was lack of funds and expertise to support it. Generally, no institution among those we visited maintained an organized and specialized biodiversity database.

Relevance of the Biodiversity Information

The respondents were also asked to opine on the relevance of the biodiversity information available at their information systems. Out of the 32 respondents who reported to be aware of the existence of biodiversity information, 25(78%), said biodiversity information was relevant, 5(16%) said it was not and only 2(6%) said it was moderate. These findings indicate that something needs to be done to step up the quality and use of biodiversity information.

As regards the adequateness of biodiversity information, the findings are summarized in Figure 3:



Source: Field data, 2012

Figure 3 shows that only 9(23%) of the respondents out of 39 who reported to be aware of the existence of the biodiversity information thought the information was adequate for their needs. These constitute 9% of all the respondents (98) in this study. The other 24(61%) said biodiversity information available was not adequate and 6(24%) others said the information was moderately adequate. Adequacy of information has great bearing on access and use of the biodiversity information in these important institutions. As the majority of the respondents are not satisfied with adequacy of the available information in the institutions studied, something needs to be done to step up user satisfaction with the available information, hence assurance of relevancy of information and its quality to the users, to promote effective use of biodiversity information.

Up to date Information

This question was particularly relevant as the users prefer to use information which is up-to-date. With the exception of the Sokoine Agricultural University respondents 5(13%), who said information was up to date, all other respondents 34(87%) said information was not up-to-date. This was a major recipe for users' dissatisfaction with the information provided by various information systems, since responses on the users' satisfaction with the biodiversity information followed exactly the same pattern.

CONCLUSIONS

Despite the critical contribution biodiversity information has towards addressing the threat of Biodiversity extinction; this study has established that very little attention is given to the marketing, review and maintenance of the biodiversity information systems in the Eastern Zone of Tanzania. It has also been established that most information contained therein, is not current and it is inadequate for planning and decision-making purposes, hence the users' dissatisfaction with the information that was being provided. New initiatives are needed to ensure the users' access and therefore make use of this vital information to the survival of human kind. Moreover, there were no organized marketing strategies for the dissemination of even the little biodiversity information which exists within the institutions. Even at the Ministry of Natural Resources and Tourism the situation did not look different. Very little attention was given to NAFOBEDA database, which if it were fully developed, could have been very useful in the whole issue of planning and making informed decision in the realms of natural resources management and tourism. It will be of great importance if these shortcomings are addressed for the sake of the survival of mankind in our nation.

RECOMMENDATIONS

The following recommendations were put forward to improve access and use of biodiversity information:

- Biodiversity information should be organized in electronic databases for easy of use;
- Biodiversity information needs to be current, therefore, updating of its content in the information systems should be done regularly;
- The custodians of the biodiversity databases or resource centres should not wait for users to visit them at their own will. They should endeavor to market their resources through the use of fliers, newsletters, websites, etc.
- NAFOBEDA, which is a database at the Ministry of Natural Resources and tourism should establish effective links with research institutions within its jurisdiction and those related to its activities from other ministries and convince the ministry to finance researchers at district and regional levels to enable them to collect and deliver data on biodiversity;
- Institutions of higher learning which teach environmental science and environmental management studies should develop specialized biodiversity databases to make the dissemination of this kind of information much easier; and
- NAFOBEDA should be allocated adequate funds for its accomplishment, so that it becomes more organized, searchable and a nationally reliable resource for biodiversity information on forestry, bee-keeping, ecosystems, etc.

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