

INFORMATION AND COMMUNICATIONS TECHNOLOGIES (ICT): SUSTAINABILITY ISSUES IN ACADEMIC AND RESEARCH LIBRARIES IN TANZANIA

Desdery R.M. Katundu¹

ABSTRACT

This article discusses the status of Information and Communication Technology (ICT) and strategies needed in academic and research libraries in Tanzania to sustain ICT resources acquired through donor funding. Experience shows that most donor-funded projects in African countries, including ICT, thrive and provide quality-intended information services and products as long as donor support is available but fail once donor support is no longer forthcoming. In this paper I argue that both donors and recipients have made little effort in developing concrete strategies to ensure long-term sustainability of donor-funded ICT projects beyond donor funding. The paper proposes several ways through which recipient institutions can initiate and partially or fully sustain such resources based on available local resources.

INTRODUCTION AND BACKGROUND TO THE PROBLEM

Information and communication technology use and application is often presented as the most ideal solution for some of the problems experienced by developing countries, including underdeveloped information systems and infrastructure which deter effective dissemination of development information. Thus it is seen as a contributing factor to the development of these countries. Most of the literature argues that, since the information era is here to stay, these countries cannot afford to be bystanders watching as the world enters into a new development paradigm which is dominated by information and knowledge. Consequently, since the 1980's the donor community and international development agencies have made tremendous efforts in assisting developing countries, including Tanzania, to acquire information and communication technology so that they too can become part of the future global information system. In Tanzania there are several ICT-related projects which are supported by these agencies to try to ensure that the country becomes part of the future information society. Such

¹Dr. Desdery R.M. Katundu is a Senior Librarian and Co-ordinator of the Information Studies Graduate Programme at the University of Dar es Salaam.

continental/regional ICT projects include, among others, the PANAFTTEL project, PASCOM Satellite project, Africa One and Fibre Optic link around the world (FLAG). These projects are designed to facilitate telecommunication linkages and networks, specifically in Africa, and to link Africa with the rest of the world. Consequently, with improvement in telecommunications, Africa's Internet connectivity, both inter and intra-African exchanges of information, could become a reality.

Without donor support, many developing country institutions and organisations such as libraries, probably would not have been able, in a short space of time, to initiate ICT-related information services and products. Rosenberg (1996) shares a similar view when she argues that virtually all initiatives relating to the acquisition of information resources, staff training and the development of the information infrastructure among African libraries are the result of outside assistance. Her study of 18 African University libraries found serious levels of under-funding and almost total dependence on donor assistance for both recurrent and capital expenditure. A more generalised observation was also made by Levey (1991; 1993), who asserts that dependence on donor assistance by African libraries, specifically in information and communication technology, has been wide-spread since the 1980s. Although these observations were made almost four to six years ago, donor dependence is currently strong and on the increase.

²This study investigated 18 of Tanzania's academic and research libraries to determine if they themselves had initiated or adopted strategies to ensure the sustainability of ICT, which is mainly acquired through external donor assistance. In this paper the term "sustainability" refers to ways, means or strategies an information system or organisation employs in order to acquire, maintain and continue to use information and communication technologies as long as is necessary for providing more and improved information services and products for its users.

Despite recent donor interest in supporting libraries in developing countries, not much has been done by local information professionals to assess critically the long-term implications of such support, particularly the sustainability of donor-funded ICT projects in the same libraries (Levey, 1993; Rosenberg, 1996; Tvedt, 1998). On the one hand, the literature reviewed acknowledges the importance

² This paper is based on research conducted for a *Ph.D.* study. Since then it has been revised. The libraries involved were University of Dar es Salaam library, Tanzania Industrial Research Organisation, University College of Lands and Architectural Studies (UCLAS), Institute of Marine Sciences, Arusha Institute of Accountancy, Muhimbili Medical Library, Sokoine University of Agriculture, Co-operative College Moshi, Eastern and Southern African Management Institute, College of African Wild Life Management, School of Archive and Documentation Studies, Ministry of Agriculture Library, Tanzania Gender Networking Programme, Rwegalurila Water Resources Institute, National Environmental Management Council, Economic and Social Foundation Research and the Tanzania Food and Nutrition Centre.

