

Information services provided by Maarifa Telecentres to rural communities in ASALs in Kenya

Catherine W. Chege¹

Department of Library, Records Management and Information Studies,
Moi University
cngeci@yahoo.com

Joseph Kiplang'at²

Department of Library, Records Management and Information Studies,
School of Information Sciences, Moi University
jkngetich@yahoo.co.uk

Daniel Chebutuk Rotich³

Department of Publishing and Media Studies,
School of Information Sciences
Moi University

Department of Information Science, University of South Africa
drotich@hotmail.com

Abstract

Telecentres are established to provide information, to bridge the information and digital gap, foster development and confront the requirements of the poverty stricken in remote and isolated rural areas in developing nations. The purpose of this study was to explore information services provided by two Maarifa centres to rural communities in arid and semi-arid lands (ASALs) in Kenya. The specific objective was to establish the information needs of ASAL communities served by Maarifa centres; to explore information services provided by Maarifa centres to ASAL communities; to analyse the challenges and prospects of Maarifa centres in the provision of information to rural communities in Kenya and to make recommendations for the improvement of information services to ASALs communities in Kenya. The study employed a multiple case study research design as an overall strategy and drew upon multiple data sources to develop a triangulation of methods. Qualitative research was administered as a predominant approach. Data was gathered through interviews from a sample of 20 respondents from each Maarifa centre: Isinya in Kajiado and Ng'arua in Laikipia counties. In addition, two focus group discussions were administered with the respondents of the two Maarifa centres. Key informants included directors and programme coordinators of Maarifa centres and government agencies who provide infrastructural support to the telecentre project. This study was informed by the Department for International Development's (DFID's) theoretical framework namely: the 'Sustainable Livelihoods Approach' (SLA) framework. The findings of this study suggest that Maarifa centres are points of Arid Lands Information

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1. Catherine Chege is a PhD student in the Department of Library, Records Management and Information Studies, School of Information Sciences, Moi University.
 2. Joseph Kiplang'at PhD is Professor of Library and Information Studies at Moi University, Kenya.
 3. Daniel Chebutuk Rotich PhD is Professor of Publishing and Media Studies, Moi University, Kenya and Research Fellow, University of South Africa, South Africa.

Networks (ALINs) engagement with communities living in ASALs. People appreciate Maarifa centres as places to access information, acquire ICT skills, and improve livelihood activities such as agriculture and businesses and for social communication. The challenges are mainly infrastructural such as poor connectivity and Internet access. This study revealed that Maarifa centres have solved most of the community's information related challenges through e-government services, e-commerce and agricultural development and knowledge creation, resulting in improved livelihoods. The study contributes to knowledge because it adopts a community-centred approach that focuses on the views of users of Maarifa centres.

Keywords: Telecentres, Maarifa centres, information services, rural communities, arid lands, Kenya, economic development

1. Introduction

Telecentres are publicly accessible places where people can get help to use computers, the Internet, and other digital technologies that enable them to gather information, create, learn, and communicate with others while they develop essential digital skills. Telecentres, ICTs, Information access and community development are terms commonly used in telecentre studies and contextualisation (Mishra and Unny 2018). Telecentres are mainly non-profit information centres that offer access to computers to solve the problem of the digital divide, to serve the poor in remote areas. Telecentres have been considered the most successful projects for ICT diffusion in developing countries (Aji *et al.* 2016). Furuholt and Saebo (2017) explain that telecentres offer information services to marginalised and isolated communities to help them overcome problems of the digital divide and join the information society. Telecentres also provide space for rural community members to interact and share ideas on various issues important to their lives (Buhigiro 2012).

Sigweni *et al.* (2017) note that telecentre implementation has not always succeeded due to sustainability issues. Although there is a research gap on the cause of their collapse, this study focuses on a success story of Maarifa (tele)centres in Kenya. Although there is a growing perception that mobile phones will render telecentres irrelevant, Nemer (2018) and Arid Lands Information Network (ALIN) in Kenya acknowledge that mobile phones and telecentres complement each other in providing those who face digital inequalities a broader social technical experience. The benefits brought about by telecentres are: development of ICT skills, health, employment, education, governance, etc. (Sey *et al.* 2013).

ALIN is a knowledge driven, non-governmental organisation (NGO) that initiated and operates Maarifa centres. Information and knowledge act as its raw material, making ALIN a knowledge driven body. ALIN's mission is "To improve people's lives and livelihoods of arid lands in East African region. It relies on modern information technology to deliver practical information resources" (ALIN.net. 2019).

2. Brief literature review

This section highlights the research theoretical framework and provides a brief literature review in the following sections.

2.1 Theoretical framework

This study applied DFID's Sustainable livelihood Approach (SLA) framework. In operationalising SLA, the framework used a pentagon figure to demonstrate a range of capital assets that communities access and use to improve their lives and eradicate poverty. The pentagon depicts interrelatedness of the capital assets with:

Social capital representing social resources upon which people draw their livelihood pursuit (DFID 1999). DFID (1999) explains that social capital is important because it has a direct impact upon other types of capital; social capital can help increase people's incomes and rates of saving (financial capital) through the improved efficiency of economic relations; social capital can be effective in improving the management of common resources (natural capital) and the maintenance of shared infrastructure (physical capital). Kapondera and Namusanya (2017) explain that telecentres can enhance social capital by fostering communication through ICTs within the telecentres and providing space for workshop discussion and debates.

Human capital includes knowledge, skills, the ability to work including health to help people pursue different livelihood strategies and achieve their livelihood objectives (DFID1999). Telecentres achieve human capital through teaching computer lessons.

