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The feasibility of ICT diffusion amongst African rural women: a case study of South Africa and Kenya

Abstract:

This study explores whether ICT use is feasible in the rural areas of South Africa and Kenya by using largely survey research method. The survey involved interviewing 400 women aged between 16-60 from both Kenya and South Africa. The multistage sampling data was obtained from Census household data of the magisterial districts of Umlalazi i.e. Eshowe, Amatikulu, Gigindlovu and Mtunzini (South Africa), and from the sub-divisions of the Kaplamai Division in Trans-Nzoia district, i.e. Kimoson, Sinyerere, Sitatunga and Makutano (Kenya). 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 the computer/internet, more than half (115: 57.5%) of the respondents faced problems ranging from affordability to distance and time. Additionally, there is a marked correlation between educational level, type of ICTs accessed on one hand and information need and purposes on the other. It is observed that alone, ICTs are insufficient for significant benefits to emerge. Information ethical challenges are identified and recommendations made.

Agenda

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Introduction

Although definitions as to what Information and Communication Technologies (ICTs) 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 of 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, 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 IT in all sectors of the economy. Some authors, like Chowdhury in Adeya (2002:1), are of the opinion that "*the poor cannot eat high-speed Internet*", while others like Barlow in Adeya (2002:1) maintain that "*Africa should skip industrialism entirely and leap directly into the information era*".

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

Economic implications primarily focus on the importance of science and technology (Basson: 1996). Basson stresses the need for African governments to utilize 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. Rathgeber observes that newly industrialized 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 and Mansell in Rathbeger, 2000:3). According to the World Bank (1998/99:20), this capacity for ICT production has immensely contributed to East Asian economic growth. The World Bank further asserts that the 'knowledge gap' in many developing countries is a contributory factor to poverty. According to their report, 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 e-mail access to a vast number of individuals.

One of the most innovative breakthroughs of the 20th Century was the Internet, whose effects are changing how traditional technologies are used, and how wireless technologies are deployed. According to Marker, Wallace and Macnamara (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; i.e., recent innovations in hand-held devices, in mobile telephony, and in 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, Wallace and Mcnamara (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 on poverty alleviation at various community levels. Examples of ICT access by the African rural poor in addressing their information needs are largely drawn from health, agriculture, community mobilization, and education and training.

When citing political implications, a narrative by Mudhai (2004:2-4) in the World Summit on 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' and gives examples of achievements in Nigeria, where there is an increase in fixed telephone lines from 300,000 to 720,000, and a rise in mobile phone subscribers from 500,000 to 2.5 million over the last two years. Other examples, provided by Mudhai, are: Egypt, which stresses the importance of the E-Africa Connection project within NEPAD; and Mozambique's and Rwanda's Heads of State, 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 East Africa's technological hub, with broadband fibre-optic and wireless access to all schools within three years. Equally encouraging is Botswana, which is investing in ICTs as an imperative industry with the proposed US$ 300million East African Submarine Cable

System (EASSy). This cable system's intended docking points are situated in Kenya, Tanzania, Uganda, Mozambique, Madagascar, Djibouti and South Africa. All these 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 women 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 (Momo, 2005:2; Amoake in Soltane 2002:1; Adhiambo, 2001:1).

The UNDP (2001:3-16) argues that harnessing ICTs for human development requires raising awareness 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 telecommunications 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, Wallace and McNamara (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), illustrate 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 licenses, and on the ensuing skills required to use and manage this industry. This 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 International Technology Development Group [ITDG] (2005) has expressed the view that women rarely contribute to the policy debate surrounding poverty as most are often illiterate, lack confidence and mobility. Related problems and challenges have also been noted in studies by Ngimwa, Ocholla and Ojiambo (1997) on Kenya, Jiyane and Ocholla (2004) on South Africa, Ikoja – Odongo on women entrepreneurs in Uganda (2002), and Mooko (2002) on Botswana.