of donor support without which it would have been difficult, if not impossible, to acquire ICT and provide related information services and products, given the limited fiscal resources of these libraries. On the other hand, the same literature fails to state that while donor support was originally designed to meet critical resource shortages in these libraries, the question of sustainability was not taken into consideration. As a result of this, library management in these countries has also become complacent about addressing the question of long-term ICT sustainability. Essentially, donors themselves are responsible for this complacency and, therefore, part of their responsibility should be to stimulate and encourage management of these libraries to devise long-term and locally based strategies for sustaining them.

Valadez and Bamberger (1994), referring to the World Bank's ICT-supported projects in the Agricultural sector, observed that donor agencies rarely address the sustainability of projects they support in various sectors, including libraries, which fail to deliver beyond the intended life span of the project. Similarly, this issue has also not been internally addressed by most African academic and research libraries even though these libraries are the major recipients of donor support.

This study was designed to determine the status of ICT development and use in academic and research libraries, how ICT is acquired and also the level and impact of donor funding and involvement. It also examined factors which may deter effective use of these resources as well as determining what efforts recipient libraries have made towards the sustainability of these resources. Finally it proposed measures which could help to alleviate these problems in the respective academic and research libraries, after donor support comes to an end. Essentially the study was designed to influence or stimulate the creation of local strategies to ensure long-term sustainability of ICT resources because, as Rosenberg (1996), points out, this is often neglected.

Local strategies and capabilities are crucial in ensuring effective sustainability of ICT resources once donor funding is no longer forthcoming. For example, Mushi and Kjeshus (1982) and Priestley (1993) argue that donor support would be more effective if it also prepared recipients and facilitated the environment for the latter to be self-reliant.

Despite the extended period of the relative dearth of information on ICT sustainability in African and Tanzania libraries in general, the question of sustainability is given little thought by both donors and recipient libraries (Rosenberg, 1994). There is a need to address these issues if we are to develop local, relevant and long-lasting ICT sustainable strategies in these libraries. The underlying assumptions of this study were that:

- Donor support for ICT may have contributed directly and indirectly to sustainability problems currently faced by African academic and research

libraries, including those found in Tanzania. For example, acknowledging a similar observation, Camara (1988: 6) noted that :

... rivalry and competition among donors themselves, the nature of aid or support being a “one time-off investment,” and the limited period (mostly of three to five years) within which such information projects are to be implemented, put many African institutions in difficult financial positions before even new systems and services had a chance to become fully operational and demonstrate their usefulness.

- Due inadequate resources, African library managers may have been forced to seek alternative sources of funding rather than donors, thus giving them greater freedom and the ability to provide a conducive environment for enhancing library productivity. In turn, this would have allowed them to seek for locally based alternative sources which would indirectly enhance their skills in strategic planning. It also would have encouraged them to apply locally based innovative skills gained through experience on the job.
- If acquisition of ICT library resources were to rely heavily on local resources this could encourage self-reliance, as opposed to complacency among African library and information professionals including library management. It would also have ensure the integration of library and information policies in national development plans. Policies and strategic planning are critical and essential ingredients in the sustainability of libraries and information services. In addition, they provide information systems with suitable frameworks within which to develop and sustain these (information) systems.

RELEVANCE OF ICT SUSTAINABILITY TO AFRICAN LIBRARIES

Unpredictable Levels of External Donor Support

In view of declining donor support, librarians in developing countries including Africa need to develop local strategies to sustain ICT resources and the information sector. For example, a recent World Bank Report (1998) shows that donor support or aid for developing countries had fallen sharply by a third, from about US\$ 69 billion to only US\$ 48 billion by 1998. By implication this means that donor funding cannot be depended upon to promote socio-economic development in these countries. Consequently, institutions in these countries have no choice but to look for alternative funding locally in order to ensure sustainability of formerly donor-funded information systems, services and products.