Physical capital includes basic infrastructure such as affordable transport, adequate water supply and sanitation, secure shelter and building, clean affordable energy, communication and production equipment and access to information that enables people to pursue their livelihood strategies (DFID1999).

Financial capital denotes the financial resources that people use to achieve their livelihood objectives (DFID 1999).

Natural capital includes the natural resources such as land and water used to generate means of survival. Natural capital is the term used for the natural resource stocks from which resource flows and services (e.g. nutrient cycling, erosion protection) useful for livelihoods are derived (DFID 1999).

These assets are supported by an information system like telecentres (Parkinson and Ramirez, 2007, Soriano 2007) hence the choice of the framework in this study.

These capital assets helped to confirm the findings of this research. Heeks and Molla (2008) merge livelihood assets and information to realise livelihood outcomes as depicted in the diagram below:

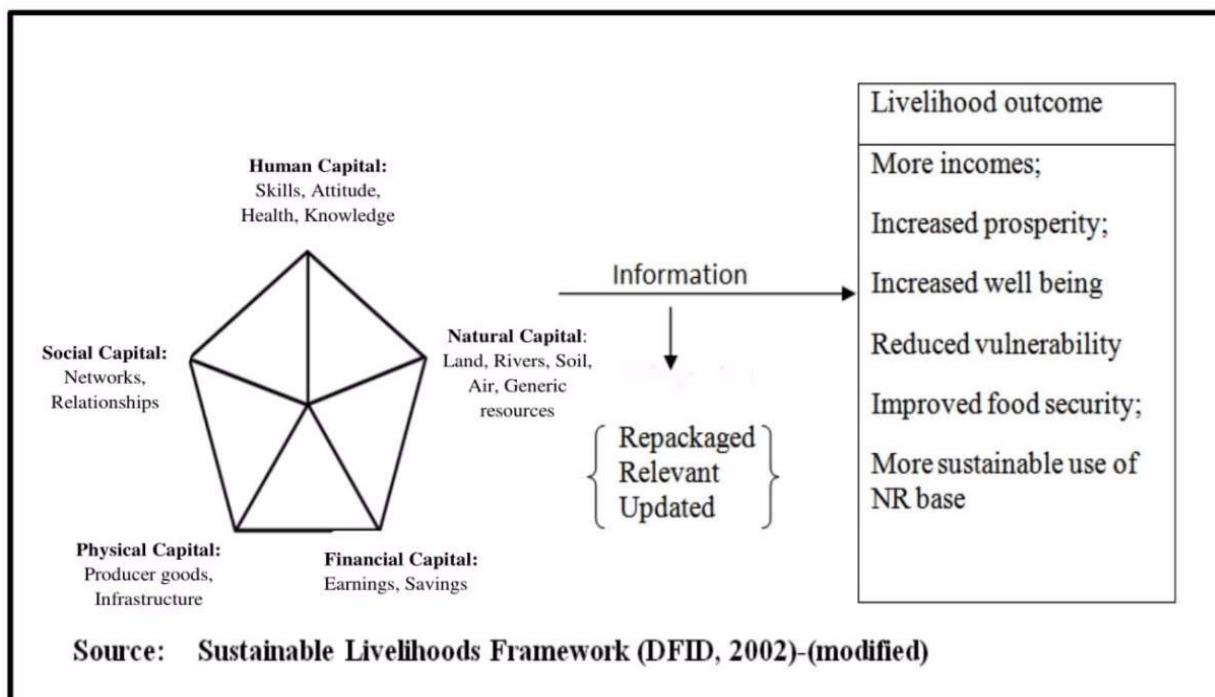


Figure 1: Sustainable Livelihood Framework

Livelihood outcomes identified in SLA include more income, increased prosperity, improved food security, reduced susceptibility; and more suitable exploitation of the natural resource base. Information is a key component that can enhance the benefits of this process. For poor people to use information and ICTs, information must be relevant to their needs; information must help them make informed decisions and choices. The whole process is expected to be interactive and user-centred. Telecentres are institutions that help the realisation of improved livelihood outcomes.

2.2 Information needs

Central to information for making informed decisions are specific information needs for those involved at different levels including those living in ASALs. Information needs assessment will also facilitate dissemination of the required information (Kapondera 2014). A community can only experience value added benefits accrued from a telecentre if they access information that corresponds to their information needs. Zulkhairi *et al.* (2017) offer an explanation that a telecentre ecosystem can transform Malaysian rural areas into communities that are capable of adding value as a result of the services offered. This ecosystem can be achieved based on information priorities presented by various stakeholders through expression of information needed to create socio-economic value.

Chilimo, Ngulube and Stilwell, (2011) defined information need as an instance when there is a problem that can only be solved through some information. Information can be sourced from an information service provider to satisfy that information need. BBC News (2017) described Malawi as an example of developing countries where the majority of the population live in rural areas and rely on agriculture. They therefore have enhanced agricultural information needs that can be satisfied through ICT public access telecentres. Mbangala and Samzugui (2014) reiterate that ICTs have the potential to enhance access to the necessary agricultural information. Other information needed by people living in remote rural areas across regions are educational, healthcare, government services, market prices and weather information to farmers (Buhigiro 2012; Kapondera *et al.* 2018), crop, livestock husbandry and value addition (Elly and Silayo 2013).

ASAL communities' information needs lean towards agricultural and marketing information that ALIN helps to solve through Maarifa centres.