This study is largely informed by Info – mobilisation theory. In the light of the aforementioned concepts of systems and STS theories, Harris (2004) describes Info-mobilisation as an organic process of change in which collaborative groups discover and explore problems and address solutions together. Harris explains that Info-mobilisation is a form of interactive development that caters for a collaborative learning process, based on the evolving needs of a community. Thus, in his view Info-mobilisation involves adaptive learning, community learning, and the alignment of social and technological systems, participative values, and social and stakeholder groups. The overall view by Harris (2002) suggests that the development community should look toward the corporate world in order to understand the paths that they have traversed in adopting ICT. According to the author,

> *"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"* (Harris, 2002:1).

Accordingly, the concept of "community" is under-stressed 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:

1. Info mobilisation is concerned with the information requirements of communities. It addresses the design, delivery and utilisation of community information systems (Harris: 2004:38).

2. ICTs can only have optimal impacts in rural communities if they are imbedded within other community development initiatives (Harris, 2004:38).

3. 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 (Harris 2004:35-36).

This 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 principals could be applied to rural set-ups in any African environment.

The study answered the following questions: How does ICT development, policies and strategies in Kenya and South Africa compare? What are 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 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 population in order to determine their current status in relation to information and the use of ICTs. The study was carried out in two countries, namely Kenya and South Africa. In South Africa, the study narrowed its focus down to the uMlalazi (KZ 283) municipality. According to the Uthungulu Distict Municipality report (2003), most of the population within the Umlalazi sub-region is migrant, resulting in larger female numbers in the region. Umlalazi sub-region/municipality is mostly rural in nature, with only a few urban settlements This municipality is located in Uthungulu District in the province of Kwa-zulu 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 (South African Statistics (http://www.statssa.gov.za/ :2001). While 43% live in urban areas, 57% reside in the rural areas (Kwa-Zulu – Natal, 2001). In Kenya, the study focused on the Transnzoia District, which is situated in the Rift Valley province of Kenya. The Rift Valley province is one of eight provinces in Kenya and has a population density of 7 million people (Opondo and Sekou-Ochieng, 2000).The Rift Valley province is one of the largest and most economically vibrant provinces in Kenya. Trans – Nzoia Disrict is an administrative district of the Rift Valley Province, Kenya, 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 - the free Encyclopaedia, 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 sub-groups in the population, purposive sampling was first applied. This sampling technique allowed us to initially identify suitable regions in Kenya and in South Africa which possessed high population densities. Using 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 South Africa and Kenya, stage 1 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 foundation that they are both densely populated. Additionally, most of the populations in both these regions reside 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 the highest population densities, but also a population with a fair mix of all four races i.e. Black, White, Indian and Colored.

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 sub-divisions 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 minimize and control bias and cut down 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 wards were placed in a box from which four wards were randomly drawn, namely: Eshowe, Amatikulu, Gigindlovu and Mtunzini.

In Kenya, the sub-divisions of Kaplamai Division, namely Kimoson, Motosiet, Sinyerere, Sitatunga, Makutano, Biribiriet, Kapsara and Kapolet, served as suitable starting points from which to draw four subdivisions. Having placed these subdivisions in a box, four sub-divisions were drawn, namely: Kimoson, Sinyerere, Sitatunga and Makutano.

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 Kenya and South Africa. The selection of the sample size was based on Gay's (1996:125) guidelines. According to Gay: (i) the larger the population size, the smaller the percentage of the population required to get a representative sample; (ii) for smaller populations (N<100) there is little point in sampling; (iii) if the population size is around 1500, 20% should be sampled; and (iv) beyond 5000, the population size is irrelevant and a sample size of 400 is adequate. The sample size was deemed suitable because 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 years; 21-30 years; 31-40 years; 41-50 years and 51-60 years.

Data was collected using a structured questionnaire, whereby the questionnaire was used 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 the respondents. The completed questionnaires from 400 respondents formed the basis of data analysis and interpretations for survey research. A total of approximately 400 questionnaires were administered and divided under the following categories:

- Section one: personal information;
- Section two: the information needs and seeking behaviour of rural women: This included:
    1. Health information needs, purposes, sources and ICTs used
    2. Educational information needs, purposes, sources and ICTs used
    3. Social welfare information needs, purposes, sources and ICTs used
    4. Agricultural information needs, purposes, sources and ICTs used
    5. Commerce and trade information needs, purposes, sources and ICTs used
- Section three: enhancement of quality of life and social welfare
- Section four: hindrances to ICT tools and services
- Section five: training needs.