Strengthening Professional Commitment in Information Planning and Development

Sustainability of African information systems is important but also requires giving priority and attention to the development of ICT and the information sector. This presupposes that recipient libraries would be guaranteed the freedom of choice, and control in the planning and provision of ICT and information services and products that are based on locally identified user information needs. One tends to agree with Ballantyne (1994:27) who argues that "ICT, regardless of the means by which it is acquired, like information in general, should be evaluated against its usefulness to established local requirements or needs and priorities". Otherwise, development of information services would be technology and not user information needs driven.

Facilitation of Indigenous Planning and Decision-Making Processes

The development of ICT in most African countries is highly dependent on donor funding, making it difficult for African library management to devise independent ICT sustainable strategies. Locally based sustainability strategies would ensure provision of a variety of ICT-based information services and products by these libraries because the latter would no longer be tied to donor funding needs and condition. Similarly, an understanding on the part of the recipients that donor support is time-limited would promote the spirit of self-reliance in the planning and efficient management of these resources.

Methods

Data for this survey was collected through triangulation. This method was used in order to do away with shortfalls associated with each of the data gathering instruments. Data for this research was collected through a highly unstructured self-administered questionnaire, face to face interviews, observations and visits to selected libraries. In each institution heads of libraries or their deputies were interviewed. Face to face interviews allowed the researcher to probe and to clarify crucial issues pertaining to the research question.

Data for this research was collected from 18 Tanzanian academic and research libraries. These were chosen because of their extensive use of ICT in processing and managing information services. In addition, the methodology provided quantitative data specifically on the status of ICT in these libraries. Information gathered during field work and through literature review related to ICT acquisition not only enriched the study but was also important in determining possible strategies for enhancing effective use and sustainability of ICT resources in individual institutions.

DISCUSSION

An analysis of the status of ICT in the 18 selected academic and research libraries was important in determining the implications associated with methods and means of acquiring ICT resources in these libraries. The original study (Katundu, 1998) provided baseline data and information based on respondents' responses to the four research questions related to the problem. The questions were aimed at establishing the extent of ICT operations and availability in the 18 libraries and its impact regarding effective use and application of ICT and its sustainability.

The study also examined whether the current state and status of ICT resources in these libraries influenced library management to put in place measures to sustain the technology, information services and products accruing from the projects. In determining the status of ICT resources in these libraries the following factors were considered, namely, the level of development, quantity, quality and the range of ICT resources available in each library.

The Status of ICT in Libraries

Findings revealed that ICT development and infrastructure in a majority of these libraries as at the infant stage. The number of computers and ICT components in each library varied greatly from library to library. For example, sixty one percent (61%) of the libraries had less than the average of six computers. At the same time sixty seven percent (67%) said they are also expected to serve the varying and complex ICT related information needs of between 200 to 1000 users. Therefore, if the number of computers in each of the 18 libraries is taken as a representative sample of ICT acquisition and development, then it can be assumed that the overall level of ICT development in these libraries was low and unevenly distributed. It is also clear that ICT development in some libraries is influenced by the presence of a proactive and aggressive library management.

A vital factor concerning the development of ICT was include the type of library management in place and its ability to attract donor funding and also its ability to sustain such technology. The willingness of donors in initiating and supporting joint research programmes with specific academic and research institutions was also an important factor. Libraries in respective institutions also benefited from these links as they acquired research-related equipment and ICT to facilitate data processing, organising and disseminating of scientific information. A third factor was the important role played by the institution and its library in national development. These factors also influence donor perceptions and interest. For example, Universities (and their libraries) are highly regarded by donors because they contribute to the development of a country as a whole. Thus, not only does this determine the level of donor support and funding to a given library but also variations in the development and quantity of ICT resources in each of the 18 libraries in this study.

Financing and ICT Sustainability

Under this item, the study examined the level of financial contributions to libraries by donors for ICT acquisition, maintenance and sustainability. Basically the study sought to establish if these libraries had alternative funding to sustain ICT resources. It was also assumed that since libraries owned and used ICT they also recognised its importance and potential in improving the quality of services. Consequently, they would have strategies in place to ensure the technology is sustained once donor support is no longer forthcoming.