2.3 Telecentre services

Telecentre services are crucial for telecentre existence; in other words, all that telecentres do is to offer services to users and satisfy their livelihood needs. Hassan *et al.* (2010) outline the range of information content and services provided broadly relating to the following areas:

1. To create a community knowledge centre in rural areas;
2. To educate and improve people's standards of living;
3. To facilitate online access to global information;
4. To open up markets for local products through the Internet and e-commerce; and
5. To provide e-government information services.

Development is realised through information services offered at the telecentre. Parkinson and Ramirez (2007) used SLA to assess the effects of Colombia telecentres on the livelihood beneficiaries. Soriano (2007) established a link between community telecentres and poverty reduction in Wu'an province of China.

Several research projects have been conducted on the information services offered by telecentres and their contribution to socio-economic development across African countries and in other parts of the world. There is however a noticeable gap in such research outputs for the Kenyan perspective. Some examples of such cases are: the link between telecentres and community development in Malawi's Vikwa community telecentre by Kapondera (2017);

Tanzania's Public Internet Access Points (PIAPs) by Furuholt and Saebo (2017); livelihood enhancement in agro-rural communities in Zimbabwe by Mago and Mago (2015); and telecentre sustainability in India by Mishra and Unny (2018). Much has also been discussed in these articles about the contribution of telecentres in poverty alleviation as well as relating telecentres to information needs and services such as e-government, e-commerce, and telemedicine for rural communities.

Ullah (2016) conducted a study in Bangladesh based on the Union Information and Service Centre (UISC), a telecentre model, and what came from the study is that 'UISC is the torchbearer of modernity, hope and opportunities that enhance one-stop public service delivery to the rural poor'. Ullah (2016) goes further and explains that besides being poor, people who require telecentre information services are illiterate, especially women and the elderly; they have very limited chances of accessing ICTs. The presence of UISC in their midst has enabled them to access ICTs particularly for e-government services; it has brought services close to people thus saving them time, cost (because services are either free or very cheap), minimising the distance and enhancing access to information. Government agencies have initiated ICTs to modernise their service for improved service delivery to citizens. They rely on telecentres to achieve this in the remote areas (Lin, Kuo and Myers 2015).

2.4 Telecentres in the age of mobile phones

Mobile phones have been embraced by telecentres to enhance their services to users. This is because access to ICT is widely and rapidly provided through mobile phones due to mobile phone penetration. Furuholt and Saebo (2017) observed that telecentres combine rendering services both through users visiting the telecentres as well as the use of personal mobile phones. Mobile phones are platforms for information sharing, marketing and financial transaction services. Mobile phones have enormous capabilities; they can create awareness, foster digital skills and provide access to many applications and content. Prasad and Ray (2012) explain that provision of basic services such as education and health for communities living in remote areas is offered through telecentres.

Furuholt and Saebo (2017) argue that a combination of both mobile phone services and use of telecentres for complex tasks such as university application and medical queries are performed through the Internet from telecentres. Ray and Prasad (2014) suggest that telecentres and mobile phones must play complementary roles in bringing connectivity to rural areas. Vannini, Nemer and Rega (2017) posit that mobile phones and telecentres are both primary tools that facilitate access to information.

Furuholt and Saebo (2017) observe that poor people living in rural areas are financially restricted from having expensive phones with Internet capabilities. Telecentres are therefore still important Internet access points.

2.5 General challenges faced by telecentres

Telecentre challenges are experienced both ways, by the telecentres and by telecentre users as well. A major challenge faced by telecentre establishments is in the effort to make telecentre content relevant to the users' needs (Colle 2004; Kapondera 2014). Telecentres are also required to justify their existence in the age of mobile technology because some services offered by telecentres are accessed using mobile technologies (Chigona *et al.* 2011).

Researchers have expressed other challenges including: cost of access that limit the number of services provided to the communities; unreliable and high cost of power supply, unreliable and slow Internet connectivity, etc. (Mtega and Melakani 2009; Kapondera 2014)

Users' lack of abilities to navigate the Internet to access the desired information and difficulties to analyse and synthesise the quality of information retrieved (Huerta and Sandoval-Almazán, 2007). This challenge is attributable to limited skills, especially when perceived users

fail to attend training sessions offered at the telecentres. Lack of searching skills will yield poor results and discourage people from appreciating telecentre services (Mtega and Malekani 2009).

Opening hours are a challenge because most telecentres operate within government working hours, which is a very short time for people living in the rural areas (Kapondera 2014). Chigalu (2009) and Gcora *et al.* (2015) suggest that telecentres should be open when people want to use them.

Physical facilities especially space make users of telecentres uncomfortable; they are unable to enjoy privacy when interacting with the computer (Etta and Parvyn-Wamahiu 2003). Telecentres do not have enough computers (Kapendora 2017). Squeezed space leads to other problems such as limited access, as only a few people can use computers at any given time.

Lack of information content written in local languages, web-based information written in a foreign language and in scientific jargon cannot be read and understood by local communities (Gomez and Ambikar 2008; Mtega and Malekani 2009). This situation makes the local illiterate members of the community perceive that telecentres are places for the educated (Etta and Parvyn-Wamahiu 2003).

The location of telecentres presents a problem of distance from some users who may have to incur transport costs. This discourages usage as most people in remote locations are poor and cannot afford transport to the telecentres (Coward, Gomez and Ambikar 2008).

3. Aim and objectives of the study

This study investigated how and to what extent Maarifa centres are providing information to communities in ASALs with a view to establishing the challenges and coming up with possible solutions for improving information provision.

