

The feasibility of ICT diffusion among rural African women: A case study of South Africa and Kenya

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This study explores whether ICT use is feasible in the rural areas of South Africa and Kenya by using largely a survey research method. The survey involved interviewing 400 women aged between 16-60 from both Kenya and South Africa. The multi-stage sampling data was obtained from census household data of four magisterial districts of Umlalazi in South Africa (Amatikulu, Eshowe, Gigindlovu and Mtunzini) and from the subdivisions of the Kaplamai division in the Trans-Nzoia district in Kenya (Kimoson, Makutano, Sinyerere and Sitatunga). The survey results signify that problems of access and exclusion are still predominant. For instance, while a meagre average of 11 (5.4%) of the respondents in South Africa use modern technologies, such as computers and the Internet, more than half of the respondents (115, 57.5%) faced problems ranging from affordability to distance and time. Additionally, there is a marked correlation between, on the one hand, educational level and type of ICTs accessed, and information need and purposes on the other hand. It is observed that ICTs alone are insufficient for significant benefits to emerge. Information ethical challenges are identified and recommendations made.

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Introduction

Although definitions as to what exactly information and communication technologies (ICTs) are differ widely, they do bear some similarities. A fairly authoritative definition of ICTs is provided by the European Commission (2001:3), which states that ICTs include:

... a wide range of services, applications and technologies, using various types of equipment and software, often running over telecommunications networks.

The EC enumerates such technologies to include:

... well-known telecommunication services such as telephony, mobile telephony and fax. Applications include video-conferencing, tele-working, distance learning, management information systems, and stocktaking. Technologies can be said to include a broad array, ranging from old technologies such as radio and TV, to new ones such as cellular mobile communications. Networks may comprise copper or fibre optic cable, wireless or cellular mobile links, and satellite links. Equipment includes telephone handsets, computers and network elements such as base stations for wireless service. Software programs are the lifeblood of all these components, the sets of instructions behind everything from operating systems to the Internet.

The EC sums it up adequately by stating that:

ICTs are enabling and facilitating technologies. Individuals, community groups, business or government departments with access to affordable communications and computers can use them to save time and money and improve the quality of their work or home lives.

The benefits of ICTs are difficult to gauge in most African countries, particularly in the wake of poverty, hunger and disease. For example, the United Nations Commission on Science and Technology for Development (UNCSTD) (in Marcelle, 2000:1) stresses that:

ICTs do not offer a panacea for social and economic dislocation, and these may lead policy makers to give lower priority to the need to create effective national ICT strategies. However, on the basis of the evidence, it is apparent that the risks of failing to participate in the ICT revolution are enormous. Failure to give priority to ICT strategies that enable developing countries and countries in transition

both to develop their national infrastructures and to join the GII (Global Information Infrastructure) will exacerbate the gap between rich and poor. There is a growing need to evaluate the social and economic impacts of ICTs and to create opportunities for capacity building that will ensure their beneficial use and absorption within national economies and civil society.

Needless to say, views on the role and usefulness of ICTs in African development initiatives are diverse and occasionally contradictory. For instance, Kenney (1995) argues that access to ICTs is dependent on education and income distribution, while Moyo (1996) stresses the inevitability and pervasion of information technology (IT) in all sectors of the economy. Some authors, like Chowdhury, are of the opinion that “the poor cannot eat high-speed Internet”, while others like Barlow maintain that “Africa should skip Industrialism entirely and leap directly into the information era” (both in Adeya, 2002:1).

Generally, viewpoints on the role of ICTs in rural development can be grouped into four major categories: political, economic, social, and technological, giving the acronym PEST.

Economic implications primarily focus on the importance of science and technology. Basson (1996) stresses the need for African governments to utilise science and technology and compete in commerce and industry. This is in keeping with Rathgeber (2000), who identifies poor infrastructure – including telecommunications infrastructure – and the lack of skilled manpower as Africa’s major challenges. She observes that newly industrialised Asian countries took on this challenge and offered foreign investors both skilled labour and an excellent infrastructure. In 1995, ICTs accounted for more than 25% of all exports from East Asian economies (Crede & Mansell, in Rathgeber, 2000:3).

According to the World Bank (1998/9:20), this capacity for ICT production has immensely contributed to economic growth in East Asia. The World Bank further asserts that the “knowledge gap” in many developing countries is a contributory factor to poverty, and that there is no better way to bridge this divide than through the use of ICTs. Due to their ability to “decouple” or separate information from its physical repository, ICTs are excellent channels of communication. This view is supported by Pohjola (in Bedi,

1999:4), who argues that this decoupling characteristic is “revolutionary”, as large bodies of information can be accessed by individuals, irrespective of time and space. Bedi (1999) adds that the use of ICT networks enables email access to a vast number of individuals.

One of the most innovative breakthroughs of the 20th century was the Internet, whose effects are changing the way in which traditional technologies are used and wireless technologies are deployed. According to Marker et al. (2002:14), the Internet dramatically reduces the costs associated with making information available to others and accessing global information and knowledge resources. The authors further add that satellites and other advanced technologies make new things possible – recent innovations in hand-held devices, mobile telephony and satellite communications have led to cutting-edge information and communication tools specifically relevant to the needs of the poor. In some developing countries, rural health workers are now using small hand-held devices to record health data from their clients.

The social implications of ICTs are also highly regarded. Studies by Marker et al. (2002:9–13) maintain a positive approach towards the role of ICTs in development, and affirm that ICTs do in fact have an impact on the standards of living and poverty alleviation at various community levels. Examples of ICT access by the African rural poor in addressing their information needs are largely drawn from the health, agriculture, community mobilisation, and education and training sectors.