Findings revealed that in 12 libraries donor funding constituted about sixty-two (62%) percent of their total budget for ICT development. This was followed by a combination of the donor's and library's own funds, which was thirty four percent (34%), i.e. five libraries, although even in this category the donor contribution was greater than that of the libraries.

Only one out of the 18 libraries (about 6%) used its own budget to acquire ICT resources. Findings also revealed that, in general, local budgetary allocation for ICT resources as very low, averaging between one and five percent of the total library budget. This also confirms Baker's (1993: 44) observation that between the late 1980's and throughout the 1990's donors were a very powerful influence in almost every sector in Tanzania. Consequently, most donor-supported projects in the country often included an ICT component in the budget. Thus, donor policies tended to influence ICT development in recipient countries, libraries being one such area in which ICT was developed.

Findings also showed that, between 1986 and 1996, 32 aid agencies provided funding for the 18 academic and research libraries in this study. These findings also confirm those of Baker (1993), Mulira (1995) and Cyamukungu (1996) that ICT development in most African countries is highly dependent on multiple donors hence the proliferation that exists of different ICT makes, models, standards and networks which do not necessarily meet the needs of African users.

ICT Policies

The development of ICT in the majority of libraries is greatly influenced by the donors who also determine the nature of information activities as well as how the technology is used and applied. Scholars also argue that the establishment of computer network infrastructures in Africa does not often take into consideration the interests of aid recipients (Cyamkungu, 1996; Baker, 1993 and Kluzer, 1990). This was also evident in the libraries under study. Basically this tends to jeopardise future sustainability of ICT resources in these countries. For example, while assessing the sustainability of rural grain mill technology in West Africa, Freudenberger (1994) argued that user ownership and control is critical in guaranteeing increased user demand and effective use and sustainability of any technology.

The findings of the study also revealed that the majority of these libraries (83.33 %) did not have policies neither to guide the selection of relevant ICT, its use and application nor its development. Donors always determined activity areas for the use and application of ICT. In this respect it is the donors who had the final say.

The lack of policies on ICT development is a common phenomenon in most African countries. For example, in his study, Abifarin (1993) identified 17 University libraries in Nigeria which had no ICT policies and concluded that this also affected the level of ICT planning and development in these libraries. Dependence on donors was also seen as a major constraint hindering effective development of ICT infrastructure and sustainability in Nigeria. These findings also corroborate those of Garcha and Buttlar (1994) in their study of 71 academic, research and public libraries in Ghana, Kenya and Nigeria.

Although the majority of libraries in this study (61.11%) indicated that some freedom existed for recipient library management to make decisions on ICT planning and use, it was difficult to determine the extent of this freedom, given the influence of donors. In addition, it seemed obvious that most library management could not make independent decisions on the use, planning and sustainability of ICT without consulting the funding agencies.

Barriers to ICT Sustainability

Results indicated three categories of barriers that affect the use and sustainability of ICT:

- i) Technology-related ICT barriers;
- ii) Scarcity of resources;
- iii) Policy and management-related problems.

A detailed analysis of the data revealed that the majority (53%) of the respondents indicated technology to be the major barrier while 43% mentioned scarcity of resources as a barrier. Only 3% indicated policy and management as a barrier to sustainability of ICT.

Technology-related Barriers

These included, among others, shortages of all types of ICT hardware and software, limited maintenance expertise, inadequate back-up services, under-utilisation and also incompatibility due to lack of standardisation of ICT equipment or software. This could also be explained by the lack of ICT needs assessment.

Resource-related Barriers

These included: insufficient local funding; low levels of skills, knowledge and competence of ICT use; lack of in-country training opportunities at advanced levels and retention problems of qualified ICT personnel due to poor remuneration.

Management-related Barriers

These included limited capacity, lack of participatory in decision-making processes (which is a characteristic of most library management), and lack of involvement of the library management in decision-making concerning ICT development. Other barriers included the lack of information and experience on how donor support such as for ICT could be effectively integrated and used within the library environment, without perpetuating the vicious circle of donor dependence. Other issues dealt with how to effect sustainability resource-sharing, commercialisation of information services and institution user fees including establishing twinning programmes with other libraries.