The study was guided by the following three research objectives:

1. Establish and verify the information services provided by Maarifa centres to rural communities in ASALs in Kenya;
2. Analyse the challenges experienced in the provision of information in rural communities in ASALs in Kenya, and
3. Suggest recommendations for the improvement of services offered at Maarifa centres.

4. Methodology

This study adopted an interpretive paradigm that relies heavily on natural methods through qualitative research such as case study by use of interviews, observation and analysing existing texts. This research has a multiple case study exploratory research design; it investigated Maarifa centres as units that offer information services to people living in ASALs. There are eight Maarifa centres in Kenya, but this study selected two of the eight. Furthermore, there are other telecentres in Kenya such as the Pasha Digital villages at various locations, and religion-based centres such as the National Christian Council of Kenya (NCCCK) in Korogocho informal settlement in Nairobi.

The study used triangulation of multiple data sources to gather information and to enable in-depth investigation that helped capture the reality of events (Muganda, 2010). Both structured and semi-structured interviews, focus group discussions and observation techniques were used for data collection. The use of data collection triangulation was important to compensate for shortfalls of the different data-gathering methods

The study population included: two Maarifa centres, each with 65 users amounting to a total of 130 users (respondents); 20 users were randomly picked to be interviewed and to participate in FGD. Key informants to be interviewed included 2 telecentre managers, 5 officers from the Communication Authority of Kenya (CAK); 3 from ALIN and three officers from the ICT Board of Kenya.

Table 1: Samplings.NO.	Unit/ Category	Population	Sample	Sampling technique
1	Communication Authority of Kenya Officers	5	5	Purposive
2	Arid Lands Information Network officials	3	3	Purposive
3	Managers of the 2 telecentre	2	2	Purposive
4	Users of the 2 telecentre	130	20 (31% of population)	Simple random
6	Total participants	140	30	

The study data were gathered from different interviews such as users of Isinya and Ng'arua Maarifa centres (referred to as U1, 2, 3 etc. in the findings), managers of the telecentres (eg IM for Isinya and NM for Ng'arua), directors of the agency responsible for Maarifa centres' projects (ALIN) (referred to as D1, 2), and government agencies providing infrastructural support to Maarifa centres' projects. Two focus discussion groups and observation methods were used as well. This helped collate multiple data sources and therefore enhance the validity and reliability of the findings by investigating varied views of the situation under study (Taylor, Kermode and Roberts 2007).

Interview was the dominant method of collecting data in this study, with four sets of interview schedules. The interviewer followed a rigid procedure of written questions to ensure that no omission of pertinent aspects was experienced. The questions were semi-structured.

Focus group discussion (FGD) is a good way to gather people from similar backgrounds or experiences on a specific topic of interest. Seven participants in FGD were picked from among users of Maarifa centres under study; users formed a key segment of this study's respondents. Managers of the Maarifa centres participated in the FGD sessions. FGD facilitators posed questions from the focus group discussion guide. These questions were prepared beforehand in line with the objectives of the study. Data was also collected with the help of observation that involved field visits, writing notes focusing on people, situations and the environment as well as taking photographs of activities.

As far as data analysis was concerned, NUD.IST Vivo (Nvivo) which is a qualitative data analysis software package designed for handling data that are not in the form of numbers was used. Nvivo was considered ideal for this study because its data were majorly qualitative. SPSS was used to analyse data from the semi-structured interviews with users of Maarifa centres and other key informants that emanate from the set of closed-ended questions requiring processing using quantitative analysis. Quantifiable data is not reported in this paper.

5. Results and discussions

5.1 Introduction

This section provides an interpretation of the research findings on information services provided by Maarifa centres to rural communities in Kenya. The findings looked into ICT-based information services that aim at improving the ASALs communities' livelihoods. The research findings were derived from the analysis of the data collected from Isinya and Ng'arua Maarifa

centres. Information from the literature review was used to support the interpretation of the research findings of the study.

The findings in this section are arranged by research objectives or themes mentioned earlier. The demographic description of users precedes the information needs of ASALs communities served by Maarifa centres followed by services provided by Maarifa centres, such as: training services, business support services, financial and social capital investment services and online communication, challenges that affect telecentre services and recommendations.

5.2 Demographics of Isinya and Ng'arua Maarifa Centre

The demographic composition of users in this study helped establish whose livelihoods Maarifa centres support. The most popular user age group that visited Maarifa centres consisted of youth aged between 18 and 25 years, 60% (30) in Ng'arua and 45% (22) in Isinya. Observation confirmed a heavy presence of youth and male users. However, the Ng'arua Maarifa centre manager intimated that their "main targets are farmers, business people and civil servants." Most previous findings from the literature (Kapondera and Namusanya 2017; Mbangala and Samzughi 2014) reveal that youth comprised the dominant telecentre user group.

Users of both Maarifa centres responded to the demographic section by stating their age. The main explanation of the categories of users was given by the Isinya centre manager explaining that diverse categories of users are served by the Maarifa centres since services are offered free of charge to all; user groups consisted of local community members, high school students. High school leavers visited the telecentres to make university applications and those in institutions of higher learning use Maarifa centres to apply for higher education loans from the Higher Education Loans Board (HELB). Farmers, both men and women, visit the centres for capacity building; they are helped to do e-commerce and also gain access to marketing their products. Civil servants visit to look for their data such as access pay slips, download Kenya Revenue Authority (KRA) forms and certificates for filing income returns and generally access work-related information. Teachers, business community members and others in informal sectors use the services as well. This means that Maarifa centres serve as a critical source of information to a diverse population of the rural communities in ASALs in Kenya.