A coding scheme was developed and input into the Statistical Package for Social Science (SPSS). Data was then analyzed 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 that sought to ascertain personal information such as their age, field of occupation and educational attainment. These 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 assistantsd administered the survey.

Regarding age group, data obtained from rural KZN indicates that the highest number of respondents were between the ages of 31-40 years (66; 33.0%), followed by respondents in the 13-20 year 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. Coming to Kenya, the highest number 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 Kenya and South Africa indicates that there is 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 are more respondents between the ages of 13-20 residing in the rural areas of Kenya, there are more respondents between the ages of 21 – 30 residing in the rural areas of South Africa. Alternatively, there is 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 Kwa-Zulu Natal (KZN) [SA], most respondents (81; 40.5%) had acquired secondary education, while 62 (31.0%) had primary education. However, only 34 (17.0%) respondents had acquired tertiary-college/varsity education, with 23 (11.5%) respondents reportedly having no schooling at all. Therefore, an average of 72 (35.8%) respondents had acquired basic education.

In rural Rift Valley Province (RVP) [Kenya], survey results indicate that most respondents (71; 35.5%) had primary education, 66 (33%) had secondary education, and 33 (16.5%) had obtained tertiary-college/varsity education. 30 (15%) respondents had no schooling at all. On average, 69 (34.2%) respondents had obtained basic education.

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

In terms of the occupations of rural women in KZN (S.A), it was established that 58 (29.0%) respondents are small-scale traders, followed by those who work as housewives/homemakers (48; 24.0%). Other categories are farm workers (25; 12.5%), domestic workers (18; 9.0%), educators/teachers (16; 8.0%) and students (15; 7.5%). 3 (1.5%) respondents were entrepreneurs owning large-scale enterprises, i.e. a guesthouse, a sugar cane plantation and a fruit farm. Only 9 (4.5%) respondents worked as clerical and community development workers (6; 3.0%). There were two preachers (2; 1.0%). In RVP (Kenya), the study's empirical results indicate that 68 (34%) respondents are small-scale traders, followed by: housewives, 29 (14.5%); educators/teachers, 27 (13.5); farmers, 26 (13.0); and students, 11(5.5%). Domestic workers and preachers accounted for 10 (5.0%) each. This is closely followed by farm workers (6; 3.0%); large-scale entrepreneurs (5; 2.5%); nurses (4; 2.0%); clerical workers (2; 1.0%) and community development workers (2; 1.0%).

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

The P-values for the occupations of rural women in South Africa and Kenya indicate that with the exception of traders and preachers (in which percentages for Kenya are higher), there is a higher percentage of housewives, farm workers, 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 has a fair share of farmers and nurses, South Africa has no record of these two occupations amongst its rural respondents.

ICTs frequently used to access/receive educational, business/ trade, health, agricultural and social welfare 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 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, the respondents also use other sources to obtain information, such as printed material, libraries, friends, neighbours etc. (see table 1).

Within the field of education, the information needs of the respondents in rural KZN (SA) 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 ranged from personal welfare and better living standards, to study assignments, counselling, further studies and job opportunities. The table above reveals that radio broadcasts are still highly prevalent as a source of information (160; 80%). The use of TV is relatively low (82; 41%). While 32 (16%) respondents also use film to access educational information, a similar number of respondents 25 (13%) use the cell-phone and telephone. Videos are also common (30; 15%). In comparison to other sectors, the educational sector has the highest number of respondents using the computer/internet (22; 11%). Only 8 (4%) respondents use mobile cinemas and CD-ROMs (2%) to access educational information.

In rural RVP (Kenya), the information needs of respondents ranged from course work/research topics (23.5%), to student services/colleges (22%), occupational information (12%), pre-school/primary school information (11.0%), further studies (10.5%), business education/financial management (9.5%), teaching (8.5%) and curriculum studies (3.0%).