Proposed solutions looked at the need for libraries to ensure guaranteed avenues of adequate financial resources so that the resource base of these libraries could be sustained.

ICT Sustainable Strategies

In many donor-funded ICT projects, much emphasis is placed on project implementation rather than strategies for sustaining such projects. Even though sustainability is not treated as a priority issue, however, librarians in these institutions had a lot of ideas on the issue. For example, seventy two percent (72%) of the respondents said ICT could be sustained with concrete strategies that take a holistic approach in their implementation. In other words, no single strategy could effectively sustain ICT, unless all of them are implemented concurrently, given their interrelationships and interactions.

The libraries proposed three levels of strategies for sustaining ICT. For example, resource-related strategies were ranked highest (54.54%), implying that adequate resource-generation strategies are a critical component in effecting ICT sustainability. The findings corroborate those of Agha (1992), Freudemberger (1994) and Stefanini (1995) who argue that, if resource-generation strategies can be effectively implemented, this is likely to create an adequate sustainable resource base for the libraries. Ranked second (213.23%) include those sustainability strategies concerned with the effective implementation of policy, planning and management within the library/information environment. These affect the formulation of effective library/information policy as an essential ingredient in effective planning and providing a conducive environment for the implementation of sustainable strategies. Finally, strategies related to enhancing the role of information as a critical resource in decision-making, planning and execution of various programmes were also emphasised as being equally critical.

CONCLUSION

The findings of this study have demonstrated that donor funding plays a major role in the development of modern information systems in the majority of African academic and research libraries. Furthermore, they tend to have an upper hand in determining ICT needs and requirements including where it is located in these institutions (Kluzer, 1990; Mulira, 1995; and Cyamukungu, 1996). In view

of this, it is imperative that recipient libraries are involved in charting out the required path for ICT development in these institutions. This is critical in ensuring not only that adequate ICT resources are acquired, but also that what is acquired is based on the needs of these libraries and their clients.

Findings also revealed that not only is the level of ICT development in these institutions relatively low and inadequate, both in quantity and quality, but also sustainability is not concretely addressed, particularly once donor support is no longer forthcoming.

The libraries, which participated in this research, proposed a number of strategies, which, if implemented, could become a starting point in effecting sustainability. Therefore, willingness, commitment and imagination on the part of African information professionals and library management in experimenting with these new ideas must be a priority if they are to improve their resource base.

RECOMMENDATIONS

While the findings of this study have contributed to a better over-all understanding of sustainability problems associated with ICT development in African academic and research libraries, are not definitive. Therefore more studies are needed to refine the methodology and identify a checklist of strategies that could effectively promote ICT sustainability in African libraries. Valadez and Bamberger (1994) share similar views by arguing that “when the sustainability of any activity or project is not taken care of or is ignored, the life of such activity or project is significantly reduced and the quantity and quality of services provided decline sharply.”

It is equally stressed that donors do contribute directly or indirectly to stifling local self-reliance initiatives concerning information systems and services in African academic and research libraries. Consequently, donors (and recipients alike) have a collective responsibility for encouraging and stimulating ICT sustainability initiatives in these libraries. Similarly, donors should also support library planning and improvement of implementation capacities in order to ensure long-term ICT sustainability.

Current donor policies and the nature of assistance to most African libraries have tended to be too rigid and little attention is given to developing local ICT skills and capabilities to ensure long-term sustainability after donor support ends. Furthermore, donor policies and processes should empower Libraries and their parent institutions.

Another equally important observation of the study also is the glaring absence of ICT policies in these libraries. Therefore, ICT policies must be part and parcel of library strategic planning and development. It is within such planned sustainability framework that most of the proposed strategies can be concurrently implemented and achieved. ICT and library sustainability therefore should be viewed as a multi-phased and continuous or complimentary process. This is perhaps the most rational and appropriate approach in ensuring effective ICT sustainability in libraries.