A point to note is that Maarifa centre users gave almost similar responses to interview questions; the researcher picked some for discussion in Section 5.3.

5.3 Information Services in Maarifa Centres

As mentioned earlier, telecentres are facilities for development. They serve marginalised communities who cannot afford the services of ICTs individually. They bring the benefits of ICT to the people to bridge the digital divide. The director of ALIN (DI) confirmed that Maarifa centres consolidate and create relevant content to help satisfy users' information needs through needs assessment programmes. Users from both telecentres were asked what information services they employ at Maarifa centres in order to improve their lives. Prominent among reasons users visited Maarifa centres are:

U4 -To acquire ICT skills: this is part of a human's assets.

U8 -To broadly access agricultural information and to find information on best farming practices. Farmers are able to regularly check prices for their farm produce, constantly communicate with buyers and the whole cycle increases their income as part of their financial asset management

U2 - To communicate with friends and relatives, thus increasing social interaction.

U10 - To access health information

U1- To search for jobs online after acquiring some training

U3 - Entertainment, etc.

The observation guide had asked them to 'check other sources of information'.

U13 – to borrow books – there are library shelves with books in Maarifa centres

U14 – to attend workshops.

An ALIN Director (D1) offered background information of the origins, the aims and structure of Maarifa centres' initiatives:

ALIN began as a network facilitating knowledge-sharing among people involved in agricultural and livestock extension through print magazines, then satellite radio to deliver information to remote places. When the Internet became widely available, they also evolved and created permanent centres where computers and Internet access were installed. Maarifa centres are now evolving into the use of mobile devices to link farmers with information and knowledge about agriculture and livestock through Sokopepe.

Isinya Maarifa centre's manager (IM) explained the rationale behind the establishment of Maarifa centre in rural community as:

based on the right to access information ... Maarifa centres were established to serve people in the remote area who would otherwise not have had access to information relevant to the livelihood needs; to get ICT infrastructure especially the Internet.

One of the initial questions posed to the managers of both Isinya (M1) and Ng'arua Maarifa centres (NM) was on the aims, objectives and the structure of the Maarifa community knowledge centre (CKC) initiative. Both telecentres are projects of ALIN and are guided by similar aims and objectives.

Managers from Isinya and Ng'arua Maarifa centres said the aim and objectives are:

IM - To improve ICT skills through training, and open rural areas to opportunities such as e-learning, e-government, e-commerce and outsourcing.

NM - To provide access to information.

NM - To increase local content through documenting best practices and sharing to the network.

NM - To assist pastoralists and farmers through imparting knowledge on farming and how to improve as well as sharing information.

IM - To provide a platform for exchange of experience and their knowledge.

IM - Create linkages or liaisons between the farmers and other stakeholders e.g. Ministry of livestock development, ministry of agriculture and social services and NGOs such as Practical Action , Hand in Hand etc.

The structure of Maarifa centres according to Isinya Maarifa centres Manager is

IM - Telecentres are branches spread in ASALs, the occupants in the branches are field officers, focus groups and users of Maarifa centres. ALIN, situated in Nairobi is the headquarter where the directors, finance officers, project officers, administrative assistants, ICT officers among other workers sit.

Telecentres are service providers and the first objective of this study was to understand how Maarifa centres support livelihoods. This was made possible by examining the range of services offered by Maarifa centres to people living in ASALs. The aim of finding out the services offered was to identify how Maarifa centres support livelihoods for the poor and marginalised communities.

The questions were guided by the fact that Information Communication Technologies (ICTs) such as Internet, e-mail and satellite technology have the potential to improve the livelihood opportunities for the poor and marginalised. The Director (D1) in charge of ALIN elucidated that the range of services provided by Maarifa centres has evolved with technological developments. A study conducted by UNCTAD (2007) reported that telephone services have been superseded by the emergence of mobile phones. ALIN director concurred with the UNCTAD report that communication systems have change and said:

Maarifa centres as currently constituted will have to change both in functions and services they offer, because users can now access ALIN's' content through their mobile phone devices. They do not have to physically visit Maarifa centres and they are not restricted to 8 am – 5 pm opening hours. ALIN's focus is now on the use of mobile devices to link users through Sokopepe.

Telecentre business hours was one of the observation parameters in the observation guide. The researcher observed that Maarifa centres operated from 8 am to 5 pm.

Chilimo (2008) explains that mobile phones have made life easy; they can go for some time without requiring connection to electricity power sources, much better than other computer-related ICTs because mobile phone operators (Safaricom, Airtel, and Orange, among others) install masts and users are able to keep their mobile phones charged. Access to information via mobile phones is much easier.

The key services offered by Maarifa centres therefore include but are not limited to: computer training, dissemination of information, linking ASAL communities with new contacts through workshops by bringing together farmers and small business traders to narrate their testimonies, help farmers promote their brands and sell their products and services online through the Sokopepe platform. Users use Maarifa ICT facilities for social communication (social capital), to do business transactions, to trade, i.e. buy and sell goods or services (financial capital), to do research and get assistance on administrative matters (human capital).

The finding established a substantial level of satisfaction with the telecentre services at 73.46% (36) of the users expressing satisfaction. Therefore, the level of satisfaction on information services offered at Maarifa centres was high, in line with DFIDs capital assets.

5.3.1 Training services

When asked to explain what “mechanisms are used by Maarifa centre to avail, train and sensitise people on ICTs.”

An Isinya centre manager explained that they use community networks such as social gatherings, churches, chiefs meetings, posters on notice boards, SMS to inform people that the centre is offering computer trainings. They also pass information through the Maarifa blogger site¹. The Ng'arua centre manager added that they also use word of mouth by asking people to spread the word, by the use of social media and Google plus.