When citing political implications, a narrative by Mudhai (2004:2–4) at the World Summit on the Information Society (WSIS) held in Geneva, Switzerland, underscores the importance of ICTs in uniting African countries in development. Mudhai reflects on the latest developments initiated by African governments to leap into the information age, citing examples of achievements in Nigeria, where fixed telephone lines have increased from 300 000 to 720 000, and mobile phone subscribers from 500 000 to 2.5 million over the last two years. Other examples provided by Mudhai are that of Egypt, which stresses the importance of the E-Africa Connection project within NEPAD; and the heads of state of Mozambique and Rwanda, who reiterate that Africans have gone beyond the dilemma of

choosing between ICTs and other development priorities. Mozambique has established a high-level multi-sector task force for ICTs, while Rwanda, a landlocked country, has “an ambitious ICT programme” poised to make it the technological hub of East Africa, with broadband fibre-optic and wireless access to all schools within three years. Equally encouraging is the example of Botswana, which is investing in ICTs as an imperative industry with the proposed US\$300 million Eastern Africa Submarine Cable System (EASSy). This cable system’s intended docking points are situated in Djibouti, Kenya, Madagascar, Mozambique, South Africa, Tanzania and Uganda. All such efforts are no doubt a step in the right direction for Africans, as ICTs can and will provide a new window for Africa to accelerate sustainable human development, which would inherently benefit rural women.

The significance of the role women play in development is crucial, given that they represent slightly more than half of Africa’s population. However, it is lamentable that, although these women are agents of production, growth and change, most are impoverished and live in economically fragile areas (Amoake, in Soltane 2002:1; Adhiambo, 2001:1).

The UNDP (2001:3–16) argues that harnessing ICTs for human development requires awareness raising and constituency building across all levels of society. As maintained by the UNDP, the link between ICTs and many development challenges is not always obvious, especially in countries with high levels of illiteracy, low levels of basic telecommunication infrastructure and electrification, and high levels of debt.

Similarly, several other authors cite examples in which these shortcomings are clearly spelt out. For instance, Marker et al. (2002:9–14) argue that problems underlying rural development in most African countries include issues of access and exclusion, which are still quite significant. By the same token, Bridges.org (2001) illustrates that “real access” to technology is one of the key elements necessary for integrating technology into society. This organisation further describes access with the term “physical access”. In other words, is the technology in question available, physically accessible and affordable?

Reports from authors such as Harris (2004:35) and the World Bank (2002) stipulate that poverty,

and not ICTs, is the primary bottleneck to ICT development initiatives in most developing countries. According to these authors, ICTs act as an amplifier for such underlying processes, and what makes development function well, can be made to function better using ICTs. Needless to say, ICTs are dependent on national policy, the regulation of broadcasting licences, and on the ensuing skills required to utilise and manage this industry. The situation is still wanting in many developing countries, as there is a lack of enthusiasm on the part of decision makers to embark on ICT projects. For instance, as opposed to South Africa, which does have a national ICT policy framework, the ICT policy debate in Kenya still awaits parliamentary approval after numerous years of trial, discussion and debate.

Given their multiple roles in society as mothers, wives and workers, women's voices are insufficiently heard. To this end, the Intermediate Technology Development Group has expressed the view that women rarely contribute to the policy debate surrounding poverty, as most are often illiterate and may lack confidence and mobility (ITDG, 2005). Related problems and challenges have also been noted in studies by Ngimwa et al. (1997) on Kenya; Jiyane & Ocholla (2004) on South Africa; Ikoja-Odongo (2002) on women entrepreneurs in Uganda; and Mooko (2002) on Botswana.

This study is largely informed by the info-mobilisation theory. In the light of the aforementioned concepts of systems and socio-technical systems theories, Harris (2004) describes info-mobilisation as an organic process of change in which collaborative groups discover and explore problems and address solutions together. It is a form of interactive development that caters for a collaborative learning process, based on the evolving needs of a community. Thus, in Harris' view, info-mobilisation involves adaptive learning and community learning, as well as the alignment of social and technological systems, participative values, and social and stakeholder groups. The overall view by Harris (2004:1) suggests that the development community should look towards the corporate world in order to understand the paths that they have traversed in adopting ICT:

It is the program that must be developed and ICT placed within context, rather than the familiar idea

of "build it" and the applications will naturally flow; or, build it and then let's see what evolves serendipitously.

Accordingly, the concept of "community" is understressed and not given the attention it deserves. To this end, Harris (2004:35-38) focuses and expounds on three important approaches in which he analyses and gives insights into the info-mobilisation theory:

- Info-mobilisation is concerned with the information requirements of communities. It addresses the design, delivery and utilisation of community information systems.
- ICTs can only have optimal impacts in rural communities if they are imbedded within other community development initiatives.
- The success of ICTs in rural development yields better results when social, political and economic factors, and varying modes of communication, are taken into account and used during implementation.

The present study set out to investigate and identify ICTs that provide access to and use of information, enhance quality of life, and improve the economic standards of rural women by conceptualising a model for the development, management, exploitation and use of ICTs in an African rural environment. As the study is a comparative analysis of Kenya and South Africa, this aim is conceptualised with the two countries in mind, although the accruing principles could be applied to rural set-ups in any African environment.

The study answered the following questions: How do ICT development, policies and strategies in Kenya and South Africa compare? What are the ICT information needs and e-services of rural women in areas such as health, education, agriculture, social welfare, entertainment, commerce and industry, in both Kenya and South Africa? What are the ICT training needs of rural women in Kenya and South Africa? What are recommendations, and what are the implications of these findings to information ethics?

Methodology

A survey method was used to collect data from a cross-section of female members of the South African and Kenyan populations in order to determine their current status in relation to

information and the use of ICTs. The study was carried out in both countries.

In South Africa, the study narrowed its focus down to the Umlalazi (KZ 283) Municipality. According to the Uthungulu District Municipality report (2003), most of the population within the Umlalazi subregion is migrant, resulting in larger female numbers in the region. The Umlalazi subregion is mostly rural in nature, with only a few urban settlements. This municipality is located in the Uthungulu District in the province of KwaZulu-Natal (KZN), South Africa. Uthungulu has the third highest population in the province, after the Durban Metropolitan Council and the Umgungundlovu District Municipality. KZN has the largest population per province in South Africa – approximately 9.3 million (SSA, 2001) – with 43% of the population living in urban areas and 57% residing in the rural areas (Profile KZN, 2001).