Reasons for yielding educational information ranged from personal welfare and better living standards, to study assignments, counselling, child welfare, job opportunities, study assignments and future careers. The table above reveals that the radio is also highly prevalent among users (154; 77%). The TV is used by 81 (41%) respondents. While 25 (13%) respondents use films as a source of information, there are more respondents who use the cell phone (24; 12%) than the telephone (7; 4%). Video is used by 7 (4%) respondents. An equal number of respondents (5; 3%) use the computer/internet and the mobile cinema respectively.

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

ICTs	Education		Health		Business		Agriculture		Social Welfare		AV		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
Films	13	16	24	20	7	18	9	26	20	16	14.6	18.2	0.3315
Cell-phone	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 cinemas	3	4	4	5	3	1	3	3	3	6	3.2	3.8	0.2092
CD-ROM	-	2	-	2	-	1	-	-	-	-	-	1.0	-

With regard to health, the information needs of the respondents from rural KZN (S.A) ranged from respiratory illnesses e.g. TB and asthma (21.3%), to HIV/AIDS (21.3%), arthritis (10.6%), terminal and chronicle diseases such as cancer (6.3%), waterborne diseases (6.3%), diet/nutrition (6.3 %), rheumatism (5.0%), family planning (5.0%), rabies (4.0%), snake bites (3.8%), sexually transmitted diseases (3.8%), dentistry (3.8%), and fits (2.5%). Reasons for obtaining this information ranged from personal welfare, to children's welfare and general awareness. The radio scored highly as a source of information, as survey results revealed that 162 (81%) respondents use it to access information. The TV is equally important, as 88 (44%) respondents use it on occasion to source their health information.

While 40 (20%) respondents use film to access health information, there are more respondents who use the cell-phone (35; 18%), than the telephone (8; 4%). An insignificant number of respondents (12; 6%) use the computer/internet and video (12; 6%) for accessing health information. Only 10 (5.0%) use the mobile cinema, while 3 (2%) use the CD-ROM.

With regard to the health information needs of rural respondents from RVP (Kenya), the information needs ranged from family planning/gynaecology (32.5%), to tropical diseases e.g. malaria (24.0%), HIV/AIDS (17.0%), respiratory illnesses/coughs (7.0%), cancer (2.5%), Sexually Transmitted Infections (3.5%), snake bites (3.0), waterborne diseases (2.5%), diet/nutrition (1.5%), diabetes (1.0%), dentistry (3.5%), and fits (2.0%).

The reasons for obtaining this information ranged from personal welfare, to child and family welfare, and in some instances, for general awareness. The radio came first as a source of information (176; 88%), followed by the TV, which is only used by 65 (33%) respondents. While 47 (24%) respondents use films as their source of information, 40 (20%) respondents use the cell phone and only 5 (3%) use the telephone. Likewise, 10 (5.0%) respondents use the video, and only 7 (4.0%) respondents use mobile cinemas. Notably, there are no respondents who use the computer/internet and CD-ROM for their health information needs.

In the area of business and trade, areas in which respondents in RVP (Kenya) required information ranged from starting up a business (30.0%), pricing/marketing (14.0%), finance/book-keeping (12.5%), planning/management (10.5%), supplies/purchasing (8.0%), animal husbandry (7.0%), poultry keeping (7.0%), craftsmanship (5.5%), and exchange rates (5.5%). Reasons for obtaining this information include 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%) respondents use the radio, 71 (36%) use the TV for their information needs. Notably, 13 (7%) respondents use films as their source of information, while 14 (7%) use the cell phone. Only 8 (4%) use the telephone, compared to a slightly higher number of respondents (14; 7%) who use the telephone. The use of the computer/internet is negligible, with only 2 (1%) respondents using it as their source. None of the

respondents use the CD-ROM. The video is used by 6 (3%) respondents, while mobile cinemas are used by 5 (3%).