Training is at the heart of the telecentre. As earlier pointed out, a telecentre is equipped with computers and has Internet connectivity. It was observed that both Isinya and Ng'arua Maarifa centres are connected to electricity and the Internet. People go to these telecentres to access the Internet and related digital technologies (Rahman and Bhuinan 2016). People use facilities offered at the telecentre to learn, gather information, and communicate at the same time gain essential skills. Similarly, this research confirmed that the main activity of Maarifa centres is to train users. Most respondents indicated that their main reason for visiting the telecentre was for 'computer training'. The UNCTAD report (2007) points out that training services helped develop competencies that helped users conduct economic activities; that is, human capital. Human capital will then be exchanged for financial assets. Training is supposed to be relevant to trainees' needs. This means that the existence of Maarifa centres is very important to communities living in ASALs.

Training of ICT skills at Maarifa centres contributed to boosting the human capital when people acquired skills that enabled them to secure employment that resulted in financial capital. Soriano (2007) reports that telecentres in China advocated e-literacy which enabled some learners to secure employment. Similarly, in this study, most users explained that they needed ICT literacy to benefit from ICT applications and secure employment. This suggests that people

1. www.isisnyamaarifa.blogspot.com and www.ngaruamaarifa.blogspot.com.

in ASAL regions of Kenya rely heavily on ICT training at Maarifa centres to help towards bridging the digital divide. The training on skills to use *soko pepe.com* (a platform supporting farmers by offering market information and farm records management services) was very welcome as it formed the respondents' gateway to the information society. Chilimo (2008) points out that "mobile phone is a technology that has ushered rural people into information society" because mobile phone offer seamless access to information anywhere any time.

5.3.2 Business support services

According to responses from users, the business support services offered at Isinya and Ng'arua Maarifa centres included: access to professional sectors, job searching/advertising, buying and selling, training facilitation services, content development, access to government services, data storage and management, export-import/trade, tax filing and employment opportunities. The following were some of their statements

U5 -Training on how to use ICTs puts ASALs residents in a position to secure job opportunities

U13 -Training on information techniques e.g. advertising for their agricultural products

U11 -Train farmers

U1 - Job searching after training. Users visit telecentres to apply and track on the status of their applications.

U12 - Access government services such as KRA's tax filing, application of PIN,

U10 - ALIN links farmers with trader for their agricultural products.

The telecentres open rural areas for opportunities to ICT-related services such as marketing and accessing competitive prices of their agricultural produce. From the responses above it is evident that Maarifa centres support economic activities through business support services. The findings show that Maarifa centres are a strategic source of business information that helps the rural communities in ASALs to learn and access opportunities that may assist them in improving their livelihoods. The Manager of Ng'arua Maarifa centre confirmed that they *achieved this by providing information and knowledge that is related to farming i.e. Maarifa centres provide best farming mechanisms of getting more yields.*

Concerning the relationship between the services offered and socio-economic development, Isinya Manager confirmed that:

The main socio-economic activities that support livelihoods in ASALs are agro-pastoralist. Maarifa centres align their services to these socio-economic activities, needs and problems with the aim of improving their socio-economic status.

5.3.3 Financial and social capital investment services

The five types of capital assets in the SLA pentagon are applied to ICTs and their interaction to improve livelihood outcomes. For instance, how does the community use the Internet to realise *social equity, improve education, agriculture and marketing* and, at what cost? This study established that services at Maarifa centres are offered free of charge. This proves that Maarifa centres have enabled rural communities in ASALs to access information considering that the majority of the community members are economically challenged. Maarifa centres are therefore very important sources of information and have been helpful for human capital. Users 1, 3, 4 and 7 confirmed that Maarifa centres reduced the amount of money that the rural communities use to cater for their information needs, for instance travelling costs, cyber costs and the cost of purchasing textbooks, magazines and newspapers. Money saved and knowledge gained can be used to improve their livelihoods and satisfy other household needs. Users 8, 1, 2 and 13 attested to receiving up-to-date information from the field officers on farming through research the field officers conducted from the Internet at Maarifa centres.

These changes translate into improved quality of life, improved income levels, access to public goods and services, coverage of basic needs like health, housing and nutrition, social relations and confidence levels. Most of the respondents such as Users 1, 2, 3, 4 and 5 cited behavioral change due to confidence gained in the use of ICTs. Users 7, 8, 9, 10 and 13, cited improved income levels as a result of getting employed or job promotion after acquiring computer skills from Maarifa centres.

Users 9, 10, 11, 12 and 13 cited improved provision of information services especially distance learning students and agricultural extension workers. Users 10 and 12 cited improved public services like access to digital KRA information e.g. iTax, university enrolment and HELB application forms. Agriculture and marketing information is critical because it helps increase income through better prices and people in ASALs can in turn afford food, shelter, health facilities and education.

5.4.4 Online communication

Users were asked to demonstrate how their investment in the exploitation of the Internet had been beneficial for social communications (social capital). A common response from users 1, 2, 3, 4, 5, 6, 7 and 8 was that they have been able to connect and interact with friends through social media like Facebook, Twitter and e-mails. The same users said that it had also helped them in linking up with the extension officers and sharing of knowledge on better methods of farming and income generating activities to boost their livelihood; and in sharing knowledge and ideas with their friends. Users 1, 2, 3, 4, 5 and 6 further said they had learnt how to use the Internet to apply for scholarships, get access to strategic information such as jobs, e-government services, and agricultural advisory services, ability to make online applications, skills to qualify for new jobs, the and ability to access online information. Users 1, 2, 3, 4 and 5 who were form four school leavers showed increased interest in studying IT-related subjects at advanced level after interacting with the basic training at the telecentres.