In Kenya, the study focused on the Trans-Nzoia District, which is situated in the Rift Valley province of Kenya. It is one of eight provinces in Kenya and has a population density of 7 million people (Opondo & Sekou-Ochieng, 2000). The Rift Valley province is one of the largest and most economically vibrant provinces in Kenya. The Trans-Nzoia District is an administrative district of this province and is located between the Nzoia River and Mount Elgon. Although the area has mainly been inhabited by the Kalenjin community, Kenya's independence in 1963 saw many of the farms vacated by white settlers and bought by individuals from other ethnic groups in Kenya (Wikipedia, 2005).

The study used non-probability (purposeful) and probability (simple random) sampling techniques to create a sampling frame. In order to achieve the desired representation from various subgroups in the population, purposive sampling was first applied. This sampling technique allowed the researchers initially to identify suitable regions in Kenya and South Africa that possessed high population densities. Using the random sampling technique, suitable wards/divisions had an equal chance of being selected. This sampling technique also helped to prevent bias in the selection process. By using the snowball technique, women directly and indirectly connected to each other were interviewed.

In Stage 1, the study purposefully selected provinces in South Africa and Kenya with similar characteristics. As the units of study were the rural women of both countries, the first stage of the study selected populations that were homogeneous in nature. For instance, the choice of the KwaZulu-Natal province in South Africa, and the Rift Valley province in Kenya, was based on the fact that they are both densely populated. Additionally, most of the population in both regions resides in the rural areas.

In South Africa, the first stage was achieved with the help of demographic data adopted from the Umlalazi Integrated Development Plan (UIDP, 2002:1). In order for the sample size to be representative of the mixed racial population found in South Africa, the study purposefully selected suitable wards from this frame list. This was done by identifying wards with not only high population densities, but also a population with a fair mix of the four predominant races (black, white, Indian and coloured). In Kenya, the first stage was achieved with the help of census data from the Population and Housing Census of 1999. By the same token, the study selected suitable subdivisions with high densities.

In Stage 2, the study adopted the simple random technique to select its population from both countries. This method was deemed suitable because of the distances between respondents in rural areas. It was therefore important to minimise and control bias, and cut down on time and cost related to this survey.

In South Africa, wards 11, 12, 13, 15, 16, 18 and 25 of the Umlalazi Municipality served as good starting points from which to draw four wards. In order to avoid bias in the selection of suitable wards, the above names were placed in a box, from which four were randomly drawn, namely Amatikulu, Eshowe, Gigindlovu and Mtunzini. In Kenya, the subdivisions of the Kaplamai division (Biribiriet, Kapolet, Kapsara, Kimoson, Makutano, Motosiet, Sinyerere and Sitatunga) served as suitable starting points from which to draw four subdivisions. Having placed these names in a box, four were drawn: Kimoson, Makutano, Sinyerere and Sitatunga.

In Stage 3 of the sampling, the snowball technique was applied, whereby women respondents connected to one another through direct and indirect links were identified and consequently

interviewed. Approximately 400 respondents were sampled from both countries. The selection of the sample size was based on Gay's (1996:125) guidelines:

- The larger the population size, the smaller the percentage of the population required to get a representative sample.
- For smaller populations ($N < 100$), there is little point in sampling.
- If the population size is around 1 500, 20% should be sampled.
- Beyond 5 000, the population size is irrelevant and a sample size of 400 is adequate.

The sample size was deemed suitable, as the sample population approximated the qualities and characteristics of the general population. The main categories sampled for the study included women between the ages of 15–20, 21–30, 31–40, 41–50 and 51–60 years.

Data was collected using a structured questionnaire to interview the respondents. In situations where the respondents were unable to understand English, the region's national languages, namely Swahili (in Kenya) and IsiZulu (in South Africa), were used to communicate with them. The completed questionnaires from 400 respondents formed the basis of data analysis and the interpretations for survey research. A total of approximately 400 questionnaires were administered and divided into the following categories:

- Section I: Personal information
- Section II: The information needs and seeking behaviour of rural women, which included:
 - Health information needs, purposes, sources and ICTs used
 - Educational information needs, purposes, sources and ICTs used
 - Social welfare information needs, purposes, sources and ICTs used
 - Agricultural information needs, purposes, sources and ICTs used
 - Commerce and trade information needs, purposes, sources and ICTs used
- Section III: Enhancement of quality of life and social welfare
- Section IV: Hindrances to ICT tools and services
- Section V: Training needs

A coding scheme was developed and entered into the Statistical Package for Social Sciences

(SPSS). Data was then analysed using descriptive statistics, where frequencies, percentages and means were calculated and data presented accordingly. Relationships among variables were compared and interpretations made.

Results

Demographic profile of the respondents

Respondents were asked questions about personal information such as their age, field of occupation and educational attainment. The structured questions were meant to determine relationships between demographic characteristics and the purposes and uses of ICTs. The overall response rate of the respondents was 100%, as the researcher and research assistants administered the survey.

Regarding age group, data obtained from rural KZN indicates that the highest numbers of respondents were between the ages of 31–40 years (66; 33%), followed by respondents in the 13–20 age group (41; 20.5%). Respondents between the ages of 41–50 and those over 50 ranked third and fourth, with 35 (17.5%) and 37 (18.5%) respectively. The lowest number consisted of 21 (10.5%) respondents between the ages of 21–30 years.

In Kenya, the highest numbers of respondents were between the ages of 31–40 years (83; 41.5%), followed by respondents between 13–20 years (58; 29%). Respondents between the ages of 41–50 and those over 50 came third and fourth, with 29 (14.5%) and 19 (9.5%) respectively. The lowest number consisted of 11 (5.5%) respondents between 21–30 years.

The P-value for age group levels in both countries indicates that there was a significant difference between rural women in the age groups of 13–20, 21–30, and those over 50 in South Africa and Kenya. More specifically, while there were more respondents between the ages of 13–20 residing in the rural areas of Kenya, there were more respondents between the ages of 21–30 residing in the rural areas of South Africa. There was also a larger percentage of respondents over the age of 50 residing in the rural areas of South Africa than in Kenya.