In KZN (SA), 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/book-keeping (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 ranged from 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 use the radio alone for their information requirements, 68 (34%) use the TV. The number of those who use film to obtain business information is 9 (18%). Notably, although not necessarily unusual in modern times, there are more respondents who use the cell-phone (25; 13%), than the telephone (10; 5%). Videos are also accessed by 12 (6%) respondents for business related needs. A negligible number of respondents (6; 3%) use the computer/internet to obtain information. There were two respondents who used the mobile-cinema, and one who used CD-ROMs.

The agricultural information requirements of the respondents from KZN (SA) included farm inputs/new technology (28.8%), crop type/diseases (22.5%), soil types/fertility (18.8%), livestock keeping (13.8%), herbicides/fencing (10.0%), and gardening/crop management (6.3%). This information was required for good harvests, enhancing animal fertility, preventing crop and animal diseases, improving sales, aesthetics and spiritual offerings. Most of those interviewed (142; 71%) used the radio, while less than half of this number 70(35%) used the TV. Cell–phones stood at 28 (14%), while the telephone was used by 23 (12%) respondents. Only 6 (3%) respondents use the mobile cinema, while two (1%) respondents use the computer/internet and video respectively.

The agricultural information needs of the respondents from RVP (Kenya) ranged from animal husbandry (35.5%), farm inputs/new technology (47%), soil type (5.5%), crop type/diseases (4.5%, 1.5%) and gardening/crop management (6.0%). In turn, this information was required for good

harvests, farming, enhancing herd fertility, prevention of diseases, aesthetic values and for health. Most of those interviewed (130; 65%) use the radio for their information needs, while 71 (36%) use the TV. While 17 (9%) respondents use films for their information needs, there are more respondents who use the cell-phone (14; 7%), than those who use the telephone (8; 4%). The video is used by 10 (5%) respondents for agricultural information needs. Only 5 (3%) respondents use mobile cinemas. Notably, there are no respondents who use the computer/internet and CD-ROM.

Social welfare information needs in rural KZN (SA) ranged from water resources and pit latrines (42.5%) to music/religious gatherings (23.8%), travel/holidays (10%), and community projects/women group activities (8.8%), pension (8.8%) and shopping/movies (6.3%). Reasons for obtaining this information ranged from leisure activities, entertainment, spiritual growth and relaxation and improved standards of living. Once again, the radio as a source of information scored high (160; 80%). The TV (86; 43%) was equally useful. Films (32; 16%) were also used as a source of information. The use of the cell-phone and the telephone stood at 34 (17%) and 32 (16%) respectively. The video is used by 22 (11%) respondents to source information, compared to 12 (6%) respondents who use the computer/internet for their information requirements.

In Kenya, the need to acquire social welfare information ranged from community projects/social meetings (154; 77%), water resources/pit latrines (11; 5.5%), spiritual matters (21; 10.5%), sports (4; 2%), shopping/travelling (3; 1.5%) and pension/housing (7; 3.5%). Reasons given for accessing this information ranged from leisure activities, spiritual growth, women's empowerment, improved standards of living, relaxation and for health reasons. The radio as a source of information came first, as 153 (77%) respondents use it to access social welfare information. The TV is used by 85 (43%) respondents. Films, on the other hand, are used by 39 (20%) respondents, while the cell-phone is used by 36 (18%) respondents. Notably, the telephone is used by only 9 (5%) respondents. The computer/internet plays no significant role, as only 2 (1%) respondents use it for their information needs. While 6 (3%) respondents use mobile cinemas, there were no respondents who use the CD-ROM.

On the whole, the radio is evidently highly accessed and is used by approximately 73% of the rural

women in South Africa, particularly for education, health and social welfare needs. The TV plays an equally important role in accessing information, as 39% of the respondents use it for their information requirements. The cell–phone has a clear advantage over the telephone, as 15% of the respondents use it, compared to 10.2% who use the telephone. Those who are mostly in the field of education (30; 15%) and social welfare (22; 11%) use videos. Although the computer/internet maintains a dismal average of only 5.6%, it is mostly used by those in the field of education (22; 11%).