REFERENCES

- Abifarin, E.P., 1993: 'Availability and Use of Information Technologies in Nigerian University Libraries,' *Library Review*, vol.42 (5): 4-14.
- Agha, S.S., 1992: 'Sustainability of Information Systems in Developing Countries: An Appraisal and Suggested Course of Action.' Ottawa: IDRC. (Manuscript No.316e).
- Baker, S., 1993: 'The Survey of Information Technology in Tanzania,' Dar-es-Salaam: Tanzania Commission for Science and Technology (COSTECH).
- Ballantyne, R., 1994: 'Bridging the Gap Between Practice and Policy: Policy Challenges for Agricultural Information Specialists.' *Quarterly Bulletin of the International Association of Agricultural and Information specialists*, Vol.19 (1-2): 24 -29.
- Camara, A.B., 1988: Implementing the Information Strategy for Africa: The First Stages. *Information Development*, Vol. 6 (5): 55-61.
- Cyamukungu, M., 1996: 'Developing Strategies for an African Computer Network,' (short communication). *Information Technology for Development*, Vol. 7: 91-95.
- Doust, R. W., 1997: 'Standing on Our Own Feet.' *Zimbabwe Librarian*, Vol.29 (1): 15-16.
- Freudenberger, K.S., 1994: 'New Technology for Rural Women: Paradoxes of Sustainability,' *Development in Practice*, Vol. 4 (1): 13-22.
- Garcha, R. and L.J. Buttlar, 1996) 'Profiling African Libraries: Automation in Ghana, Kenya and Nigeria,' *Library Review*, Vol. 45 (6): 125-135.
- Katundu, D.R.M., 1998: 'The Use and Sustainability of Information Technology (IT) in Academic and Research Libraries in Tanzania.' (Ph.D.) Department of Information Studies, University of Natal.
- Kluzer, S., 1990: 'Computer Diffusion in Black Africa - A Preliminary Assessment.' In: *Proceedings of the IFIP/TC9/TC 8 Working Conference on the Impact of Information systems on Developing countries*. New Delhi, India, 24 - 26th Nov., edited by B. Bhatnagar and Bjorn Andersen. North-Holland, Amsterdam: Elsevier B.V. pp175-188.

- Levey, L., 1991: 'Computer and CD-ROM Capability in Sub-Saharan African University and Research Libraries.' Washington, DC: American Association for the Advancement of Science (AAAS).
- Levey, L., 1993: 'A Profile of African Research Libraries in Sub-Saharan Africa,' Washington, DC: AAAS.
- Mulira, K.H., 1995: 'Managing Information Technology in Uganda: Strategies and Policy Formulation.' *Information Technology for Development*, Vol. 6: 95-105.
- Mushi, S.S. and H. Kjeshus (eds.), 1982: *Aid and Development: Some Tanzanian Experience*. Oslo: Norwegian Institute of International Affairs.
- Pakkiri, D., 1991: 'Library Management Strategies Under ESAP: A Programme for Survival,' In: *Annual Conference Proceedings on "Libraries in an era of scarce resources – is there a way forward?"* Bulawayo, Zimbabwe, 4th April 1991. Pp. 20-24.
- Parker, J.S., 1990: IDRC: 'Twenty Years in Information Development.' *Information Development*, 6(1).
- Priestley, C., 1993: 'SAREC Library Support Programme; Evaluation and Review: Ethiopia, Mozambique and Tanzania,' Stockholm: SAREC/ Gotab (SAREC Documentation series; 1993:1).
- Rosenberg, D., 1994: 'Can Libraries in Africa Ever Be Sustainable? Information Development,' Vol. 10 (4): 247-251.
- Rosenberg, D., 1996: *University Libraries in Africa: A Review of Their Current State and Their Future Potential*. (3 volumes). London: International African Institute.
- Stefanini, A., 1995: 'Sustainability: The Role of NGOS'. *World Health Forum*, Vol. 16: 42-46.
- Tvedt, T., 1998: *Angels of Mercy or Development Diplomats?* Trenton, Oxford: Africa World Press, (James Currey).
- Valadez, J. and M. Bamberger, 1994: *Monitoring and Evaluation of Social Programmes in Developing Countries*, Washington D.C: World Bank.
- World Bank, 1998: *World Bank Report*. Washington DC: World Bank.