Analysis by levels of education revealed that in rural KZN, most respondents (81; 40.5%) had

acquired secondary education, while 62 (31%) had primary education. However, only 34 (17%) respondents had acquired tertiary college/university education, with 23 (11.5%) reportedly having no schooling at all. Thus, an average of 72 (35.8%) respondents had acquired basic education.

In rural Rift Valley province (RVP), the results indicate that most respondents (71; 35.5%) had acquired primary education, 66 (33%) secondary education and 33 (16.5%) tertiary college/university education. Some 30 (15%) respondents had no schooling at all. On average, 69 (34.2%) of the respondents had obtained basic education.

The P-value for education levels in both Kenya and South Africa revealed that there was no significant difference between the education levels of rural women in both countries. While an average of 34% of respondents in both Kenya and South Africa had basic education, well over 10% in both countries had no schooling at all.

In terms of the occupations of rural women in KZN, it was established that 58 (29%) respondents were small-scale traders, followed by those who worked as housewives/homemakers (48; 24%). Other categories were farmworkers (25; 12.5%), domestic workers (18; 9%), educators/teachers (16; 8%) and students (15; 7.5%). Only 3 (1.5%) respondents were entrepreneurs owning large-scale enterprises: a guesthouse, a sugarcane plantation and a fruit farm. Nine (4.5%) respondents were clerical and community development workers (6; 3%). There were two preachers (2; 1%).

In RVP, the study's empirical results indicate that 68 (34%) of the respondents were small-scale traders, followed by housewives (29; 14.5%); educators/teachers (27; 13.5%); farmers (26; 13%) and students (11; 5.5%). Domestic workers and preachers accounted for 10 (5%) each. This was closely followed by farmworkers (6; 3%); large-scale entrepreneurs (5; 2.5%); nurses (4; 2%); clerical workers (2; 1%) and community development workers (2; 1%).

According to the study, the single largest occupation of the respondents in both Kenya and South Africa was that of small-scale traders.

The P-values for the occupations of rural women in both countries indicate that, with the exception of traders and preachers (in which percentages for Kenya are higher), there was a higher

percentage of housewives, farmworkers, domestic workers, students, educators/teachers, entrepreneurs, clerical workers and community development workers in South Africa than in Kenya. The study further illustrates that, whereas Kenya's respondents had a fair share of farmers and nurses, there was no record of these occupations among South Africa's rural respondents.

ICTs frequently used to access/receive information in Kenya and South Africa

The survey took into account the possibility that an individual could use a combination of different technologies while accessing or seeking information. Respondents were therefore at liberty to name all ICTs they used to access information, whether traditional or modern. By capturing these responses, the survey was able to ascertain the ICTs that the respondents accessed and frequently used. Notably, they also used other sources to obtain information, such as printed material, libraries, friends, neighbours and so on (Table 1).

In the field of education, the information needs of the respondents in rural KZN varied from student services/colleges (48.8%), to course work/research topics (25%), further studies (7.5%) and funding sources (7.5%), occupational information (5%), social work (1.3%) and business management (1.3%). Reasons for yielding educational information included personal welfare and better living standards, study assignments, counselling, further studies and job opportunities.

Table 1 reveals that radio broadcasts were still highly prevalent as a source of information (160; 80%), but the use of television for this purpose was relatively low (82; 41%). While 32 (16%) respondents also used film to access educational information, 25 (13%) respondents used a cell-phone or telephone. Videos were also common (30; 15%). Compared with other sectors, the educational sector had the highest number of respondents using a computer and/or the Internet to access educational information (22; 11%). Only 8 (4%) respondents used mobile cinema and CD-ROMs (2%) to do so.

In rural RVP, the information needs of respondents ranged from course work/research topics (23.5%), to student services/colleges (22%), occu-

ICTs	Education		Health		Business		Agriculture		Social welfare		Average		P-value
	K %	SA %	K %	SA %	K %	SA %	K %	SA %	K %	SA %	K %	SA %	
Radio	77	80	88	81	65	55	65	71	77	80	74.4	73.4	0.8200
Television	41	41	33	44	36	34	36	35	43	43	37.8	39.4	0.7430
Film	13	16	24	20	7	18	9	26	20	16	14.6	18.2	0.3315
Cellphone	12	13	20	18	7	13	7	14	18	17	12.8	15.0	0.5252
Telephone	4	13	3	4	4	5	4	12	5	17	4.0	10.2	0.0000
Video	4	15	5	6	3	6	5	1	6	11	4.6	7.8	0.0000
Computer/ Internet	3	11	–	6	1	3	–	1	1	6	1.0	5.4	0.0000
Mobile cinema	3	4	4	5	3	1	3	3	3	6	3.2	3.8	0.2092
CD-ROM	–	2	–	2	–	1	–	–	–	–	–	1.0	–

Table 1: ICTs frequently used to access/receive educational, health, business/trade, agricultural and social welfare information in Kenya and South Africa [n=400]

pational information (12%), preschool/primary school information (11%), further studies (10.5%), business education/financial management (9.5%), teaching (8.5%) and curriculum studies (3%). Reasons for seeking educational information included personal welfare and better living standards, study assignments, counselling, child welfare, job opportunities, study assignments and future careers.

Table 1 shows that use of the radio was also highly prevalent among RVP respondents (154; 77%), and that television was used by 81 (41%) to gain information. While 25 (13%) used film, more used a cellphone (24; 12%) than a telephone (7; 4%). Video was used by 7 (4%) respondents, while only five (3%) used computers and the Internet, and mobile cinema, respectively.