Kenya's empirical results indicate that radio and television are the most commonly used ICTs amongst rural women in Kenya. An average of 74.4% use the radio for their information needs, while the TV is used by an average of 37.8%. The cell-phone has a comparative advantage over the telephone as it is used by 12.8% of the respondents. The latter is used by only 4.0%. Notably, the use of films as a source of information is on average higher than the cell-phone and the telephone, as 14.6% use it to source information. While 4.6% of the respondents use the video, 3.2% use mobile cinemas. Invariably, data indications are that the computer/internet and the CD-ROM have no value amongst rural women in Kenya.

use mobile cinemas. Invariably, data indications are that the computer/internet and the CD-ROM have no value amongst rural women in Kenya.

From the above results the study can safely deduce that an average of 74% of the respondents from both South Africa and Kenya use the radio as a medium of information access. Correspondingly, an average of only 38% use the TV for their information needs. Whereas 10.2% of the respondents in KZN (SA) use the telephone, only 4% from RVP (Kenya) use the telephone. In both countries, the use of modern technologies such as the computer/internet is negligible.

Alternative sources of information for educational, business/trade, health, agricultural and social welfare information amongst rural women in Kenya and South Africa.

In this question, 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 (38.0%) form the bulk of alternative sources of information amongst the respondents in RVP (Kenya). This is 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. Other sources such as traditional healers (7.8%), information centres (4.9%), newspapers (2.4%), magazines (2.4%), farmer's cooperatives (1.5%) and nurses/midwives (1.5%) are less used as sources of information.

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

Sources of Information	Education		Health		Business		Agriculture		Social Welfare		Av		
	SA	*K*	SA	K	SA	K	SA	K	SA	K	SA	K	
	f	*f*	*f*	*f*	*F*	*f*	*f*	*F*	*f*	*f*	*%*	*%*	P-Value
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/Ext. 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 Ass/co-operatives	-	-	-	-	-	-	-	3	-	-	-	1.5	-
Exhibitions/ Trade Fairs	-	-	5	-	23	54	10	29	-	-	6.3	20.8	0.0000
Nurses/Mid-wives	-	-	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

Similarly, friends (54.2%), neighbours (48.4%) and family (46.2%) are highly favoured as alternative sources of information amongst the respondents from KZN (SA). Other sources include 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%) are not popular sources of information amongst the rural women in South Africa.

The P-Value for alternative sources of information for educational, business/ trade, health, agricultural and social welfare information amongst women in Kenya and in South Africa illustrates that there is a higher use of alternative sources of information, such as newspapers, magazines, friends and neighbours, in rural KZN (SA) than in RVP (Kenya). However, community leaders, area leaders and trade fairs/exhibitions play a more significant role in RVP (Kenya) than in KZN (SA).

Comments on the use and availability of ICTs in rural KZN (South Africa) and rural RVP (Kenya)

In table 3, respondents were asked to give their personal responses to an open-ended question regarding the use and availability of ICTs in their community. The aim of this question was to capture varying opinions and attitudes related to ICT use and accessibility in their community. Data was then analyzed using content analysis. The survey revealed that a significant number (57; 28.5%) of the respondents in KZN (SA) felt that ICTs were not only unavailable and inaccessible to them, but also difficult to use. Similarly, 25 (12.5%) respondents felt that ICTs are costly and unaffordable. Coincidentally, the number 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. 9 (9.5.0%) respondents were of the opinion that ICTs were easily available and accessible, while 18 (9.0%) felt that ICTs are affordable. A few respondents attuned to problems with infrastructure, such as lack of power (13; 6.5%) and poor TV and radio networks (10; 5.0%).

Table 3 Comments on the use and availability of ICTs in the community. N=200 (South Africa)

Comments	Frequency	Percent
Unavailable, difficult to use	57	28.5
ICTs are costly & unaffordable	25	12.5
ICTs are handy	20	10.0
Establish ICT centres near rural women	20	10.0
Easily available and accessible	19	9.5
ICTs are affordable	18	9.0
Lack of power	13	6.5
Great improvement in ICTS	10	5.0
Poor TV& Radio networks	10	5.0
There's no trust in ICTs	8	4.0
Total	**200**	**100**

In table 4, results from Kenya indicate that a large number of the 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 portrayed that 139 (69.5%) respondents felt that ICTs were either too far, too costly or entirely unavailable. Only 16 (8%) respondents acknowledged the usefulness and availability of ICTS, citing that they were "handy" (2; 1%) or "improved access to information" (14; 7%).