The finding established that the most common purposes of using Maarifa centres were personal communication. This concurs with a study conducted by Etta and Parvyn-Wamahi (2003) who noted that telecentres were mainly used for communication and entertainment rather than for economic activities. Users 10, 12 and 13 were engaged in business and agricultural activities, they make more business communication rather than personal communication, for example, selling farm produce through *sokopepe.com*. Those in employment like the agricultural extension officers users 11 and 13 communicate to solve administrative matters like writing and sending reports to their head offices.

6.0 Challenges in the provision of information

Respondents explained challenges that existed before the establishment of Maarifa centres in ASALs as:

U5 - Problem of accessing/using computers and the Internet

U13 -There were few cyber cafes if any;

U9 - ASALs community is financially disadvantaged and therefore lacks money to access information services

U 8 and 9 -They lacked computer skills,

U13 -They had to travel long distances to get information.

The establishment of Maarifa centres by ALIN have addressed most of the above challenges. However, concerning the facility, respondents from both Ng'arua and Isinya expressed certain issues about Maarifa facility that require improvement. Some of their responses were:

U 1 - *Expand to accommodate more people*. A Maarifa acentre has been described as a room or a '*fabricated shipping container*' where communities access information resources. The

Community Knowledge Centre captured below is a clear indication of how small they are. the sizes of rooms that house Maarifa centres were seen to be small. Some users had to wait outside for their turn to gain access to the room.



U 1 - *Increase number of computers*; Maarifa centres are small rooms equipped with computers and Internet connectivity. Only a few computers can be fitted in each.

U11 - *Increase attendance*; since ALIN deploys only one manager per centre. This was observed upon the researchers' visit.

U 3 and 5 - *Improve Internet speed/efficiency*. Most of them were subscribing and relying on Safaricom modems at the time of this research. Safaricom Internet data plans were slow unlike the current 4G+ wifi option. Modems were expensive and were increasing the operating the cost of running Maarifa centre; they were sim-locked meaning that one could not migrate to other cheaper options like Orange or Airtel.

U10 - *Enhance security*. Security is likely to be compromised because Maarifa centres are public spaces which all can access. Due to the fact that services are free of charge it is likely that, people with ulterior motives can easily gain entry.

U 8 - *Buy a photocopying machine*. It was noticed from observation that although a telecentre is supposed to be equipped with machines as recommended by users, Maarifa centres are scantily equipped. Machines such as photocopiers, fax machines, even printers were not physically visible.

U9 - *Install a standby generator or install solar panels*. This was recommended due to frequent power outages experienced especially during the rainy seasons. Electricity is also very expensive to maintain.

An ALIN director (D1) outlined the following impediments to the implementation of Maarifa centres including Isinya and Ng'arua centres:

- *Poor infrastructure particularly in ASALs*: poor infrastructure which hinders the functionality of the Maarifa centres' full operationalisation. Inadequate equipment and scarce connectivity. Unstable power supply is an obvious primary constraint. However, power generators can be used if electricity is not available. Poor roads limit access to the telecentres by communities who are geographically isolated. They suffer from inadequate access to physical markets and inadequate market information

- *Low levels of literacy*

Illiteracy presents a problem because most of those targeted in rural areas are illiterate; this presents a problem of slow uptake of technologies by agro-pastoralists served by the Maarifa centres. The language barrier hinders access to information, especially if information is packaged in scientific jargon. Besides, information on the Internet is mainly in English which is not a common language for the rural communities

- *High levels of poverty*: poor people are more concerned about basic needs, especially food. They spend most of their time looking for basic items and may find it inappropriate to visit Maarifa centres.
- *Cultural barriers* such as those that bar women from participating in certain forums where new knowledge is acquired. Maasai women in Kenya for instance are not allowed to mingle with men; they are therefore constrained in exploiting resources at Maarifa centres.
- *Declining interests in telecentres among donors*: donors can support a programme for a specific period of time. ALIN is then forced to look for other donors and come up with innovative fundraising strategies to sustain Maarifa centres' progress.

The Isinya Centre Manager (IM) confirmed that the challenges expressed still persist and there are more such as negative perceptions of computers by the older generation. These major constraints need to be addressed so that the telecentres can perform better and improve livelihoods of people in ASALs. Notable is the fact that no respondent mentioned anything to do with telephone service; this is attributed to mobile phone penetration (85%) even in the rural areas. ALIN realised this and the director explained that they have remained relevant after:

D1 - Having reached its peak in 2012, ALIN felt that there could be a mismatch between technology trends and the idea of having fixed means of accessing knowledge. The future is mobile, and hence ALIN's move to consolidate Sokopepe to use the online space by accessing it through mobile devices, particularly the mobile phone. In a sense, the mobile phone has become a "Maarifa in your hand".

This is not to say Maarifa centres have been rendered irrelevant by mobile phone technology. As we have seen, they are active in training and assisting users in various ways. The Director said:

D1 - *ALIN's work is mainly field-based. Maarifa centres are physical spaces out of which the work takes place. In a sense they are like ALIN's field offices which operate as the points of ALIN's engagement with communities.*

Some of the challenges mentioned cannot be solved within the management of ALIN and Maarifa centres. To counter these challenges, ALIN has deployed several strategies. The director explained that:

They are involved with communities in running Maarifa centres. A Maarifa centre is managed by 5-8 committee members drawn from local community stakeholders. A volunteer who manages the telecentre works with a local person known as a Community Knowledge Facilitator (CKF) representing local interests. A hosting institution (partner) supervises the volunteer who works at the centre.