With regard to health, the information needs of the respondents from rural KZN included respiratory illnesses, such as tuberculosis and asthma (21.3%), HIV/AIDS (21.3%), arthritis (10.6%), terminal and chronic diseases, such as cancer (6.3%), waterborne diseases (6.3%), diet/nutrition (6.3%), rheumatism (5%), family planning (5%), rabies (4%), snake bites (3.8%), sexually transmitted diseases (3.8%), dentistry (3.8%) and fits (2.5%). Reasons for obtaining this information included personal welfare, children's welfare and general awareness. The radio scored

highly as a source of information, as survey results revealed that 162 (81%) respondents used it to access information. Television was equally important, as 88 (44%) of the respondents used it on occasion to source their health information. While 40 (20%) respondents used film to access health information, more used a cellphone (35; 18%) than a telephone (8; 4%). An insignificant number of respondents (12; 6%) used a computer/the Internet and video (12; 6%) to access health information. Only 10 (5%) used mobile cinema, while 3 (2%) used CD-ROMs.

The information needs of rural respondents from RVP ranged from family planning/gynaecology (32.5%) to tropical diseases, such as malaria (24%), HIV/AIDS (17%), respiratory illnesses/coughs (7%), cancer (2.5%), sexually transmitted infections (3.5%), snake bites (3), waterborne diseases (2.5%), diet/nutrition (1.5%), diabetes (1%), dentistry (3.5%) and fits (2%). Reasons for obtaining this information included personal welfare, child and family welfare and, in some instances, general awareness. The radio came first as a source of information (176; 88%), followed by television, which was only used by 65 (33%) of respondents. While 47 (24%) of the respondents used film as a source of information, 40 (20%) used a cellphone and only 5 (3%) used a telephone. Likewise, 10 (5%) respondents made use

of video and only 7 (4%) used mobile cinema to access information. Notably, no respondents used computers/the Internet or CD-ROMs for their health information needs.

In the field of business and trade, areas in which respondents in RVP required information included starting up a business (30%), pricing/marketing (14%), finance/bookkeeping (12.5%), planning/management (10.5%), supplies/purchasing (8%), animal husbandry (7%), poultry keeping (7%), craftsmanship (5.5%) and the exchange rates (5.5%). Reasons for obtaining this information included stocking, embroidery, financial management, business techniques, better living standards, profit making, income generation and family welfare.

Survey findings for business and trade reveal that while 130 (65%) of the respondents used radio, 71 (36%) used television for their information needs. Notably, 13 (7%) used film as a source of information, while 14 (7%) used a cellphone and only 8 (4%) used a telephone. The use of a computer/the Internet was negligible, with only 2 (1%) of the respondents accessing it for information. None of the respondents used CD-ROMs. Video was used by 6 (3%) respondents, whereas mobile cinema was used by 5 (3%).

In KZN, respondents required information ranging from starting up a business (46.3%), to cookery (13.8%), pricing/marketing (10%), purchasing/supplies (10%), stock management (7.1%), financial management/bookkeeping (6.3%), horn covering/tourism (2%), hair and beauty salons (2.5%), and poultry and animal husbandry (2%). These needs seem to be closely related to the findings of a study by Ikoja-Odongo (2002). Reasons for obtaining this information included skills enhancement, embroidery, stocking, financial help, financial management, business techniques, income generation, seeking customers and family welfare.

Survey findings for business and trade reveal that while 110 (55%) respondents used radio alone for their information requirements, 68 (34%) used television. Only 9 (18%) used film to obtain business information. Notably, although not necessarily unusual in modern times, more respondents used a cellphone (25; 13%) than a telephone (10; 5%). Videos were accessed by 12 (6%) respondents for business-related needs. A negligible number (6; 3%) used a computer and/

or the Internet to obtain information. Two respondents used mobile cinema, and only one used CD-ROMs.

The agricultural information requirements of the respondents from KZN included topics such as farm inputs/new technology (28.8%), crop type/diseases (22.5%), soil types/fertility (18.8%), live-stock keeping (13.8%), herbicides/fencing (10%) and gardening/crop management (6.3%). This information was required for ensuring good harvests, enhancing animal fertility, preventing crop and animal diseases, improving sales and aesthetics, and making spiritual offerings. Most of those interviewed (142; 71%) used radio, while less than half of this number (70; 35%) used television. Cellphones were utilised for information gathering by 28 (14%) respondents, and telephones by 23 (12%). Only 6 (3%) respondents used mobile cinema, while two (1%) used a computer/the Internet and video.

The agricultural information needs of respondents from RVP included animal husbandry (35.5%), farm inputs/new technology (47%), soil type (5.5%), crop type/diseases (4.5%; 1.5%) and gardening/crop management (6%). This information was required for ensuring good harvests, improving farming, enhancing herd fertility, preventing diseases, and for aesthetic reasons and health. Most of those interviewed (130; 65%) used radio for their information needs, while 71 (36%) used television. While 17 (9%) respondents used film for their information needs, more respondents used a cellphone (14; 7%) than a telephone (8; 4%). Video was used by 10 (5%) respondents for their agricultural information needs. Only 5 (3%) respondents used mobile cinema. Notably, there were no respondents using a computer, the Internet or CD-ROMs.

Social welfare information needs in rural KZN covered water resources and pit latrines (42.5%), music/religious gatherings (23.8%), travel/holidays (10%), community projects/women's group activities (8.8%), pension (8.8%) and shopping/movies (6.3%). Reasons for obtaining such information included leisure activities, entertainment, spiritual growth and relaxation, and improved standards of living. Once again, radio as a source of information scored high (160; 80%); television (86; 43%) and films (32; 16%) were also useful. Users of cellphones and telephones stood at 34 (17%) and 32 (16%) respectively. Video was used by 22 (11%) respondents to source inform-

ation, compared with 12 (6%) who used computers/the Internet for this purpose.

In Kenya, the need to acquire social welfare information included topics such as community projects/social meetings (154; 77%), water resources/pit latrines (11; 5.5%), spiritual matters (21; 10.5%), sport (4; 2%), shopping/travelling (3; 1.5%) and pension/housing (7; 3.5%). Reasons given for accessing this information dealt with leisure activities, spiritual growth, women's empowerment, improved standards of living, relaxation and health. Radio as a source of social welfare information ranked first, used by 153 (77%) respondents, with television used by 85 (43%) and films by 39 (20%) respondents. Cellphones were used by 36 (18%) respondents and telephones by only 9 (5%). Computers/the Internet played no significant role, as only 2 (1%) respondents used it to access information. While 6 (3%) respondents used mobile cinema, none used CD-ROMs.