Table 4 Comments on use and availability of ICTs in the Community. (Kenya) N=200

Comments	Kenya	
	Frequency	**Percent**
Would like affordable ICTs	63	31.5
ICTs should be made available	48	24
ICTs should be made accessible	28	14
There is improved information access with the use of ICTs	14	7
Use of ICTs depends on ones lifestyle	11	5.5
ICTs are very handy	2	1
There is need for ICT centres in rural areas	15	7.5
TV/ Radio networks are poor	2	1
Lack of power hinders use of ICTs	15	7.5
Total	**200**	**100**

How ICTs have enhanced the rural women's quality of life

A number of arguments have been raised as to 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 areas in which ICTs have served them best. In this question, the scale of 4 denoted a high and favourable response, (i.e. "always"), followed by 3 (i.e. "often"), 2 (i.e. "sometimes"), 1 (i.e. "never") and a "not applicable" scale. 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 (91.5% in South Africa and 91.0% in Kenya) respondents felt that ICTs, particularly the radio and TV, helped them socially enrich their lives. This was followed closely by the need to keep in touch with family and friends (81.0% in South Africa and 87.0% in Kenya). To most respondents, the mobile phone was particularly useful in this regard. Under entertainment, the respondents listed the ability to listen to music and other entertaining programs as important. With the help of ICTs, this service recorded the highest result overall, with 94.0% for Kenya and 71.5% for South Africa. Interestingly, although the use of the fax machine (44%) stood out as an important activity, particularly in South Africa, it scored dismally in Kenya (16.0%).

Additionally, the P-Value on how ICTs have enhanced the rural women's quality of life illustrates that respondents in both RVP (Kenya) and KZN (SA) feel that ICTs help them in accessing/receiving news items and keeping in touch with family and friends.

There is, however, a higher percentage of respondents in RVP (Kenya) than in KZN (SA) who feel that ICTs enhance their lives through entertainment, for research purposes and for distance education.

Table 5 How ICTs have enhanced the women's quality of life in South Africa (n=200) and Kenya (n=200).

Activity	Always		Often		Some-Times		Never		N/a		Av=% 4+3+2		P-Value
	SA	K	SA	K	SA	K	SA	K	SA	K	SA	K	
To listen to news	157	121	12	35	14	26	12	12	5	6	91.5	91.0	0.8596
In touch with family and friends	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
To fax doc.	41	11	17	5	30	16	90	162	22	6	44.0	16.0	0.0000
Data proc.	38	9	5	6	15	31	115	147	27	7	29.0	23.0	0.1721
For research purposes	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 Agen.	25	12	3	14	10	46	138	123	24	5	19.0	36.0	0.0002
Internet/ related serv.	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

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Training needs for Kenya (n=200) and training needs for South Africa (n=200)

In the table below, 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, i.e. very essential, followed by 3 (i.e. essential), 2 (i.e. quite essential), 1(not very essential) and a "not applicable" scale. 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 (S A) and 25.5% of the respondents in RVP (Kenya) felt that basic education was essential. Similarly, while 26.5% have a need for basic education in KZN (SA), there was an average of 45.0% in RVP (Kenya) who also felt that they needed secondary education. Notably, 42.0% of the respondents in KZN (SA) and 45.5% of the respondents in RVP (Kenya) felt that adult education was essential. Interestingly, from all the enlisted training needs, computer/internet training scored highly, as 66.5% in KZN (SA) and 81.5% in RVP (Kenya) felt that this training would be essential. This was followed by 50.5% in KZN (SA) and 62.5% in RVP (Kenya) indicating that vocational training would be of foremost importance to them.

The P-Value on training needs for Kenya and South Africa illustrates that the with the exception of basic primary education and adult education, there is a significant difference in the training needs for Kenyan and South African rural women.

On the whole, results from both countries indicate that there is a definite need for the [internet/computer] training of rural women in order to assist them in accessing ICTs more often.