They work with hosting organisations; all Maarifa centres are hosted by institutions, for example Isinya is hosted by the Masaai Rural Training Center (MTRTC) while Ng'arua is hosted by Laikipia Centre for Knowledge and Information (LACKIN). Locating field officers to run the day-to-day operations at Maarifa centres: the director confirmed this by explaining in detail that:

D2 - ALIN's approach to involve communities in the management of Maarifa centres and to work with hosting organisations in some areas has been highly successful, winning several national and global awards. These include the 2011 Bill & Melinda Gates Foundation's Access to Learning Award (ATLA); and UNESCO's International Prize for Rural Communication given under its International Programme for Development of Communication (IPDC) – 2012.

Working with hosting institutions has the advantage of walk-ins, those who visit the institution for other reasons may drop in to read e-mails, to read newspapers, to pass the time as they wait for their appointment or even print document copies at the telecentre hence increasing patronage. D1 further explained that ALIN has built networks and partnerships with Government, the private sector, civil society and communities in running Maarifa centres. For instance, ALIN sources for material from Communication Authority of Kenya (CAK) and ICT board of Kenya.

Provision of expertise and skills; publicity, outreach, goodwill and solidarity: the government is the author of the National ICT policy of Kenya.

The policy subscribes to enhancing rural access to ICT infrastructure and according to the respondent from the ICT board of Kenya, they:

ICT 1- provide support in infrastructure such as energy and rural access to the Internet.

ICT 1 - Ensure affordability of ICT support; they provide adequate resources to the ICT sector.

ICT 1 - provide incentives for service providers to deploy services in rural and under-served areas.

CAK 2 said – CAK provides infrastructure to ALIN who has sufficient experience in rural ICT development.

6. Conclusion

This study explored the information services provided by Maarifa centres to rural communities in ASALS in Kenya. From the findings, it can be deduced that telecentres are agents of development for the communities they serve. The main outcome from the study is that Maarifa centres are improving human skills and knowledge through computer training. Telecentres are also enhancing access to a large pool of electronic information resources. Access to the Internet has strengthened social life since users are able to communicate easily with relatives and friends who live away through e-mail and social media. The finding reveals bridging of digital gap and geographical barriers through provision of ICTs at Maarifa centres, a service that was initially scarcely available in the urban centres. The study further revealed that Maarifa centres have helped ASALs communities increase their financial capital through improved access to agricultural and market information with the help of ALINs *Sokopepe* application. Farmers are now realising increased farm production and increased sales of their produce. Furthermore, people are finding gainful employment after computer training received at Maarifa centres; this generally contributes to improved livelihoods. The study revealed further importance of Maarifa centres: they provide relevant information to the communities they serve, which has enabled people living in ASAL to make informed decisions and informed choices concerning their livelihoods. Information obtained is expected to and indeed does fulfil information needs for socio-economic development. This study makes the overall conclusion that, despite the challenges experienced, Maarifa centres have realised the objectives stipulated by ALIN.

Above all, Maarifa centres' initiative has ushered ASALs communities into information and knowledge society. There are many positive outcomes from Maarifa centre initiatives; Maarifa centres are actively participating in rural development thus helping the country overcome rural-urban migration due to the availability of employment in small and medium sized enterprises. Food security is assured due to improved farming practices. Enhanced access to a wide range of information contributes to improved health.

This study investigated the provision of information for actual users of Maarifa centres, Collecting data from non-users in ASALs would give a broader perspective to the study. It is the researchers' desire that investigation from non-users' perspective is highly encouraged to fill the gap.

This study recommends that Maarifa centres widen their areas of operation to serve communities outside ASALs. ALIN may take advantage of the evolved methods of rendering services in view of the advent of ICTs; the use of mobile phone technology can reach not only ASALs but far and wide. Lessons learnt can be shared by more Kenyans and even globally for socio-economic advantage.

Beside expanding services, another recommendation from this study is that more telecentres be set up in convenient areas closer to the people. There are only eight Maarifa centres in Kenya, that can only serve a limited number of people in ASALs; this study further

recommends more concerted joint efforts with the government and other stakeholders to support the expansion of telecentres in Kenya.

ALIN has good livelihood programmes that are useful and can be of help to many even in other marginalised communities; this study recommends that they repackage information and share it widely.

Publicity to raise awareness of the existence of Maarifa centres should be enhanced. This is because most of those who were asked how they got to know about Maarifa centres said they were told by friends; this is not bad, but a very rudimentary method of creating awareness. Better still, communities in ASALs should be enlightened on the value of information for their sustained economic growth. This study recommends the aggressive use of community media to create awareness; for instance local FM radio stations and use of social media: it has been established that there is a heavy penetration of mobile phone services in ASALs among other places.

This study recommends a programme that will encourage even older people to patronise the telecentres; probably introduce more flexible business hours instead of the 8am – 5pm standard hours to enable patrons visit Maarifa centres when they can and want.

Based on the conclusions, the study recommends that ALIN undertakes aggressive seminars and sensitisation programs to influence the community to relax some of their cultural beliefs that restrict women to mingle with men in forums such as trainings at the telecentres. This will also help in making the goal of universal access to information a reality.

For long-term sustainability, this study recommends the introduction of lenient and aggressive income-generating activities to ensure Maarifa centres' continuity should the donors withdraw their support.

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