On the whole, information on the radio is evidently highly accessed, being used by approximately 73% of rural women in South Africa, particularly for education, health and social welfare needs. Some 39% of the respondents used television for their information requirements. Cellphones (15%) had a clear advantage over telephones (10.2%). Those respondents who were mostly in the fields of education (30; 15%) and social welfare (22; 11%) used video. Although users of computers and/or the Internet maintained a low average of only 5.6%, this ICT was mostly used by those respondents in the field of education (22; 11%).

Kenya's empirical results indicate that radio and television were the most commonly used ICTs among rural women. An average of 74.4% respondents used radio for their information needs, while television was used by an average of 37.8%. Cellphones (12.8%) had an advantage over telephones (4%), with the use of films (14.6%) being notably higher. While 4.6% of the respondents used video, 3.2% used mobile cinema for their information needs. Data indications are that computers/the Internet and CD-ROMs had little value among rural women in Kenya.

On the whole, radio was evidently highly accessed and was used by approximately 73% of the rural women in South Africa, particularly for education, health and social welfare needs.

Television also played an important role in this regard, with 39% of the respondents using it for their information requirements. Cellphone usage (15%) had a clear advantage over telephone usage (10.2%). Those respondents who were mostly in the field of education (30; 15%) and social welfare (22; 11%) used video. The average use of computers/the Internet stood at 5.6%, mostly used in the field of education (22; 11%).

Kenya's empirical results indicate that radio and television were the most commonly used ICTs among rural women. An average of 74.4% of the respondents used radio for their information needs, while an average of 37.8% used television. Cellphones were used by 12.8% of the respondents to source information, telephones by 4% and films by 14.6%. While 4.6% used video, 3.2% used mobile cinema. Data indications are that computers/the Internet and CD-ROMs have little value among rural women in Kenya.

From the above results, the study could safely deduce that an average of 74% of the respondents from both countries used radio as a medium of accessing information, while an average of 38% used television. Whereas 10.2% of respondents in KZN used telephones for this purpose, only 4% from RVP did. In both countries, the use of modern technologies such as computers and the Internet was negligible.

Alternative sources of information among rural women in Kenya and South Africa

In this question of the study, respondents were at liberty to mention all, or any other, sources of information that they used in their quest for information, aside from ICTs. This question aimed to gather information that would help determine the effectiveness and efficiency of rural information systems in the rural environments of Kenya and South Africa.

In Table 2, survey results indicate that family (53.2%), friends (43.3%) and neighbours (38%) informed the bulk of alternative sources of information among the respondents in RVP. This was closely followed by community leaders (38.6%), books (30.9%), exhibitions/trade fairs (20.8%), area leaders (15.8%), educators (10.8%) and social/extension workers. Others, such as traditional healers (7.8%), information centres (4.9%),

Source of information	Education		Health		Business		Agriculture		Social welfare		Average		P-value
	SA f	K f	SA f	K f	SA F	K f	SA f	K F	SA f	K f	SA %	K %	
Newspapers	5	5	3	2	5	8	5	4	15	5	3.3	2.4	0.0469
Magazines	5	5	3	2	5	8	5	4	15	5	3.3	2.4	0.0469
Family	160	54	133	110	43	88	43	111	83	169	46.2	53.2	0.1623
Friends	103	73	100	81	133	65	93	69	113	145	54.2	43.3	0.0298
Neighbours	90	64	88	79	128	73	73	86	105	78	48.4	38.0	0.0364
Books	68	46	75	72	58	91	43	69	53	31	29.7	30.9	0.7941
Information centres	8	11	5	6	8	10	23	18	–	4	5.5	4.9	0.2305
Community leaders	60	41	30	97	13	55	25	80	83	113	21.1	38.6	0.0002
Area leaders	–	–	–	–	–	–	3	5	13	68	4.0	15.8	0.0000
Traditional healers	–	–	13	11	–	11	15	16	25	24	8.8	7.8	0.0081
Social/extension workers	10	6	43	46	–	12	30	25	3	4	10.8	9.3	0.0000
Educators	90	60	13	14	5	11	23	10	–	13	16.3	10.8	0.1089
Farmers' associations/cooperatives	–	–	–	–	–	–	–	3	–	–	–	1.5	–
Exhibitions/trade fairs	–	–	5	–	23	54	10	29	–	–	6.3	20.8	0.0000
Nurses/midwives	–	–	23	1	–	–	–	–	23	2	11.5	1.5	0.3025
Local/city councils	8	–	–	–	3	–	8	–	8	–	3.3	–	–
Schools	3	6	–	3	–	–	3	–	–	3	1.5	2.0	0.1890

Table 2: Alternative sources of information for educational, business/trade, health, agricultural and social welfare information among women in Kenya [n=200] and South Africa [n=200]

newspapers (2.4%), magazines (2.4%), farmers' cooperatives (1.5%) and nurses/midwives (1.5%) were less frequently used to gain information.

Similarly, friends (54.2%), neighbours (48.4%) and family (46.2%) were highly favoured as alternative sources of information among the respondents in KZN. Other sources included books (29.7%), community leaders (21.1%), educators (16.3%), social/extension workers (10.8%) and nurses/midwives (11.5%). Information centres (5.5%), magazines (3.3%) and newspapers (3.3%) were not popular sources of information among these rural women.

The P-value for alternative sources for educational, business/trade, health, agricultural and social welfare information among women in Kenya and

South Africa illustrates that there is a higher use of alternative sources of information, such as newspapers, magazines, friends and neighbours, in rural KZN than in RVP. However, community leaders, area leaders and trade fairs/exhibitions played a more significant role in RVP than in KZN.

Comments on the use and availability of ICTs in rural KZN and rural RVP

In Table 3, respondents were asked to give their personal responses to an open-ended question on the use and availability of ICTs in their community. The aim was to capture varying opinions and attitudes related to ICT use and accessibility.