Table 6 Training needs for Kenya (n=200) and Training needs for South Africa (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

Discussions and Conclusions

Essentially, while there are more respondents between the ages of 13-20 residing in the rural areas of Kenya, there are more respondents between the ages of 21 – 30 residing in the rural areas of South Africa. Alternatively, there are a larger number of respondents over the age of 50 residing in the rural areas of South Africa than in Kenya. Secondly, in terms of education, the study indicates that there is no significant difference between the education levels of rural women in South Africa and Kenya. More specifically, while an average of about 34% have basic education in both Kenya and South Africa, well over 10% of the respondents in both the two nations, have no schooling at all. It was also noted further that with the exception of traders and preachers (in which percentages for Kenya are higher), there is a higher percentage of housewives, farm workers, 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 has a fair share of farmers and nurses, South Africa has no records of either of these occupations amongst its rural respondents. Thirdly, ICTs most commonly used by rural women indicate that an average of 74% of the respondents from both South Africa and Kenya use the radio as a medium of information access. An average of only 38% use the TV for their information needs. In both KZN (SA) and RVP (Kenya), the cell–phone has a clear advantage over the telephone. While the cell phone is used by 15% of the respondents in KZN (compared to 10.2% who use the telephone), it is used by 12.8% of the respondents in RVP (Kenya), compared to 4.0% who use the telephone. In both countries, the use of modern technologies such as the computer/internet is negligible. Family, friends and neighbours form the bulk of alternative sources of information in both RVP (Kenya) and KZN (South Africa). Additionally, there is a higher use of alternative sources of information, such as newspapers, magazines, friends and neighbours, in rural KZN (SA) than in RVP (Kenya). However, community leaders, area leaders, trade fairs/exhibitions play a more significant role in RVP (Kenya) than in KZN (SA). Fourthly, a large number (57; 28.5%) of the respondents in KZN (SA) felt that ICTs were not only unavailable and inaccessible, but also difficult to use. 25 (12.5%) respondents felt that ICTs are costly and unaffordable. Coincidentally, the number of those who found ICTs useful (20; 10%) and those who felt that ICT centres should be established near rural women (20; 10%) were similar. 9 (9.5.0%) respondents were of the opinion that ICTs were easily available and accessible, while 18 (9.0%) felt that ICTs are affordable. A few respondents attuned to problems with infrastructure, such as lack of power (13; 6.5%) and poor TV and radio networks (10; 5.0%).In Kenya, a large number of respondents (63; 31.5%) indicated that ICTs were unaffordable, followed by 48 (24%) stating them unavailable and 28 (14%) inaccessible. Fifthly, there is an indication that respondents in both RVP (Kenya) and KZN (SA) feel that ICTs help them in accessing/receiving news items and keeping in touch with family and friends. There is, however, a higher percentage of respondents in RVP (Kenya) than in KZN (SA) who feel that ICTs enhance their lives through entertainment, for research purposes and for distance education. In so far as training is concerned, results from both countries indicate that there is a definite need for the [internet/computer] training of rural women in order to assist them in accessing ICTs more often.

Recommendations and information ethical issues

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

Literacy

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

b) 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 amongst other participatory development programs such as focus group discussions, direct interviews and workshops.

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

Cost

Cost issues of ICT access particularly affect women due to their family responsibilities, e.g. 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 marginalized. According to the World Bank, competition between telecommunication companies can slash service costs and improve access to the said technology. Since large telecom operators tend to limit their operations to high income urban areas, privatization should be extended in order to allow small entrepreneurs to supply telecomm 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 women trainers wherever possible. There is also a need to support programs that provide hardware, modems and online access to women's NGOs and women's centres in organizations and institutions which 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:

i. Health information and advocacy for women and children (especially concerning reproductive rights and AIDS)

ii. Women's rights and legal frameworks supporting the education of women and girls

iii. 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 are incorporated not only according to the information needs of women, but also in light of other activities and projects aimed at empowerment, e.g. women's NGOs, health centres, educational institutions, self-employment and entrepreneurial centres, and even churches. In this way, women would be able to experience the tangible use of ICTs.

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