Comments	Freq.	%
Unavailable, difficult to use	57	28.5
Costly and unaffordable	25	12.5
Handy	20	10.0
ICT centres to be near rural women	20	10.0
Easily available and accessible	19	9.5
Affordable	18	9.0
Lack of power	13	6.5
Great improvement in ICTs	10	5.0
Poor television and radio networks	10	5.0
There's no trust in ICTs	8	4.0
Total	200	100

Table 3: Comments on the use and availability of ICTs in the community in South Africa [n=200]
(Note: Freq. = Frequency)

Data was then analysed using content analysis. The survey revealed that a significant number (57; 28.5%) of the respondents in KZN felt that ICTs were not only unavailable and inaccessible to them, but also difficult to use. Similarly, 25 (12.5%) felt that ICTs were costly and unaffordable. Coincidentally, the numbers of those who found ICTs to be handy (20; 10%) and those who felt that ICT centres should be established near rural women (20; 10%) were similar. Nineteen (95%) respondents were of the opinion that ICTs were easily available and accessible, while 18 (9%) deemed them affordable. A few respondents pointed out problems with infrastructure, such as lack of power (13; 6.5%) and poor television and radio networks (10; 5%).

In Table 4, results from Kenya indicate that a large number of respondents (63; 31.5%) believed that ICTs were unaffordable, followed by 48 (24%) stating them as unavailable and 28 (14%) as inaccessible. Therefore, on average, the survey revealed that 139 (69.5%) respondents felt that ICTs were too far, too costly or entirely unavailable. Only 16 (8%) acknowledged the usefulness and availability of ICTs, citing that they were "handy" (2; 1%) or "improved access to information" (14; 7%).

How ICTs have enhanced rural women's quality of life

A number of arguments have been raised as to

Comments	Freq.	%
Would like affordable ICTs	63	31.5
ICTs should be made available	48	24
ICTs should be made accessible	28	14
ICTs improve information access	14	7
ICT use depends on one's lifestyle	11	5.5
ICTs are very handy	2	1
A need for ICT centres in rural areas	15	7.5
Television/radio networks are poor	2	1
Lack of power hinders use of ICTs	15	7.5
Total	200	100

Table 4: Comments on the use and availability of ICTs in the community in Kenya [n=200]

whether or not ICTs contribute to improving a society's quality of life. With this in mind, a structured question making use of the Likert scale was designed. Respondents were expected to answer the question based on the areas in which ICTs have served them best (Table 5). In this scale, 4 denoted a high and favourable response ("always"), followed by 3 ("often"), 2 ("sometimes"), 1 ("never") and "not applicable". By calculating the average for each area listed, the study was able to arrive at conclusive remarks.

Evidently, ICTs enable most women to keep abreast of current affairs. Many rural women underscored the role ICTs play in daily news broadcasts. Most respondents (KZN 91.5%; RVP 91%) felt that ICTs, particularly radio and television, helped them to enrich their lives socially. This was followed closely by the need to keep in touch with family and friends (KZN 81%; RVP 87%). For most, cellphones were particularly useful. Under entertainment, respondents cited the ability to listen to music and other entertaining programmes as being important.

With the help of ICTs, this service recorded the highest result overall (KZN 71.5%; RVP 94%). Interestingly, although the use of fax machines (44%) stood out as an important activity, particularly in South Africa, it scored less in Kenya (16%).

Additionally, the P-value for how ICTs have enhanced rural women's quality of life illustrates

Activity	Always		Often		Sometimes		Never		N/A		Average (%) 4+3+2		P-value
	SA	K	SA	K	SA	K	SA	K	SA	K	SA	K	
Listening to news	157	121	12	35	14	26	12	12	5	6	91.5	91.0	0.8596
Keeping in touch	160	85	2	35	8	54	24	20	6	6	85.0	87.0	0.5647
Entertainment	88	117	35	42	20	30	47	6	10	5	71.5	94.5	0.0000
Fax documents	41	11	17	5	30	16	90	162	22	6	44.0	16.0	0.0000
Data processing	38	9	5	6	15	31	115	147	27	7	29.0	23.0	0.1721
For research	20	7	15	13	18	73	130	103	17	4	26.5	46.5	0.0431
E-commerce/ trade	10	10	13	4	18	20	118	160	41	6	20.5	17.0	0.3704
Contact business support agency	25	12	3	14	10	46	138	123	24	5	19.0	36.0	0.0002
Internet-related services	20	3	6	7	12	34	160	152	2	4	19.0	22.0	0.4578
Distance education	28	11	5	20	6	46	134	120	27	3	16.5	38.5	0.0000

Table 5: How ICTs have enhanced women's quality of life in South Africa [n=200] and Kenya [n=200]

Training needs	Very essential (4)		Essential (3)		Quite essential (2)		Not very essential (1)		N/A		Average % (4+3+2)		P-value
	SA	K	SA	K	SA	K	SA	K	SA	K	SA	K	
	f	f	f	f	f	F	F	f	f	f	%	%	
Basic primary education	25	36	5	9	8	6	98	144	64	5	19.0	25.5	0.1189
Secondary school education	50	47	-	14	3	29	100	105	47	5	26.5	45.0	0.0001
Computer/ Internet training	98	77	15	51	20	35	35	32	32	5	66.5	81.5	0.0007
Vocational training	68	41	15	46	18	38	38	70	61	5	50.5	62.5	0.0159
Adult education	73	48	8	23	3	20	23	106	93	3	42.0	45.5	0.4809

Table 6: Training needs for Kenya [n=200] and South Africa [n=200]

that respondents in both Kenya and South Africa felt that ICTs helped them in accessing and receiving news items and keeping in touch with family and friends. There was, however, a higher percentage of respondents in Kenya than in South Africa who felt that ICTs enhanced their lives through offering entertainment, research information and distance education.

Training needs for Kenya and South Africa

In Table 6, respondents were expected to answer a question based on the type of training they would require in order to assist them in accessing ICTs more often. In this question, the scale of 4 denoted a favourable response ("very essential"), followed by 3 ("essential"), 2 ("quite essential"), 1

("not very essential") and N/A ("not applicable"). By calculating the average for training needs under scales 4, 3 and 2, the study was able to arrive at conclusive remarks.

Survey results indicate that 19% of the respondents in KZN and 25.5% of those in RVP felt that basic education was essential. Similarly, while 26.5% had a need for basic education in KZN, an average of 45% in RVP also felt that they needed secondary education. Notably, 42% and 45.5% in KZN and RVP respectively believed that adult education was essential. Interestingly, from all the listed training needs, computer/Internet training scored highly, with 66.5% (KZN) and 81.5% (RVP) stating that such training would be essential. This was followed by 50.5% (KZN) and 62.5% (RVP) indicating that vocational training would be of foremost importance to them.

The P-value for training needs for Kenya and South Africa illustrates that, with the exception of basic primary education and adult education, there was a significant difference in the training needs of Kenyan and South African rural women. On the whole, results from both countries indicate that there was a definite need for computer/Internet training for rural women in order to assist them in accessing ICTs more often.

Discussion and conclusions

Essentially, while there were more respondents between the ages of 13–20 residing in the rural areas of Kenya, there were more respondents between the ages of 21–30 in the rural areas of South Africa. In addition, a larger number of respondents over the age of 50 resided in the rural areas of South Africa than in Kenya. In terms of education, the study indicates that there was no significant difference between the education levels of rural women in South Africa and Kenya. More specifically, while an average of about 34% in both countries had basic education, well over 10% of all the respondents had no schooling at all.

It was further noted that, with the exception of traders and preachers (in which percentages for Kenya were higher), there was a higher percentage of housewives, farmworkers, domestic workers, students, educators/teachers, entrepreneurs, clerical workers and community development workers in South Africa than in

Kenya. It is further illustrated that whereas Kenya had a fair share of farmers and nurses among the respondents, South Africa had no records of either of these occupations among its rural respondents.

The ICTs most commonly used by rural women indicate that an average of 74% of the respondents from both South Africa and Kenya used the radio as a medium of accessing information. An average of only 38% used television for their information needs. In both KZN and RVP, the use of cellphones for this purpose had a clear advantage over the use of telephones. In both countries, the use of modern technologies such as computers and the Internet was negligible. Family, friends and neighbours formed the bulk of alternative sources of information in both Kenya and South Africa. There was also a higher use of sources such as newspapers, magazines, friends and neighbours in rural KZN than in rural RVP. However, community leaders, area leaders, trade fairs/exhibitions played a more significant role in RVP than in KZN.

A large number of respondents in KZN felt that ICTs were not only unavailable and inaccessible, but also difficult to use. Some felt that ICTs were costly and unaffordable. Coincidentally, the number of those who found ICTs useful and those who felt that ICT centres should be established near rural women were similar. A few respondents were of the opinion that ICTs were easily available and accessible, while others felt that they were affordable. A few pointed out problems with infrastructure, such as lack of power and poor television and radio networks. In Kenya, a large number of respondents indicated that ICTs were unaffordable, followed by fewer listing them as unavailable and inaccessible.

There is also an indication that respondents in both countries felt that ICTs helped them in accessing and receiving news items and keeping in touch with family and friends. There was, however, a higher percentage of respondents in Kenya than in South Africa who felt that ICTs enhanced their lives through entertainment and made research and distance education possible. Results from both countries indicated that there was a definite need for the training of rural women in computer and Internet use in order to assist them in accessing ICTs more often.

Recommendations and information ethical issues

In order for rural women to benefit most from ICTs, the following issues need to be addressed.

Literacy

Due to high levels of illiteracy in computer technology and basic education among rural African women, there is a need to integrate ICT with literacy education in many areas.

In order to create a demand-driven ICT consumer community in rural areas, hindrances to accessibility must be significantly reduced, either before or during the provision of the technology. This necessitates training and skills enhancement initiatives, among other participatory development programmes, such as focus group discussions, direct interviews and workshops.

The development of professionals and teachers as viable intermediaries in bridging the digital divide experienced by low-literate or illiterate youth in school education programmes in rural areas is also of crucial importance.

Cost

The cost of ICT access particularly affects women due to their family responsibilities, such as health and the education of their children. It is therefore necessary to effect and implement policies that involve connectivity and take into account the constraints facing the marginalised. According to the World Bank, competition between telecommunication companies can slash service costs and improve access to technology. As large telecom operators tend to limit their operations to high-income urban areas, privatisation should be extended in order to allow small entrepreneurs to supply telecommunication services to rural areas. Through regulation and subsidies, private operators can be invited to bid for the provision of services in areas that are not commercially viable, in return for a subsidy financed with a universal access fund.

Training

As rural women generally experience lower levels of education than men and a lack of

proficiency in English, ICT training for women would need to be gender sensitive and offered by female trainers wherever possible. There is also a need to support programmes that provide hardware, modems and online access to women's non-governmental organisations (NGOs) and women's centres in organisations and institutions that are embedded in appropriate women's support and distribution systems.

It is also important to support the implementation of ICT technical training programmes for women, and women's access to higher-level training in technical expertise and repair services by examining the role that existing local and national-level women's NGOs can play in ICT distribution, training and support in partnership with technology providers. Women need to be encouraged to feel confident in their ability to use ICTs by focusing on thematic ICT activities that provide tangible benefits of participation. These include:

- Health information and advocacy for women and children (especially concerning reproduction and AIDS)
- Women's rights and legal frameworks supporting the education of women and girls
- Business and entrepreneurial information

Time

Women generally have heavy responsibilities, particularly those involving their families, which result in time constraints. It is therefore imperative that ICTs should be incorporated not only according to the information needs of women, but also in the light of other activities and projects aimed at empowerment, such as women's NGOs, health centres, educational institutions, self-employment and entrepreneurial centres, and churches. In this way, women would be able to experience the tangible use of ICTs.

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